IBM DB2 10.5
for Linux, UNIX, and Windows

What's New for DB2 Version 10.5

SC27-5519-00

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Note
Before using this information and the product it supports, read the general information under Appendix D, "Notices," on page 107.

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Contents

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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 features and enhancements introduced in Version 10.5, read Part 1, "What's New," on page 1.

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.

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Part 2: What's changed

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 "FP*x*" prefix at the beginning of the topic title, where *x* represents a fix pack level.

The following highlighting conventions are used in this book.

Bold	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.
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.

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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)

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- 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.

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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.

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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

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- OBJECT_COL_GBP_INVALID_PAGES
- OBJECT_COL_LBP_PAGES_FOUND
- OBJECT_COL_GBP_INDEP_PAGES_FOUND_IN_LBP

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_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
  - 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

- 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 ACTIVITY METRICS control is set to `BASE`.

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
  - 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 SUPERASYNC 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.

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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 -1 -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.

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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.

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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.

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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

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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.

  See Call Level Interface Guide and Reference Volume 2 .
- 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

  See Call Level Interface Guide and Reference Volume 2 and Call Level Interface Guide and Reference Volume 1.
- You can now validate all database and DSN entries in the `db2dsdriver.cfg` file with the **db2cli** command. See Command Reference.

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.

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- 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

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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.

Troubleshooting command	New parameter
db2pd	**detail** This parameter is a new suboption to the `db2pd -wlocks` command. Use this parameter to display the TableNm, SchemaNm, and AppNode columns for application locks that are being waited on. **-extentmovement** Use this parameter to display the extent movement status of your database. **-membersubsetstatus** Use this parameter to dump the state of member subsets. **-subsetid** Use this parameter to identify a subset.
db2support	**-alldbs | -alldatabases** Use this parameter to specify that information about all databases that are found in the database directory is collected. **-sg** *group_name* **| -system_group** *group_name* Use this parameter to collect system-related information about the specified system group. **-su** *user_name* **| -system_user** *user_name* Use this parameter to collect system-related information about the specified system user. **-wlm** Use this parameter to collect information that is related to WLM issues as part of the optimizer mode with collection level 0 and above.

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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 instancewith a superset topology. Restore support includes a tablespace rollforward operation through member addition events.

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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.

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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.

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- 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 2. Summary of new Version 10.5 database manager configuration parameters

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

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

Registry variable	New values
DB2_WORKLOAD	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.

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

Registry variable	Changed behavior
DB2DSDRIVER_CFG_PATH	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.

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

Parameter name	Description	Details
extended_row_sz	Extended row size	This parameter specifies if a table definition can exceed the maximum row length of the page.
dft_table_org	Default table organization	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.
nchar_mapping	National character mapping	This parameter determines the data type mapping for national character string data types in Unicode databases.

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Table 5. New Version 10.5 database configuration parameters (continued)

Parameter name	Description	Details
opt_direct_wrkld	Optimize directed workload	This database configuration parameter enables or disables explicit hierarchical locking (EHL). It affects the database across the entire DB2 pureScale instance.
page_age_trgt_gcr	Page age target group crash recovery	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.
page_age_trgt_mcr	Page age target member crash recovery	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.
string_units	Default string units	This parameter specifies the default string units that are used when you are defining character data types and graphic data types.

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

Parameter name	Description	Details
db_mem_thresh	Database memory threshold configuration parameter	In Version 10.5, the default value for **db_mem_thresh** is changed from 10 to 100 for new (not upgraded) databases.
hadr_spool_limit	HADR log spool limit configuration parameter	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.
hadr_syncmode	HADR synchronization mode for log write in peer state configuration parameter	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.

Table 6. Database configuration parameters with changed behaviors, new ranges, or new values (continued)

Parameter name	Description	Details
hadr_target_list	HADR target list configuration parameter	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.
sortheap	Sort heap size configuration parameter	In Version 10.5, the default value for **sortheap** is changed from `4 194 303` to `4 294 967 295` for 64-bit platforms.

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.COLUMNS catalog view
- SYSSTAT.INDEXES catalog view
- SYSSTAT.TABLES catalog view

The following system catalog views have been added in Version 10.5:

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- "SYSCAT.MEMBERSUBSETATTRS catalog view" in SQL Reference Volume 1
- "SYSCAT.MEMBERSUBSETMEMBERS catalog view" in SQL Reference Volume 1
- "SYSCAT.MEMBERSUBSETS catalog view" in SQL Reference Volume 1

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 7. Changed DB2 commands

DB2 command name	Details about the change
db2cat	The **db2cat** output now displays information for random ordering of index keys. Since random ordered indexes are extended indexes, **Extend Index Info** is also displayed for any output that is returned by the command.
db2exfmt	The **db2exfmt** output now displays information for random ordering of index keys. `R` indicates a column with a RANDOM order. `A` indicates a column with an ASCENDING order. `D` indicates a column with a DESCENDING order. The **db2exfmt** command now also generates output for queries that access column-organized tables.
db2expln	The **db2expln** output now displays information for random ordering of index keys. `Random` indicates a column with a RANDOM order. The **db2expln** command now also generates output for queries that access column-organized tables.
db2level	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 **db2level** command with the **-localMember** parameter. In earlier releases, the **db2level** command displayed the current version and service level for the member where the command was issued.
db2look	This command now generates DDL statements to create column-organized tables in addition to row-organized tables.
db2pd	The **-apinfo** parameter now displays more information about current and past activities of the unit of work (UOW). The **-edus** parameter now also displays the agents that are processing column-organized data. The **showlocks** 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 **showlocks** parameter with the **-locks** parameter. The **-tablespace** parameter now displays the RSE column to indicate whether the reclaimable space feature is enabled. The **-transactions** parameter now displays the total number of application commits and the total number of application rollbacks.

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Table 7. Changed DB2 commands (continued)

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

Changes to SQL statements

The following SQL statements have been changed:

Table 8. Changed SQL statements

SQL statement	Details about the change
CREATE TABLE statement	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 **dft_table_org** database configuration parameter. The default table organization is ROW, unless the **DB2_WORKLOAD** registry variable is set to ANALYTICS prior to creating the database. For more details, see "Creating column-organized tables" in *Database Administration Concepts and Configuration Reference*.
CREATE INDEX statement	New RANDOM clause to specify a random ordering for the index that is created.

Discontinued DB2 commands or SQL statements

The following DB2 commands or SQL statements are discontinued:

Table 9. Discontinued DB2 commands or SQL statements

DB2 command or SQL statement	Details about the change
db2IdentifyType1	The **db2IdentifyType1** 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.
STATISTICS YES parameter of the **LOAD** command	The **STATISTICS YES** parameter of the **LOAD** command is discontinued. The functionality associated with this parameter has been replaced with the functionality associated to the **STATISTICS USE PROFILE** parameter.
dynexpln	The **dynexpln** command is discontinued. Use the **db2expln** command instead of the **dynexpln** command. The **db2expln** command provides equivalent functionality because it can process dynamic statements directly.

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.

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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

Registry or environment variable	Details
DB2_EVMON_EVENT_LIST_SIZE	Setting this registry variable has no effect because of the changes that were made to the underlying event monitor infrastructure in Version 9.7.
DB2_NCHAR_SUPPORT	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".

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

Parameter name	Description	Details
buffpage	Buffer pool size	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.
softmax	Recovery range and soft checkpoint interval	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.

The following database configuration parameters are discontinued:

Table 12. Discontinued database configuration parameters

Parameter name	Details
auto_stats_prof	This configuration parameter is discontinued because automatic statistics profiling is discontinued. For more information, see "Automatic statistics profiling is discontinued" on page 66.
auto_prof_upd	This configuration parameter is discontinued because automatic statistics profiling is discontinued. For more information, see "Automatic statistics profiling is discontinued" on page 66.

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 **dynexpln** 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

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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

Discontinued routine or view	Deprecated since	New routine or view	Replaced since
SNAPSHOT_AGENT table function	Version 9.1	MON_GET_AGENT table function and MON_GET_CONNECTION table function	Version 10.5 and Version 9.7
SNAPSHOT_APPL table function	Version 9.1	MON_GET_CONNECTION table function and MON_GET_UNIT_OF_WORK table function	Version 9.7
SNAPSHOT_APPL_INFO table function	Version 9.1	MON_GET_CONNECTION table function and MON_GET_UNIT_OF_WORK table function	Version 9.7
SNAPSHOT_BP table function	Version 9.1	MON_GET_BUFFERPOOL table function	Version 9.7
SNAPSHOT_CONTAINER table function	Version 9.1	MON_GET_CONTAINER table function	Version 9.7
SNAPSHOT_DATABASE table function	Version 9.1	MON_GET_DATABASE table function and MON_GET_TRANSACTION_LOG table function	Version 10.5
SNAPSHOT_DBM table function	Version 9.1	MON_GET_INSTANCE table function	Version 10.5
SNAPSHOT_DYN_SQL table function	Version 9.1	MON_GET_PKG_CACHE_STMT table function	Version 9.7
SNAPSHOT_FCM table function	Version 9.1	MON_GET_FCM table function	Version 9.7 Fix Pack 2
SNAPSHOT_FCMNODE table function	Version 9.1	MON_GET_FCM_CONNECTION_ LIST table function	Version 9.7 Fix Pack 2
SNAPSHOT_FILEW procedure	Version 9.1	SNAP_WRITE_FILE procedure	Version 9.1
SNAPSHOT_LOCK table function	Version 9.1	MON_GET_APPL_LOCKWAIT table function, MON_GET_LOCKS table function, MON_FORMAT_LOCK_NAME table function	Version 9.7 Fix Pack 1

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

Discontinued routine or view	Deprecated since	New routine or view	Replaced since
SNAPSHOT_LOCKWAIT table function	Version 9.1	MON_GET_APPL_LOCKWAIT table function, MON_GET_LOCKS table function, and MON_FORMAT_LOCK_NAME table function	Version 9.7 Fix Pack 1
SNAPSHOT_QUIESCERS table function	Version 9.1	SNAP_GET_TBSP_QUIESCER table function	Version 9.1
SNAPSHOT_RANGES table function	Version 9.1	SNAP_GET_TBSP_RANGE table function	Version 9.1
SNAPSHOT_STATEMENT table function	Version 9.1	MON_GET_ACTIVITY table function and MON_CURRENT_SQL administrative view	Version 10.5 and Version 9.7 Fix Pack 1
SNAPSHOT_SUBSECT table function	Version 9.1	SNAP_GET_SUBSECTION table function	Version 9.1
SNAPSHOT_SWITCHES table function	Version 9.1	SNAP_GET_SWITCHES table function	Version 9.1
SNAPSHOT_TABLE table function	Version 9.1	MON_GET_TABLE table function	Version 9.7
SNAPSHOT_TBREORG table function	Version 9.1	MON_GET_UTILITY table function and SNAP_GET_TAB_REORG table function	Version 10.5 and Version 9.1
SNAPSHOT_TBS table function	Version 9.1	MON_GET_TABLESPACE table function	Version 9.7
SNAPSHOT_TBS_CFG table function	Version 9.1	MON_GET_TABLESPACE table function and MON_GET_REBALANCE_STATUS table function	Version 9.7 and Version 10.1
SNAPSHOT_UTIL table function	Version 8	MON_GET_UTILITY table function	Version 10.5
SNAPSHOT_UTIL_PROG table function	Version 8	SNAPUTIL_PROGRESS administrative view and SNAP_GET_UTIL_PROGRESS table function	Version 9.1
SQLCACHE_SNAPSHOT table function	Version 9.1	MON_GET_PKG_CACHE_STMT table function	Version 9.7

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

Registry or environment variable	Details
DB2_INDEX_FREE	This registry variable provided the same functionality as the PCTFREE clause in a CREATE INDEX statement. The difference is that **DB2_INDEX_FREE** applies to all indexes that you create and the PCTFREE clause applies to one index. For more details, see CREATE INDEX statementCREATE INDEX statement. Setting this registry variable results in an error because the associated functionality is no longer available.
DB2_TRUSTED_BINDIN	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.

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

Parameter name	Description	Details
buffpage	Buffer pool size	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.
softmax	Recovery range and soft checkpoint interval	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.

The following database configuration parameters are discontinued:

Table 16. Discontinued database configuration parameters

Parameter name	Details
auto_stats_prof	This configuration parameter is discontinued because automatic statistics profiling is discontinued. For more information, see "Automatic statistics profiling is discontinued" on page 66.
auto_prof_upd	This configuration parameter is discontinued because automatic statistics profiling is discontinued. For more information, see "Automatic statistics profiling is discontinued" on page 66.

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

Release	Links to additional information
Version 9.7	• See "Discontinued functionality summary" at http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/topic/com.ibm.db2.luw.wn.doc/doc/c0023234.html
Version 10.1	• See "Discontinued functionality summary " at http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/c0023234.html • 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
Version 10.5	• See "Discontinued functionality summary " at http://publib.boulder.ibm.com/infocenter/db2luw/v10r5/topic/com.ibm.db2.luw.wn.doc/doc/c0023234.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

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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

Functionality	Discontinued in release	Links to additional information
ADD PARTITIONING KEY and DROP PARTITIONING KEY clauses of the ALTER TABLE statement	To be determined	See "ADD PARTITIONING KEY clause of the ALTER TABLE statement is deprecated" at http://publib.boulder.ibm.com/infocenter/db2luw/v9/topic/com.ibm.db2.udb.rn.doc/doc/c0023217.htm and "DROP PARTITIONING KEY clause of the ALTER TABLE statement is deprecated" at http://publib.boulder.ibm.com/infocenter/db2luw/v9/topic/com.ibm.db2.udb.rn.doc/doc/c0023216.htm
COLNAMES column in SYSCAT.INDEXES	To be determined	See "COLNAMES column in SYSCAT.INDEXES is deprecated" at http://publib.boulder.ibm.com/infocenter/db2luw/v9/topic/com.ibm.db2.udb.rn.doc/doc/c0023225.htm
Database logging using raw devices	To be determined	See "Database logging using raw devices is deprecated" at http://publib.boulder.ibm.com/infocenter/db2luw/v9/topic/com.ibm.db2.udb.rn.doc/doc/c0023086.htm
Default function entry points support in external routine libraries	To be determined	See "External routines now require an explicit entry point specification" at http://publib.boulder.ibm.com/infocenter/db2luw/v9/topic/com.ibm.db2.udb.rn.doc/doc/c0023021.htm
iCheckPending parameter	To be determined	See "Check pending table state is replaced and iCheckPending parameter is deprecated" at http://publib.boulder.ibm.com/infocenter/db2luw/v9/topic/com.ibm.db2.udb.rn.doc/doc/c0024079.htm
IMPORT command options **CREATE** and **REPLACE_CREATE**	To be determined	See "IMPORT command options CREATE and REPLACE_CREATE are deprecated" at http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/topic/com.ibm.db2.luw.wn.doc/doc/i0052280.html
logretain and **userexit** configuration parameter	Version 10.1	See "Some configuration parameters have been deprecated and discontinued" at http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058741.html

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

Functionality	Discontinued in release	Links to additional information
the **-file** option of the **db2flsn** command	To be determined	See "Log control file SQLOGCTL.LFH has been renamed and copied" at http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/topic/com.ibm.db2.luw.wn.doc/doc/i0051995.html
LONG VARCHAR and LONG VARGRAPHIC data types	To be determined	See "FP1: LONG VARCHAR and LONG VARGRAPHIC data types have been deprecated" at http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/topic/com.ibm.db2.luw.wn.doc/doc/i0053661.html
Network Information Services (NIS and NIS+) support and related registry variable (Linux and UNIX operating systems)	To be determined	See "Network Information Services (NIS and NIS+) support is deprecated (Linux and UNIX)" at http://publib.boulder.ibm.com/infocenter/db2luw/v9/topic/com.ibm.db2.udb.rn.doc/doc/c0024980.htm
agentpri configuration parameter	To be determined	See "Some database manager configuration parameters have changed" at http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/topic/com.ibm.db2.luw.wn.doc/doc/i0052553.html
app_ctl_heap_sz, **appgroup_mem_sz**, and **groupheap_ratio** configuration parameters	To be determined	See "Some database configuration parameters have changed" at http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/topic/com.ibm.db2.luw.wn.doc/doc/i0052508.html
buffpage database configuration parameter	To be determined	See "Version 8 incompatibilities with previous releases" at http://publib.boulder.ibm.com/infocenter/db2luw/v8/index.jsp?topic=/com.ibm.db2.udb.doc/admin/r0008109.htm
indexsort database configuration parameter	Version 8	See "Version 8 incompatibilities with previous releases" at http://publib.boulder.ibm.com/infocenter/db2luw/v8/index.jsp?topic=/com.ibm.db2.udb.doc/admin/r0008109.htm
maxagents and **maxcagents** configuration parameters	To be determined	See "Some database manager configuration parameters have changed" at http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/topic/com.ibm.db2.luw.wn.doc/doc/i0052553.html

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

Functionality	Discontinued in release	Links to additional information
numsegs database configuration parameter	To be determined	See "Some database configuration parameters have changed" at http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/topic/com.ibm.db2.luw.wn.doc/doc/i0052508.html
query_heap_sz database manager configuration parameter	To be determined	See "Some database manager configuration parameters have changed" at http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/topic/com.ibm.db2.luw.wn.doc/doc/i0052553.html
Static data stream snapshot output	To be determined	See "Static data stream snapshot output is deprecated" at http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/topic/com.ibm.db2.luw.wn.doc/doc/i0052585.html
SNAP_GET_DB_V91, SNAP_GET_DB_V95, and SNAP_GET_DYN_SQL_V91 table functions	Version 10.1	See "Some version-suffixed SQL administrative routines have been discontinued" at http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058675.html
ADMINTABCOMPRESSINFO and SNAPTBSP_PART administrative views, ADMIN_GET_TAB_COMPRESS_INFO and WLM_GET_ACTIVITY_DETAILS table functions	To be determined	Deprecated Version 9.5 SQL administrative routines and their replacement routines or viewsSee "Deprecated Version 9.5 SQL administrative routines and their replacement routines or views" at http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/topic/com.ibm.db2.luw.sql.rtn.doc/doc/r0023171.html
IBM DB2 Geodetic Data Management Feature	Version 10.1	See "IBM DB2 Geodetic Data Management Feature has been discontinued" at http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0059833.html
HP-UX 32-bit client support	To be determined	See "FP7: HP-UX 32-bit client support has been deprecated" at http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/topic/com.ibm.db2.luw.wn.doc/doc/i0058505.html
DB2 Health Advisor	To be determined	See "FP8: DB2 Health Advisor has been deprecated" at http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/topic/com.ibm.db2.luw.wn.doc/doc/i0059075.html

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

Registry variable	Discontinued in release	Links to additional information
DB2_ALLOCATION_SIZE	To be determined	See "Some registry and environment variables are deprecated" at http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/topic/com.ibm.db2.luw.wn.doc/doc/i0052033.html
DB2ATLD_PORTS	To be determined	See "Some registry and environment variables are deprecated" at http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/topic/com.ibm.db2.luw.wn.doc/doc/i0052033.html
DB2_ASYNC_IO_MAXFILOP	Version 10.1	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
DB2_BAR_AUTONOMIC_DISABLE	Version 10.1	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
DB2BPVARS	To be determined	See "Some registry and environment variables are deprecated" at http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/topic/com.ibm.db2.luw.wn.doc/doc/i0052033.html
DB2_COMMIT_ON_EXIT	To be determined	See the "Deprecated registry variables in Version 9.1 table" at http://publib.boulder.ibm.com/infocenter/db2luw/v9/index.jsp?topic=/com.ibm.db2.udb.admin.doc/doc/r0004670.htm%23r0004670__depr-rv
DB2COUNTRY	Version 10.1	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

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

Registry variable	Discontinued in release	Links to additional information
DB2_CORRELATED_PREDICATES	To be determined	See the "Deprecated registry variables in Version 9.1 table" at http://publib.boulder.ibm.com/infocenter/db2luw/v9/index.jsp?topic=/com.ibm.db2.udb.admin.doc/doc/r0004670.htm%23r0004670__depr-rv
DB2DEFPREP	Version 10.1	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
DB2_DJ_COMM	Version 10.1	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
DB2DMNBCKCTLR	Version 10.1	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
DB2_ENABLE_BUFPD	To be determined	See the "Deprecated registry variables in Version 9.1 table " at http://publib.boulder.ibm.com/infocenter/db2luw/v9/index.jsp?topic=/com.ibm.db2.udb.admin.doc/doc/r0004670.htm%23r0004670__depr-rv
DB2_ENABLE_SINGLE_NIS_GROUP	To be determined	See the "Deprecated registry variables in Version 9.1 table " at http://publib.boulder.ibm.com/infocenter/db2luw/v9/index.jsp?topic=/com.ibm.db2.udb.admin.doc/doc/r0004670.htm%23r0004670__depr-rv
DB2FFDC	Version 10.1	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
DB2_HASH_JOIN	Version 10.1	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

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

Registry variable	Discontinued in release	Links to additional information
DB2_INDEX_FREE	Version 10.5	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
DB2_MAP_XML_AS_CLOB_FOR_DLC	Version 10.1	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
DB2_MAPPED_BASE	To be determined	See the "Deprecated registry variables in Version 9.1 table " at http://publib.boulder.ibm.com/infocenter/db2luw/v9/index.jsp?topic=/com.ibm.db2.udb.admin.doc/doc/r0004670.htm%23r0004670__depr-rv
DB2MEMMAXFREE	Version 10.1	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
DB2_NO_MPFA_FOR_NEW_DB	To be determined	See the "Deprecated registry variables in Version 9.1 table" at http://publib.boulder.ibm.com/infocenter/db2luw/v9/index.jsp?topic=/com.ibm.db2.udb.admin.doc/doc/r0004670.htm%23r0004670__depr-rv
DB2_PARTITIONEDLOAD_DEFAULT	To be determined	See "Some registry and environment variables are deprecated" at http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/topic/com.ibm.db2.luw.wn.doc/doc/i0052033.html
DB2_PRED_FACTORIZE	To be determined	See the "Deprecated registry variables in Version 9.1 table " at http://publib.boulder.ibm.com/infocenter/db2luw/v9/index.jsp?topic=/com.ibm.db2.udb.admin.doc/doc/r0004670.htm%23r0004670__depr-rv
DB2PRIORITIES and **DB2NTPRICLASS**	To be determined	See "Some registry and environment variables are deprecated" at http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/topic/com.ibm.db2.luw.wn.doc/doc/i0052033.html

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

Registry variable	Discontinued in release	Links to additional information
DB2ROUTINE_DEBUG	Version 10.1	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
DB2_RR_TO_RS	Version 10.1	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
DB2_SNAPSHOT_NOAUTH	Version 10.1	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
DB2_TRUSTED_BINDIN	Version 10.5	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
DB2_UPDATE_PART_KEY	Version 10.1	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
DB2_VENDOR_INI	To be determined	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
DB2YIELD	Version 10.1	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

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 20. Functionality deprecated in Version 9.7

Functionality	Discontinued in release	Links to additional information
CREATE EVENT MONITOR FOR DEADLOCKS statement and DB2DETAILDEADLOCK event monitor	To be determined	See "CREATE EVENT MONITOR FOR DEADLOCKS statement and DB2DETAILDEADLOCK event monitor have been deprecated" at http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/topic/com.ibm.db2.luw.wn.doc/doc/i0054715.html
CREATE EVENT MONITOR FOR TRANSACTIONS statement	To be determined	See "CREATE EVENT MONITOR FOR TRANSACTIONS statement has been deprecated" at http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/topic/com.ibm.db2.luw.wn.doc/doc/i0054716.html
DB2 Governor	To be determined	See "DB2 Governor and Query Patroller have been deprecated" at http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/topic/com.ibm.db2.luw.wn.doc/doc/i0054901.html
Query Patroller	Version 10.1	See "Query Patroller has been discontinued" at http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058730.html
IBM DB2 Geodetic Data Management Feature	Version 10.1	See "IBM DB2 Geodetic Data Management Feature has been discontinued" at http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0059833.html
db2imigr and **db2ckmig** commands	Version 10.1	See "db2imigr and db2ckmig commands have been discontinued" at http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058593.html
MIGRATE DATABASE commands; sqlemgdb and sqlgmgdb APIs	To be determined	See "Instance and database migration commands and APIs have been deprecated" at http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/topic/com.ibm.db2.luw.wn.doc/doc/i0053793.html
-s parameter of the **db2iupdt** command	Version 10.1	See "**-s** parameter of the db2iupdt command has been discontinued" at http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058592.html

Table 20. Functionality deprecated in Version 9.7 (continued)

Functionality	Discontinued in release	Links to additional information
-file parameter of the **db2rfpen** command	Version 10.1	See "-file parameter of the db2flsn and db2rfpen commands has been discontinued" at http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058592.html
-global parameter of the **db2trc**, **db2pd**, **db2fodc**, **db2pdcfg**, and **db2support** command	To be determined	See "FP4: The -global parameter for troubleshooting tools has been deprecated" at http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/topic/com.ibm.db2.luw.wn.doc/doc/i0058858.html
CONVERT parameter of the **REORG INDEXES** command	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
Worksheet Format (WSF) for Import and Export utilities	Version 10.1	See "Worksheet Format (WSF) for Import and Export utilities have been discontinued" at http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0057410.html
LIST TABLESPACES and **LIST TABLESPACE CONTAINERS** commands and related APIs: • sqlbctsq • sqlbftsq • sqlbftpq • sqlbgtss • sqlbmtsq • sqlbotsq • sqlbstpq • sqlbstsq • sqlbtcq	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)

Functionality	Discontinued in release	Links to additional information
sqlugrpn API	To be determined	See "sqlugrpn API has been deprecated" at http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/topic/com.ibm.db2.luw.wn.doc/doc/i0054733.html
sqlugtpi API	To be determined	See "sqlugtpi API has been deprecated" at http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/topic/com.ibm.db2.luw.wn.doc/doc/i0053643.html
db2HistoryCloseScan, db2HistoryGetEntry, db2HistoryOpenScan, and db2HistoryUpdate APIs	Version 10.1	See "Support in COBOL, FORTRAN, and REXX for DB2 APIs that manage database history records has been discontinued" at http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0059298.html
details_xml reported in logical data groups	To be determined	See "FP6: Reporting of metrics in details_xml by the statistics event monitor has been deprecated" at http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/topic/com.ibm.db2.luw.wn.doc/doc/i0060390.html
dyn_query_mgmt database configuration parameter	Version 10.1	See "Some configuration parameters have been deprecated and discontinued" at http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058741.html
DB2SE_USA_GEOCODER	Version 10.1	See "DB2SE_USA_GEOCODER has been discontinued" at http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0059643.html
Subset of Net Search Extender features and commands	To be determined	See "Subset of Net Search Extender features and commands have been deprecated" at http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/topic/com.ibm.db2.luw.wn.doc/doc/i0054683.html
Subset of SQL administrative routines	To be determined	See "Deprecated Version 9.7 SQL administrative routines and their replacement routines or views" at http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/topic/com.ibm.db2.luw.sql.rtn.doc/doc/r0023171.html

Table 20. Functionality deprecated in Version 9.7 (continued)

Functionality	Discontinued in release	Links to additional information
SNAP_GET_TBSP_PART_V91 table function	Version 10.1	See "Some version-suffixed SQL administrative routines have been discontinued" at http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058675.html
SNAP_GET_DBM_MEMORY_POOL table function and SNAPDBM_MEMORY_POOL administrative view	To be determined	See "FP5: Some monitoring routines and views are deprecated" at http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/topic/com.ibm.db2.luw.wn.doc/doc/i0059455.html
SNAP_GET_DB_MEMORY_POOL table function and SNAPDB_MEMORY_POOL administrative view	To be determined	See "FP5: Some monitoring routines and views are deprecated" at http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/topic/com.ibm.db2.luw.wn.doc/doc/i0059455.html
SNAP_GET_AGENT_MEMORY_POOL table function and SNAPAGENT_MEMORY_POOL administrative view	To be determined	See "FP5: Some monitoring routines and views are deprecated" at http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/topic/com.ibm.db2.luw.wn.doc/doc/i0059455.html
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	Version 10.1	See "DB2 administration tools have been discontinued" at http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058731.html

Table 20. Functionality deprecated in Version 9.7 (continued)

Functionality	Discontinued in release	Links to additional information
DB2 administration server (DAS)	To be determined	See "Control Center tools and DB2 administration server (DAS) have been deprecated" at http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/topic/com.ibm.db2.luw.wn.doc/doc/i0054250.html
DB2 Health Advisor	To be determined	See "FP4: DB2 Health Advisor has been deprecated" at http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/topic/com.ibm.db2.luw.wn.doc/doc/i0059075.html
Health monitor	To be determined	See "Health monitor has been deprecated" at http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/topic/com.ibm.db2.luw.wn.doc/doc/i0055045.html
HP-UX 32-bit client support	To be determined	See "FP3: HP-UX 32-bit client support has been deprecated" at http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/topic/com.ibm.db2.luw.wn.doc/doc/i0058505.html
IBM SDK Version 1.4.2 support for Java routines	To be determined	See "IBM Software Developer's Kit (SDK) 1.4.2 support for Java routines has been deprecated" at http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/topic/com.ibm.db2.luw.wn.doc/doc/i0055421.html
Visual Studio 2005 support	Version 10.1	See "Visual Studio 2005 support has been discontinued" at http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0060222.html

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

Registry variables	Discontinued in release	Links to additional information
DB2_CAPTURE_LOCKTIMEOUT	To be determined	See "Some registry and environment variables are deprecated" at http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/topic/com.ibm.db2.luw.wn.doc/doc/i0052033.html

Table 21. Registry variables deprecated in Version 9.7 (continued)

Registry variables	Discontinued in release	Links to additional information
DB2_QP_BYPASS_APPLICATIONS	Version 10.1	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
DB2_QP_BYPASS_COST	Version 10.1	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
DB2_QP_BYPASS_USERS	Version 10.1	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
DB2_SERVER_ENCALG	To be determined	See "Some registry and environment variables are deprecated" at http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/topic/com.ibm.db2.luw.wn.doc/doc/i0052033.html
DB2_USE_DB2JCCT2_JROUTINE	Version 10.1	See "Some registry and environment variables are deprecated" at http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/topic/com.ibm.db2.luw.wn.doc/doc/i0052033.html

Table 21. Registry variables deprecated in Version 9.7 (continued)

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

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

Functionality	Discontinued in release	Links to additional information
Activity monitor routines	To be determined	See "Activity monitor routines have been deprecated" at http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0059660.html

Table 22. Functionality deprecated in V10.1 (continued)

Functionality	Discontinued in release	Links to additional information
Agent priority of service classes	Version 10.5	See "Agent priority of service classes has been deprecated" at http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0059645.html
Automatic statistics profiling	Version 10.5	See "Automatic statistics profiling has been deprecated" at http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0060240.html
Collations based on the Unicode Standard version 4.0.0	To be determined	See "Collations based on the Unicode Standard version 4.0.0 have been deprecated" at http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058749.html
INSTALL_TSAMP response file keyword	To be determined	See "IBM Tivoli System Automation for Multiplatforms (SA MP) is now automatically installed" at http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0059123.html
Net Search Extender	To be determined	See "Net Search Extender has been deprecated" at http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058722.html
DMS permanent table spaces	To be determined	See "FP1: DMS permanent table spaces are deprecated" at http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0060577.html
SMS permanent table spaces	To be determined	See "SMS permanent table spaces are deprecated" at http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058748.html
Subset of version-suffixed SQL administrative routines	To be determined	See "Some version-suffixed SQL administrative routines have been deprecated" at http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058674.html

Table 22. Functionality deprecated in V10.1 (continued)

Functionality	Discontinued in release	Links to additional information
db2IdentifyType1 command	Version 10.5	See "db2IdentifyType1 command has been deprecated" at http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0059642.html
db2_install command	To be determined	See "db2_install command has been deprecated (Linux and UNIX)" at http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058736.html
-flushbp parameter of the **db2pdcfg** command	To be determined	See "**-flushbp** parameter of the **db2pdcfg** command has been deprecated" at http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058772.html
One column output by the **-tcbstat** parameter of the **db2pd** command	To be determined	See "One column output by the **-tcbstat** parameter of the **db2pd** command has been deprecated" at http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058932.html
Some parameters of the CREATE DATABASE command	To be determined	See "Some parameters of the CREATE DATABASE command have been deprecated" at http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058750.html
dynexpln command	Version 10.5	See "**dynexpln** command has been deprecated" at http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058770.html
PRUNE LOGFILE command	To be determined	See "**PRUNE LOGFILE** command is deprecated" at http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0060625.html
ALLOW READ ACCESS parameter of the **LOAD** command	To be determined	See "FP1: ALLOW READ ACCESS parameter of the **LOAD** command is deprecated"at http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058771.html

Table 22. Functionality deprecated in V10.1 (continued)

Functionality	Discontinued in release	Links to additional information
Some options of the REORG INDEXES/TABLE command and parameter values for related DB2 API data structures	To be determined	See "REORG INDEXES/TABLE command parameters and parameter values for related DB2 API data structures have been deprecated or discontinued" at http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0059689.html
Format of the **-m** and **-cf** parameters in some commands that manage instances	To be determined	See "Some commands that manage instances have changed" at http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0059122.html
ALTER DATABASE statement	To be determined	See "ALTER DATABASE statement has been deprecated" at http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058773.html
details_xml reported in logical data groups	To be determined	See "FP1: Reporting of metrics in details_xml by the statistics event monitor has been deprecated" at http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0060390.html
health_mon database configuration parameter	To be determined	See "Some configuration parameters have been deprecated and discontinued" at http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058741.html
mincommit database configuration parameter	To be determined	See "Some configuration parameters have been deprecated and discontinued" at http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058741.html
ENHANCED_MULTIPLE_DISTINCT setting for **DB2_EXTENDED_OPTIMIZATION**	To be determined	See "Some registry and environment variables have changed" at http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0052034.html
SNAPHADR administrative view and SNAP_GET_HADR table function	To be determined	See "Some monitoring interfaces for HADR have been deprecated" at http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0059582.html

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

Registry variables	Discontinued in release	Links to additional information
DB2_LIKE_VARCHAR	To be determined	See "Some registry and environment variables have been deprecated" at http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0052033.html

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

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

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

Registry variables	Discontinued in release	Links to additional information
	To be determined	See “Some registry and environment variables are deprecated” at http://publib.boulder.ibm.com/infocenter/db2luw/v10r5/topic/com.ibm.db2.luw.wn.doc/doc/i0052033.html

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

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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

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Part 4. Appendixes

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Appendix A. Functionality in DB2 features and DB2 product editions

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

Functionality	DB2 Express-C	DB2 Express® Edition[1]	DB2 Workgroup Server Edition	DB2 Enterprise Server Edition	DB2 Advanced Workgroup Server Edition	DB2 Advanced Enterprise Server Edition	DB2 Developer Edition
Adaptive Compression and classic row compression	No	No	No	No	Yes	Yes	Yes
Change data capture replication with two other DB2 LUW servers	No	No	No	No	Yes	Yes	Yes
Compression: backup	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Connection concentrator	No	No	No	Yes	Yes	Yes	Yes
Continuous Data Ingest	No	No	No	No	Yes	Yes	Yes
DB2 Advanced Copy Services (using Tivoli Storage FlashCopy® Manager)	No	Yes	Yes	Yes	Yes	Yes	Yes
DB2 column-organized tables	No	No	No	No	Yes	Yes	Yes
functionality	No	No	No	No	Yes[2]	Yes[2]	Yes
DB2 Governor	No	No	No	Yes	Yes	Yes	Yes
DB2 pureScale functionality	No	No	No	No	Yes	Yes	Yes
DB2 Recovery Expert		IBM DB2 Advanced Recovery Feature	IBM DB2 Advanced Recovery Feature	IBM DB2 Advanced Recovery Feature	IBM DB2 Advanced Recovery Feature	IBM DB2 Advanced Recovery Feature	IBM DB2 Advanced Recovery Feature
DB2 Merge Backup		IBM DB2 Advanced Recovery Feature	IBM DB2 Advanced Recovery Feature	IBM DB2 Advanced Recovery Feature	IBM DB2 Advanced Recovery Feature	IBM DB2 Advanced Recovery Feature	IBM DB2 Advanced Recovery Feature
Federation with DB2 LUW and Informix® Data Server data sources	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Federation with DB2 LUW and Oracle data sources	No	No	No	Yes[2]	Yes[2]	Yes	Yes

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Table 26. Functionality in DB2 features and DB2 database product editions (continued)

Functionality	DB2 Express-C	DB2 Express® Edition[1]	DB2 Workgroup Server Edition	DB2 Enterprise Server Edition	DB2 Advanced Workgroup Server Edition	DB2 Advanced Enterprise Server Edition	DB2 Developer Edition
High availability disaster recovery	No	Yes	Yes	Yes	Yes	Yes	Yes
IBM Data Studio	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IBM InfoSphere Data Architect	No	No	No	No	Yes[3]	Yes[3]	Yes[3]
IBM InfoSphere Optim Configuration Manager	No	No	No	No	Yes	Yes	Yes
IBM InfoSphere Optim Performance Manager Extended Edition	No	No	No	No	Yes	Yes	Yes
IBM InfoSphere Optim pureQuery® Runtime	No	No	No	No	Yes	Yes	Yes
IBM InfoSphere Optim Query Workload Tuner	No	No	No	No	Yes	Yes	Yes
IBM InfoSphere Optim High Performance Unload		IBM DB2 Advanced Recovery Feature	IBM DB2 Advanced Recovery Feature	IBM DB2 Advanced Recovery Feature	IBM DB2 Advanced Recovery Feature	IBM DB2 Advanced Recovery Feature	IBM DB2 Advanced Recovery Feature
IBM Mobile Database	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IBM Mobile Database Sync	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Label-based access control (LBAC)	No	Yes	Yes	Yes	Yes	Yes	Yes
Materialized query tables (MQTs)	No	No	No	Yes	Yes	Yes	Yes
Multidimensio-nal clustering (MDC) tables	No	No	No	Yes	Yes	Yes	Yes
Multi-Temperature Storage	No	No	No	Yes	Yes	Yes	Yes
Net Search Extender	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Online reorganization	No	Yes	Yes	Yes	Yes	Yes	Yes
Oracle Compatibility	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Partitioning - partitioned database environment	No	No	No	No	Yes	Yes	Yes
Partitioning - Table partitioning	No	No	Yes	Yes	Yes	Yes	Yes
pureXML® storage	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Q Replication with two other DB2 LUW servers	No	No	No	No	Yes	Yes	Yes

Table 26. Functionality in DB2 features and DB2 database product editions (continued)

Functionality	DB2 Express-C	DB2 Express® Edition[1]	DB2 Workgroup Server Edition	DB2 Enterprise Server Edition	DB2 Advanced Workgroup Server Edition	DB2 Advanced Enterprise Server Edition	DB2 Developer Edition
Query parallelism	No	No	No	Yes	Yes	Yes	Yes
Replication tools	Yes[4]	Yes[4]	Yes[4]	Yes[4]	Yes	Yes[4]	Yes
Row and column access control (RCAC)	No	Yes	Yes	Yes	Yes	Yes	Yes
Spatial Extender	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SQL Replication between DB2 LUW and Informix Data Server	No	Yes	Yes	Yes	Yes	Yes	Yes
Time Travel Query	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IBM Tivoli System Automation for Multiplatforms	No	Yes	Yes	Yes	Yes	Yes	Yes
Workload management	No	No	No	No	Yes	Yes	Yes

Note:

1. DB2 Express Edition including DB2 Express Edition Fixed Term License
2. This functionality is availably 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

Functionality	DB2 Connect Personal Edition	DB2 Connect server editions
Adaptive Compression	No	No
Advanced Copy Service	No	Yes
Compression: backup	No	No
Compression: Data	No	No
Compression: Index	No	No
Compression: Temp table	No	No
Compression: XML	No	No
Connection concentrator	No	Yes
Continuous Data Ingest	No	No
Database partitioning	No	No
DB2 Governor	No	Yes
Heterogeneous Federation	No	No
High availability disaster recovery	No	Yes
Homogeneous Federation	No	Yes
Homogeneous Q Replication	No	No
IBM Data Studio	Yes	Yes
IBM InfoSphere Optim Performance Manager Extended Edition[1]	No	No
IBM InfoSphere Optim pureQuery Runtime	No	Yes[2]
Label-based access control (LBAC)	No	No
Materialized query tables (MQT)	No	Yes
Multidimensional clustering (MDC) tables	No	Yes
Multi-Temperature Storage	No	No
Online reorganization	No	No
DB2 pureScale	No	No
pureXML storage	No	No

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Table 27. Functionality in DB2 Connect product editions (continued)

Functionality	DB2 Connect Personal Edition	DB2 Connect server editions
Query parallelism	No	Yes
Replication tools	No	Yes[3]
Scan Sharing	No	No
Spatial Extender	No	Yes
Time Travel Query	Yes	Yes
Table partitioning	No	No
Tivoli System Automation	No	Yes
Workload management	No	Yes

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.
2. Only DB2 Connect Unlimited Edition for System z® and DB2 Connect Application Server Advanced Edition include IBM InfoSphere Optim pureQuery Runtime.
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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Do not use this email address to contact DB2 Customer Support. If you have a DB2 technical issue that the documentation does not resolve, contact your local IBM service center for assistance.

DB2 technical library in hardcopy or PDF format

The following tables describe the DB2 library available from the IBM Publications Center at www.ibm.com/e-business/linkweb/publications/servlet/pbi.wss. English and translated DB2 Version 10.1 manuals in PDF format can be downloaded from www.ibm.com/support/docview.wss?rs=71&uid=swg27009474.

Although the tables identify books available in print, the books might not be available in your country or region.

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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

Name	Form Number	Available in print	Availability date
Administrative API Reference	SC27-5506-00	Yes	July 28, 2013
Administrative Routines and Views	SC27-5507-00	No	July 28, 2013
Call Level Interface Guide and Reference Volume 1	SC27-5511-00	Yes	July 28, 2013
Call Level Interface Guide and Reference Volume 2	SC27-5512-00	Yes	July 28, 2013
Command Reference	SC27-5508-00	Yes	July 28, 2013
Database Administration Concepts and Configuration Reference	SC27-4546-00	Yes	July 28, 2013
Data Movement Utilities Guide and Reference	SC27-5528-00	Yes	July 28, 2013
Database Monitoring Guide and Reference	SC27-4547-00	Yes	July 28, 2013
Data Recovery and High Availability Guide and Reference	SC27-5529-00	Yes	July 28, 2013
Database Security Guide	SC27-5530-00	Yes	July 28, 2013
DB2 Workload Management Guide and Reference	SC27-5520-00	Yes	July 28, 2013
Developing ADO.NET and OLE DB Applications	SC27-4549-00	Yes	July 28, 2013
Developing Embedded SQL Applications	SC27-4550-00	Yes	July 28, 2013
Developing Java Applications	SC27-5503-00	Yes	July 28, 2013
Developing Perl, PHP, Python, and Ruby on Rails Applications	SC27-5504-00	No	July 28, 2013
Developing RDF Applications for IBM Data Servers	SC27-5505-00	Yes	July 28, 2013
Developing User-defined Routines (SQL and External)	SC27-5501-00	Yes	July 28, 2013
Getting Started with Database Application Development	GI13-2084-00	Yes	July 28, 2013

Table 28. DB2 technical information (continued)

Name	Form Number	Available in print	Availability date
Getting Started with DB2 Installation and Administration on Linux and Windows	GI13-2085-00	Yes	July 28, 2013
Globalization Guide	SC27-5531-00	Yes	July 28, 2013
Installing DB2 Servers	GC27-5514-00	Yes	July 28, 2013
Installing IBM Data Server Clients	GC27-5515-00	No	July 28, 2013
Message Reference Volume 1	SC27-5523-00	No	July 28, 2013
Message Reference Volume 2	SC27-5524-00	No	July 28, 2013
Net Search Extender Administration and User's Guide	SC27-5526-00	No	July 28, 2013
Partitioning and Clustering Guide	SC27-5532-00	Yes	July 28, 2013
pureXML Guide	SC27-5521-00	Yes	July 28, 2013
Spatial Extender User's Guide and Reference	SC27-5525-00	No	July 28, 2013
SQL Procedural Languages: Application Enablement and Support	SC27-5502-00	Yes	July 28, 2013
SQL Reference Volume 1	SC27-5509-00	Yes	July 28, 2013
SQL Reference Volume 2	SC27-5510-00	Yes	July 28, 2013
Text Search Guide	SC27-5527-00	Yes	July 28, 2013
Troubleshooting and Tuning Database Performance	SC27-4548-00	Yes	July 28, 2013
Upgrading to DB2 Version 10.5	SC27-5513-00	Yes	July 28, 2013
What's New for DB2 Version 10.5	SC27-5519-00	Yes	July 28, 2013
XQuery Reference	SC27-5522-00	No	July 28, 2013

Table 29. DB2 Connect-specific technical information

Name	Form Number	Available in print	Availability date
DB2 Connect Installing and Configuring DB2 Connect Personal Edition	SC27-5516-00	Yes	July 28, 2013
DB2 Connect Installing and Configuring DB2 Connect Servers	SC27-5517-00	Yes	July 28, 2013
DB2 Connect User's Guide	SC27-5518-00	Yes	July 28, 2013

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/.

For DB2 Version 9.5 topics, the *DB2 Information Center* URL is http://publib.boulder.ibm.com/infocenter/db2luw/v9r5.

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C

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F

G

H

I

J

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IBM DB2 10.5 for Linux, UNIX, and Windows

What's New for DB2 Version 10.5