IBM Db2 13 for z/OS delivers leading-edge AI innovations and enhancements, reinforcing it as the foundation for enterprise computing within the hybrid cloud and digital world

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At a glance

IBM(R) Db2(R) 13 for z/OS(R) (Db2 13) delivers significant innovations and capabilities that can help with:

- Industry-first integrated approach to developing and deploying AI insights within applications
- Infusing AI to improve operational efficiency and reduce costs
- Enhanced resiliency, efficiency, and application stability for unparalleled availability
- Synergy with IBM z16 for enhanced efficiency and differentiating business value
- Simplified database management and upgrades to help accelerate feature adoption and time to value

Overview

Db2 13 brings leading-edge AI innovation and enhancements to help reinforce Db2 for z/OS as a foundation for enterprise computing within the hybrid cloud and digital world. Db2 13 continues to enhance availability, security, and resiliency while also applying AI to help improve the performance of operational processes and business results.

Industry-first embedded AI uncovers hidden insights using SQL in the new SQL Data Insights feature

- Offers an innovative database-integrated approach to developing large-scale AI insights
- Uncovers hidden insights and inferred meaning within Db2 for z/OS
- Provides data and relationship maps to help answer potential questions
- Embeds deep-learning AI capabilities into Db2 to uncover insights based on hidden relationships and inferred meaning of Db2 data
- Offers AI-related built-in functions in SQL Data Insights that are partially ZIIP eligible

Infused AI helps improve operational efficiency, reduces costs, and increases database administrator (DBA) productivity

Db2 delivers an enhanced customer experience with improved application performance and business resiliency by exploiting AI and machine learning (ML) technology:

- Supports application growth and performance with smarter insert processing
- Improves index maintenance operations
- Reduces downtime when implementing application changes

Enhanced resiliency, efficiency, and application stability for unparalleled availability

Db2 reduces application outages to accommodate application workload growth to simplify processes for DBAs:

- Exploits partition-by-range (PBR) tablespaces with minimal impact to applications
- Provides Application Timeout and Deadlock control
- Turns on/off special registers and global variables without updating applications

Synergy with IBM z16 for enhanced efficiency and differentiating business value

Downtime is expensive. It costs both time and money and can have grave consequences for organizations that are not sufficiently prepared. According to Gartner, downtime costs $5,600 per minute on average. This results in average costs between $140,000 and $540,000 per hour, depending on the organization. Db2 13 increases resiliency with the exploitation of system recovery boost, which helps improve restart performance and minimize downtime.

Enhanced scalability, security, and compliance, enabling businesses to grow in the digital world

Businesses want to expand their systems quickly and easily as their business grows, such as during seasonal business peak periods, without impacting availability. Db2 13 supports new and growing workloads without having to enact deep changes to the Db2 for z/OS environment, as follows:

- Offers improved storage conditions, higher concurrent threads, and increased concurrent data sets or other Db2 activities
- Improves Db2 installation and the process for customizing the amount of private storage
- Provides enhanced DDF storage relief, which gives clients room to grow while helping to reduce outages
- Enhances Real Time Statistics scalability and improved serviceability
- Improves support for log reading from table space at a partition level

With each new release, Db2 for z/OS gets faster and more secure. In database environments, security is critical. Continual monitoring for compliance with standards helps improve security.

- Db2 for z/OS adds automated compliance evidence data collection that enables the IBM Z Security and Compliance Center solution to provide Db2 for z/OS clients with the compliance posture of application and infrastructure running in a Db2 for z/OS environment and simplifies the regulatory controls validation for audits
- Db2 for z/OS improves productivity by enabling DBAs to create routine packages within the trusted context of Db2 for z/OS

Simplified database management and upgrades for faster adoption and time to value

- Ability to upgrade to Db2 13 and exploit new features and functions designed to avoid impacting availability, security, or performance

- Simplified process to upgrade to Db2 13 in a single phase using the CATMAINT job
- Improved ability for ISV products to better support data replication environments through the ability to write decompression dictionaries to the Db2 log
- Improved performance through enhanced REORG INDEX
- Collection of real-time and historical information regarding utility executions

SAP solutions

SAP is currently validating Db2 13. All relevant release information will be published in SAP Note 3152911 and within IBM's SAP on IBM Z(R) Community.

Key requirements

- IBM z/OS V2.4 Base Services (5650-ZOS), or later
- IBM zEC12, or higher, processors running z/OS V2.4, or later

Planned availability date

May 31, 2022

Availability within a country is subject to local legal requirements.

Description

The increasing need for faster business insights, combined with the explosive growth of data, presents unique opportunities and challenges for companies wanting to take advantage of their mission-critical resources. Built on the proven, trusted availability, security, and scalability of Db2 12 for z/OS and the IBM Z platform, the gold standard in the industry, Db2 13 brings you deep learning AI capabilities, improved performance, and synergy with the new IBM z16 hardware.

Db2 13 delivers innovations in these key areas:

New SQL Data Insights feature

SQL Data Insights is a new optional, no-charge feature that provides the user interface for training models and exploring data insights. Db2 13 provides the in-database infrastructure for training and model table (vector table) management. Clients can use this feature to embed deep-learning AI capabilities into Db2 to uncover insights based on hidden relationships and inferred meaning of existing Db2 data. The currently implemented AI-related built-in functions in SQL Data Insights are partially ZIIP eligible.

AI infused in Db2 for z/OS for improved performance

Db2 13 is infused with AI capabilities that help to better serve business and technical insights with improved support for application growth and performance with smarter insert processing, reducing the need for DBA performance-tuning expertise. Additionally, Db2 13 is also designed to deliver the following in this key area:

- Fast index traversal (FTB) support for larger index keys without application changes.
- Improved insert performance for partition-by-growth (PBG) tablespaces.
- With Db2 13, APREUSE offers the option to manage a more granular level access path reuse and reduce error or warning cases from rewritten queries.
- Help reduce downtime for implementing application changes.
- Improved index maintenance operations.

- Reduced overhead for replication of subsets and data partitions.

Qualities of service expanded with scalability, availability, and reliability enhancements

Businesses want to expand their systems quickly and easily as their business grows, such as during seasonal business peak periods, and for end-of-month or end-of-year processing without impacting availability. Db2 13 supports new and growing workloads without having to enact deep changes to the Db2 for z/OS environment by helping reduce internal resource needs of Db2 13 while allowing administrators to quickly adjust to changing system demands. The following enhancements also contribute:

- Improved internal virtual and real storage management
- Reduced ECSA consumption for IFC tracing
- Reduced virtual storage footprint below the 2 Gb bar for SQL statement text
- Improved DBAT termination processes to further reduce the storage footprint below the 2 Gb bar
- Exploitation of z/OS V2.5 capability to reduce storage consumption for open data sets, thereby allowing a larger number of open data sets in Db2
- Improved management of IRLM memory allocation
- SPT01 and SYSLGRNX table spaces converted to DSSIZE 256 GB
- Enhanced dynamic allocation processing
- Dynamically Alter CF lock structure storage

Maintaining availability and serviceability

Businesses must provide continuous access to database resources during planned and unplanned outages. They want to avoid overloading a server in the system to help ensure data availability and to help prevent, for example, denial of service attacks.

- Online conversion from partition-by-growth (PBG) to partition-by-range (PBR) partitioning scheme allows clients to exploit PBR with minimal application impact.
- Application-level control of lock time out intervals and the ability to influence deadlock decisions.
- Ability to delete an active log data set from the BSDS while Db2 is running.
- Enables clients to turn on/off special registers and global variables without updating their applications, and improve availability.
- Authorization cache improvements reduce RACF$^{(R)}$ overhead and reduce contention on RACF resources.

Simplification and ease of use

- Full support for replication of tables containing edit procedures (EDITPROC).
- Enable ISV products that replicate Db2 data to find and use the decompression dictionary to expand the compressed data.
- Improved performance through enhanced REORG INDEX.
- Support for log reading at table space partition level improves replication performance and throughput.

Faster and more secure

Db2 13 is faster and more secure, providing continuous monitoring to help ensure compliance with security standards. Db2 13 helps provide this in the following ways:

- Integrates Db2 for z/OS with the IBM Z Security and Compliance Center product to help Db2 for z/OS clients with the compliance posture of application and infrastructure running in a Db2 for z/OS environment and remains current as regulations change

- Improves productivity by enabling the DBA to create routine packages within the trusted context of Db2 for z/OS using their authorization id, removing the dependency on the security administrator

IBM z16 hardware synergy

- New System Recovery Boost (SRB) in IBM z16 can help improve Db2 for z/OS restart performance, thereby minimizing downtime
- Better insights to tune Db2 performance in data sharing environments with the exploitation of IBM z16
- Expanded SORTL instruction usage based on machine learning on the amount of storage and the number of records being sorted, requires IBM z15™ or higher

Overview of optionally orderable features of Db2 13 for z/OS

Db2 13 for z/OS consists of the base Db2 product with a set of optional, separately orderable features. Some of these features are available at no additional charge and others are chargeable:

SQL Data Insights is a new, nonchargeable feature that provides the user interface for training models and exploring data insights. Db2 13 provides the in-database infrastructure for training and model table (vector table) management. Clients can use this feature to embed deep learning AI capabilities into Db2 to uncover insights based on hidden relationships and inferred meaning of existing Db2 data. The currently implemented AI-related built-in functions in SQL Data Insights are partially ZIIP eligible.

QMF Enterprise Edition feature provides a complete business analytics solution for enterprise-wide business information across end-user and database platforms. QMF Enterprise Edition is a chargeable feature that consists of the following capabilities:

- QMF for TSO and CICS[(R)]
- QMF Enhanced Editor
- QMF applications (previously named QMF Analytics for TSO)
- QMF Z Client
- QMF High Performance Option (HPO)
- QMF Vision
- QMF for Workstation
- QMF for WebSphere[(R)]
- QMF Data Service, including QMF Data Service Studio

New enhancements for each capability are as follows:

QMF for TSO and CICS deliver the following enhancements:

- The CURRENT LOCK TIMEOUT special register can be set from within a QMF SQL query. This special register specifies the number of seconds to elapse before a resource timeout is detected.
- By using new keyword parameters options ALL or NONE on the folder keyword of the LIST command, users can view QMF objects needing to be organized by FOLDER that may help users organize QMF objects. The DESCRIBE Panel has been updated to show all folder names currently assigned to the QMF objects. The DESCRIBE command is executed from an active list of QMF objects.

QMF for Workstation and **QMF for WebSphere** deliver the following enhancements:

- For workstation configurations rollout related to Repository Connections, the JDBC library has been simplified. Users will be able to publish configurations to QMF Server. All workstations connected to QMF Server will receive notification for new configuration. Users will be able to easily apply the new configuration

to their workstation from the download option provided with the notification message. Admin Users will be able to monitor the new configuration rollout from the QMF Server interface. QMF servers can set up in a cluster for scalability and failover.

- The Tip of the day feature can help user productivity by making users more aware of QMF features. Tips are based on individual user activity.

- Users can specify a time zone for scheduling tasks with a drop-down selection menu. The values in the drop-down are sorted by UTC time and can be easily searched and viewed.

- QMF provides support for MongoDB as a read-only data source with the ability to query MongoDB from QMF. QMF accesses MongoDB using MongoDB connector for BI.

- QMF supports hybrid cloud deployment on IBM cloud and Microsoft™ Azure, connecting to on-premises data sources. QMF also supports topology where it can be deployed on-premises and connected to data sources on cloud.

- All QMF objects are supported with Amazon Athena and RedShift.

- z/OS Container Extensions (zCX) enables clients to deploy applications as Docker containers on z/OS, with z/OS Quality of Service. Certification of QMF for WebSphere on zCX simplifies installation and operation of the QMF for WebSphere application on z/OS. Workloads deployed on zCX are zIIP eligible. Clients do not need to provision for a separate Linux[(R)] server.

  Note: zCX support is applicable to QMF for WebSphere, and it is not applicable to QMF for Workstation.

QMF Z Client delivers the following enhancements:

- Support for new global variables for Column default and null indicator. New Global variables supported are DSQCP_TEDFLT, DSQCP_TEDFLT_DBCS, DSQCP_TENULL, and DSQCP_TENULL_DBCS. DSQCP_TEDFLT and DSQCP_TEDFLT_DBCS are used to specify default value for a column. DSQCP_TENULL and DSQCP_TENULL_DBCS are used to indicate null value in a column.

QMF Classic Edition feature supports users working entirely on traditional mainframe terminals and emulators, including IBM Host On Demand, to access Db2 databases. QMF Classic Edition is a chargeable feature that consists of the following capabilities in version 13:

- QMF for TSO and CICS
- QMF Enhanced Editor
- QMF applications (previously named QMF Analytics for TSO)
- QMF for TSO and CICS Classic Edition
- QMF High Performance Option (HPO)

z/OS Application Connectivity to Db2 for z/OS feature is a nonchargeable feature that consists of Universal Database Driver for z/OS Java™ Edition, a pure Java type 4 JDBC driver. It is nonchargeable and designed to deliver high performance and scalable remote connectivity for Java-based enterprise applications on z/OS to a remote Db2 for z/OS database server.

IBM Db2 for z/OS Developer Extension offering is available as a nonchargeable development tool that provides SQL syntax support and basic administrative capabilities for developing applications for Db2 for z/OS. It is not an orderable feature of Db2 for z/OS but instead is available for download from IBM Db2 for z/OS Developer Extension.

Section 508 of the US Rehabilitation Act

The product or offering is capable as of the planned availability date, when used in accordance with associated IBM documentation, of satisfying the applicable standards, including the Worldwide Consortium Web Content Accessibility Guidelines,

European Standard EN 301 349, and US Section 508, provided that any assistive technology used with the product properly interoperates with it. An Accessibility Conformance Statement can be requested on the IBM Accessibility Conformance Report website.

Reference information

For more information about IBM z16, see Hardware Announcement 122-001, dated April 5, 2022.

For more information about Db2 for z/OS tools, see Software Announcement 222-121, dated April 5, 2022.

Availability of national languages

Description	Availability date	Language
Db2 13 for z/OS	May 31, 2022	English, Kanji
SQL Data Insights	May 31, 2022	English
QMF Classic Edition Db2 13	May 31, 2022	English, MUL
QMF Enterprise Edition 13	May 31, 2022	English, MUL
Application Connect Db2 13	May 31, 2022	English

Translation information, if available, can be found at the Translation Reports website.

Program number

Program number	VRM	Program name
5698-DB2$^{(R)}$	13.1.0	IBM Db2 13 for z/OS

Services

IBM Systems Lab Services

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For assistance, contact Systems Lab Services at ibmsls@us.ibm.com.

To learn more, see the IBM Systems Lab Services website.

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For more information, contact Security Expert Labs at sel@us.ibm.com.

For additional information, see the IBM Security Expert Labs website.

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Technical information

Specified operating environment

Hardware requirements

Processors

Db2 13 operates on zEC12, or higher, processors running z/OS 2.4, or later. The processors must have enough real storage to satisfy the combined requirements of:

- Db2 13 for z/OS
- z/OS
- The appropriate DFSMS storage management subsystem components, access methods, telecommunications, batch requirements, and other customer-required applications

Db2 13 will require increased real storage as compared to Db2 12 for z/OS.

The configuration must include sufficient I/O devices to support the requirements for system output, system residence, and system data sets. Sufficient disk storage must be available to satisfy the user's information storage requirements and can consist of any direct-access facility supported by the system configuration and the programming system.

Auxiliary storage

Db2 is independent of disk, solid-state devices (SSD), and tape device type. You can use any magnetic, optical, or tape device that is supported by the data facilities component of DFSMS or the Db2 data sets. Tape products are not supported for databases but can be used for the Db2 archive log and utility functions. The following Db2 data sets are supported by the following device types:

- Active recovery log data sets: disk
- Archive recovery log data sets: disk, tape
- Image copy data sets: disk, tape
- Bootstrap data sets: disk
- User data sets: disk, tape (if migrated by HSM)
- Db2 catalog data sets: disk
- Work data sets (for utilities): disk, tape

If these data sets are on disk that is shared with other z/OS systems, you should use global resource serialization to prevent concurrent access by more than one z/OS system.

The minimum disk space requirement, based on installing Db2 using the panel default values, is approximately 1.3 GB. You need additional disk space for your data. If you use dual logging and tape for the log archiving device, you need at least two tape drives.

Virtual storage

Most of Db2 data resides in shared memory of the Db2 address spaces, above the bar. Db2 13 requires 1 TB of contiguous 64-bit shared private storage above the 2 GB bar for each Db2 subsystem. This storage is virtual, controlled by the z/OS HVSHARE parameter in IEASYSxx. This storage is not backed at allocation, only as it is used. Most control blocks and buffers reside in the extended private area above the 2 GB bar, while modules and some data reside above the 16 MB line, but below the 2 GB bar.

The amount of space needed for the common service area (CSA) below the 16 MB line is less than 40 KB for each Db2 for z/OS subsystem and 24 KB for each IRLM subsystem. High concurrent activity, parallelism, or high contention can require more E/CSA. The amount of 64-bit above the bar common storage needed for each Db2 subsystem is a minimum of 6 GB contiguous controlled by the z/OS HVCOMMON parameter in IEASYSxx.

The SQL Prepare statement text and attributes allocated in the DBM1 address space have changed to ATB storage for both local and distributed applications. Below-the-Bar (BTB) storage savings is application dependent. With FL M500, E/CSA demands are reduced from a maximum of 50 MB to 8 MB when using Db2 trace. Additional E/CSA storage needed for DBATs has been removed in Db2 13. In Db2 13, local and distributed thread E/CSA requirements are now the same.

Db2 13 requires that data sets for the catalog and directory reside on SMS-managed storage. These data sets must belong to an SMS data class that is defined with the extended addressability (EA) attribute. See prefix.SDSNSAMP(DSNTIJSS) for a sample SMS environment.

Data communication devices

Db2 operations can be controlled from:

- The system console
- Authorized IMS Transaction Manager terminals
- Authorized CICS[R] terminals
- TSO terminals (by authorized users)

Function-dependent hardware requirements for Db2 for z/OS components

Certain functions of Db2 for z/OS have associated hardware requirements as specified below. If you do not use these Db2 functions, the hardware requirements do not apply. Some of these functions were made available in previous Db2 for z/OS versions, as noted.

- IBM z16
    - SQL Data Insights performance improvements require the IBM Z Integrated Accelerator for AI (zAIU) component of IBM z16 with z/OS 2.4, or later.
    - Group Buffer Pool residency time reporting requires Coupling Facility Level (CFLEVEL) 25 with IBM z16. This CFLEVEL designation refers to the level of coupling facility images that are used in the sysplex. See the latest Coupling Facility (CF) level recommended for your processor.
- IBM z15[TM] or higher
    - IBM Z Data Privacy for Diagnostics (also in Db2 12 for z/OS)

- zSORT (also in Db2 12 for z/OS) requires IBM Integrated Accelerator for zSORT z15, or higher
- IBM z14[R] or higher
  - Asynchronous Group Buffer Pool (GBP) cross invalidation (also in Db2 12 for z/OS) requires CFLEVEL 23, or later
  - Huffman Compression (also in Db2 12 for z/OS)
  - zHyperLink read (available since Db2 11 for z/OS) and write (available in Db2 12 for z/OS), connecting to IBM DS8880 storage subsystem or higher models
- IBM z13[R] or higher
  - Db2 for z/OS support for asynchronous CF duplexing requires CFLEVEL 21 with service 2.16, or later.
  - Single Instruction Multiple Data (SIMD) exploitation with XML Parser requires an IBM z13 processor, or higher, supporting SIMD instruction.
- Others
  - CF cache write-around (Group Buffer Pool write-around feature since Db2 11 for z/OS) requires CFLEVEL 17 or later.
  - zHyperwrite (available since Db2 11 for z/OS) requires DS8870 storage subsystem level R7.4 or later with GDPS[R] or TPC-R HyperSwap[R] configured.

Function-dependent hardware requirements for QMF V13 components

There are six installation entities across the QMF Enterprise Edition and QMF Classic Edition separately orderable, chargeable features:

QMF TSO and CICS clients' requirements:

- Operates on any IBM Z hardware configuration that supports the required software.
- Runs on any processor that is supported by the operating system. Some operations, however, will not work with columns that contain decimal floating-point data if the processor on which QMF is running does not support decimal floating-point instructions.
- Accesses all DASD devices that are supported by z/OS and Db2 for z/OS, as well as all display devices supported by Graphical Data Display Manager (GDDM).
- To implement a national language feature that uses a double-byte character set (DBCS), you need a workstation that supports DBCS. Ensure that this device is supported by GDDM.
  - For the amount of storage required to copy the QMF V13.1 libraries from the distribution media using SMPE, review the QMF program directory that is appropriate for your QMF edition and national language.
- When you plan your region size, consider the storage required to load modules during initialization and the virtual storage requirements for report operations.
- **Restriction:** For QMF TSO only, consider the amount of space required to run applications other than Db2 QMF.

Db2 QMF for Workstation requires:

- A hardware configuration that supports the Microsoft™ Windows™ operating system
- Network connectivity
- Minimum of 1 GB disk space and 4 GB of RAM

Db2 QMF for WebSphere[R] requires:

- Hardware configuration that supports the Microsoft or Linux[R] operating systems
- Minimum of 500 MB disk space
- Minimum of 4 GB of RAM on each server in which it is installed and an additional 50 MB of RAM for each concurrent user

Db2 QMF Vision requires:

- Hardware configuration that supports the Microsoft or Linux operating system
- Minimum of 250 GB disk space and 8 GB of RAM
- 4-core microprocessor

Db2 QMF Data Service requires:

- Operates on any IBM Z hardware configuration that supports the required software
- Runs on any processor that is supported by the operating system

Db2 QMF Data Service Studio requires:

- Any hardware configuration that supports the required Microsoft software
- Approximately 1 GB of disk space (single language installation)
- Minimum of 1 GB of RAM
- Network connectivity

Software requirements

The following licensed programs or specific elements and features of licensed programs are required in the Db2 13 environment. Also identified are requirements that are associated with specific Db2 capabilities and optional programs that you can use with Db2 13. Clients may use subsequent versions or releases of the programs, unless stated otherwise. For the most current information about these programs, see the IBM Software Lifecycle website.

Db2 for z/OS operating system and support programs

Db2 13 requires the function that is provided by the following licensed programs or their equivalents. Subsequent versions or releases of these products are acceptable.

- z/OS 2.4 (5650-ZOS), or later, base and optional services: Language Environment$^{(R)}$ Base services, Security Server (RACF$^{(R)}$), and DFSMS
- IRLM 2.3 (delivered with Db2 13)

The availability of new function in Db2 13 depends on the type of enhancement, the activated function level, and the application compatibility levels of the applications. A general exception exists for optimization and virtual storage. For a list of all available function levels in Db2 13, search for "Db2 13 function levels" in the online product documentation.

z/OS Unicode Services and appropriate conversion definitions are required. For additional information about Unicode conversions, search for ” Working with international data" in the online product documentation.

Some of the basic operation of a DBMS is provided by utility functions, such as backup, recovery, reorganization, loading and unloading data, gathering statistics and checking data, indexes, and large objects. Clients should ensure that these functions are provided either by ordering Db2 Utilities Suite for z/OS, 13.1 (5698-DUT) or by obtaining equivalent function elsewhere.

Db2 for z/OS function-dependent program requirements

The following functions of Db2 require specific licensed programs or features of licensed programs before they can be used.

Application execution: Applications written in high-level programming languages, such as applications or stored procedures written in the C language and using the ODBC or CLI interfaces to Db2, require Language Environment at run time. Applications or stored procedures written in Java™, such as those using the JDBC or

SQLJ interfaces to Db2, require IBM SDK for z/OS, Java 2 Technology Edition V8, or later, at run time.

Requirements for dependent functions of Db2 13

Before using these features, see the installation information for these features to ensure you have all required and recommended products.

- System-level Backup and Recovery function requirements from z/OS 2.4:
  - DFSMShsm
  - DFSMSdss
  - FlashCopy[(R)] Version 1
  - FlashCopy Version 2 (required for object-level recovery from system-level backup and FlashCopy image copy)

Requirements for the SQL Data Insights feature

Requirements to set up on the z/OS operating system:

- IBM Db2 13 for z/OS (5698-DB2 or 5698-DBV)
- IBM Z Deep Neural Network Library, including IBM Z AI Optimization Library and IBM Z AI Data Embedding Library:
  - z/OS 2.4 with APARs OA62849, OA62886, and OA62887
  - z/OS 2.5 with APARs OA62901, OA62902, and OA62903
- z/OS Supervisor: APAR OA62728 (z/OS 2.4 and 2.5)
- OpenBLAS: APARs PH45663 (2.4), PH45672 (z/OS 2.5), and PH44479 (z/OS 2.4 and 2.5)
- IBM 64-bit SDK for z/OS Java Technology Edition Version 8 SR7, FP6 or later

Requirements to set up the SQL Data Insights UI and training service:

- SQL Data Insights FMID HDBDD18
- z/OS OpenSSH

Requirements for dependent functions of the QMF components

QMF for TSO and CICS clients require:

- IBM z/OS, 2.4 (5650-ZOS), or later
- One of the following IBM Db2 for z/OS releases:
  - Db2 12 for z/OS (5650-DB2)
  - Db2 12 for z/OS Value Unit Edition (5770-AF3)
  - Db2 13 for z/OS (5698-DB2)
  - Db2 13 for z/OS Value Unit Edition (5698-DBV)

QMF for Workstation requires one of the following operating systems:

- Microsoft Windows 8 or Microsoft Windows 10
- Windows Server 2012, Windows Server 2016, or Windows Server 2019

QMF for WebSphere requires:

- One of the following application servers:
  - IBM WebSphere Application Server 8.5.5 or WebSphere Application Server 9
  - Apache Tomcat 8.5 or Apache Tomcat 9
  - IBM WebSphere Application Server Liberty 19.0
- One of the following web browsers:

- Google Chrome Version 96.0.4664.45, or later

- Mozilla Firefox Version 94.0.2, or later

- Microsoft Edge Version 96.0.1054.43, or later. To enable Data Service connectivity, Java 8 is required.

  Note: QMF V13.1 uses the Data Server JDBC driver, which only supports Java 8.

QMF Vision installation entities require:

- One of the following operating systems:
  - Windows Server 2012
  - Windows Server 2016 with .NET Framework 3.5 enabled
- One of the following browsers:
  - Google Chrome version 96.0.4664.45, or later
  - Mozilla Firefox version 94.0.2, or later
  - Microsoft Edge version 96.0.1054.43, or later

QMF Data Service installation entities requirements:

- IBM zEnterprise[R] 114 (z114), IBM zEnterprise 196 (z196), or more recent IBM zEnterprise system
- IBM z/OS 2.4 (5650-ZOS), or later

Data Service load library

- The load library for Data Service is allocated as a partitioned data set extended (PDSE). When a PDSE is used to store load modules, it stores them in structures called *program objects*.
- You cannot copy a PDSE to a partitioned data set (PDS). For more information, see the IBM z/OS documentation.

QMF Data Service Studio installation entity requires one of the following operating systems:

- Microsoft Windows 8 or Microsoft Windows 10
- Microsoft Windows Server 2012, Microsoft Windows Server 2016, or Microsoft Windows Server 2019

Mandatory operational requisites of the QMF components

Db2 QMF for TSO and CICS clients operate with any of the following:

- Db2 12 for z/OS (5650-DB2)
- Db2 12 for z/OS Value Unit Edition (5770-AF3)
- Db2 13 for z/OS (5698-DB2)
- Db2 13 for z/OS Value Unit Edition (5698-DBV)

In addition,

- For advanced graphical capabilities of the QMF Analytics for TSO client, GDDM-PGF, a component in z/OS, is required.
- Db2 QMF for TSO and CICS running under CICS requires CICS Transaction Server for z/OS.
- QMF Vision requires MongoDB 3.X, or later, to be installed. This is done when the optional QMF Vision component is selected during the QMF install and the user is asked to download/install Mongo during this part of the QMF install.

  Note: The program's specifications and specified operating environment information may be found in documentation accompanying the program, if

available, such as a readme file, or other information published by IBM, such as an announcement letter. Documentation and other program content may be supplied only in the English language.

Limited-use license for z/OS Application Connectivity to Db2 for z/OS

The zero-priced z/OS Application Connectivity to Db2 feature, a Type 4 JDBC driver, is licensed for installation and use solely on z/OS. Its sole authorized use is limited to connecting an application that runs on z/OS to version 10, 11, 12, or 13 of Db2 for z/OS running in a separate partition on the same server as the application or on a different z/OS server. You can also connect applications to a subsequent supported version of Db2 for z/OS. Authorized use does not extend to applications that run on Linux or any other platform or operating system.

Optional program requirements

The following functions are enabled in conjunction with the specified optional licensed programs when used together with Db2. Note that the information is for expected toleration support for Db2 13.

Connectivity

For database applications that run on Linux, UNIX$^{(R)}$, or Windows operating systems, clients can use Db2 Connect and then perform one of the following actions:

- Install the IBM Data Server Driver package and deploy one of the client drivers to access Db2 for z/OS through a Db2 Connect Server.
- Install the IBM Data Server Driver package and deploy one of the provided client drivers to access Db2 for z/OS directly.

Both approaches, direct access or access through the gateway, provide runtime support to access Db2 by applications that use ODBC, CLI, .NET, OLE DB, PHP, Ruby, JDBC, pureQuery$^{(R)}$, JPA, SQLJ, Python, Perl, and more. These approaches can be used alone or in combination, as needed.

Db2 for z/OS suggests using one of the supported client drivers (without the use of a Db2 Connect server) provided with the IBM Data Server package, for the best performance and availability. To choose the right IBM Client Package for your needs, see the IBM Db2 V11 for Linux, UNIX, and Windows, or higher, see the product information in the online Db2 LUW IBM Documentation.

The minimum IBM Data Server Client Package Version 11.1 driver level is required to move to packages with applcompat V12R1M501, or higher. A lower applcompat setting can be used by any IBM Data Server Client Package version.

The recommended best practice is to use the latest fix pack of the IBM Data Server Client Package in support.

Db2 sysplex support requires either a CLI driver requiring 11.1, or later, and JCC driver in 11.1 MP4 FP4, or later. This level provides enhanced workload balancing and automatic client reroute to provide a better balance of work across the group, and reroute is changed to reroute once using the data source IP address, which should be the distributed address.

Db2 13 acting as a server supports DRDA as an open interface, enabling access from any client.

Db2 13 acting as a client supports the following relational database products:

- IBM Db2 Advanced Enterprise Server Edition for Linux, UNIX, and Windows, 11.5 (5725-L47), or later
- IBM Db2 Enterprise Server Edition for Linux, UNIX, and Windows, 11.5 (5765-F41), or later
- IBM Db2 Advanced Workgroup Server Edition for Linux, UNIX, and Windows, 11.5 (5725-L15), or later

- IBM Db2 Workgroup Server Edition for Linux, UNIX, and Windows 11.5 (5765-F35), or later
- IBM Db2 Developer Edition, 11.5 (5724-N76), or later
- Any other DRDA-compliant relational DBMS server

Web connectivity is provided by any of the Db2 Connect clients using one of the IBM Data Server clients or drivers. For support services and information, see the online product documentation.

JDBC

Db2 13 supports the following JDBC 4.0 APIC specification levels at run time, if supported:

- OpenJDK 8 (LTS)
- OpenJDK 11 (LTS)
- OpenJDK 14
- IBM 31-bit SDK for z/OS, Java Technology Edition, V8 (SDK8) (5655-DGG), or later
- IBM 64-bit SDK for z/OS, Java Technology Edition, V8 (SDK8) (5655-DGH), or later

For more current information about SDKs, go to the IT Infrastructure website and the IBM developer kits lifecycle dates website.

The following transaction management products work with Db2 13:
- Information Management System (IMS)
  - IMS 15 .1 (5635-A06), or later
- Customer Information Control System (CICS)
  - CICS Transaction Server for z/OS, 5.4 (5655-Y04), or later

Operational support

The following programs provide operational support for Db2 13:

DFSMS features, part of the Systems Management optional feature of z/OS, specifically:

- DFSMShsm for archiving
- DFSMSdss for concurrent copy in utilities

Programming languages

The following application development programming languages can be used to build applications for Db2 13:

Building applications by using a Db2 precompiler:

- Assembler
  - High Level Assembler, part of the System Services element of z/OS
- C/C++
  - C/C++ (without Debug Tool), which is an optional priced feature of z/OS
- COBOL (any of the following):
  - Enterprise COBOL for z/OS, V4.2 (5655-S71)
  - Enterprise COBOL for z/OS, V6.1 (5655-EC6), or later
  - Enterprise COBOL for z/OS Value Unit Edition, 6.1 (5697-V61), or later
- Fortran

- VS Fortran 2.6 (5668-806, 5688-087, 5668-805)
- PL/I (any of the following):
  - Enterprise PL/I for z/OS, 5.1 (5655-PL5), or later
  - Enterprise PL/I for z/OS Value Unit Edition for z/OS, 5.2 (5655-EPL), or later

Building applications by using a Db2 coprocessor:

- C/C++
  - C/C++ (without Debug Tool), which is an optional priced feature of z/OS
- COBOL (any of the following):
  - Enterprise COBOL for z/OS, V4.2 (5655-S71)
  - Enterprise COBOL for z/OS, 6.1 (5655-EC6), or later
  - Enterprise COBOL for z/OS Value Unit Edition, 6.1 (5697-V61), or later
- PL/I (any of the following):
  - Enterprise PL/I for z/OS, 5.1 (5655-PL5), or later
  - Enterprise PL/I for z/OS Value Unit Edition for z/OS, 5.2 (5655-EPL), or later

Building applications that are not supported with a precompiler or coprocessor:

- Java:
  - Applications or stored procedures written in Java, such as those using the JDBC or SQLJ interfaces to Db2, require IBM 64-bit SDK for z/OS, Java Technology Edition, Version 8 (SDK8) (5655-R32), or later, at run time.

    For more information about SDKs, go to the IT Infrastructure website and the IBM developer kits lifecycle dates website.

Building applications by using unsupported compilers:

For some COBOL and PL/I compilers that are no longer supported since version 8, you can use a DSNHPC7 version of the precompiler that enables you to precompile applications that have dependencies on these unsupported compilers, but only use DB2 for z/OS Version 7 SQL. The use of DSNHPC7 is "as is".

Query support

The following query program works with Db2 13:

- The Db2 Query Management Facility (QMF) family of products, version 13. For more information, go to the IBM Fix Category Values and Descriptions website.

Tools for application development

The following application development tools can be used to build applications for Db2:

- Visual Studio Code, available from the Visual Studio Code website
- IBM Db2 for z/OS Developer Extension, available for download from the IBM Db2 for z/OS Developer Extension website
- IBM Db2 Administration Foundation for z/OS, 1.1 (5698-ADF)
- IBM Db2 Accessories Suite for z/OS, 4.2 (5697-Q05), Database Services Expansion Pack feature that delivers SQL Tuning Services

Note: The recommended no-charge development tool is Visual Studio Code along with IBM Db2 Developer Extension for z/OS, which provides SQL syntax support and basic administrative capabilities for developing applications for Db2 for z/OS.

Tools support

The following tools are the minimum level that provide support/toleration for Db2 13 for z/OS. Exploitation of future new functions may require additional PTF maintenance or the eventual migration to higher releases of these products that are service supported. For details on additional requirements, go to the Db2 Tools Compatibility for Db2 13 website.

IBM Tools for Database Administration and System Management Support, including the following tools:

- IBM Db2 Administration Foundation for z/OS, 1.1 (5698-ADF)
- IBM Db2 Administration Solution Pack for z/OS, 3.3 (5697-ASP)
- IBM Db2 Administration Tool for z/OS, 13.1 (5655-DT2)
- IBM Db2 Change Management Solution Pack for z/OS, 1.1 (5655-CH1)
- IBM Db2 Cloning Tool for z/OS, 3.2 (5655-N15)
- IBM Db2 Management Solution Pack for z/OS, 2.4 (5655-MS2)
- IBM InfoSphere$^{(R)}$ Guardium Data Encryption for IMS and Db2 Databases, 1.2 (5655-P03)

IBM Tools for Database Application Management, including the following tools:

- IBM Application Performance Analyzer for z/OS, 14.2 (5655-Q49)
- IBM Db2 Analytics Accelerator for z/OS, 5.1 (5697-DA5)
- IBM Db2 Analytics Accelerator Loader for z/OS, 2.1 (5639-OLE)
- IBM Db2 DevOps Experience for z/OS, 1.2 (5698-DEX)
- IBM Fault Analyzer for z/OS, 14.1 (5655-Q41)

IBM Tools for Performance Management, including the following tools:

- IBM Db2 Management Solution Pack for z/OS, 2.4 (5655-MS2)
- IBM Db2 Performance Solution Pack for z/OS, 1.6 (5655-E74)
- IBM Db2 Query Monitor for z/OS, 3.3 (5655-V42)
- IBM Db2 Query Workload Tuner for z/OS, 5.2 (5655-AB4)
- IBM Db2 SQL Performance Analyzer for z/OS, 5.1 (5697-W51)
- OMEGAMON$^{(R)}$ XE for Db2 Performance Expert on z/OS, 5.5 (5655-W37)

IBM Tools for Replication Management, including the following tool:

- IBM InfoSphere Data Replication for Db2 for z/OS, 11.4 (5655-DRQ)

IBM Tools for Utilities Management, including the following tools:

- IBM Db2 Automation Tool for z/OS, 4.3 (5655-E37)
- IBM Db2 High Performance Unload for z/OS, 5.1 (5655-HP5)
- IBM Db2 Log Analysis Tool for z/OS, 3.5 (5655-T56)
- IBM Db2 Recovery Expert on z/OS 3.2 (5655-W78)
- IBM Db2 Sort for z/OS, 2.1 (5655-AA9)
- IBM Db2 Utilities Solution Pack for z/OS, 4.3 (5698-US4)
- IBM Db2 Utilities Suite for z/OS, 13.1 (5698-DUT)

Compatibility

Db2 13 is upwardly compatible with earlier releases of Db2 for z/OS. Migration with full fallback protection is available for clients who are running on Db2 12 for z/OS. Existing clients must be running on Db2 12 for z/OS with FL510 activated before migrating to Db2 13 for z/OS.

Fallback SPE APAR PH37108 must be applied.

IRLM 2.3 APAR PH43770 is required with Db2 13 for z/OS.

Clients may use FIX CATEGORIES IBM.Migrate-Fallback.DB2.V13 and
IBM.Coexistence.DB2.SYSPLEXDataSharing to identify and apply fixes that enable
prior releases of Db2 to migrate to or fallback from Db2 13 for z/OS and fixes that
enable Db2 13 to co-exist when in data sharing mode, respectively.

For more information about FIXCAT, see the IBM Fix Category Values and
Descriptions website.

User group requirements

This announcement satisfies or partially satisfies 97 requirements.

Db2 for z/OS Aha! Ideas delivered in Db2 13 or in a prior Db2 version through
continuous delivery.

Idea number	Idea description
DB24ZOS-I-1312	Add system profile support to allow you to increase the level of concurrency between DDL and DML by reducing the amount and duration of serialization
DB24ZOS-I-1213	Simplify migration experience with DSNTIJSG changes to UTS tablespaces
DB24ZOS-I-1169	Profile Table Support for Local Threads (access rights of a DBA through trusted context)
DB24ZOS-I-1158	DDF ECSA Storage Relief scalability improvement
DB24ZOS -I-1153	Enable IRLM to Support Long names
DB24ZOS-I-1066	Support of IFCID 306 log reading from TS partition level
DB24ZOS - I-1054	Caching of plan authorization to reduce RACF contention
DB24ZOS-I-919	Insert performance - tablespace (Enhance DSNT376I message)
DB24ZOS-I-864	Deferred ALTER support for conversion of segmented TS to UTS-PBR
DB24ZOS-I-861	Online Delete Active Logs
DB24ZOS-I-751	Increased flexibility for package ownership
DB24ZOS-I-724	Resolve space issues with SPT01 and SYSLGRNX
DB24ZOS-I-719	Online Conversion from PBG to PBR (alter tablespace)
DB24ZOS-I-478	Set up different timeout values for OLTP and BATCH, thus reduce application lock wait time
DB24ZOS-I-269	Application Timeout & Deadlock control
DB24ZOS-I-143	Allow longer column names (<30 bytes)
DB24ZOS-I-90	Online Conversion ALTER from PBG to PBR
DB24ZOS-I-87	COPYTOCOPY option to delete source FlashCopy dataset and entry from SYSCOPY
DB24LUW-I-8	Edit Procedure (EDITPROC) Support in IFCID 306
The following enhancements were delivered in a prior version of Db2 through continuous delivery.	
DB24ZOS-I-1250	Alias for REST Services
DB24ZOS-I-1245	Different Column Names for Union Query
DB24ZOS-I-1238	Rebinding/Binding old native stored procedure packages
DB24ZOS-I-1234	START/STOP Profile Enhancement with individual PROFILEIDs

DB24ZOS-I-1229	Allow BIND(REPLACE) on a DB2 REST service
DB24ZOS-I-1210	Command to display status of state of LOG (Suspended or Resumed)
DB24ZOS-I-1205	Enable DAE to suppress flood of duplicate Db2 dumps in all situations
DB24ZOS-I-1156	Increase Password Size for Db2 Supplied Stored Procedures
DB24ZOS-I-1042	Add Db2 support to allow tools to exploit Multi-Factor Authentication
DB24ZOS-I-1026	zHyperLink dual logging performance improvements
DB24ZOS-I-981	Make parent business temporal table updatable
DB24ZOS-I-970	Db2 Profile Concurrency Limit at the Data-Sharing Level
DB24ZOS-I-951	Officially support the ability to set which version of a REST service is the default one
DB24ZOS-I-918	Improve partial RTS externalization communication to the user
DB24ZOS-I-831	Provide compression capability for LOB tablespaces
DB24ZOS-I-795	Execution of static programs which contains ALTER SEQUENCE statements in which the sequence name is not fully qualified
DB24ZOS-I-781	DB2 V10 Change To EXPLAIN(ONLY) Binds/Rebinds
DB24ZOS-I-780	New BLKSIZE parameter for TEMPLATE utility
DB24ZOS-I-765	Allow capability to ALTER the UPDATES column of SYSCOLUMNS
DB24ZOS-I-759	Ability to set number of locks before a SQL gets a 00C90096
DB24ZOS-I-748	Maintain catalog column UNCOMPRESSED_DATASIZE
DB24ZOS-I-703	Collect MVS parameters affecting DB2
DB24ZOS-I-687	Support OR REPLACE option in Native SQL Procedures
DB24ZOS-I-684	LOAD a TABLE with WHEN / DISCARD
DB24ZOS-I-679	Improve versioning in Db2
DB24ZOS-I-629	Instrumentation to identify uncommitted catalog/directory resource holders
DB24ZOS-I-623	Auto Rebind support of APREUSE Option
DB24ZOS-I-589	Reset and Collect new statistics in one go
DB24ZOS-I-588	Recover the TABLESPACE from the IMAGE COPY
DB24ZOS-I-584	Unique DB2 Message to Indicate that GRECP and LPL Recovery Is Complete and There Are No More Objects Flagged As GRECP or LPL
DB24ZOS-I-573	Db2 for z/OS please allow CREATE OR REPLACE PROCEDURE statement (and FUNCTION)
DB24ZOS-I-501	Add a new DB2 message to note that 85% of the MAXDBAT parameter has been hit and when exceeded
DB24ZOS-I-481	Allow pending Alter to convert multi table tablespaces to PBG
DB24ZOS-I-457	Port number info in DSNL200I msg for TCP/IP server connections
DB24ZOS-I-441	REORG SYSTSCPY improvements with SHRLEVEL CHANGE

Idea number	Idea description
DB24ZOS-I-417	Allow Db2 for z/OS REORG with NOCHECKPEND
DB24ZOS-I-412	User Specified Correlation ID Acceptance and Propagation throughout IMS, Db2 for z/OS and Guardium
DB24ZOS-I-410	DB2 z/OS V11 NFM - 6-Byte LOG RBA Limit Reached for BASIC format objects
DB24ZOS-I-398	Request to add parameters - Control Unload Utility: Specify new "Register" Option by Db2 Subsystem(zparm)
DB24ZOS-I-328	Db2 Distributed Thread - hidden high CPU consumption
DB24ZOS-I-318	Enhance Db2 command: DISPLAY .. CLAIMERS
DB24ZOS-I-312	Allow preformat of Auxiliary tablespaces for Load and Reorg
DB24ZOS-I-302	Online REORG on base Tablespace - prevent copy-pending on LOB Tablespace
DB24ZOS-I-270	Convert multi-table segmented Tablespace to multiple UTS PBGs
DB24ZOS-I-255	Enhance DANACCOX to always reflect the latest best practices to minimize REORG and RUNSTATS recommendations
DB24ZOS-I-254	Data import at speed of LOAD
DB24ZOS-I-253	Allow online REORG of DB2 Catalog/ Directory objects without preceding image copy
DB24ZOS-I-248	SELECT on table UDF without correlation name
DB24ZOS-I-234	Reorg TS at partition level should take care about Pending Online Change
DB24ZOS-I-230	Deterministic UDF within SQL statement or transaction
DB24ZOS-I-227	Merge the view an outer join exists in the view and there is no join predicates on the outer table
DB24ZOS-I-186	Db2 Display Progress Report for Utilities
DB24ZOS-I-163	Operability of ROW CHANGED TIMESTAMP GENERATED ALWAYS
DB24ZOS-I-145	Remove the restriction on dropping a table in an explicitly created universal table space
DB24ZOS-I-131	Queue multiple pending changes to reduce outages
DB24ZOS-I-96	LOAD utility syntax to support concatenation of multiple SYSREC datasets in SYSIN instead of having to do it through JCL.
DB24ZOS-I-75	TAPEUNITS for inline copy option to allow production of image copy by partition
DSTUDIO-I-13	Enable two-factor authentication (2FA) for Data Studio

QMF for z/OS Aha! Ideas delivered in version 13 or in a prior QMF version through continuous delivery.

Idea number	Idea description
QMFEE-I-19	Scheduled task to have optional time zone drop down
QMFEE -I-21	Support for MongoDB through JDBC
The following enhancements were delivered in a prior QMF version through continuous delivery.	
Other	Usability enhancement with option to use Db2 for z/OS cross-loader when saving data through the TABLE keyword on the

	RUN QUERY command for usability can also help to reduce storage and improve performance
Other	Usability enhancement for Db2 Analytics Accelerator users creating Accelerator Only Tables (AOTs) to optionally supply name via SAVE DATA, IMPORT TABLE or RUN QUERY Commands
Other	SAVE DATA completion messaging updated to report the number of rows saved or inserted during command processing
Other	QMF Administrators can check user setting via the user's QMF profile with new profile settings in the MODEL column.
Other	Global variable DSQEC_DSQFISO added to change the DSQFISO program parameter functionality from within a QMF session with report formatting override capability for the CHAR (datetime-expression) data to match local DB2 date and time formats
Other	DSQ_ED_DEC global variable updated to allow '*' specifications for all allowable decimal edit codes
Other	Global variable DSQAO_ROW_LENGTH to provide length of each data row returned from the last run query if the report is still in storage

QMF Vision functions delivered through continuous delivery are listed below:

Idea number	Idea description
Other	Ease of use search of QMF objects with specific file name or content across multiple data sources within connected repository
Other	Ability to format headers and footers in Quick Report
Other	Collate option to enable case-sensitive/ insensitive comparison while creating Analytical Queries
Other	Normalize Transform user interface redesigned
Other	Reduced number of steps when scheduling task from Repository Explorer
Other	Dateadd function of calculated column enhanced to add/subtract day, month, or a year from any given date
Other	Ability to view index information in Tables section of Query Builder editor
Other	Additional transformations (Union, Intersect, Except) for flexibility and usability

QMF Z Client functions delivered through continuous delivery are listed below:

Idea number	Idea description
Other	Application development enhancement interface including ability to develop applications programs for running QMF commands for C, C++, and COBOL languages
Other	Query and procedure editor supports text up to 2MB and up to 600000 rows
Other	Large object support

Planning information

Client responsibilities

Migration considerations

Migration with full fallback protection is available for clients who are running on Db2 12 for z/OS. Existing clients must be running on Db2 12 for z/OS with FL510 activated before migrating to Db2 13 for z/OS.

Fallback SPE APAR PH37108 must be applied.

Clients may use FIX CATEGORIES IBM.Migrate-Fallback.DB2.V13 and IBM.Coexistence.DB2.SYSPLEXDataSharing to identify and apply fixes that enable prior releases of Db2 to migrate to or fallback from Db2 13 for z/OS and fixes that enable Db2 13 to co-exist when in data sharing mode, respectively.

For more information about FIXCAT, see the IBM Fix Category Values and Descriptions website.

Deprecated function

During migration, be aware of certain capabilities that Db2 13 for z/OS supports that are deprecated, meaning that their use is discouraged. Although many capabilities may remain supported, support is likely to be removed eventually. Avoid creating new dependencies that rely on the following deprecated function, and develop plans to remove any dependencies on such function:

- DRDA data stream encryption
- Enabling Db2 to receive PassTickets for RACF-protected user IDs
- Secure Network Access (SNA) support

For the list of Db2 for z/OS deprecated function and recommended alternatives, search for "Deprecated function in Db2 13" in the online product documentation.

Direct client support

Direct client support is provided by IBM Operational Support Services - SoftwareXcel Enterprise Edition or SoftwareXcel Basic Edition. These fee services can enhance your productivity by providing voice and electronic access into the IBM support organization. IBM Operational Support Services - SoftwareXcel Enterprise Edition or SoftwareXcel Basic Edition will help answer questions pertaining to usage, how-to, and suspected software defects for eligible products.

Installation and technical support will be provided by IBM Global Services. For more information about services, call 888-426-4343.

Eligible clients can obtain installation and usage assistance from the Industry Support Center through a telephone response line.

Packaging

The following materials are included with the base and optional features of Db2 13:

Title	Publication number
Db2 13 for z/OS feature:	
Program Directory (ENU and JPN)	GI13-5534
License Program Specifications (ENU and JPN)	GC28-2779
SQL Data Insights feature:	
Program Directory (ENU)	GI13-5531
QMF Classic Edition Db2 13 feature:	
Program Directory (ENU)	GI13-5535
Program Directory (MUL)	GI13-5536
QMF Enterprise Edition 13 feature:	
Program Directory (ENU)	GI13-5537
Program Directory (MUL)	GI13-5538

Title	Publication number
Accessing QMF distributed components DVD (ENU and MUL)	LCD7-7807
Application Connect Db2 13 feature:	
Program Directory (ENU)	GI13-5539

Security, auditability, and control

Db2 13 uses the security and auditability features of the host z/OS systems. It also provides facilities for the protection and control of its resources. These facilities include controls for:

- System access

- Data access and control

- Concurrent access

- Data recovery

- Accounting and auditing

The client is responsible for evaluation and implementation of security features, administrative procedures, and appropriate controls in application systems and communication facilities.

The client is responsible for evaluation, selection, and implementation of security features, administrative procedures, and appropriate controls in application systems and communication facilities.

Ordering information

Ordering z/OS through the internet

Shopz provides an easy way to plan and order your z/OS packaged offering. It will analyze your current installation, determine the correct product migration, and present your new configuration based on z/OS. Additional products can also be added to your order. Shopz will determine whether all product requisites are satisfied. Shopz is available in all countries. For more details and availability, go to the Shopz website.

New licensees

Orders for new licenses can be placed now. Registered clients can access IBMLink for ordering information and charges. Shipment will not occur before the availability date.

New users of Db2 13 for z/OS should specify: Type: 5698 Model: DB2

Parallel Sysplex License Charges (PSLC)

Parallel Sysplex[R] license charge (PSLC) basic license

To order a basic license, specify the program number and quantity of MSU.

If there is more than one program copy in a Parallel Sysplex, the charge for all copies is associated to one license by specifying the applicable PSLC license options and quantity represented by the sum of the Service Units in Millions (MSUs) in your Parallel Sysplex. For all other program copies, specify the System Usage Registration No-Charge (SYSUSGREG NC) Identifier on the licenses.

Program name: Db2 13 for z/OS

Program ID: 5698-DB2

Entitlement identifier	Description	License option/Pricing metric
S018M7N	Db2 13 for z/OS	Basic MLC, PSLC below 3 MSU
S018M7N	Db2 13 for z/OS	Basic MLC, PSLC AD
S018M7N	Db2 13 for z/OS	SYSUSGREG NC, PSLC AD
S018M7K	QMF Classic Edition Db2 13	Basic MLC, PSLC below 3 MSU
S018M7K	QMF Classic Edition Db2 13	Basic MLC, PSLC AD
S018M7K	QMF Classic Edition Db2 13	SYSUSGREG NC, PSLC AD
S018M7L	QMF Enterprise Edition 13	Basic MLC, PSLC below 3 MSU
S018M7L	QMF Enterprise Edition 13	Basic MLC, PSLC AD
S018M7L	QMF Enterprise Edition 13	SYSUSGREG NC, PSLC AD
S018M8L	SQL Data Insights	Basic MLC, PSLC below 3 MSU
S018M8L	SQL Data Insights	Basic MLC, PSLC AD
S018M8L	SQL Data Insights	SYSUSGREG NC, PSLC AD
S018M7M	Application Connect Db2 13	Basic MLC, PSLC below 3 MSU
S018M7M	Application Connect Db2 13	Basic MLC, PSLC AD
S018M7M	Application Connect Db2 13	SYSUSGREG NC, PSLC AD

Advanced Workload License Charges (AWLC)

Advanced Workload License Charges (AWLC) basic license

To order a basic license, specify the program number and quantity of MSUs. If there is more than one program copy in a Parallel Sysplex, the charge for all copies is associated to one license by specifying the applicable AWLC license options and quantity represented by the sum of the Service Units in Millions (MSUs) in your Parallel Sysplex. For all other program copies, specify the System Usage Registration No-Charge (SYSUSGREG NC) Identifier on the licenses.

Program name: Db2 13 for z/OS

Program ID: 5698-DB2

Entitlement identifier	Description	License option/Pricing metric
S018M7N	Db2 13 for z/OS	Basic MLC, AWLC
S018M7K	QMF Classic Edition Db2 13	Basic MLC, AWLC
S018M7L	QMF Enterprise Edition 13	Basic MLC, AWLC
S018M8L	SQL Data Insights	Basic MLC, AWLC
S018M7M	Application Connect Db2 13	Basic MLC, AWLC

Advanced Entry Workload License Charges (AEWLC)

Advanced Entry Workload License Charges (AEWLC) basic license

To order a basic license, specify the program number and quantity of MSUs.

Program name: Db2 13 for z/OS

Program ID: 5698-DB2

Entitlement identifier	Description	License option/Pricing metric
S018M7N	Db2 13 for z/OS	Basic MLC, AEWLC
S018M7K	QMF Classic Edition Db2 13	Basic MLC, AEWLC
S018M7L	QMF Enterprise Edition 13	Basic MLC, AEWLC
S018M8L	SQL Data Insights	Basic MLC, AEWLC
S018M7M	Application Connect Db2 13	Basic MLC, AEWLC

Country Multiplex License Charges (CMLC)

Country Multiplex License Charges (CMLC)

To order a license, specify the program number and quantity of MSUs.

If there is more than one program copy in a Country Multiplex, the charge for all copies is associated to one license if all the copies are licensed to one client number within the multiplex. If there is more than one client number, the charge for all copies is prorated to one license for each client within the multiplex.

For each license being charged, specify the applicable CMLC license options and the prorated quantity of the Service Units in Millions (MSUs) for each client number within the multiplex. For all other program copies, specify the Workload Registration No-Charge (WLREG NC) Identifier on the licenses.

Program name: Db2 13 for z/OS

Program ID: 5698-DB2

Entitlement identifier	Description	License option/Pricing metric
S018M7N	Db2 13 for z/OS	Basic MLC, CMLC
S018M7K	QMF Classic Edition Db2 13	Basic MLC, CMLC
S018M7L	QMF Enterprise Edition 13	Basic MLC, CMLC
S018M8L	SQL Data Insights	Basic MLC, CMLC
S018M7M	Application Connect Db2 13	Basic MLC, CMLC

Variable Workload License Charge (VWLC)

Workload License Charge (WLC) Basic License

If there is more than one program copy in a Parallel Sysplex, the charge for all copies is associated to one license by specifying the applicable WLC license options and quantity represented by the sum of the Service Units in Millions (MSUs) in your Parallel Sysplex. For all other program copies, specify the Workload Registration Variable WLC Identifier on the licenses.

Program name: Db2 13 for z/OS

Program ID: 5698-DB2

Entitlement identifier	Description	License option/Pricing metric
S018M7N	Db2 13 for z/OS	Basic MLC, Variable WLC
		Workload Registration, Variable WLC
S018M7K	QMF Classic Edition Db2 13	Basic MLC, Variable WLC
		Workload Registration, Variable WLC
S018M7L	QMF Enterprise Edition 13	Basic MLC, Variable WLC

Entitlement identifier	Description	License option/Pricing metric
		Workload Registration, Variable WLC
S018M8L	SQL Data Insights	Basic MLC, Variable WLC
		Workload Registration, Variable WLC
S018M7M	Application Connect Db2 13	Basic MLC, Variable WLC
		Workload Registration, Variable WLC

Workload License Charge (WLC) Basic License

To order a basic license, specify the program number and the quantity of MSUs.

Entry Workload License Charges (EWLC)

Entry Workload License Charge (EWLC) Basic License

To order a basic license, specify the program number and the quantity of MSUs.

Program name: Db2 13 for z/OS

Program ID: 5698-DB2

Entitlement identifier	Description	License option/Pricing metric
S018M7N	Db2 13 for z/OS	Basic MLC, Entry WLC
S018M7K	QMF Classic Edition Db2 13	Basic MLC, Entry WLC
S018M7L	QMF Enterprise Edition 13	Basic MLC, Entry WLC
S018M8L	SQL Data Insights	Basic MLC, Entry WLC
S018M7M	Application Connect Db2 13	Basic MLC, Entry WLC

IBM Z Usage License Charge (UCL)

Usage License Charge (ULC) basic license

Charges will be based upon the Peak MSUs. Usage reported between thresholds of features 1, 2, or 3 will be rounded up to the next MSU level. Above 1.0 MSU, usage will be rounded to the nearest whole MSU. For example, 2.4 MSUs would round to 2.0 MSUs for pricing, and 2.5 MSUs would round to 3.0 MSUs for pricing.

Program name: Db2 13 for z/OS

Program ID: 5698-DB2

Entitlement identifier	Description	License option/ Pricing metric
S018M7N	Db2 13 for z/OS	0 to 0.25 MSU Base
		0.26 to 0.5 MSU Base
		0.51 to 1.0 MSU Base
		Level A Chg/MSU (2 to 11 MSUs)
		Level B Chg/MSU (12 to 44 MSUs)
		Level C Chg/MSU (45 to 78 MSUs)
		Level D Chg/MSU (Above 78 MSUs)
		Level D Chg/MSU (Above 78 MSUs), per 50 MSUs

New Application License Charge (NALC)

N/A

IBM Z Entry License Charge (zELC)

IBM Z Entry License Charge (zELC) basic license

To order a basic license, specify the program number and machine model.

Program name: Db2 13 for z/OS

Program ID: 5698-DB2

Entitlement identifier	Description	License option/ Pricing metric
S018M7N	Db2 13 for z/OS	Basic MLC, zELC
S018M7K	QMF Classic Edition Db2 13	Basic MLC, zELC
S018M7L	QMF Enterprise Edition 13	Basic MLC, zELC
S018M8L	SQL Data Insights	Basic MLC, zELC
S018M7M	Application Connect Db2 13	Basic MLC, zELC

Extended License Charge (ELC)

N/A

Basic machine-readable material

Orderable Supply ID	Language	Description
S018M7P	US English	Db2 13 for z/OS
S018M7T	JPN	Db2 13 for z/OS
S018M7R	US English	QMF Classic Edition Db2 13
S018M7S	MUL	QMF Classic Edition Db2 13
S018M7V	US English	QMF Enterprise Edition 13
S018M7W	MUL	QMF Enterprise Edition 13
S018M8M	US English	SQL Data Insights
S018M8F	US English	Application Connect Db2 13

IBM recommends internet delivery. However, if you still require physical media, you can choose DVD.

Customization options

Expedite shipments will be processed to receive 72-hour delivery from the time IBM Software Delivery and Fulfillment (SDF) receives the order. SDF will then ship the order by overnight air transportation.

Publications

With the exception of the following publications, no other publications are shipped with the announced features:

- Db2 13 for z/OS *License Program Specification* (GC28-2779)
- QMF Enterprise Edition *Accessing QMF Enterprise distributed components DVD* (LCD7-7807)
- A supporting Program Directory for each orderable feature

For additional information, see the online product documentation.

Subsequent updates (technical newsletters or revisions between releases) to the publications shipped with the product will be distributed to the user of record for as

long as a license for this software remains in effect. A separate publication order or subscription is not needed.

Customized Offerings

Product deliverables are shipped only through CBPDO and ServerPac. These customized offerings are offered for internet delivery from Shopz. For more details on internet delivery, go to the Help section on the Shopz website.

IBM recommends internet delivery. However, if you still require physical media, you can choose DVD.

Many products can be ordered in ServerPac the month following their availability in CBPDO. z/OS can be ordered through CBPDO and ServerPac on the planned availability date. Many products will also be orderable in a ServerPac without also having to order the z/OS operating system or subsystem.

Shopz and CFSW will determine the eligibility based on product requisite checking. For more details on the ServerPac, go to the Help section on the Shopz website.

Production of software product orders will begin on the planned availability date.

- CBPDO shipments will begin within 3 business days after the planned availability date.
- ServerPac availability and shipments will begin within 3 - 4 weeks after the planned availability date due to additional customization and data input verification.

Terms and conditions

Agreement

IBM Client Relationship Agreement (CRA) or IBM Customer Agreement (ICA)

Support lifecycle policy

Program technical support

You will be notified, through an announcement letter, of discontinuance of support with 14-months' notice.

If you require additional technical support from IBM, including an extension of support beyond the discontinuance date, contact your IBM representative or IBM Business Partner. This extension may be available for a fee.

For additional information about the IBM software lifecycle policies, see the IBM Continuous Delivery Support Lifecycle Policy web page.

Variable charges apply

No

Location license applies

No

Educational allowance available

Yes, 15% education allowance applies to qualified education institution Clients.

Volume orders

Not applicable.

Multi-Version Measurement

Multi-Version Measurement (MVM) Sub-Capacity charges for the most recent program version are for the combined concurrent peak utilization of the LPARs where any version of the eligible program is used. MVM Full Capacity charges for the most recent program version are for the full capacity of the machine. Program charges are waived for any older eligible versions. MVM does not extend support dates for programs withdrawn from service.

For more information about MVM, including requirements for qualification, see the MVM web page. For a list of eligible programs, see the Sub-Cap MLC web page on the IBM Z software contracts website.

Warranty applies

Yes

Licensed program materials availability

```
Restricted Materials of IBM:     None
Non-Restricted Source Materials: None
Object Code Only (OCO):          All
```

Program services

Support Center applies:	Yes
	Access available through the IBM Support Center
Available until discontinued:	14 months written notice
APAR mailing address:	
	IBM Db2 for z/OS Client Success Team 555 Bailey Avenue San Jose, CA 95141-1003

IBM Operational Support Services - SoftwareXcel

For operating system software, the revised IBM Operational Support Services - SoftwareXcel offering will provide support for those operating systems and associated products.

This will ensure total support coverage for your enterprise needs, including IBM and selected non-IBM products. For complete lists of products supported under both the current and revised offering, go to the Supported product list website.

Statement of good security practices

IT system security involves protecting systems and information through prevention, detection, and response to improper access from within and outside your enterprise. Improper access can result in information being altered, destroyed, or misappropriated or can result in misuse of your systems to attack others. Without a comprehensive approach to security, no IT system or product should be considered completely secure and no single product or security measure can be completely effective in preventing improper access. IBM systems and products are designed to be part of a lawful, comprehensive security approach, which will necessarily involve

additional operational procedures, and may require other systems, products, or services to be most effective.

Important: IBM does not warrant that any systems, products, or services are immune from, or will make your enterprise immune from, the malicious or illegal conduct of any party.

IBM Electronic Services

The IBM Electronic Service Agent, in combination with IBM Support, is dedicated to providing fast, exceptional support to organizations that have IBM Systems. The IBM Electronic Service Agent is a no-additional-charge tool that proactively monitors and reports hardware events, such as system errors, performance issues, and inventory. The Electronic Service Agent can help you stay focused on your company's strategic business initiatives, save time, and spend less effort managing day-to-day IT maintenance issues. Servers enabled with the Electronic Service Agent can automatically open a problem with IBM Support when covered under IBM warranty or maintenance agreements.

Integrated into the base operating system of IBM i, AIX$^{(R)}$, Power Linux Tools pack, and the Power hardware management console (HMC), the Electronic Service Agent is designed to automatically and electronically report system failures and utilization issues to IBM, which can result in faster problem resolution and increased availability. The Electronic Service Agent includes a powerful web user interface, giving the administrator easy access to configurations, status, tool settings, problem information, and filters. System configuration and inventory information collected by the Electronic Service Agent also can be viewed on the IBM Support website and used to improve problem determination and resolution by you and the IBM support team.

For more information and documentation on how to configure and use the Electronic Service Agent, go to the IBM Electronic Service Agent website.

IBM Support is a single internet entry point that replaces the multiple entry points traditionally used to access IBM internet services and support. IBM Support enables you to gain easy access to IBM resources for assistance in resolving technical problems. The Call Home web, which is available from the My support menu with links to My systems and My inventory, and premium search functions make it easy for organizations with Electronic Service Agent enabled products to track system inventory and find pertinent fixes.

Prices

For additional information and current prices, contact your local IBM representative or IBM Business Partner.

Entitlement identifier	Description	License option/ Pricing metric
S018M7N	Db2 13 for z/OS	Basic MLC, zELC
S018M7K	QMF Classic Edition Db2 13	Basic MLC, zELC
S018M7L	QMF Enterprise Edition 13	Basic MLC, zELC
S018M8L	SQL Data Insights	Basic MLC, zELC
S018M7M	Application Connect Db2 13	Basic MLC, zELC

z800 models

0A1
0B1
0C1

001
0A2
002
003
004

Entitlement identifier	Description	License option/ Pricing metric
S018M7N	Db2 13 for z/OS	Basic MLC, PSLC below 3 MSU
		Basic MLC, PSLC AD
		SYSUSGREG NC, PSLC AD
S018M7K	QMF Classic Edition Db2 13	Basic MLC, PSLC below 3 MSU
		Basic MLC, PSLC AD
		SYSUSGREG NC, PSLC AD
S018M7L	QMF Enterprise Edition 13	Basic MLC, PSLC below 3 MSU
		Basic MLC, PSLC AD
		SYSUSGREG NC, PSLC AD
S018M8L	SQL Data Insights	Basic MLC, PSLC below 3 MSU
		Basic MLC, PSLC AD
		SYSUSGREG NC, PSLC AD
S018M7M	Application Connect Db2 13	Basic MLC, PSLC below 3 MSU
		Basic MLC, PSLC AD
		SYSUSGREG NC, PSLC AD

Entitlement identifier	Description	License option/ Pricing metric
S018M7N	Db2 13 for z/OS	Basic MLC, AWLC
S018M7K	QMF Classic Edition Db2 13	Basic MLC, AWLC
S018M7L	QMF Enterprise Edition 13	Basic MLC, AWLC
S018M8L	SQL Data Insights	Basic MLC, AWLC
S018M7M	Application Connect Db2 13	Basic MLC, AWLC

Entitlement identifier	Description	License option/ Pricing metric
S018M7N	Db2 13 for z/OS	Basic MLC, AEWLC
S018M7K	QMF Classic Edition Db2 13	Basic MLC, AEWLC
S018M7L	QMF Enterprise Edition 13	Basic MLC, AEWLC
S018M8L	SQL Data Insights	Basic MLC, AEWLC
S018M7M	Application Connect Db2 13	Basic MLC, AEWLC

Sub-capacity charges for AWLC, AEWLC, CMLC, zNALC, VWLC, EWLC, and MWLC products

Sub-capacity charges for eligible products are based on product LPAR utilization capacity. Product LPAR utilization capacity for a sub-capacity product is the highest number of MSUs utilized by the combined LPARs in which the product runs concurrently during a reporting period. The number of MSUs is based on the highest observed rolling 4-hour average utilization used by the combination of the relevant LPARs during the reporting period.

Sub-capacity charges terms and conditions

IBM Z software charges at less than full machine capacity for eligible sub-capacity products apply when z/OS, z/TPF, or z/VSE$^{(R)}$ is running in z/Architecture$^{(R)}$ (64-bit) mode on an IBM Z, no other MVS-based, TPF-based, or VSE-based operating system

respectively is licensed to that server, and the required information is provided by the client in accordance with the applicable terms.

Sub-capacity charges for a sub-capacity product are based on the utilization of the LPARs where/when the product executes. To obtain charges at less than full machine capacity for sub-capacity products, the client is required to:

- Sign and abide by the terms of one of the following:

  - Attachment for IBM System z$^{(R)}$ Advanced Workload License Charges (Z125-8538)
  - Attachment for IBM System z Advanced Entry Workload License Charges (Z125-8755)
  - Attachment for IBM Country Multiplex Pricing (Z126-6965)
  - Attachment for zNALC License Charges on IBM System z (Z125-7454)
  - Attachment for IBM System z Workload License Charges (Z125-6516)
  - Attachment for EWLC, TWLC, zELC, and z/OS.e License Charges (Z125-6587)
  - Attachment for IBM System z Midrange Workload License Charges (Z125-7452)

- Required service will be listed on the IBM Z software pricing website.

- Collect SMF or SCRT89 data as required by the Sub-Capacity Reporting Tool. Retain the collected data for a period of not less than six months.

- Use the IBM provided Sub-Capacity Reporting Tool to process the collected SMF or SCRT89 data. The Sub-Capacity Report produced by the tool is used to determine required license capacity for the sub-capacity products. Required license capacity is determined based on the largest MSU value of a sub-capacity product running concurrently in all LPARs during the reporting period. IBM reserves the right to request the system data that supports these product-defined capacity values for a period of up to six months after the data was collected.

- Provide an initial Sub-Capacity Report to begin to receive the benefits of less than full machine capacity charges. Sub-capacity charging will follow submission of a Sub-Capacity Report. There will be no retroactive application of sub-capacity charges.

- Submit Sub-Capacity Reports monthly between the second and ninth day of the month after the reporting period.

- Submit Sub-Capacity Reports for all sub-capacity products with complete data for the entire reporting period through the method specified on the IBM Z software pricing website.

  Sub-Capacity Reports that reflect a changed product defined capacity will be considered to be orders placed by the client without further action on the client's part, and IBM is authorized to make any resulting billing increase or decrease, including the ordering of any necessary new licenses. To discontinue licenses, move licenses between machines, report a hardware model upgrade, or enable or disable product features, the client must contact IBM or their IBM Business Partner.

- Configure the machine to send weekly Transmit System Availability Data (TSAD) to IBM through the IBM Z Remote Support Facility (RSF). If the machine cannot connect through the RSF, provide this TSAD through an alternate means documented in the *SCRT Users Guide* (SG24-6522) publication on the IBM Z software pricing website.

Entry Workload License Charge (EWLC):

Entitlement identifier	Description	License option/ Pricing metric
S018M7N	Db2 13 for z/OS	Basic MLC, Entry WLC
S018M7K	QMF Classic Edition Db2 13	Basic MLC, Entry WLC
S018M7L	QMF Enterprise Edition 13	Basic MLC, Entry WLC
S018M8L	SQL Data Insights	Basic MLC, Entry WLC
S018M7M	Application Connect Db2 13	Basic MLC, Entry WLC

New Application License Charge (NALC) charges

Entitlement identifier	Description	License option/ Pricing metric	Charge
S018M7N	Db2 13 for z/OS	0 to 0.25 MSU Base	
		0.26 to 0.5 MSU Base	
		0.51 to 1.0 MSU Base	
		Level A Chg/MSU (2 to 11 MSUs)	
		Level B Chg/MSU (12 to 44 MSUs)	
		Level C Chg/MSU (45 to 78 MSUs)	
		Level D Chg/MSU (Above 78 MSUs)	
		Level D Chg/MSU (Above 78 MSUs), per 50 MSUs	

PLC/ALC:

Clients who pay a PLC and an ALC for a licensed program receive enhancements and future releases, if any, at no additional charge. Significant new functions may be offered as an optional feature and charged for separately. If a replacement program is announced and the client elects to license the replacement program for a PLC/ALC and replace the prior program, an upgrade charge may apply.

The first payment consists of the primary license charge and the annual license charge. The annual license charge applies yearly thereafter.

Variable charges:

The applicable processor based one-time charge will be based on the group of the designated machine on which the program is licensed for use. If the program is designated to a processor in a group for which no charge is listed, the charge of the next higher group listed applies. For movement to a machine in a higher group, an upgrade charge equal to the difference in the then-current charges between the two groups will apply. For movement to a machine in a lower group, there will be no adjustment or refund of charges paid.

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Corrections

(Corrected on June 2, 2022)

The Software requirements section was revised.