IBM DB2 10 for z/OS

Program number 5605-DB2

IBM® DB2® 10 for z/OS® is a relational database management system licensed program for the z/OS environment.

In this document, DB2 10 for z/OS is sometimes referred to as “DB2 for z/OS.” In cases where the context makes the meaning clear, DB2 for z/OS is sometimes referred to as “DB2.”

Highlights

DB2 for z/OS is a licensed program that supports the relational data model with a high-level language to access DB2 data. DB2 offers many functions in support of traditional database application areas, e-business, and business intelligence. The highlights of this licensed program and its functions are described below.

- **Relational data model**: DB2 provides a tabular data structure. Users view data as a series of rows and columns. DB2 for z/OS provides hybrid data-server support for both relational and pureXML® storage, with services to support both data structures.

- **Structured query language**: Structured query language (SQL) is a high-level language that is used for data manipulation, data definition, and control. SQL does not depend on data paths, placement, or order when it accesses relational databases. In DB2 10 for z/OS, enhancements to SQL facilitate easier portability of applications from other members of the DB2 family or from competitive database products.

- **pureXML**: DB2 for z/OS support for XML. With pureXML, your client applications can manage XML data in DB2 tables. In DB2 10 for z/OS, enhancements to pureXML improve productivity, help optimize performance, and improve consistency across the DB2 family of products. Key enhancements include support for the binary XML format, XML schema validation as a built-in function, and XML parameters in routines.

- **Access to data**: DB2 can be accessed by many applications, including:
  - IBM Information Management System (IMS™) Transaction Manager
  - IBM Customer Information Control System (CICS®) Transaction Server
  - IBM Time Sharing Option (TSO) users
  - Web users
  - WebSphere® Application Server
  - Batch jobs

Application programs that run under the control of IMS Transaction Manager or the CICS Transaction Server can also access DB2 data, IMS data, or both. The data sharing function allows a group of DB2 subsystems to have concurrent access to the same data without replication.

In addition, DB2 can access, or be accessed by, different instances of DB2 or by other database management systems that support Distributed Relational Database Architecture™ (DRDA®). These systems must be connected to the local DB2 subsystem by TCP/IP or Advanced Communication Facility/Virtual Telecommunications Access Method (ACF/VTAM). Each data sharing member can have up to 200,000 concurrent connections; up to 2000 of those connections can be active at one time. Data can be changed and read at more than one subsystem in a single unit of work, and the commit processing of all data is coordinated. Other programs can access the data at the same time.

- **Application programming**: Programmers can use an integrated development environment (Java, WebSphere Studio Enterprise Developer, or Microsoft .NET), many languages, and many access styles...
to access DB2. Users can access and manipulate DB2 data by using SQL through application programs that are written in Java, C#, APL®, Perl, PHP, Ruby on Rails, SQL procedural language, REXX, C, C++, COBOL, Fortran, PL/I, or assembler language. C and C++ languages can use embedded SQL or ODBC. Users can write applications that are written in the Java programming language and that access DB2 for z/OS data or data on any DRDA server. These applications can access data either dynamically through JDBC or through static embedded SQL by using pureQuery or SQLJ.

Several other ways to develop or run applications are available. You can, for example:

- Run workloads in the UNIX, Windows, or Linux environments by using IBM DB2 Connect™ to interact with DB2 for z/OS.
- Use one of the IBM DB2 Query Management Facility™ (QMF™) licensed programs.
- Use IBM WebSphere Enterprise Developer to develop applications.
- Use the IBM Rational® Developer for System z® application development workbench, which provides an integrated set of tools that support end-to-end, model-based development, runtime testing, and rapid deployment of simple and complex applications.
- Use the integrated set of DB2 Development Add-Ins for Microsoft Visual Studio .NET that are provided through IBM Data Studio to support iterative development of server-side stored procedures and user-defined functions.
- Use Optim™ Development Studio to develop and test SQL, PL/SQL, and Java database routines, generate and deploy database web services, create and run SQL and XQuery scripts, and develop Java database applications.
- Use Optim pureQuery Runtime for z/OS to build high-quality, better performing database applications, and then deploy pureQuery or pureQuery-enabled Java applications to production environments.
- Use the tools that are provided with Optim Query Tuner and Optim Query Workload Tuner to analyze queries and to analyze and monitor query workloads that run on data servers.

- **Flexibility in migration paths:** DB2 10 for z/OS offers upward compatibility for earlier releases of DB2 for z/OS. Migration with fallback protection is available for customers that are running on DB2 Version 9.1 for z/OS or DB2 UDB for z/OS Version 8 in new-function mode. In addition, DB2 Version 8 or Version 9.1 can coexist with Version 10 in a data sharing environment and in a distributed environment. Supporting migration from either Version 8 or Version 9.1 provides you with greater flexibility as you plan for DB2 10 for z/OS.

### Optional features

The features that are described in this section work directly with DB2 for z/OS. Some of these features are available at no additional charge, and others are chargeable.

### Chargeable features

#### DB2 Query Management Facility

DB2 Query Management Facility (DB2 QMF), which is comprised of two optional features, works directly with DB2 for z/OS. DB2 QMF is packaged in the following editions:

- **DB2 QMF Enterprise Edition,** which provides the following licensed programs that support the entire DB2 QMF family of products:
  - DB2 QMF for TSO/CICS
  - DB2 QMF High Performance Option (HPO)
  - DB2 QMF for Workstation
  - DB2 QMF for WebSphere
- **DB2 QMF Classic Edition,** which provides the DB2 QMF for TSO/CICS program to support users who access DB2 databases entirely from traditional mainframe terminals and emulators.

### Features available with no additional charge
**z/OS Application Connectivity to DB2 for z/OS:** z/OS Application Connectivity to DB2 for z/OS provides the IBM Data Server Driver for JDBC and SQLJ, which is a pure Java, type 4 JDBC driver. This driver is designed to deliver high performance and scalable remote connectivity for z/OS Java-based enterprise applications on z/OS to a remote DB2 for z/OS database server.

**IBM DB2 Accessories Suite for z/OS:** IBM DB2 Accessories Suite for z/OS provides DB2 for z/OS with expanded capabilities in the areas of spatial support, text search support, and Unicode support. This suite includes:

- IBM Spatial Support for DB2 for z/OS
- IBM OmniFind® Text Search Server for DB2 for z/OS
- IBM International Components for Unicode for DB2 for z/OS

**Specified operating environment**

DB2 10 for z/OS has hardware and software requirements for the operating environment.

**Hardware requirements**

The hardware requirements for DB2 10 for z/OS are identified below.

**Processors**

DB2 10 for z/OS operates on System z or equivalent processors that are running in 64-bit mode with z/OS V1R10 or later. These processors include zEnterprise 196 (z196), z10®, z9®, z990, z890, and later processors that are supported by z/OS V1R10. The processor must have enough real storage to satisfy the combined requirements of the following items:

- DB2 10 for z/OS
- z/OS
- The appropriate DFSMS storage management subsystem components, access methods, telecommunications, batch requirements, and other customer required applications

In addition, 64-bit virtual addressing support is likely to require increased real storage for a workload as compared to DB2 Version 9.1 for z/OS or DB2 UDB for z/OS Version 8.

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 users’ information storage requirements. Disk storage can consist of any direct-access facility that is supported by the system configuration and the programming system.

**Auxiliary storage**

DB2 for z/OS is independent of both disk and tape device type. The customer can use any magnetic, optical, or tape device that is supported by the data facilities component of DFSMS or by 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 or tape
- *Image copy data sets:* disk or tape
- *Bootstrap data sets:* disk
- *User data sets:* disk or tape (if migrated by HSM)
- *DB2 catalog data sets:* disk
- *Work data sets (for utilities):* disk or tape
If these data sets are on a disk device that is shared with other z/OS systems, use global resource serialization to prevent concurrent access by more than one z/OS system.

The minimum disk space requirement, based on installing DB2 with the panel default values, is approximately 1 GB. Users need additional disk space for their data.

For subsystems that use dual logging and tape for the log archiving device, at least two tape drives are needed.

**Data communications devices**

DB2 operations can be controlled from the following devices:

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

For information about the data communication devices that are supported by IMS Transaction Manager, CICS, and z/OS, refer to the documentation for these products.

**Function-dependent hardware requirements**

Certain functions of DB2 10 for z/OS have associated hardware requirements, as specified in the following list. If you do not use these DB2 functions, the hardware requirements do not apply.

- **DRDA Data Stream Encryption**: DRDA Data Stream Encryption requires cryptographic hardware but can optionally use a cryptographic coprocessor, cryptographic accelerator, or set of cryptographic instructions.
- **Encryption and decryption functions**: Built-in functions for encryption and decryption require cryptographic hardware but can optionally use a cryptographic coprocessor, cryptographic accelerator, or set of cryptographic instructions.
- **Group Buffer pool (GBP) Batching**: Group buffer pool batching requires the Coupling Facility. See the latest Coupling Facility (CF) level that is recommended for your processor at [www.ibm.com/systems/z/advantages/pso/cftable.html](http://www.ibm.com/systems/z/advantages/pso/cftable.html).

**Programming requirements**

This section lists licensed programs, or specific elements and features of licensed programs, that are required in the DB2 10 for z/OS environment. You can use subsequent versions or releases of the programs, unless stated otherwise. This section also identifies the requirements that are associated with specific DB2 capabilities and optional programs that you can use with DB2 10 for z/OS. Refer to the following web sites for the most current information:

- For information about the product life cycle dates for z/OS and DB2 for z/OS, see [www.ibm.com/software/support/systemsz/lifecycle/](http://www.ibm.com/software/support/systemsz/lifecycle/)
- For specific information about DB2 10 for z/OS, see the DB2 for z/OS web page at [www.ibm.com/software/data/db2/zos/](http://www.ibm.com/software/data/db2/zos/)
- For a variety of support-related information about DB2 for z/OS, visit the IBM Support Portal [www.ibm.com/support/entry/portal](http://www.ibm.com/support/entry/portal). You can register and personalize your product list to experience the many features of the Support Portal. If you want to visit the Support Portal with DB2 for z/OS preselected, go to [www.ibm.com/support/entry/portal/Overview/Software/Information_Management/DB2_for_z-OS](http://www.ibm.com/support/entry/portal/Overview/Software/Information_Management/DB2_for_z-OS)

**Operating system and support programs**

DB2 10 for z/OS requires the function that is provided by the following licensed programs or their equivalents, including subsequent versions or releases:

- z/OS Version 1 Release 10 Base Services (5694-A01), with the following base and optional elements:
- DFSMS Version 1 Release 10
- Language Environment® Base Services
- z/OS Version 1 Release 10 Security Server (RACF®)
- If you have large buffer pools that are page fixed (standard) and z10 or zEnterprise machines, z/OS uses large pages and thus requires the following z/OS APARs:
  - For z/OS V1.10: APARs OA24441, OA25169, OA25485, OA27799, OA31116, OA32001, OA32668
  - For z/OS V1.11 or V1.12: APARs OA32001, OA31116, OA32668
• IRLM Version 2 Release 3 (delivered with DB2 10 for z/OS).
• z/OS Unicode Services and appropriate conversion definitions.
• Either Version 10 of the DB2 Utilities Suite for z/OS (5655-V41), or an equivalent alternative function that provides some of the basic operation of a DBMS (including backup, recovery, reorganization, loading, and unloading of data, gathering of statistics, and checking of data, indexes, and large objects).

New functions are available only in new-function mode, unless explicitly stated otherwise in the product documentation. A general exception exists for optimization and virtual storage. In prior versions, most utility functions were available in conversion mode, but for DB2 10 for z/OS, most new utility enhancements work only in new-function mode.

### Virtual storage requirements

Most DB2 data resides in the shared memory of the DB2 address spaces, which is above the bar. DB2 10 for z/OS requires 128 GB of 64-bit shared private storage for each DB2 subsystem that is above the 2 GB bar. This storage is virtual and is controlled by the z/OS parameters HVSHARE and HVCOMMON in IEASYSxx. This storage is not physically assigned (or "backed") as it is allocated; it is backed only as it is used. Most control blocks and buffers reside in the extended private area above the 2 GB bar. Modules and some data resides above the 16 MB line, but below the 2 GB bar.

The amount of space that is 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 less than 24 KB for each IRLM subsystem. High concurrent activity, parallelism, or high contention can require more CSA.

DB2 10 for z/OS 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.

### Function-dependent program requirements

The following functions of DB2 10 for z/OS require specific licensed programs, or features of licensed programs, before they can be used in the context of application execution:

- Applications that are written in high-level programming languages, such as applications or stored procedures that are written in the C language and that use the ODBC or CLI interfaces to DB2, require Language Environment at run time.
- Applications or stored procedures that are written in Java, such as those that use the JDBC or SQLJ interfaces to DB2, require IBM SDK for z/OS, Java 2 Technology Edition, Version 1.4 (SDK1.4.2) (5655-I56) or later, at run time.

### Optional program requirements

The following functions are enabled in conjunction with the specified optional licensed programs when used together with DB2 for z/OS. This section describes which versions of these associated products are tolerated by DB2 10.

**Connectivity**

For DB2 database applications running on Linux, UNIX, or Windows operating systems, customers can use DB2 Connect and then perform one of the following actions:
• deploy the DB2 Connect gateway server for access to DB2 10
• use non-gateway DB2 Connect direct access from the database client machine to DB2 10

Especially for application servers such as WebSphere, the direct access approach provides excellent performance and scalability for all DB2 applications.

Both of these 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, JPA, SQLJ, Python, Perl, and so on. These approaches can be used alone or in combination, as needed. For more information about DB2 Connect deployment choices, see the documentation for the DB2 Connect product.

DB2 10 supports the following IBM relational database products:
• IBM DB2 9 for Linux, UNIX, Windows (5765-F41), or later
• IBM DB2 for i Version 6 Release 1 (5761-SS1), or later
• DB2 Server for VSE & VM Version 7 Release 3 (5697-F42), or later
• Any other DRDA-compliant client or relational DBMS server

**JDBC**

DB2 10 for z/OS supports the following JDBC application programming interface specification levels:
• JDBC 3.0 API requires any of the following at run time:
  – IBM SDK for z/OS, Java 2 Technology Edition, Version 1 Release 4 (SDK1.4.2) (5655-I56), or later
  – IBM 64-Bit SDK for z/OS, Java 2 Technology Edition, Version 5 (SDK5) (5655-N99), or later
• JDBC 4.0 API requires any of the following at run time:
  – IBM 31-bit SDK for z/OS, Java Technology Edition, Version 6 (SDK6) (5655-R31), or later
  – IBM 64-bit SDK for z/OS, Java Technology Edition, Version 6 (SDK6) (5655-R32), or later


**Web connectivity**

The following products provide connectivity to DB2 10 for z/OS from the web:
• Any of the following editions of WebSphere Application Server:
  – WebSphere Application Server Version 6 (5724-J08), or later
  – WebSphere Application Server for z/OS Version 6 Release 1 (5655-N01), or later
• Any of the following editions of DB2 Connect:
  – DB2 Connect Version 9 Release 1 (Fix Pack 1), or later
  – DB2 Connect Enterprise Edition (CEE) Version 9 Release 1 (5765-F30), or later
  – DB2 Connect Unlimited Edition (CUE) Version 9 Release 1 (5724-B62), or later
  – DB2 Connect Application Server Edition (CASE) Version 9 Release 1 (Fix Pack 1 or later) (5724-D54), or later
  – DB2 Connect Unlimited Edition for iSeries® Version 9 Release 1 (5724-M15), or later

DB2 Connect 9.7 (Fix Pack 3a) supports new functions in DB2 10 for z/OS.

For information about DB2 Connect support services, see [www.ibm.com/support/entry/portal](http://www.ibm.com/support/entry/portal)
Transaction management
The following transaction management products work with DB2 10 for z/OS:

- Information Management System (IMS) (either of the following versions):
  - IMS Version 11 (5635-A02)
  - IMS Version 10 (5635-A01)
- Customer Information Control System (CICS) (either of the following versions):
  - CICS Transaction Server for z/OS Version 4 Release 1 (5655-S97)
  - CICS Transaction Server for z/OS Version 3 Release 1 (5655-M15), or later
- WebSphere MQ (any of the following versions):
  - WebSphere MQ for z/OS Version 7.0.1 (5655-R36)
    For this version, WMQWF Version 3 Release 6 Service Pack 8 or later is required.
  - WebSphere MQ for z/OS Version 6 (5655-L82), or later
  - WebSphere MQ Extended Security Edition Version 6 (5724-E84)
  - WebSphere MQ Workflow for z/OS Version 3 Release 6 (5655-BPM)

Query support
The following query programs work with DB2 10 for z/OS:

- IBM DataQuant for z/OS Version 1 Release 2 (5697-N64)
- The DB2 Query Management Facility (QMF) Version 9 and Version 10 family of products

Data warehouse support
The following product provides warehouse management capabilities for DB2 10 for z/OS:

- InfoSphere™ Warehouse on System z, Version 9 Release 5.2 (5724-E34), or later

Development tools
The following application development tools can be used to build applications for DB2 10 for z/OS:

- Optim Development Studio, Version 2 Release 2 (5724-X83), or later
- IBM Optim pureQuery Runtime for Linux, UNIX, and Windows, Version 2.2.1 (5724-X84) or later
- IBM Optim pureQuery Runtime for z/OS, Version 2.2.1 (5655-V80) or later
- IBM InfoSphere Data Architect, Version 7 Release 5 (5724-V15), or later

The recommended no-charge query optimization and service tool for DB2 for z/OS is Data Studio. With Data Studio, DB2 for z/OS customers have a no-charge query serviceability tool for DB2 for z/OS. This tool is based and built on the foundation of the IBM Optimization Service Center for DB2 for z/OS.

Programming languages:
The following application development programming languages can be used to build applications for DB2 10 for z/OS:

- Building applications by using the DB2 precompiler:
  - Assembler: High Level Assembler, which is 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: Enterprise COBOL for z/OS Version 3 Release 4 (5655-G53), or Enterprise COBOL for z/OS Version 4 Release 1 (5655-S71), or later.
  - Fortran: VS Fortran Version 2 Release 6 (5668-806, 5668-087, 5668-805); data types and SQL functions that are new as of DB2 Version 9.1 for z/OS are not supported.
  - PL/I: Enterprise PL/I for z/OS Version 4 Release 1 (5655-W67), or later, or Enterprise PL/I for z/OS Version 3 Release 7 (5655-H31), or later.
• Building applications by using the DB2 coprocessor:
  – **C/C++**: C/C++ for z/OS (without Debug Tool), which is an optional priced feature of z/OS.
  – **COBOL**: Enterprise COBOL for z/OS Version 3 Release 4 (5655-G53), or Enterprise COBOL for z/OS Version 4 Release 1 (5655-S71), or later.
  – **PL/I**: Enterprise PL/I for z/OS Version 4 Release 1 (5655-W67), or later, or Enterprise PL/I for z/OS Version 3 Release 7 (5655-H31), or later.

• Building applications that are supported with processes other than the precompiler or coprocessor:
  – **Java**: Applications or stored procedures that are written in Java, such as those that use the JDBC or SQLJ interfaces to DB2 for z/OS have certain requirements. They require IBM SDK for z/OS, Java 2 Technology Edition Version 1.4 (SDK1.4.2, 5655-I56), or later, at run time. Optionally, for Java applications other than stored procedures, you can instead use IBM 64-Bit SDK for z/OS, Java 2 Technology Edition, Version 5 (SDK5) (5655-N99), or later, at run time. 5655-I56 and 5655-N99 are independent products and can co-exist on the same z/OS system.
  – **REXX**: IBM TSO Extensions for MVS™ REXX, which is part of z/OS.
  – **SQL procedural language**:
    – Native SQL procedural language.
    – External SQL procedural language: A C language compiler is required on z/OS to develop stored procedures by using the external SQL procedural language.
  – **APL2**:
    – Mainframe APL2 Version 2 Release 2 (5688-228) (full APL2)
    – APL2 Application Environment Version 2 Release 2 (5688-229)

**Operational support**

The following program can provide operational support for DB2 10 for z/OS:

• DFSMS features, which are part of the Systems Management optional feature of z/OS; specifically:
  – DFSMShsm for archiving
  – DFSMSdss for concurrent copy in utilities

**Tools support**

Refer to the IBM Data Management Tools web site [www.ibm.com/software/data/db2imstools](http://www.ibm.com/software/data/db2imstools) for the complete list of IBM products.

Refer to the IBM DB2 and IMS Tools Support web site for recent news about IBM DB2 Tools compatibility with DB2 10 for z/OS: [ibm.com/software/data/db2imstools/support.html](http://ibm.com/software/data/db2imstools/support.html)

IBM tools that support DB2 10 for z/OS include:

• IBM tools for replication management, including the following tools:
  – IBM WebSphere Replication Server Version 9 Release 1 (5655-R55)
  – IBM WebSphere Data Event Publisher Version 9 Release 1 (5655-R56)

• IBM tools for database recovery, including the following tools:
  – IBM DB2 Change Accumulation Tool for z/OS, Version 2 Release 1 (5655-F55), or later
  – IBM DB2 Object Restore for z/OS, Version 2 Release 1 (5697-I20)
  – IBM DB2 Log Analysis Tool for z/OS, Version 3 Release 2 (5655-T56)
  – IBM DB2 Recovery Expert for z/OS, Version 2 Release 2 (5697-N92)

• IBM tools for database application management, including the following tools:
  – DataQuant for z/OS, Version 1 Release 2 (5697-N64)
  – IBM DB2 Table Editor for z/OS, Version 4 Release 3 (5697-G65)
IBM tools for database administration and system management support, including the following tools:

- DB2 Administration Tool for z/OS, Version 10 Release 1 (5655-W34)
- DB2 Audit Management Expert, Version 2 Release 1 (5655-T57)
- DB2 Object Comparison Tool for z/OS, Version 10 Release 1 (5655-W36)

IBM tools for utilities management, including the following tools:

- DB2 Automation Tool for z/OS, Version 3 Release 1 (5655-T59)
- DB2 Cloning Tool for z/OS, Version 2 Release 2 (5655-S91)
- DB2 Utilities Suite for z/OS, Version 10 Release 1 (5655-V41)
- DB2 Utilities Enhancement Tool, Version 2 Release 1 (5655-T58)
- DB2 High Performance Unload for z/OS, Version 4 Release 1 (5655-AA1)

IBM tools for database performance management, including the following tools:

- Optim Query Tuner for DB2 for z/OS Version 2 Release 2 (Modification Level 1) (5655-V91)
- Optim Query Workload Tuner for DB2 for z/OS Version 2 Release 2 (Modification Level 1) (5655-V81)
- DB2 Buffer Pool Analyzer for z/OS, Version 5 Release 1 (5655-W35)
- Tivoli® OMEGAMON® XE for DB2 Performance Expert Version 5 Release 1 (5655-W37)
- Tivoli OMEGAMON XE for DB2 Performance Monitor Version 5 Release 1 (5655-W38)

Other vendor software for tools support DB2 10 for z/OS. Contact the independent software vendors for additional information.

Requirements for dependent functions of DB2

DB2 10 for z/OS includes the following functions, some of which have requirements of their own, above and beyond what the base DB2 for z/OS product requires. This section identifies the requirements for using these functions, without repeating the requirements for DB2 10 for z/OS.

Recommendation: Before using these features, refer to the relevant installation information to ensure that you have all required and recommended products.

- **System level point-in-time backup and recovery function:** This utility function requires the following prerequisites:
  - DFSMShsm
  - DFSMSdss
  - FlashCopy® Version 1
  - FlashCopy Version 2 (required for object-level recovery from system-level backup and FlashCopy backups)
  - z/OS V1.11 (5694-A01). z/OS V1.11 removes the following RECOVER utility restriction for object recovery from a system-level backup:
    RECOVER uses HSM to restore objects from a system-level backup recovery base. Prior to z/OS 1.11, HSM had a restriction that any data set that is restored must reside on the same volume on which it resided when the system-level backup was created. As a result, RECOVER restricted the use of a system-level backup as a recovery base if a subsequent utility might have moved the data set. HSM removed this restriction in z/OS 1.11. Therefore, the RECOVER restriction is also removed.

- **Extended Address Volumes (EAV):** Large sequential data sets require z/OS Version 1 Release 11 (5694-A01).

- **Encryption and decryption functions:** Built-in functions for encryption and decryption require the z/OS Cryptographic Services Integrated Cryptographic Service Facility (ICSF).

- **DRDA data stream encryption:** DRDA data stream encryption can optionally use the z/OS Cryptographic Services Integrated Cryptographic Service Facility (ICSF).
• **Offload queries that run with CP query parallelism to zIIP:** These queries require WLM APAR OA26104.

• **QMF:**
  - QMF Classic Edition feature includes QMF for TSO/CICS.
  - QMF Enterprise Edition feature includes the following licensed programs:
    - QMF for TSO/CICS
    - QMF High Performance Option (HPO)
    - QMF for Workstation
    - QMF for WebSphere

  QMF Classic Edition Version 10 and QMF Enterprise Edition Version 10 are separately orderable, priced features of both DB2 10 for z/OS and DB2 Version 9.1 for z/OS. Although QMF Version 10 can be used with earlier versions of DB2 for z/OS, you must have a license for DB2 10 or DB2 Version 9.1 to use QMF Version 10 with any supported version of DB2.

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**Compatibility**

DB2 10 for z/OS is upwardly compatible with earlier releases of DB2 for z/OS. Migration is available for customers that are running in new-function mode on DB2 Version 9.1 for z/OS or on DB2 UDB for z/OS Version 8. Existing customers should ensure they are successfully running on DB2 Version 9.1 for z/OS (new-function mode) or on DB2 UDB for z/OS Version 8 (new-function mode) before migrating to DB2 10. Fallback protection is provided for the steps of moving to DB2 10 conversion mode, to enabling-new-function mode, and to new-function mode.

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**Licensed program materials availability**

Restricted materials - No. This licensed program is available without source licensed program materials. It is available in object code.

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**Supplemental terms**

DB2 10 for z/OS has supplemental terms.

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**Designated machine identification**

Designated machine identification is required.

The machine identification requirement prohibits copying platform-independent components that are delivered with this product, such as JDBC drivers, to other machines or operating systems unless specifically permitted by this document.

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**Limited-use license for z/OS Application Connectivity to DB2 for z/OS**

The z/OS Application Connectivity to DB2 for z/OS feature, a type 4 JDBC driver, is licensed for installation and use solely on z/OS. The sole authorized use of z/OS Application Connectivity to DB2 for z/OS is limited to connecting an application that runs on z/OS to Version 7, 8, 9, or 10 of DB2 for z/OS that is running in a separate partition on the same server as the application is running 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 on any other platform or operating system.
QMF Enterprise Edition and accompanying program licenses

QMF Enterprise Edition consists of the following licensed programs:
- DB2 QMF for TSO/CICS
- DB2 QMF High Performance Option (HPO)
- DB2 QMF for Workstation
- DB2 QMF for WebSphere

The QMF for TSO/CICS and QMF HPO licensed programs are installed and run on z/OS and are licensed to you under the terms of the IBM Customer Agreement. The QMF for Workstation and QMF for WebSphere licensed programs are licensed under the terms of the IBM International Program License Agreement that accompanies the CD media for these licensed programs and is displayed and must be accepted during installation.

Although QMF Version 10 can be used with earlier versions of DB2 for z/OS, you must have a license for DB2 10 or DB2 Version 9.1 to use QMF Version 10 with any supported version of DB2.

Usage restriction

Not applicable.

Type and duration of program services

IBM Software Support will be provided until discontinued by IBM with a minimum of six months written notice.

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