



IBM DB2 12 for z/OS Early Support Program

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At a glance

IBM^(R) DB2^(R) 12 for z/OS^(R) continues to extend the value delivered to your business by IBM's industry-leading data server, while empowering your future, in the following ways:

- Delivers business insights faster while reducing costs.
- Delivers unmatched availability, reliability, and security for business-critical information.
- Enables easy access, easy scale, and easy application development for the mobile enterprise.
- Offers more flexible partitions, dynamic plan stability, integrated RUNSTATS, and EXPLAIN improvements.
- Provides streamlined migration process, self-healing, and self-managing capabilities.
- Improves in-memory performance supporting the mobile economy and uses the more affordable memory available in the latest IBM zEnterprise^(R) EC13.
- Enables easy access to your enterprise systems of record.

Selected features that deliver these valuable benefits to your business include:

- Support for SQL as a Service (SQLaaS) through RESTful connectivity to your DB2 for z/OS data.
- Improvements in support of Analytics workloads including optimized performance and improved zIIP offload in support of in-transaction analytics. 100% of parallel child task processing is now zIIP eligible.
- Expanded in-memory processing for greater performance improvement and emerging use case support, such as synergy with latest z SystemsTM processors, which offer significantly expanded memory capacity.
- Support for modernized, multiplatform, automated application deployments through DevOps using IBM Urban Code Deploy and z/OSMF.
- Up to 25% CPU improvement for query workloads and up to 10% online transaction processing (OLTP) CPU savings with larger memory and activation of memory exploitation features. CPU reductions and performance improvements for certain OLTP as well as select query workloads.
- High volume insert performance equaling two times throughput increase for concurrent sequential insert without clustering.
- Enhanced support for cloud and mobile workloads with dramatic scalability improvements for tables, increasing the maximum table size from 16 TB to 4 PB enabling support for up to 256 trillion rows in a single DB2 table.
- Deliver insights faster with up to 50% elapsed query time improvement.

Overview

IBM will make DB2 12 for z/OS available to a select group of clients in a closed Early Support Program (ESP) on March 4, 2016.

The demands of the mobile economy combined with the explosive growth of data present unique opportunities and challenges for companies wanting to take advantage of their mission-critical resources. Built on the proven availability, security, and scalability of DB2 11 for z/OS and the IBM z Systems™ platform, DB2 12 gives you the capabilities needed to meet the demands of mobile workloads and increased mission-critical data. It delivers world-class analytics and online transaction processing (OLTP) performance.

DB2 for z/OS delivers innovations in these key areas:

Scalable, low-cost, enterprise OLTP and analytics

DB2 12 continues to improve upon the value offered with DB2 11 with further CPU savings and performance improvements. Compared to DB2 11, DB2 12 clients can achieve up to 5% CPU savings for various traditional OLTP, heavy INSERT, and SAP workloads. Select query workloads may see even more benefits, with up to 25% CPU savings. Read-intensive OLTP workloads may see up to 10% CPU savings with DB2 12. Decompressing data is much faster using DB2 12 with significant performance improvements, delivering up to 15% CPU savings when running the queries against compressed tables.

DB2 12 provides deep integration with the IBM zEnterprise EC13, offering the following benefits:

- More efficient use of compression
- Support for compression of LOB data (also available with the IBM zEnterprise EC12)
- Support for large memory

Enhancements to compression aids DB2 utility processing by reducing elapsed time and CPU consumption with the potential to improve data and application availability. Hardware exploitation to support compression of LOB data can significantly reduce storage requirements and improve overall efficiency of LOB processing.

DB2 12 includes the new SQL TRANSFER OWNERSHIP statement, allowing better security and control of objects that contain sensitive data.

The real-world proven, system-wide resiliency, availability, scalability, and security capabilities of DB2 and z Systems continues to be the industry standard- keeping your business running when other solutions may not. This is especially important as enterprises support dynamic mobile workloads and the explosion of data in their enterprises. DB2 12 continues to excel and extend the unique value of z Systems, while empowering the next wave of applications.

Easy access, easy scale, and easy application development for the mobile enterprise

In-memory performance improvements

As enterprises manage the emergence of the next generation of mobile applications and the proliferation of the Internet of Things (IoT), database management system (DBMS) performance can become a critical success factor. To that end, DB2 12 contains many features that exploit in-memory techniques to deliver world-class performance, including:

- In-memory fast index traverse
- Contiguous and larger buffer pools

- Use of in-memory pipes for improved insert performance
- Increased sort and hash in-memory to improve sort and join performance

DB2 12 offers features to facilitate the successful deployment of new analytics and mobile workloads. Workloads connecting through the cloud or from a mobile device may not have the same performance considerations that enterprise workloads had. To that end, DB2 12 has many features to help ensure that new application deployments are successful. Improvements for sort-intensive workloads, workloads that use outer joins and UNION ALL as well as CASE expressions can experience improved performance and increased CPU parallelism offload to zIIP.

Easy access to your enterprise systems of record

DB2 Adapter for z/OS Connect is a service provider that connects RESTful web, mobile, and cloud applications to DB2 in the z/OS environment for service discovery and invocation. This solution is effective for companies looking to simplify the deployment of mobile or cloud-based applications that require access to their mission-critical DB2 for z/OS assets. It can supplement existing user-written mobile solutions as well as mobile solutions offered by IBM. The DB2 Adapter for z/OS Connect feature is available in the 5697-Q04, DB2 Accessories Suite for z/OS V3.3 product. For more information refer to Software Announcement [ZP15-0513](#), dated October 5, 2015.

Key prerequisites

- z/OS V2.1 Base Services, (5650-ZOS), or later
- z196, or higher, processors running z/OS V2.1, or later

Planned availability date

March 4, 2016

Availability of Programs with encryption algorithm in France is subject to French government approval. Contact the Cryptographic Approvals Manager in France, jbbelleiteix@fr.ibm.com, Paris DCT.

Description

Selected features that deliver these valuable benefits to your business include:

- Support for SQL as a Service (SQLaaS) through RESTful connectivity to your DB2 for z/OS data.
- Improvements in support of analytics workloads, including optimized performance and improved zIIP offload in support of in-transaction analytics.
- Expanded in-memory processing for greater performance improvement.
- Support for modernized, multiplatform, automated application deployments through DevOps using IBM Urban Code Deploy and z/OSMF.
- Up to 25% CPU improvement for query workloads and up to 10% online transaction processing (OLTP) CPU savings with larger memory and activation of memory exploitation features.
- CPU reductions and performance improvements for certain OLTP as well as select query workloads.
- High-volume insert performance that equates to two times throughput increase for concurrent sequential insert without clustering.
- Enhanced support for cloud and mobile workloads with dramatic scalability improvements for tables, increasing the maximum table size from 16 TB to 4 PB enabling support for up to 256 trillion rows in a single DB2 table.

- More flexible data partitioning, enabling partitions to grow past previous size limits to avoid the need for difficult and cumbersome repartitioning. This also enables new partitions to be dynamically inserted.
- Online schema enhancements that improve manageability and availability in addition to support for improved partition management, reducing the need for planned outages.
- Exploitation of recent IBM z Systems enhancements to compress LOB data, which can dramatically reduce the amount of storage and memory for storing and manipulating LOB data.
- Extended leadership with security enhancements including support for TRANSFER OWNER and more granular ADMIN authority.
- Optimized management through improved utility performance, usability, and availability of your mission-critical assets through enhanced REORG partition processing, new FlashCopy^(R) and system-level backup capability, and further zIIP processor exploitation.
- Enhanced support for the next generation of mobile applications through the optimization of syntax common to mobile workloads such as OFFSET, SQL PL in triggers and many other improvements.
- Expanded DB2 Analytics Accelerator performance and query support.
- Continued improvements for clients using SAP applications on DB2 for z/OS, including Dynamic Plan Stability, DDL improvements for SAP Zero Downtime maintenance, and several SQL functional and performance improvements.
- Single-phase catalog migration, which reduces the change windows involved in migrating completely to the new release.

Overview of DB2 features

DB2 12 for z/OS Early Support Program consists of the base DB2 product and two optional orderable features:

DB2 Utilities Suite for z/OS

DB2 Utilities Suite for z/OS, V12.1 is a comprehensive set of utilities for managing DB2 data maintenance tasks. DB2 Utilities Suite helps you minimize downtime associated with routine DB2 data maintenance while ensuring a high degree of data integrity. DB2 Utilities Suite supports new functions and structural changes in the DB2 12 for z/OS product in addition to delivering new performance, availability, and usability features.

z/OS Application Connectivity to DB2 for z/OS, a non-chargeable feature, consists of Universal Database Driver for z/OS Java™ Edition, a pure Java type 4 JDBC driver. It is 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.

The latest version of IBM DB2 QMF™ for z/OS, V11.2, will be made available at no charge to DB2 12 ESP clients for non-production use during the program. For information on the latest QMF features refer to Software Announcement [ZP15-0388](#), dated September 1, 2015

Hardware and software support services

SmoothStart/installation services

IBM SmoothStart Services and Installation Services are not provided for the DB2 12 ESP but will be offered in conjunction with general availability of this product.

Program number

Program number	VRM	Program name
5650-DB2	12.1.0	DB2 12 for z/OS

Services

Global Technology Services

Contact your IBM representative for the list of selected services available in your country, either as standard or customized offerings for the efficient installation, implementation, and integration of this product.

Technical information

Specified operating environment

Hardware requirements

Note that the information on hardware and software requirements in the following sections is preliminary and applies to the ESP version of DB2 12 for z/OS. Changes should be expected for the generally available product.

Processors

DB2 12 operates on z196, or later, processors running z/OS V2.1, or later. The processors must have enough real storage to satisfy the combined requirements of:

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

DB2 12 will probably require increased real storage as compared to DB2 11 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 (SSDs), 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.

Data communication devices

DB2 operations can be controlled from:

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

In addition to listing auxiliary storage and data communications devices, this section identifies function-dependent hardware requirements and virtual storage requirements.

Function-dependent hardware requirements

Certain functions of DB2 12 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.

- **Data sharing** requires the Coupling Facility. Refer to the latest Coupling Facility (CF) level recommended for your processor at <http://www.ibm.com/systems/z/advantages/psocftable.html>
- **DRDA[®] data stream encryption** uses the following ICSF APIs: CSNECKM, CSNERNG, CSNFPKB, CSNFPKE, CSNEENC, and CSNEDEC. Refer to the z/OS ICSF Application Programmer's Guide for additional information on the usage of these APIs including hardware requirements. However, if possible, do not use DRDA encryption and instead secure connections by using the z/OS Communications Server IP Application Transparent Transport Layer Security (AT-TLS).
- **DRDA AES user ID password encryption** uses the following ICSF APIs: CSNEOWH, CSNERNG, CSNFPKB, CSNFPKE, CSNESYE, and CSNESYD. Refer to the z/OS ICSF Application Programmer's Guide for additional information on the usage of these APIs including hardware requirements.
- **DSNLEUSR** stored procedure uses the following ICSF APIs: CSNBCKM, CSNBENC, CSNEDEC. Refer to the z/OS ICSF Application Programmer's Guide for additional information on the usage of these APIs including hardware requirements.
- **Encryption and decryption functions:** Built-in functions for encryption and decryption require cryptographic hardware in a cryptographic coprocessor, cryptographic accelerator, or cryptographic instructions.

Software requirements

This section lists licensed programs, or specific elements and features of licensed programs, that are required in the DB2 12 environment. You can use subsequent versions or releases of the programs, unless stated otherwise. This section also identifies requirements that are associated with specific DB2 capabilities, as well as optional programs that you can use with DB2 12. For the most current information refer to the following websites

http://www.ibm.com/servers/eserver/zseries/zos/support/zos_eos_dates.html

<http://www.ibm.com/software/data/db2/zos/support.html>

Operating system and support programs

DB2 12 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 Version 2.1 Base Services (5650-ZOS), or later, with the following base and optional elements:
 - DFSMS V2.1, or later
 - Language Environment^(R) Base Services
 - z/OS V2.1 Security Server (RACF^(R)), or later
- IRLM V2.3 (delivered with DB2 12)

If DB2 12 is installed with IRLM V2.3 into the same SMP/E zone as any version of IMS with IRLM V2.3, IRLM V2R2 will be deleted during the SMP/E installation of IRLM V2.3

Notes:

- New functions are available only after new function is activated unless explicitly stated otherwise in the product documentation. A general exception exists for optimization and virtual storage.
- z/OS Unicode Services and appropriate conversion definitions are required. For additional information on Unicode conversions, refer to the *DB2 12 for z/OS Installation and Migration Guide and Support for Unicode: Using Conversion Services*, SA22-7649.
- 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. Customers should ensure that these functions are provided either by ordering DB2 Utilities Suite for z/OS, which is an orderable feature in the DB2 12 ESP program, or by obtaining equivalent function elsewhere.

Virtual storage requirements

Most of DB2 data resides in shared memory of the DB2 address spaces, above the bar. DB2 12 requires 1 TB contiguous of 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 resides 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.

DB2 12 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(DSNTIJS) for a sample SMS environment.

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 V6, or later, at runtime.

Requirements for dependent functions of DB2 12 for z/OS

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

- System-level Point-in-Time (PIT) Backup and Recovery function needs:
 - DFSMSHsm
 - DFSMSDss
 - FlashCopy V1
 - FlashCopy V2 (required for object-level recovery from system-level backup and FlashCopy image copy)
- Encryption and decryption functions: Built-in functions for encryption and decryption require z/OS Cryptographic Services Integrated Cryptographic Service Facility (ISCF).
- DRDA Data Stream Encryption can optionally use z/OS Cryptographic Services Facility (ICSF).

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 or 12 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 UDB 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 12.

Connectivity

For database applications that run on Linux, UNIX™, or Windows™ operating systems, customers 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 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^(R), JPA, SQLJ, Python, Perl, and more. These approaches can be used alone or in combination, as needed.

DB2 for z/OS by using one of the client drivers that is provided with the IBM Data Server Package without the use of a DB2 Connect server is recommended for the best performance and availability. To choose the right IBM Client Package for your needs, refer to the documentation for the DB2 Connect product at

<http://pic.dhe.ibm.com/infocenter/db2luw/v10r5/topic/com.ibm.swg.im.dbclient.install.doc/doc/c0022612.html>

DB2 for z/OS supports DRDA as an open interface, allowing access from any client.

DB2 Connect Version 10.5 with the latest fix pack exploits DB2 11 features. All versions can access DB2 12 for z/OS, and special builds can be provided to exploit

some of the DB2 12 features requiring IBM Data Server changes such as the following features:

- Global transaction enhancements
- Scalability and security improvements in support of automatic client reroute
- Fast client load utility

DB2 12 acting as a client supports the following relational database products:

- IBM DB2 for Linux, UNIX, Windows 9.5 (5765-F41), or later
 - DB2 Enterprise Server (ESE) for Linux, UNIX, and Windows V9.5 (5765-F41), or later
 - DB2 Express^(R) Edition for Linux, UNIX, and Windows, V9.5 (5724-E49), or later
 - Database Enterprise Developer Edition V9.5 (5724-N76), or later
- IBM DB2 for iSeries V6.1 (5761-SS1), or later
- DB2 Server for VSE and VM V7.3 (5697-F42), 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, refer to

<http://www-01.ibm.com/software/data/db2/db2connect>

JDBC:

DB2 12 supports the following JDBC APIC specification levels:

JDBC 3.0 API requires any of the following at run time:

- IBM 31-bit SDK for z/OS, Java Technology Edition, V7 (SDK7) (5655-W43), or later
- IBM 64-bit SDK for z/OS, Java Technology Edition, V7 (SDK7) (5655-W44), or later
- IBM 31-bit SDK for z/OS, Java Technology Edition, V6 (SDK6) (5655-R31), or later
- IBM 64-bit SDK for z/OS, Java Technology Edition, V6 (SDK6) (5655-R32), or later

JDBC 4.0 API requires any of the following at run time:

- IBM 31-bit SDK for z/OS, Java Technology Edition, V7 (SDK7) (5655-W43), or later
- IBM 64-bit SDK for z/OS, Java Technology Edition, V7 (SDK7) (5655-W44), or later
- IBM 31-bit SDK for z/OS, Java Technology Edition, V6 (SDK6) (5655-R31), or later
- IBM 64-bit SDK for z/OS, Java Technology Edition, V6 (SDK6) (5655-R32), or later

For more information, refer to

<http://www.ibm.com/servers/eserver/zseries/software/java/>
<http://www-01.ibm.com/software/support/lifecycle/>

The following transaction management products work with DB2 12:

- Information Management System (IMS): IMS V13 (5635-A04), or later
- Customer Information Control System (CICS)
 - CICS Transaction Server for z/OS, V5.1, V5.2 and V5.3 (5655-Y04), or later

- CICS Transaction Server for z/OS, V4.1 and V4.2 (5655-S97), or later

Query support:

The following query program works with DB2 12: IBM DB2 Query Management Facility™ for z/OS, V11.2 (5697-QMF)

Programming languages:

The following application development programming languages can be used to build applications for DB2 12:

Building applications 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
 - Enterprise COBOL for z/OS, V3.4 (5655-G53)
 - Enterprise COBOL for z/OS, V4.1 (5655-S71), or later
 - Enterprise COBOL for z/OS, V5.1 (5655-W32)
- Fortran: VS Fortran V2.6 (5668-806, 5688-087, 5668-805); new data types and new SQL functions are not supported since DB2 9 for z/OS.
- PL/I
 - Enterprise PL/I for z/OS, V3.9 (5655-H31)
 - Enterprise PL/I for z/OS, V4.1 (5655-W67), or later

Building applications using a DB2 coprocessor:

- C/C++: C/C++ (without Debug Tool) which is an optional priced feature of z/OS
- COBOL
 - Enterprise COBOL for z/OS, V3.4 (5655-G53) or
 - Enterprise COBOL for z/OS, V4.1 (5655-S71), or later, or
 - Enterprise COBOL for z/OS, V5.1 (5655-W32)
- PL/I
 - Enterprise PL/I for z/OS, V3.9 (5655-H31), or
 - Enterprise PL/I for z/OS, V4.1 (5655-W67), 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 31-bit SDK for z/OS, Java Technology Edition, V6 (SDK6) (5655-R31), or later, at run time. Optionally, the following may be used for applications written in Java:

IBM 64-Bit SDK for z/OS, Java Technology Edition, V6 (SDK6) (5655-R32), or later, at run time.

Note: 5655-R31 and 5655-R32 are independent products and can coexist on the same z/OS system.

For more information on SDK, refer to the following web sites

<http://www.ibm.com/servers/eserver/zseries/software/java/>
<http://www-01.ibm.com/software/support/lifecycle/>

- REXX: z/OS V2R1 TSO/E REXX Reference (5650-ZOS)

- SQL Procedure Language
 - Native SQL Procedure Language
 - External SQL Procedure Language, which requires a C language compiler
- APL2[®] (one of the following):
 - Mainframe APL2 V2.2 (5688-228) (full APL2)
 - APL2 Application Environment (5688-229)

Operational support:

The following programs provide operational support for DB2 12

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

- DFSMSshm for archiving
- DFSMSdss for concurrent copy in Utilities

Compatibility

DB2 12 for z/OS is upwardly compatible with earlier releases of DB2 for z/OS. Migration with full fallback protection is available for customers running on DB2 11 for z/OS. Existing customers should ensure they are successfully running on DB2 11 for z/OS (NFM) before migrating to DB2 12 for z/OS. Fallback SPE APAR PI33871 must be applied. Customers should also use FIX CATEGORIES IBM.Migrate-Fallback.DB2.V12 and IBM.Coexistence.DB2.SYSPLEXDataSharing to identify and apply fixes that allow prior release of DB2 to migrate to or fallback from DB2 12 for z/OS and fixes that enable to coexist when in data sharing mode, respectively.

For more information on FIXCAT go to:

<http://www.ibm.com/systems/z/os/zos/features/smpe/fix-category.html>

User group requirements

This announcement satisfies or partially satisfies many requirements from one or more of the worldwide user group communities. Specific requirement information will be included in the general availability announcement of DB2 12.

Planning information

Customer responsibilities

Review the sections in this announcement that describe the hardware and software dependencies for DB2 12 for z/OS.

Packaging

Included with each base or optional feature of DB2 12 is a Program Directory.

QPP DB2 12 for z/OS feature:

GIS0-0035: DB2 12 for z/OS Program Directory

QPP DB2 Utilities Suite V12 feature:

GIS0-0036: DB2 Utilities Suite V12 Program Directory

QPP z/OS Application Connect DB2 feature:

GIS0-0037: z/OS Application Connectivity to DB2 for z/OS Program Directory

Security, auditability, and control

DB2 12 for z/OS 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 customer is responsible for evaluation, and implementation of security features, administrative procedures, and appropriate controls in application systems and communication facilities.

Ordering information

Product information will be available on a secure web-based server to approved participants of the DB2 12 for z/OS Early Support Program.

Ordering z/OS through the Internet

Shopz provides an easy way to plan and order your z/OS ServerPac or CBPDO (please note ServerPac is not available for this program). 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 (including determination of whether all product requisites are satisfied). Shopz is available in the US, Canada, and several countries in Europe. In countries where Shopz is not available yet, contact your IBM representative (or IBM Business Partner) to handle your order via the traditional IBM ordering process. For more details and availability, visit the Shopz website at

<http://www.ibm.com/software/ShopzSeries>

New licensees

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

New users of DB2 12 for z/OS Early Support Program should specify:

Type: 5650 Model: DB2

Parallel Sysplex 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^(R), 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.

Entitlement identifier	Description	License option/Pricing metric
S017GWJ	QPP DB2 12 for z/OS	Basic MLC, PSLC below 3 MSU
S017GWJ	QPP DB2 12 for z/OS	Basic MLC, PSLC AD

Entitlement identifier	Description	License option/Pricing metric
S017GWJ	QPP DB2 12 for z/OS	SYSUSGREG NC, PSLC AD

To order a basic license, specify the program number. Specify the PSLC Base feature. If applicable, specify the PSLC Level A and PSLC Level B, and PSLC Level C, and PSLC Level D features and quantity. 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 feature numbers and quantity represented by the sum of the Service Units in Millions (MSUs) in your Parallel Sysplex. For all other program copies, specify the PSLC No-Charge (NC) Identifier feature on the licenses. Also, specify the feature number of the desired distribution medium.

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: QPP DB2 12 for z/OS

Program PID: 5650-DB2

Entitlement identifier	Description	License option/Pricing metric
S017GWJ	QPP DB2 12 for z/OS	Basic MLC, AWLC

Advanced Entry Workload License Charges (AEWLC) basic license

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

Program name: DB2 12 for z/OS Early Support Program

Program PID: 5650-DB2

Entitlement identifier	Description	License option/Pricing metric
S017GWJ	QPP DB2 12 for z/OS	Basic MLC, AEWLC

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.

Entitlement identifier	Description	License option/Pricing metric
S017GWJ	QPP DB2 12 for z/OS	Basic MLC, Variable WLC
S017GWJ	QPP DB2 12 for z/OS	Workload Registration, Variable WLC

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

Entry Workload License Charge (EWLC) Basic License

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

Entitlement identifier	Description	License option/Pricing metric
S017GWJ	QPP DB2 12 for z/OS	Basic MLC, Entry WLC

S/390 and z Systems Usage License Charge, basic license

Specify the applicable S/390^(R) and z Systems Usage License Charge option.

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.

The customer pricing will be determined by selecting either:

Entitlement identifier	Description	License option/ Pricing metric
S017GWJ	QPP DB2 12 for z/OS	0 to 0.25 MSU Base
S017GWJ	QPP DB2 12 for z/OS	0.26 to 0.5 MSU Base
S017GWJ	QPP DB2 12 for z/OS	0.51 to 1.0 MSU Base
S017GWJ	QPP DB2 12 for z/OS	Level A Chg/MSU (2 to 11 MSUs)
S017GWJ	QPP DB2 12 for z/OS	Level B Chg/MSU (12 to 44 MSUs)
S017GWJ	QPP DB2 12 for z/OS	Level C Chg/MSU (45 to 78 MSUs)
S017GWJ	QPP DB2 12 for z/OS	Level D Chg/MSU (Above 78 MSUs)
S017GWJ	QPP DB2 12 for z/OS	Level D Chg/MSU (Above 78 MSUs), per 50 MSUs

Examples for ordering:

A customer with a measured usage (from the IBM Measured Usage report) of 0.3 MSU would:

A customer with 6.6 MSUs (from the IBM Usage report) would:

- Be rounded up to 7.0 MSUs
- Order quantity 1 of the "0.51 to 1.0 MSU" base feature
- Order quantity 6 of the Level A 1 MSU feature

A customer with 15 MSUs (from the IBM Usage report) would:

- Order quantity 1 of the "0.51 to 1.0 MSU" base feature
- Order quantity 10 of the Level A 1 MSU feature
- Order quantity 4 of the Level B 1 MSU feature

A customer with 50 MSUs (from the IBM Usage report) would:

- Order quantity 1 of the "0.51 to 1.0 MSU" base feature
- Order quantity 10 of the Level A 1 MSU feature
- Order quantity 33 of the Level B 1 MSU feature
- Order quantity 6 of the Level C 1 MSU feature

A customer with 85 MSUs (from the IBM Usage report) would:

- Order quantity 1 of the "0.51 to 1.0 MSU" base feature
- Order quantity 10 of the Level A 1 MSU feature
- Order quantity 33 of the Level B 1 MSU feature
- Order quantity 34 of the Level C 1 MSU feature
- Order quantity 7 of the Level D 1 MSU feature

z Systems entry license charge (zELC)

To order zELC software, specify the program number and z800 model.

Specify the zELC monthly license option.

Entitlement identifier	Description	License option/ Pricing metric
S017GWJ	QPP DB2 12 for z/OS	Basic MLC, zELC

Specify the zELC monthly charge feature number. Also, specify the feature number for the desired distribution medium.

Basic machine-readable material

Orderable Supply ID	Language	Distribution medium	Description
S017GW4	US English	3590-128 Tape Cartridge	QPP DB2 12 for z/OS
S017GWD	US English	3590-128 Tape Cartridge	QPP DB2 Utilities Suite V12
S017GWB	US English	3590-128 Tape Cartridge	QPP z/OS Application Connect DB2

Publications

Product information will be available on a secure web-based server to approved participants of the DB2 12 for z/OS Early Support Program.

A program directory is supplied automatically as basic machine-readable material in each of the following three separately orderable features:

QPP DB2 12 for z/OS features:

Title	Order number
DB2 12 for z/OS Program Directory	GIS0-0035

QPP DB2 Utilities Suite V12 feature:

Title	Order number
DB2 Utilities Suite V12 Program Directory	GIS0-0036

QPP z/OS Application Connect DB2 feature:

Title	Order number
z/OS Application Connectivity to DB2 for z/OS Program Directory	GIS0-0037

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 via CBPDO, ServerPac, SystemPac, FunctionPac, and ProductPac^(R).

All of these customized offerings are offered for Internet delivery in countries where Shopz product ordering is available. Internet delivery reduces software delivery time and allows you to install software without the need to handle tapes. For more details on Internet delivery, refer to the Shopz help information at

<http://www.software.ibm.com/ShopzSeries>

You choose the delivery method when you order the software. IBM recommends Internet delivery. In addition to Internet and DVD, the supported tape delivery options include:

- 3590

- 3592

Most products can be ordered in ServerPac, SystemPac, FunctionPac, and ProductPac the month following their availability in CBPDO. z/OS can be ordered via CBPDO, ServerPac, and SystemPac at general availability. Many products will also be orderable in a Product 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 product ServerPac, visit the Help section on the Shopz website at

<http://www.software.ibm.com/ShopzSeries>

For additional information on the Product ServerPac option, refer to Software Announcement [ZP12-0358](#), dated July 31, 2012.

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

- CBPDO shipments will begin one week after general availability.
- ServerPac shipments will begin two weeks after general availability.
- SystemPac, FunctionPac and ProductPac shipments will begin four weeks after general availability due to additional customization, and data input verification.

Terms and conditions

Indexed monthly license charge (IMLC) applies

No

Location license applies

No

Use limitation applies

No

Educational allowance available

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

ESAP available

Yes, to qualified customers.

Volume orders

Replaced program(s)		Replacement program(s)	
Program number	Program name	Program number	Program name
5740-XYR	DB2 V1	5650-DB2	DB2 V12
5665-DB2	DB2 V2	5650-DB2	DB2 V12
5685-DB2	DB2 V3	5650-DB2	DB2 V12
5695-DB2	DB2 V4	5650-DB2	DB2 V12
5655-DB2	DB2 V5	5650-DB2	DB2 V12
5645-DB2	DB2 V6	5650-DB2	DB2 V12
5675-DB2	DB2 V7	5650-DB2	DB2 V12
5625-DB2	DB2 V8	5650-DB2	DB2 V12
5635-DB2	DB2 V9	5650-DB2	DB2 V12

Replaced program(s)		Replacement program(s)	
Program number	Program name	Program number	Program name
5605-DB2	DB2 V10	5650-DB2	DB2 V12
5615-DB2	DB2 V11	5650-DB2	DB2 V12
5650-DB2	DB2 V12	To a follow-on program, if any.	

Warranty applies

Yes

Program services

Support Center applies	Yes IBM Support Center
Available until discontinued	12-months written notice
APAR mailing address:	IBM Corporation APAR Processing 555 Bailey Avenue San Jose, CA 95141-1003

IBM Operational Support Services - Support Line

Yes

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

Electronic Service Agent™ and the IBM Electronic Support web portal are dedicated to providing fast, exceptional support to IBM Systems customers. The IBM Electronic Service Agent tool 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 tool 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 this tool can be monitored remotely around the clock by IBM Support, all at no additional cost to you.

Now integrated into the base operating system of AIX® V5.3, AIX V6.1, and AIX V7.1, 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. System configuration and inventory information collected by the Electronic Service Agent tool also can be viewed on the secure Electronic Support web portal, and used to improve problem determination and resolution by you and the IBM support team. To access the tool main menu,

simply type smitty esa_main, and select Configure Electronic Service Agent. In addition, ESA now includes a powerful web user interface, giving the administrator easy access to status, tool settings, problem information, and filters. For more information and documentation on how to configure and use Electronic Service Agent, refer to

<http://www.ibm.com/support/electronic>

The IBM Electronic Support portal is a single Internet entry point that replaces the multiple entry points traditionally used to access IBM Internet services and support. This portal enables you to gain easier access to IBM resources for assistance in resolving technical problems. The My Systems and Premium Search functions make it even easier for Electronic Service Agent tool-enabled customers to track system inventory and find pertinent fixes.

Benefits

Increased uptime: The Electronic Service Agent™ tool is designed to enhance the Warranty or Maintenance Agreement by providing faster hardware error reporting and uploading system information to IBM Support. This can translate to less wasted time monitoring the symptoms, diagnosing the error, and manually calling IBM Support to open a problem record. Its 24x7 monitoring and reporting mean no more dependence on human intervention or off-hours customer personnel when errors are encountered in the middle of the night.

Security: The Electronic Service Agent tool is designed to be secure in monitoring, reporting, and storing the data at IBM. The Electronic Service Agent tool is designed to securely transmit either via the Internet (HTTPS or VPN) or modem to provide customers a single point of exit from their site. Communication is one way. Activating Electronic Service Agent does not enable IBM to call into a customer's system.

For additional information, please refer to IBM Electronic Service Agent

<http://www-01.ibm.com/support/esa/>

More accurate reporting: Because system information and error logs are automatically uploaded to the IBM Support Center in conjunction with the service request, you are not required to find and send system information, decreasing the risk of misreported or misdiagnosed errors. Once inside IBM, problem error data is run through a data knowledge management system and knowledge articles are appended to the problem record.

Customized support: Using the IBM ID entered during activation, you can view system and support information in the My Systems and Premium Search sections of the Electronic Support website at

<http://www.ibm.com/support/electronic>

My Systems provides valuable reports of installed hardware and software using information collected from the systems by Electronic Service Agent. Reports are available for any system associated with your IBM ID. Premium Search combines the function of search and the value of Electronic Service Agent information, providing advanced search of the technical support knowledgebase. Using Premium search and the Electronic Service Agent information that has been collected from your system, you are able to see search results that apply specifically to your systems.

For more information on how to utilize the power of IBM Electronic Services, contact your IBM Systems Services Representative, or visit

<http://www.ibm.com/support/electronic>

Prices

Entitlement identifier	Description	License option/ Pricing metric
S017GWJ	QPP DB2 12 for z/OS	Basic MLC, PSLC below 3 MSU
S017GWJ	QPP DB2 12 for z/OS	Basic MLC, PSLC AD
S017GWJ	QPP DB2 12 for z/OS	SYSUSGREG NC, PSLC AD
Entitlement identifier	Description	License option/ Pricing metric
S017GWJ	QPP DB2 12 for z/OS	Basic MLC, AWLC
Entitlement identifier	Description	License option/ Pricing metric
S017GWJ	QPP DB2 12 for z/OS	Basic MLC, AEWLC
Entitlement identifier	Description	License option/ Pricing metric
S017GWJ	QPP DB2 12 for z/OS	Basic MLC, Variable WLC
S017GWJ	QPP DB2 12 for z/OS	Workload Registration, Variable WLC

Sub-capacity charges for VWLC products

Sub-capacity charges for VWLC products are based on product LPAR utilization capacity. Product LPAR utilization capacity for a VWLC product is the highest number of MSUs utilized by the combined LPARs in which a VWLC 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

z Systems software charges at less than full machine capacity for eligible VWLC products apply when z/OS is running in z/Architecture[®] (64-bit) mode on an IBM z Systems 900, no other MVS-based operating system is licensed to that server, and the required information is provided by the customer in accordance with the applicable terms.

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

- Sign and abide by the terms of the Attachment for IBM z Systems Workload License Charges - (Z125-6516).
- Obtain the latest version of the Sub-Capacity Reporting Tool.
- Install any VWLC product and IBM z Systems 900 Licensed Internal Code (LIC) service required for sub-capacity charging. Required service will be listed on the WLC website
<http://www.ibm.com/zseries/swprice>
- Collect SMF data as required by the Sub-Capacity Reporting Tool. Retain the collected SMF data for a period of not less than six months.
- Use the IBM provided Sub-Capacity Reporting Tool to process the collected SMF data. The Sub-Capacity Report produced by the tool is used to determine required license capacity for the VWLC products. Required license capacity is determined based on the largest MSU value of a VWLC 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.
- Submit Sub-Capacity Reports for all VWLC products with complete data for the entire reporting period to the email address and by the date specified in the current IBM z Systems Workload License Charges Exhibit (Z125-6324) and on the z Systems Software Pricing website

<http://www.ibm.com/zseries/swprice>

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

- Configure the machine to send weekly Transmit System Availability Data (TSAD) to IBM via the IBM z Systems 900 Remote Support Facility (RSF). If the machine cannot connect via the RSF, provide this TSAD via an alternate means documented in the z/OS publication *Planning for Workload License Charges* at

<http://www.ibm.com/zseries/swprice>

Entitlement identifier	Description	License option/ Pricing metric
S017GWJ	QPP DB2 12 for z/OS	Basic MLC, CMLC

CMLC is a new sub-capacity offering that allows clients to use their z Systems capacity within a given country without the constraints of sysplex aggregation rules and many of the limitations of previous reporting methodologies.

For all local charges, contact your IBM representative.

IBM Global Financing

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<http://www.ibm.com/financing>

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