IBM DB2 12 for z/OS Value Unit Edition expands the value offered to your business by IBM's industry-leading mainframe data server

At a glance

IBM(R) DB2(R) 12 for z/OS(R) Value Unit Edition (DB2 12 VUE) 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 helping to reduce costs
- Enables easy access, scale, and application development for the mobile enterprise
- Improves in-memory database performance, helping to reduce costs
- Continues to be the industry gold standard for availability, reliability, and security for business-critical information

Overview

IBM will make DB2 12 for z/OS Value Unit Edition (DB2 12 VUE) generally available on October 21, 2016. DB2 12 VUE is the one-time charge option for DB2 12 for z/OS available for select workloads, described in the Terms and conditions section.

DB2 12 VUE takes DB2 to a new level, both extending the core capabilities and empowering the future. DB2 12 VUE extends the core with new enhancements to scalability, reliability, efficiency, security, and availability. DB2 12 VUE also empowers the next wave of analytics and mobile applications.

DB2 12 VUE delivers selected features that bring valuable benefits to your business.

Extending IBM analytics leadership

- Improvements in support of analytics workloads, including optimized performance and improved zIIP offload in support of in-transaction analytics. All parallel child task processing is now zIIP eligible.
- Deliver insights faster with up to 50% elapsed query time improvement.
- Improved DB2 Analytics Accelerator performance and expanded query support.

Mobile and Internet of Things (IoT) support for your enterprise

- Support for SQL as a Service (SQLaaS) through RESTful connectivity to your DB2 for z/OS data.

- Support for modernized, multiplatform, automated application deployments using technology such as IBM Urban Code Deploy and z/OSMF, which provide agility and speed to market.
- 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 280 trillion rows in a single DB2 table.
- Enhanced support for the next generation of mobile applications through the optimization of syntax that is common to mobile workloads such as OFFSET, SQL PL in triggers, and many other improvements.
- Enhanced load capability that enables cloud and mobile workloads to upload data directly into a table on DB2 z/OS using a new high-performance, low-latency zLOAD API.

IBM Cloud Provisioning and Management

- DB2 12 VUE exploits the IBM Cloud Provisioning and Management functionality provided in z/OS V2.2. These z/OS cloud capabilities provide added benefits to simplify and improve configuration and deployment of a number of components of the z/OS software landscape, thereby allowing you to improve the agility, efficiency, and economics of your IT infrastructure. With these added cloud capabilities, DB2 12 VUE supports the following capabilities: ·
  - Rapidly provision environments for workload deployment and release the resources to a shared pool when complete.
  - Enable direct access of z/OS computing resources by end users through your existing self-service portal or by using IBM's sample portal.
  - Create service catalogs with customizable services that exploit the multitenancy and rapid elasticity of z/OS.
  - Invoke these new functions through a web browser-based user interface or through programmable REST interfaces.
  - Provision DB2 12 subsystems, as well as other z/OS software subsystems such as IBM CICS[R] Transaction Server for z/OS, IBM IMS[TM] for z/OS, IBM MQ for z/OS, and IBM WebSphere[R] Application Server for z/OS.
  - Provision known DB2 database schemas by leveraging the IBM DB2 Change Management Solution Pack for z/OS, V1.1 (5655-CH1).
- For additional z/OS V2.2 details, see Software Announcement ZP16-0504, dated October 4, 2016.

Extending the unique value of z Systems[TM]

- Expanded in-memory processing for greater performance improvement and emerging use case support, such as synergy with the latest IBM z Systems[TM] processors, which offer significantly expanded memory capacity.
- Up to 30% CPU improvement for query workloads and even higher CPU improvements in select query workloads exploiting DB2 12 VUE query optimization. Up to 10% online transaction processing (OLTP) CPU savings with larger memory and activation of memory exploitation features.
- High-volume insert performance equaling two times throughput increase for concurrent sequential insert without clustering.

Simplified management and application deployment

- More flexible data partitioning, enabling partitions to grow past previous size limits to avoid the need for difficult and cumbersome repartitioning. New partitions can also be dynamically inserted.
- Extends unprecedented query performance reliability and stability to dynamic SQL with dynamic plan stability.
- Online schema enhancements that improve manageability and availability, in addition to support for improved partition management, reducing the need for planned outages.
- Greater than 4GB active log data set simplifies log management and improves recovery time.

- Exploitation of recent z Systems enhancements to compress LOB data, which can dramatically reduce the amount of storage and memory for storing and manipulating large objects.
- Extended leadership with security enhancements, including support for TRANSFER OWNER and more granular ADMIN authority.
- Enhanced system administrator capabilities to migrate and install DB2 systems while preventing unwanted access to user data.
- 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.
- Single-phase catalog migration, which reduces the change windows involved in migrating completely to the new release.

Benefiting from enhancements in a faster, more consumable way

- DB2 12 VUE continuously delivers new DB2 capabilities and enhancements in a single service stream as the code becomes ready. The result is that clients can benefit from new capabilities and enhancements without waiting for a new release. Clients can activate the new capabilities when a *function level* is delivered.
- Function levels enable you to control the timing of the activation and adoption of new features, with the option to continue to apply corrective and preventative service without adopting new features and functions.

SAP solutions

- Many enhancements are available for clients using SAP applications on DB2 for z/OS; for instance, query engine improvements and a new UDF cache for SAP Core Data Services (CDS). Also the Zero Downtime Option (ZDO) of SAP's Software Update Manager benefits from online DDL improvements. Scalability is enhanced with tables that can grow up to 4 PB in size. For the SAP fast loader, DB2 12 VUE introduces a new ultra-fast remote load capability from DB2 Connect[TM]-based clients.
- SAP has announced their successful validation and support of DB2 12 VUE to run SAP applications immediately when DB2 12 VUE is generally available. Details can be found in SAP Note 2302997.

Key prerequisites

- IBM z[TM]/OS V2.1 Base Services (5650-ZOS), or later
- IBM zEnterprise[R] 196 (z196) or IBM zEnterprise 114 (z114), or higher, processors running z/OS V2.1, or later

Planned availability date

October 21, 2016

Description

The demands of the mobile economy and the greater need for faster business insights, 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, trusted availability, security, and scalability of DB2 11 for z/OS and the z Systems platform, the gold standard in the industry, DB2 12 gives you the capabilities needed to securely meet the business demands of mobile workloads and increased mission-critical data. It delivers world-class analytics and OLTP performance in real time.

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 utilizing more memory optimization. Compared to DB2 11, DB2 12 clients can achieve up to 10% CPU savings for various traditional OLTP and heavy concurrent INSERT, query workloads may see higher benefits, with up to 30% CPU savings and even more benefit for select query workload utilizing UNION ALL, large sort and selective User Defined Functions (UDFs).

DB2 12 provides more cost reduction with more zIIP eligibility of DB2 REORG and LOAD utility.

DB2 12 provides deep integration with the IBM z13™ server, offering the following benefits:

- More efficient use of compression
- Support for compression of LOB data (also available with the IBM zEnterprise EC12)
- Faster XML parsing through the use of SIMD technology

Enhancements to compression aid 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. In addition, DB2 12 allows system administrators to migrate and install DB2 systems while preventing access to user data.

The real-world proven, system-wide resiliency, availability, scalability, and security capabilities of DB2 and z Systems continue 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
- Caching the result of User Defined Functions
- In-memory optimization in Declare Global Temporary Table (DGTT) to improve declare performance
- In-memory optimization in Resource Limit Facility to improve RLF checking

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 as do enterprise workloads.

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, UNION ALL, and CASE expressions can experience improved performance and increased CPU parallelism offload to zIIP.

Easy access to your enterprise systems of record

DB2 12 is used to connect RESTful web, mobile, and cloud applications to DB2 for z/OS, providing an environment for service, management, discovery, and invocation. This feature works with IBM z/OS Connect Enterprise Edition (z/OS Connect EE, PID 5655-CEE) and other RESTful providers to provide a RESTful solution for REST API definition and deployment.

The IBM Data Studio product, which can be used as the front-end tooling to create, deploy, or remove DB2 for z/OS services, is supported. Alternatively, new RESTful management services and BIND support are provided to manage services created in DB2 for z/OS. This capability was first made available in the DB2 Adapter for z/OS Connect feature of 5697-Q04, DB2 Accessories Suite for z/OS V3.3 product, working with both DB2 10 for z/OS and DB2 11 for z/OS.

DB2 12 for z/OS VUE consists of the base DB2 product with one optional nonchargeable feature.

Nonchargeable feature of DB2 12 for z/OS:

z/OS Application Connectivity to DB2 for z/OS 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.

Value Unit-based pricing

Value Unit pricing for eligible IBM z Systems IBM International Program License Agreement (IPLA) programs enables a lower cost of incremental growth and enterprise aggregation. Each z Systems IPLA product with Value Unit pricing has a single price per Value Unit and a conversion matrix, called a Value Unit Exhibit, for converting from some designated measurement to Value Units. Most commonly, Millions of Service Units (MSUs) is the measurement designated by IBM to be converted to Value Units. Some other measurements are engines or messages. Since MSUs are the most common measurement, that measurement will be used for the remainder of this description.

Value Unit pricing offers price benefits for you. For each z Systems IPLA program with Value Unit pricing, the quantity of that program needed to satisfy applicable IBM terms and conditions is referred to as the **required license capacity.** Each of the various Value Unit Exhibits stipulate that the larger your required license capacity, the fewer Value Units per MSU you will need. Value Unit Exhibits are uniquely identified by a three-digit code and referred to using the nomenclature VUExxx, where xxx is the three-digit code.

Subsequent acquisitions of Value Unit priced programs offer additional price benefits. The quantity of each z Systems IPLA program that you have acquired is referred to as **entitled license capacity.** If you wish to grow your entitled license capacity for a z Systems IPLA program, the calculation to determine additional needed Value Units is based upon the number of Value Units already acquired.

For each z Systems IPLA program with Value Unit pricing, you should:

- Determine the required license capacity, in MSUs.
- Aggregate the MSUs across the enterprise.
- Convert the total MSUs to Value Units, using the applicable Value Unit Exhibit.
- Multiply the price per Value Unit by the total number of Value Units to determine the total cost.

To simplify conversion from the designated measurement to Value Units or vice-versa, use the Value Unit Converter Tool. For additional information or to obtain a copy of the Value Unit Converter Tool, go to the IBM z Systems Software Pricing website.

Note that Value Units of a given product cannot be exchanged, interchanged, or aggregated with Value Units of another product.

To determine the required license capacity for the z Systems IPLA program you selected, refer to the Terms and conditions section.

Program number

Program number	VRM	Program name
5770-AF3	12.1.0	DB2 12 for z/OS Value Unit Edition

Product identification number

Program PID number	Subscription and Support PID number
5770-AF3	5697-P11

Education support

IBM training provides education to support many IBM offerings. Descriptions of courses for IT professionals and managers can be found on the IBM authorized training website.

Contact your IBM representative for course information.

Offering Information

Product information is available on the IBM Offering Information website.

Publications

The information for the features in this announcement cannot be ordered in hardcopy. The information will be available on the product availability date in IBM Knowledge Center:

- *DB2 12 for z/OS Administration Guide*
- *DB2 12 for z/OS Application Programming and SQL Guide*
- *DB2 12 for z/OS Application Programming Guide and Reference for Java^{TM}*
- *DB2 12 for z/OS Codes*
- *DB2 12 for z/OS Command Reference*
- *DB2 12 for z/OS Data Sharing: Planning and Administration*
- *DB2 12 for z/OS Installation and Migration*
- *DB2 12 for z/OS Internationalization Guide*
- *DB2 12 for z/OS Introduction to DB2 for z/OS*
- *DB2 12 for z/OS IRLM Messages and Codes for IMS and DB2 for z/OS*
- *DB2 12 for z/OS Managing Performance*
- *DB2 12 for z/OS Managing Security*
- *DB2 12 for z/OS Messages*
- *DB2 12 for z/OS ODBC Guide and Reference*

- *DB2 12 for z/OS RACF[R] Access Control Module Guide*
- *DB2 12 for z/OS SQL Reference*
- *DB2 12 for z/OS Utility Guide and Reference*
- *DB2 12 for z/OS What's New?*
- *DB2 12 for z/OS pureXML[R] Guide*

The *DB2 for z/OS Diagnosis Guide and Reference,* which has been available in previous versions of DB2 as a licensed publication, is not available for DB2 12. Much of the content of that publication is now available in IBM Knowledge Center, under "Troubleshooting problems in DB2." The remainder of the content is available to users who have DB2 12 licenses, in entitled techdocs on the web.

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, or integration of this product.

Technical information

Specified operating environment

Hardware requirements

Processors

DB2 12 VUE operates on z196 or z114, or later, processors running z/OS V2.1, or later. The processors must have enough real storage to satisfy the combined requirements of:

- DB2 12 VUE
- z/OS
- The appropriate DFSMS storage management subsystem components, access methods, telecommunications, batch requirements, and other customer-required applications

DB2 12 VUE 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 for DB2

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.

- Date sharing requires the Coupling Facility. Refer to the latest Coupling Facility (CF) level recommended for your processor at the Parallel Sysplex[R] website.
- DRDA[R] data stream encryption uses the following ICSF APIs: CSNECKM, CSNERNG, CSNFPKB, CSNFPKE, CSNEENC, and CSNEDEC. Refer to *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 *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, and CSNEDEC. Refer to *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 or cryptographic accelerator, or cryptographic instructions.
- LOB Compression uses zEnterprise Data Compression hardware. The z/OS environment needs to have the zEDC card installed to trigger the data compression capability. The zEnterprise data compress zEDC requires the following:
  - z/OS V2.1 operating system.
  - IBM zEnterprise EC12 (with GA2 level microcode) or IBM zEnterprise zBC12.
  - zEDC Express[R] feature, which is the z Systems compression accelerator that can improve the speed of data compression and is sharable across up to 15 partitions and up to 8 cards per CPU.

- zEDC Express software feature must be enabled in the IFAPRDxx parmlib member.
- Single Instruction Multiple Data (SIMD) Exploitation with XML Parser requires both a z/OS processor and operating software APAR that supports SIMD instruction, as follows:
  - z13™ processor, or above, supporting SIMD instruction
  - z/OS APARs:
    -- For z/OS V2.1: z/OS V2.1 APAR OA44545 and APAR OA49910 (see APAR descriptions below).
    -- For z/OS V2.2: z/OS V2.2 APAR OA49910.
  - APAR OA44545 provides vector processing support for z13 processors that is included in z/OS V2.2.
  - APAR OA49910 allows IEAFP START when an EUT FRR is in effect.
- Asynchronous Duplexing of CF lock structure requires the following:
  - DB2 12 enabling APAR PI66689
  - IRLM 2.3 APAR PI68378
  - z/OS V2.2 with APAR OA47796 and APAR OA49148 (available October 28, 2016)
  - CFCC (for current information see the Driver 27 Customer Exception letter at CFCC firmware specified service level)

Software requirements

This section lists licensed programs or specific elements and features of licensed programs that are required in the DB2 12 VUE 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 and optional programs that you can use with DB2 12 VUE. For the most current information, see the IT Infrastructure website.

Operating system and support programs

DB2 12 VUE 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), or later
- IRLM V2.3 (delivered with DB2 12)

If DB2 12 VUE 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 information* and also *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. Clients should ensure that these

functions are provided either by ordering DB2 Utilities Suite for z/OS, V12.1 (5770-AF4) 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 VUE 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 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. Configure additional megabytes of 1MB LFAREA for maximum benefit.

DB2 12 VUE 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 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 run time.

Requirements for dependent functions of DB2 12 VUE:

Before using these features, see 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 (required for volume-level FlashCopy support for system-level backup and recovery)
  - FlashCopy V2 (required for data-level FlashCopy, enabling 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 (ICSF).
- 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 VUE.

Connectivity

For database applications that run on Linux, UNIX™, 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 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.

It is recommended to use one of the client drivers provided with the IBM Data Server package (without the use of a DB2 Connect server) when accessing a remote DB2 for z/OS subsystem. To choose the right IBM Client Package for your needs, see the *IBM DB2 10.5 for Linux, Unix and Windows* documentation at IBM Knowledge Center.

DB2 12 VUE supports DRDA as an open interface, allowing access from any client.

DB2 Connect V10.5 with the latest fix pack is the minimum requisite for DB2 12 VUE. 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:

- A new client API to provide fast loading from mobile devices
- A new client API to determine the DB2 function level
- Support for continuous delivery
- Improved security and scalability for client Sysplex workload balancing
- Improved Sysplex support for distributed global transactions
- Support for preserving prepared dynamic statements after a ROLLBACK
- Improved client serviceability aids

DB2 12 VUE 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 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, V7.1 (5770-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, go to the IBM Software website.

JDBC

DB2 12 VUE 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 on SDKs, go to the IT Infrastructure website and the IBM developer kits lifecycle dates website.

The following transaction management products work with DB2 12 VUE:
- Information Management System (IMS)
  - IMS V14 (5635-A05)
  - IMS V13 (5635-A04)

- 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 VUE for z/OS, V5.1, V5.2, and V5.3 (5722-DFJ), 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 VUE:

- IBM DB2 Query Management Facility™ (QMF™) family of products, Version 11 and 12

Programming languages

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

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 (one of the following):

- – 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 (one of the following):
  - – 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)
- PL/I (one of the following):
  - – Enterprise PL/I for z/OS, V3.9 (5655-H31)
  - – 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 SDKs, go to the IT Infrastructure website and the IBM developer kits lifecycle dates website.

- 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$^{(R)}$ (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 VUE.

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

- DFSMShsm for archiving
- DFSMSdss for concurrent copy in Utilities

Tools support

The following tools are the minimum level that provide support for DB2 12 for z/OS. For details on any additional requirements, go to the DB2 Tools Compatibility for DB2 12 for z/OS website.

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

- DB2 Administration Solution Pack for z/OS, V2.2 (5697-DAQ)
- DB2 Administration Tool for z/OS, V11.2 (5655-DAT), with APAR PI67731, or higher
- DB2 Configuration Manager for z/OS, V4.1 (bundled in the DB2 Admin Solution Pack V2.2 (5697-DAQ))
- DB2 Object Comparison Tool for z/OS, V11.2 (5655-DOC)
- DB2 Query Workload Tuner for z/OS, V5.1 (5655-AB4)
- InfoSphere(R) Guardium(R) Data Encryption for IMS and DB2 Databases, V1.2 (5655-P03)

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

- IBM DB2 Analytics Accelerator for z/OS V5.1 (5697-DA5)
- IBM DB2 Analytics Accelerator Loader for z/OS, V2.1 (5639-OLE)
- IBM Application Performance Analyzer for z/OS, V13.1 (5655-Q09)
- IBM DB2 Table Editor for z/OS, V4.5 (5697-G65)
- IBM Debug Tool for z/OS, V13.1 (5655-Q10)
- IBM Fault Analyzer for z/OS, V13.1 (5655-Q11)
- IBM File Manager for z/OS, V13.1 (5655-Q12)

IBM Tools for Performance Management, including the following tools:

- DB2 Management Solution Pack for z/OS, V1.1 (5655-MSP)
- DB2 Performance Solution Pack for z/OS, V1.4 (5655-E74)
- DB2 Query Monitor for z/OS, V3.2 (5655-V42)
- DB2 SQL Performance Analyzer for z/OS, V5.1 (5697-W51)
- IBM Tivoli(R) OMEGAMON(R) XE for DB2 Performance Expert on z/OS, V5.3 (5655-W37)

IBM Tools for Replication Management, including the following tools:

- IBM InfoSphere Data Replication for DB2 for z/OS, V10.2.1 (5655-DRP), with APAR PI49204

IBM Tools for Utilities Management, including the following tools:

- DB2 Utilities Solution Pack for z/OS, V3.1 (5697-USP)
- DB2 Extended Utilities Suite for z/OS, V1.1 (5655-EUS)
- DB2 Automation Tool for z/OS, V4.2 (5655-E37)
- DB2 Cloning Tool for z/OS V3.2 (5655-N15)
- DB2 High Performance Unload for z/OS, V4.3 (5655-AA1)
- DB2 Sort for z/OS, V2.1 (5655-AA9)
- DB2 Utilities Enhancement Tool for z/OS, V2.2 (5655-T58)
- DB2 Utilities Suite for z/OS, V12.1 (5770-AF4)

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.

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 clients who are running on DB2 11 for z/OS. Existing clients should ensure that they are successfully running on DB2 11 for z/OS (in new-function mode) before migrating to DB2 12 for z/OS. Fallback SPE APAR PI33871 must be applied.

DB2 12 APAR PI69143 extends APPLCOMPAT to support controlling the use of new DB2 12 function for DDL and DCL (GRANT, REVOKE, TRANSFER) in DB2 12. Application of APAR PI69143 is required prior to starting DB2, to ensure that objects created with DB2 12 dependent capability or function are properly recorded in the DB2 catalog.

Clients should also use FIX CATEGORIES IBM.Migrate-Fallback. DB2.V12 and IBM.Coexistence. DB2.SYSPLEXDataSharing to identify and apply fixes that allow prior releases of DB2 to migrate to or fallback from DB2 12 for z/OS and fixes that enable DB2 11 to co-exist when in data sharing mode, respectively.

For more information on FIXCAT, go to the IBM Fix Category Values and Descriptions website.

Limitations

Information regarding any limitations can be found on the License Information documents found on the IBM Software License Agreement website.

Additional information can be found in the **Usage restrictions** section of the Terms and conditions of this announcement. See also the License Information documents found on the IBM Software License Agreement website.

IBM Electronic Support

The IBM Support Portal is your gateway to technical support. This includes IBM Electronic Support tools and resources, for software and hardware, to help save time and simplify support. The Electronic Support tools can help you find answers to questions, download fixes, troubleshoot, automate data collection, submit and track problems through the Service Request online tool, and build skills. All these tools are made available through your IBM support agreement. Read about the Electronic Support portfolio of tools on the IBM Electronic Support website.

You can also access the IBM Support Portal page and the online Service requests and PMRs tool for more support.

User group requirements

This announcement satisfies or partially satisfies many requirements from one or more of the worldwide user group communities:

RFE number	Request For Enhancement (RFE) description
19295	Add ""Time Machine Function"" to temporal tables feature in DB2 for z/OS
19313	Select a certain number of rows (hostvariable :n) from a union of two tables
20059	Automatic REBIND to use OWNERs authid when using RACF exit
20060	FREE INACTIVE Selectivity
20121	LPL restrictive state should be recovered during DB2 light restart when LPAR failure occurs on DB2 for z/OS V10.1.0

RFE number	Request For Enhancement (RFE) description
20124	Prevent long-running pseudo-close in DS member from causing time-outs
20930	Use of alias for sequences
21662	Add ""Time Machine Function"" for ""AS OF"" funciton to temporal tables in DB2 z/OS V10
22119	RUNSTATS -- Option to reset DB2 objects to default statistics (-1)
22247	Adding COLLECTION ID character length support for 128 characters
22441	counter requirement on EO support for v11
22630	Group-level Automatic GRECP completion message
22900	Implement FREQVAL parameters for REORG utility
22953	Avoid to close DB2 each time customer has to remove a RACF permit.
23261	Enhance Resource Limit Facility to include ability to limit STATIC SQL calls from bound plans/packages
23265	Drop of unused columns anywhere in a table
23468	OUTER JOIN PERFORMANCE
23539	CICS TS for z/OS should provide runaway task timeout support for DB2 transactions that consume excessive CPU reso
23963	UNLOAD utility: limiting number of parallel unloaded partitions not possible
24013	SORT before JOIN
24307	SAP FR493: Provide breakdown of wait time in IFCID 316 as detailed as class 3 wait times in accounting data
24309	SAP FR533: Piece-wise DELETE and UPDATE
24454	Enhance Resource Limiting for CICS transactions processing in DB2
24504	NPI inline stats when SORTNPSI YES is specified
25720	In DB2 10 introduce a new built-in function, named for example CHA9 with the same behavior as DB2 v9 CHAR(DECIMAL)
25941	230-VLDB2011: Remove Empty Partitions from PBG Tables During Reorg
25950	207-VL DB2 009: DB2 BACKUP SYSTEM support of multiple copypool backup storage groups
26052	Provide part-number in lock escalation message
26492	Allow BIND to have DBRMs with long and camel cased names in zFS files as input
26610	Need DB2 support for BACKUPSTORAGEGROUP in BACKUP SYSTEM
26629	Enhancements needed for Mass Data Changes
26676	Enhancement to Cost Model for XML Index Selection
26687	Support pending (deferred) alter limit keys
27089	Reorg in Partition By Growth tablespaces

RFE number	Request For Enhancement (RFE) description
27418	FR547: Extend NPGTHRSH optimizer behavior to default stats
28439	Inline Stats for NPI when Reorg on part-level
28456	UNLOAD privilege for UNLOAD Utility
29249	FREE INACTIVE PACKAGES For Native SQL Procedures
29348	Option to Enable/Disable the Generate DDL for stored procedures and UDFs to avoid to see the business logic/secured information
30299	Have a HASH scalar function in DB2
31183	Improve performance of SQL MAX function
31647	COMPACT=YES is applicable for modern ""tape"" systems
33868	Save the APCOMPARE statistics shown by message DSNT285I to explain for later reporting
34499	more aggressive DDL change
34833	Extend MERGE to allow table/view/select expression as input
36560	Phisically delete empty partitions on PBGs
36709	Add 'Full Optimized Date/Release' to SYSPACKAGE to record Optimization Info
39355	FR560: Fail REORG if FlashCopy image copy specified and cannot be used
39554	Option to specify COMMIT SIZE
40981	Resource Limit Facility (RLF) performance
41636	FR103: Preserve local dynamic statement cache at ROLLBACK
41643	3FR561: Declaim read claims on catalog objects directly after PREPARE
42016	FR564: Ensure part-level REORG completes
42417	DSNACCOX behaviour
42997	Expand DASD_USAGE in ADMIN_DS_LIST
43725	Enable RUNSTATS profiles for INLINE statistics
44051	FR567: Query performance with table functions
44324	Support for multiple actions in SQL PL Trigger (RFE_44324) (should be 'multiple-event triggers')
44339	Retain SYSPACKAGE LASTUSED date across Bind(Replace) activity
44998	AP selection LIST PREFETCH (MXI)
45382	Provide a new column attribute: generated always as user
45976	New SQL SELECT WHERE clause construction with a better optimizer path
46195	DSNU1375I on RUNSTATS with SAMPLE
46255	Request for a parameter in DB2 z/OS equivalent to the parameter IGNOREWARNINGS available in DB2 LUW into db2cli.ini file
46720	Performance bottleneck in ODBC Driver at multithreaded applications
46815	FR576: Provide HEXTOBIN as built-in function
46817	FR577: Dynamic SQL in scalar SQL PL UDFs

RFE number	Request For Enhancement (RFE) description
48757	Hard to analyze SQL statements due to lack of stable identifiers
48764	One step migration support for DB2 from one version to the next.
50994	Provide the statement level section located out of QWT02R30 for IFCIDS 53/58 for PREPARE statements
52871	Remove Limitation for MERGE Statement
52982	GBP page registration algorithm
53328	FR579: INSERT statements - read non-leaf index pages using async I/O
55020	load replace into table with IDENTITY column
60065	Scrollable cursor support with context for JDBC appications
60837	Improving OUTER JOIN performance
60858	353 VLDB2014 - Show values used to bind SQL statements in the DBACOCKPIT
61266	How to differentitate CM from ENFM mode, from a program/software
62345	Allow RLF to limit static SQL
62496	""ATTACH(ULI)"" -DB2-Precompiler/ Coprocessor: Create additional option like ATTACH(ULI)
63318	381 VLDB - Materialise pending database changes via partition level REORGs
63663	RUNSTATS should allow collection of the percent of frequency for a specific column value
64314	Increase max number of tables referenced in view/UDF/statement
64522	Provide parameter ACTION(DELETE) for program DSNTWLMB
65465	UPPER/LOWER case folding - SAP-specific locale
65522	IBA0314-1687 Have stable identifiers for all SQL statements
65549	IDB1013-1647 DB2 statement cache optimisation
65636	IDAT1211-1471 Unicode support on DB2 column level
66391	Extend the performance enhancment implemented for 'In-List' processing to more than 129 elements
66447	Increase the REORG usability on PBG tablespaces
68365	Use results of index probing more broadly to estimate composite cardinalities
68539	MODIFY RECOVERY 'NOCOPYPEND'
68660	Enhance the possibility of merging a materialized query block that is generated for LEFT OUTER JOIN
70945	Query performance is very bad in DB2/ zOS if the view with VALUE function is joined with OUTER JOIN.
71967	Rebind Packages with /
72668	Improve Filter Factor for Current Date - 1 DAYS
74784	DB2 z server should support TM using multi transport model

RFE number	Request For Enhancement (RFE) description
75746	IBAC0311-1390 Enhance Resource Limit Facility to include ability to limit STATIC SQL calls from bound plans/packages
75756	PSCHWAB0410-1336 FREE INACTIVE Selectivity
77173	DSNTIJRT option to install and maintain DB2 supplied MQI functions DB2MQ.* with option SECURITY USER

Planning information

Customer responsibilities

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

Migration considerations

DB2 12 VUE is upwardly compatible with earlier releases of DB2 for z/OS. Migration with full fallback protection is available for clients running on DB2 11 for z/OS. Existing clients should ensure that 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. Clients should also use FIX CATEGORIES IBM.Migrate-Fallback. DB2.V12 and IBM.Coexistence. DB2.SYSPLEXDataSharing to identify and apply fixes that allow prior releases of DB2 to migrate to or fallback from DB2 12 for z/OS and fixes that enable DB2 11 to co-exist when in data sharing mode, respectively.

For more information on FIXCAT, go to the IBM Fix Category Values and Descriptions website.

Deprecated functions

During migration, be aware of the functions that are deprecated in DB2 12 VUE. Although they are supported in DB2 12 VUE, support for these functions might be removed in the future. Avoid creating new dependencies that rely on these functions, and if you have existing dependencies on them, develop plans to remove these dependencies.

The following functions are deprecated in DB2 12 VUE:

Resource limit table formats: DSNRLMTxx table formats and related index formats earlier than the DB2 11 format are deprecated in DB2 12. If tables with deprecated formats are detected, DB2 issues message DSNT732I, processing for the START RLIMIT command continues, and the resource limit facility starts using the deprecated objects.

Some BIND PLAN and REBIND Plan command options are no longer supported.

- The MEMBER option of BIND PLAN and REBIND PLAN is no longer supported. If you specify MEMBER, DB2 issues a warning message, binds the specified DBRM into a package, and binds the package into a plan.

The following subsystem parameters are deprecated in DB2 12 VUE:

- MATERIALIZE _NODET_SQLTUDF.
  - In later DB2 releases, user-defined SQL table functions that are not defined with NOT DETERMINISTIC always behave as if MATERIALIZE_NODET_SQLTUDF is set to YES.

For more information on DB2 12 VUE deprecated functions, go to IBM Knowledge Center.

Packaging

The programs in this announcement are distributed with the following content:

- Basic machine-readable material
- Program Directory
- IBM International Program License Agreement (IPLA)
- IBM Agreement for Acquisition of Software Maintenance (IAASM)

Security, auditability, and control

DB2 12 VUE uses the security and auditability features of the host z/OS system.

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

Ordering information

Consult your IBM representative.

The programs in this announcement all have Value Unit-Based pricing.

Program number	Program name	Value Unit Exhibit
5770-AF3	DB2 12 for z/OS Value Unit Edition	VUE001

For each z Systems IPLA program with Value Unit pricing, the quantity of that program needed to satisfy applicable IBM terms and conditions is referred to as the *required license capacity.* Your required license capacity is based upon the following factors:

- The z Systems IPLA program you select
- The applicable Value Unit Exhibit
- The applicable terms
- Whether your current mainframes are full capacity or sub-capacity

Value Unit Exhibit VUE001

Level	Minimum	Maximum	Value Units/MSU
Base	1	3	5.25
Tier A	4	45	0.83
Tier B	46	175	0.35
Tier C	176	315	0.26
Tier D	316	+	0.20

Ordering z/OS through the internet

Shopz provides an easy way to plan and order your z/OS ServerPac or CBPDO. 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). For more details and availability, go to the Shopz website.

The products in this announcement have one charge unit: Value Units.

	MSUs	Value Units/MSU
Base	1-3	5.25
Tier A	4-45	.83
Tier B	46-175	.35
Tier C	176-315	.26

	MSUs	Value Units/MSU
Tier D	316+	.20

Note: For the actual translation from MSUs to Value Units for this product, refer to the table that follows.

Ordering example

The total number of Value Units is calculated according to the following example.

If the customer has installed 1,000 MSUs, the applicable Value Units would be:

	MSUs	*	Value Units/ MSU	=	Value Units
Base	3	*	5.25	=	15.75
Tier A	42	*	.83	=	34.86
Tier B	130	*	.35	=	45.50
Tier C	140	*	.26	=	36.40
Tier D	685	*	.20	=	137
	-----				---
Total	1,000				270

When calculating the total number of Value Units, the total is to be rounded up to the next integer.

Value Units for non-MSU-based S/390$^{(R)}$ processors using VUE001:

Model	Value Units per machine
H30	21.00
H50	22.00
H70	26.00
ESL models	9

Charge metric

Program name	Part number or PID number	Charge metric
DB2 12 for z/OS Value Unit Edition	5770-AF3	Value Unit

Basic license

On/Off CoD

DB2 12 for z/OS Value Unit Edition is eligible for On/Off CoD with a temporary use charge calculated based on MSUs per-day usage.

Translation from MSUs to Value Units

	MSUs	Value Units/MSU
Base	1-3	5.25
Tier A	4-45	.083
Tier B	46-175	0.35
Tier C	176-315	0.26
Tier D	316 or greater	0.20

To order, specify the program product number and the appropriate license or charge option. Also, specify the desired distribution medium. To suppress shipment of media, select the license-only option in CFSW.

Program name: DB2 12 for z/OS Value Unit Edition

Program PID: 5770-AF3

Entitlement identifier	Description	License option/Pricing metric
S017GXM	DB2 12 for z/OS VUE	Basic OTC, per Value Units
		Basic OTC, per MSU-day TUC

Orderable supply ID	Language	Distribution medium
S017GXH	US English	3590 Tape Cartridge
S018275	Kanji	3590 Tape Cartridge

Entitlement identifier	Description	License option/Pricing metric
S017GXJ	z/OS Appl. Connect	Basic OTC, per Value Units
		Basic OTC, per MSU-day TUC

Orderable supply ID	Language	Distribution medium
S017GXG	US English	3590 Tape Cartridge

Subscription and Support PID: 5697-P11

Entitlement identifier	Description	License option/Pricing metric
S014P4N	DB2 for z/OS VUE S&S	Basic MSC, per Value Unit SW S&S
		No charge, decline SW S&S
		Per MSU SW S&S registration

Orderable supply ID	Description	Distribution medium
S014ZVF	DB2 for z/OS VUE S&S	Hardcopy pub

Entitlement identifier	Description	License option/Pricing metric
S014P4R	z/OS Appl. Connect VUE S&S	Basic MSC, per Value Unit SW S&S
		No charge, decline SW S&S
		Per MSU SW S&S registration

Orderable supply ID	Description	Distribution medium
S014ZVP	z/OS Appl. Connect VUE S&S	Hardcopy pub

Subscription and Support

To receive voice technical support via telephone and future releases and versions at no additional charge, Subscription and Support must be ordered. The capacity of Subscription and Support (Value Units) must be the same as the capacity ordered for the product licenses.

To order, specify the Subscription and Support program number (PID) referenced above and the appropriate license or charge option.

IBM is also providing Subscription and Support for these products via a separately purchased offering under the terms of the IBM International Agreement for Acquisition of Software Maintenance. This offering:

• Includes and extends the support services provided in the base support to include technical support via telephone.
• Entitles you to future releases and versions, at no additional charge. Note that you are not entitled to new products.

When Subscription and Support is ordered, the charges will automatically renew annually unless cancelled by you.

The combined effect of the IPLA license and the Agreement for Acquisition of Software Maintenance gives you rights and support services comparable to those under the traditional ICA S/390(R) and z Systems license or its equivalent. To ensure that you continue to enjoy the level of support you are used to in the ICA business model, you must order **both** the license for the program **and** the support for the selected programs at the same Value Unit quantities.

Customized offerings

Product deliverables are shipped only through 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, go to the Help section on the Shopz website.

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 through 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, go to the Help section on the Shopz website.

For additional information about the Product ServerPac option, refer to Software Announcement ZP12-0358, dated July 7, 2012.

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

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

Terms and conditions

The information provided in this announcement letter is for reference and convenience purposes only. The terms and conditions that govern any transaction with IBM are contained in the applicable contract documents such as the IBM International Program License Agreement, IBM International Passport Advantage(R) Agreement, and the IBM Agreement for Acquisition of Software Maintenance.

Licensing

IBM International Program License Agreement including the License Information document and Proof of Entitlement (PoE) govern your use of the program. PoEs are required for all authorized use.

This software license includes Software Subscription and Support (also referred to as Software Maintenance).

Agreement for Acquisition of Software Maintenance

The following agreement applies for Software Subscription and Support (Software Maintenance) and does not require customer signatures:

- IBM Agreement for Acquisition of Software Maintenance (Z125-6011)

These programs are licensed under the IBM Program License Agreement (IPLA) and the associated Agreement for Acquisition of Software Maintenance, which provide for support with ongoing access to releases and versions of the program. These programs have a one-time license charge for use of the program and an annual renewable charge for the enhanced support that includes telephone assistance (voice support for defects during normal business hours), as well as access to updates, releases, and versions of the program as long as support is in effect. IBM z Systems Operational Support Services - Support Line is an option if you desire added services.

License Information number

GC27-8810

See the License Information documents page on the IBM Software License Agreement website for more information.

Limited warranty applies

Yes

Limited warranty

IBM warrants that when the program is used in the specified operating environment, it will conform to its specifications. The warranty applies only to the unmodified portion of the program. IBM does not warrant uninterrupted or error-free operation of the program or that IBM will correct all program defects. You are responsible for the results obtained from the use of the program.

IBM provides you with access to IBM databases containing information on known program defects, defect corrections, restrictions, and bypasses at no additional charge. For further information, see the IBM Software Support Handbook.

IBM will maintain this information for at least one year after the original licensee acquires the program (warranty period).

Program support

Enhanced support, called Subscription and Support, includes telephone assistance, as well as access to updates, releases, and versions of the program as long as support is in effect. You will be notified of discontinuance of support with 12 months' notice.

Money-back guarantee

If for any reason you are dissatisfied with the program and you are the original licensee, you may obtain a refund of the amount you paid for it, if within 30 days of your invoice date you return the program and its PoE to the party from whom you obtained it. If you downloaded the program, you may contact the party from whom you acquired it for instructions on how to obtain the refund.

For clarification, note that for programs acquired under any of IBM's On/Off Capacity on Demand (On/Off CoD) software offerings, this term does not apply since these offerings apply to programs already acquired and in use by you.

Volume orders (IVO)

No

Passport Advantage applies

No

Usage restriction

Yes

See the License Information documents page on the IBM Software License Agreement website for more information.

Software Subscription and Support applies

Yes. During the Software Subscription and Support period, for the unmodified portion of a program, and to the extent problems can be recreated in the specified operating environment, IBM will provide the following:

- Defect correction information, a restriction, or a bypass.
- Program updates: Periodic releases of collections of code corrections, fixes, functional enhancements and new versions and releases to the program and documentation.
- Technical assistance: A reasonable amount of remote assistance by telephone or electronically to address suspected program defects. Technical assistance is available from the IBM support center in the organization's geography.

Additional details regarding Technical Assistance, which includes IBM contact information, are provided in the IBM Software Support Handbook.

Software Subscription and Support does not include assistance for:

- The design and development of applications
- Your use of programs in other than their specified operating environment
- Failures caused by products for which IBM is not responsible under the IBM Agreement for Acquisition of Software Maintenance

Software Subscription and Support is provided only if the program is within its support timeframe as specified in the Software Support Lifecycle policy for the program.

All distributed software licenses include Software Subscription and Support (also referred to as Software Maintenance) for a period of 12 months from the date of acquisition, providing a streamlined way to acquire IBM software and assure technical support coverage for all licenses. Extending coverage for a total of three years from date of acquisition may be elected.

While your Software Subscription and Support is in effect, IBM provides you assistance for your routine, short-duration installation and usage (how-to) questions, and code-related questions. IBM provides assistance by telephone and, if available, electronic access, only to your information systems (IS) technical support personnel during the normal business hours (published prime shift hours) of your IBM support center. (This assistance is not available to your end users.) IBM provides Severity 1 assistance 24 hours a day, every day of the year. For additional details, go to the IBM Support Handbooks page.

Software Subscription and Support does not include assistance for the design and development of applications, your use of programs in other than their specified operating environment, or failures caused by products for which IBM is not responsible under this agreement.

For more information about the Passport Advantage(R) Agreement, go to the Passport Advantage and Passport Advantage Express website.

IBM Operational Support Services - Support Line

Yes

System i Software Maintenance applies

No

Variable charges apply

No

Educational allowance available

Yes. When ordering through the program number process, a 15% education allowance applies to qualified education institution customers.

Education Software Allowance Program applies when ordering through the program number process.

ESAP available

Yes, to qualified customers

Terms and conditions

For each z Systems IPLA program with Value Unit pricing, the quantity of that program needed to satisfy applicable IBM terms and conditions is referred to as the required license capacity. Your required license capacity is based upon the following factors:

- The z Systems IPLA program you select
- The applicable Value Unit Exhibit
- The applicable terms
- Whether your current mainframes are full capacity or sub-capacity

For more information on the Value Unit Exhibit for the z Systems IPLA program you selected, refer to the Ordering information section.

Program number	Program name	Terms	Parent, if applicable
5770-AF3	DB2 12 for z/OS Value Unit Edition	Execution-based	N/A

Full-capacity mainframes

In cases where full capacity is applicable, the following terms apply.

Execution based, z/OS based, full machine based: The required capacity of a z Systems IPLA program with these terms equals the MSU-rated capacity of the machines where the z Systems IPLA program executes.

For more information on mainframe MSU-rated capacities, go to the IBM z Systems Software Contracts website.

Reference based: The required license capacity of a z Systems IPLA program with these terms equals the license capacity of the applicable monthly license charge (MLC) program. This MLC program is called the parent program.

Sub-capacity mainframes

In cases where sub-capacity is applicable, the following terms apply.

Execution based: The required capacity of a z Systems IPLA sub-capacity program with these terms equals the capacity of the LPARs where the z Systems IPLA program executes.

z/OS based: The required license capacity of a z Systems IPLA program with these terms equals the license capacity of z/OS on the machines where the z Systems IPLA program executes.

Reference based: The required license capacity of a z Systems IPLA program with these terms equals the license capacity of the applicable monthly license charge (MLC) program. This MLC program is called the parent program.

Full machine based: The required license capacity of a z Systems IPLA program with full machine based terms equals the MSU-rated capacity of the machines where the z Systems IPLA program executes.

DB2 12 VUE is an execution-based IPLA program with additional unique terms and conditions around the qualifying application's Value Unit entitlements. These terms and conditions are defined as follows:

A "Qualified Sysplex" means a Parallel Sysplex in which z/OS is eligible for aggregated zNALC charges as described in the Charges section of the Attachment for zNALC License Charges on IBM z Systems.

DB2 12 VUE (the "Program") may be used only in a validly licensed z Systems New Application License Charge ("zNALC") LPAR for Eligible Workloads, which are defined as workloads that meet the following criteria:

- The workload (excluding applications running under Lotus(R) Domino(R)) must include the Program, where the Program has been qualified and approved through the zNALC qualification process as eligible to run in a zNALC LPAR, and
- The workload must be a net new z/OS workload deployed in a zNALC LPAR at the time of licensing the Program, and not an existing z/OS workload that a) is transferred or migrated to the zNALC LPAR from z/OS elsewhere in the Enterprise or b) is already deployed in a zNALC LPAR within the Enterprise.

In the case of an outsourcing company that may take up the operation of the Program for its customer(s) and be(come) the licensee of such Program(s) the term "Enterprise" refers in all cases to the enterprise of the outsourcing company's customer(s) and not to the outsourcing company itself.

Charges for DB2 12 VUE are based on Value Unit entitlements.

Calculation of Value Unit entitlements for the Program will be determined as follows:

- (1) There will be a calculation of the number of Value Units which would equate to the total sum of the MSUs for any copies of the Program on the machine or Qualified Sysplex, and the MSUs for all instances of the version of DB2 for z/OS that matches the version of the Program (that is, only where the version of DB2 for z/OS of such instances is the same as the version of the Program) on that machine or in the Qualified Sysplex.
- (2) There will be a calculation of the number of Value Units which would equate to the MSUs for all instances of the version of DB2 for z/OS that matches the version of the Program (that is, only where the version of DB2 for z/OS of such instances is the same as the version of the Program) on the machine or Qualified Sysplex.
- (3) The number of required Program Value Unit entitlements will be the Value Units calculated in (1) minus the Value Units calculated in (2).

No MSUs associated with any other instances of DB2 for z/OS shall be included with the Program MSUs in the calculation to determine required Value Unit entitlements.

Example:

Simply by way of example (hypothetically for the purpose of illustration only), assuming that the MSUs for the existing version of DB2 for z/OS which matches the version of the Program which would be included in the calculations = 100, and the MSUs for the Program itself = 30 (where the calculated Value Units for the copies of the Program based on Program MSUs alone would = 39):

- a. Assume that the calculated Value Units for the combined MSUs of the DB2 for z/OS and the Program (100 + 30 =130 MSUs) would = 81 (Step 1 above)
- b. Assume that the calculated Value Units for the applicable DB2 for z/OS (100 MSUs) would = 70 (Step 2 above)
- c. Then the number of Value Unit entitlements required for the Program would be the difference between the Value Units in a and b = 11 (that is, 81 - 70 = 11).

Recalculation of Value Unit entitlements:

There may be circumstances in which Your Value Unit entitlements must be recalculated based upon changes to the environment and configuration, and additional Value Units will need to be purchased if Your existing Value Unit entitlement is not sufficient. For example:

- if the utilization (for example, capacity) of Your zNALC LPAR in which the Eligible Workload is deployed for use increases;
- if the Eligible Workload is moved to another machine, into a Qualified Sysplex, or out of a Qualified Sysplex;
- if the Value Unit entitlements you acquired were based on calculations that included MSUs associated with instances of DB2 for z/OS, and the MSUs associated with such instances decline.

The Program will be treated as a "Parent Program" for purposes of calculating charges for z Systems IPLA programs with Referenced-Based Terms, just as if the Program were a monthly license charge DB2 program. Additional charges for IBM programs with Referenced-Based Terms licensed by You may apply, just as when adding MSU capacity to other DB2 Parent Programs. This Program is a z Systems IPLA program with Execution-Based Terms for purposes of Sub-Capacity pricing.

In the event a machine has both zNALC LPAR(s) running DB2 for z/OS VUE and non-zNALC LPAR(s) running DB2 for z/OS (MLC), the MSUs applicable to those DB2 products for the purpose of establishing charges for Reference-Based z IPLA Programs will be the lesser of a) the sum of the DB2 for z/OS (MLC) and DB2 for z/OS VUE MSUs or b) the peak z/OS MSUs as indicated on the SCRT report.

Subcapacity terms and conditions:

Management of the Value Unit entitlements continues to be a customer responsibility. For example, in addition to the need for Recalculation of Value Unit Entitlements as specified above, if one of the following occurs on a machine to which DB2 for z/OS VUE is licensed for deployment, the customer must determine if additional Value Units and Subscription and Support need to be ordered for those tools to cover the increase:

- The z/OS-defined capacity is increased.
- The requirements for zNALC sub-capacity charges are no longer met.

Maintenance/support fixes provided for DB2 for z/OS may not be applied to the Program. Separately available Subscription and Support for the Program must be acquired in order to obtain support for the Program.

For more information on mainframe MSU-rated capacities, refer to the IBM z Systems Machines Exhibit, Z125-3901, or visit the Mainframes section of the z Systems Exhibits website.

For additional information for products with reference-based terms, z Systems IPLA sub-capacity programs with reference-based terms add value to the parent program

across the environment, regardless of where in the environment the z Systems IPLA program executes.

An environment is defined as either a single or stand-alone machine or a qualified Parallel Sysplex. You may have one or more different environments across the enterprise. To determine the required license capacity for each z Systems IPLA program with referenced-based terms, each environment should be assessed separately.

When a z Systems IPLA sub-capacity program with reference-based terms is used in a qualified Parallel Sysplex environment, the required license capacity of the z Systems IPLA program must equal the license capacity of the parent program across the Parallel Sysplex. Qualified Parallel Sysplex refers to one:

- Where MLC pricing is aggregated across the sysplex.

Sub-capacity eligibility

To be eligible for sub-capacity charging on select z Systems IPLA programs, you must first implement and comply with all terms of either sub-capacity Workload License Charges (WLC) or sub-capacity Entry Workload License Charges (EWLC). To implement sub-capacity WLC or EWLC, a machine must be z Systems (or equivalent). On that machine:

- All instances of the OS/390[R] operating system must be migrated to the z/OS operating systems.
- Any licenses for the OS/390 operating system must be discontinued.
- All instances of the z/OS operating systems must be running in z/Architecture[R] (64-bit) mode.

For that machine, you must create and submit a Sub-Capacity Report to IBM each month. Sub-Capacity Reports must be generated using the Sub-Capacity Reporting Tool (SCRT). For additional information or to obtain a copy of SCRT, go to the IBM z Systems Software Pricing website.

You must comply with all of the terms of the WLC or EWLC offering, whichever is applicable:

- The complete terms and conditions of sub-capacity WLC are defined in the IBM Customer Agreement - Attachment for z Systems Workload License Charges(Z125-6516).
- The complete terms and conditions for sub-capacity EWLC are defined in the IBM Customer Agreement - Attachment for EWLC, TWLC, zELC, and z/OS.e License Charges(Z125-6587).

Additionally, you must sign and comply with the terms and conditions specified in the amendment to the IPLA contract - Amendment for Amendment for IBM z Systems Programs Sub-Capacity Pricing(Z125-6929).Once the amendment is signed, the terms in the amendment replace any and all previous z Systems IPLA sub-capacity terms and conditions.

On/Off CoD

To be eligible for On/Off CoD pricing, you must be enabled for temporary capacity on the corresponding hardware, and the required contract, Attachment for IBM z Systems On/Off Capacity on Demand (Z125-7883), must be signed prior to use.

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.

Prices

For all local charges, contact your IBM representative.

Announcement countries

All European, Middle Eastern, and African countries except Islamic Republic of Iran, Sudan, and Syrian Arab Republic.

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