DB2 UDB Server for OS/390, Version 6 Delivers the Power for Your e-business and Business Intelligence Needs

Overview
The DB2 Universal Database® Server for OS/390®, Version 6 program extends the DB2 Universal Database to the System/390® platform. Now IBM combines the power of PC and UNIX® application development and query tools with the industrial-strength, reliability, and performance of DB2 Universal Database Server for OS/390 (DB2® UDB Server for OS/390).

With Version 6, it is now possible to have an enterprise-wide DB2 strategy that can take full advantage of these UDB object-relational capabilities across major IBM and non-IBM operating systems. With it, you can develop e-business applications for tomorrow while continuing to meet today’s business needs.

DB2 UDB for OS/390, Version 6 delivers enhancements and improvements that can be utilized by existing applications. You can take advantage of:
- Performance improvements for utilities
- Faster restart and recovery
- Better query performance
- Greater data capacity
- More built-in functions

Version 6 also delivers more power for e-business and network computing with better performing Java™ applications, which can now use static SQL, enhanced Open Database Connectivity (ODBC) support, further improvements to stored procedures, and connection pooling that permits Distributed Data Facility (DDF) to better support large client networks. Version 6 now has the capability to:
- Enhance your data sharing availability with duplexing support for group buffer pools
- Manage system utilization with predictive governing and statement cost estimation
- Improve data I/O with the new buffer pool sizes of 8 KB and 16 KB
- Use data spaces to cache your buffer pools and free up virtual memory in your DB2 address space

At a Glance
With Version 6, DB2 UDB Server for OS/390 provides databases that are:
- Universally extensible
  - Very large objects
  - User-defined functions and distinct data types
  - Triggers for active data
- Universally accessible for e-business and BI
  - SQLJ (Java embedded SQL)
  - DDF connection pooling
  - DRDA® three-part names
  - Net.Data Version 2.2
  - QMF and QMF for Windows
  - DB2 DataPropagator
- Universally scalable and reliable
  - Support for 16 Terabyte tables
  - Faster, more usable, more parallel utilities
  - Data sharing enhancements
  - Easier to alter partitions
  - Faster restart and recovery
  - Query enhancements, prediction/governing
  - 8 KB and 16 KB page sizes

Version 6 also delivers enhancements and improvements that can be utilized by existing applications. You can take advantage of:

Key Prerequisites
Refer to the Hardware Requirements and Software Requirements sections for details.
DATABASE 2™ Universal Database Server for OS/390 is IBM’s super-server of choice for enterprise-wide data management in the twenty-first century. It is the premier relational database server solution for OS/390. The database server builds upon the momentum of previous releases furthering the themes of user productivity, e-business, high-performance, and continuous availability.

Universal Database

In response to customer and marketplace demands, Version 6 of DB2 UDB for OS/390 delivers universal database capabilities for:

- Universally extensible data through object-relational extensions and triggers
- Universal access through network computing improvements
- Universal reliability and scalability through performance and availability enhancements
- Universal applicability with improved support for OLTP, BI, data warehousing, decision support, and ERP applications
- Universal manageability through the addition of data management, query, and tuning functions to the DB2 UDB Server for OS/390

Relational databases are extensively used for mission-critical applications. Building on the strength of the relational technology, this release delivers, through object-relational extensions, support for non-traditional, object-oriented applications like multimedia. The very Large Objects (LOBs), User-Defined Functions, and User-Defined Distinct Data Types together support the handling of new, large, and complex data types needed in object-oriented applications like image, voice or multimedia. With the object-relational support delivered in Version 6, DB2 UDB for OS/390 becomes a database of choice for object-oriented application programming. In addition, this release of DB2 delivers triggers making it possible to convert the database from a passive to an active database.

DB2 Extenders

DB2 UDB for OS/390 has the capacity required to handle and store these new complex data types. A LOB column can be up to 2 GB in length and a collection of all LOB values can be up to 4,000 TB. The DB2 Extenders build on the object-relational infrastructure of DB2. Each extender is a package of predefined UDTs, UDFs, triggers, constraints, and stored procedures that satisfies a specific application domain. With the extenders, you can store text documents, images, videos, and audio clips in DB2 tables by adding columns of the new data types provided by the extenders. The actual data can be stored inside the table or outside in external files. These new data types also have attributes that describe aspects of their internal structures, such as “language” and “format” for text data. Each extender provides the appropriate functions for creating, updating, deleting, and searching through data stored in its data types. You can now include these new data types and functions in SQL statements for integrated content searching across all types of data. Four DB2 Extenders are provided as part of the DB2 UDB Server for OS/390.

The DB2 Text Extender adds the power of full-text retrieval to SQL queries by making use of features available in DB2 that let you store unstructured text documents of up to 2 GB in databases. Text Extender offers DB2 users and application programmers a fast, versatile, and intelligent method of searching through such text documents. Text Extender’s strength lies in its ability to search through many thousands of large text documents at high speed, helping you to find not only what you directly ask for, but also word variations and synonyms. You are not restricted to searching only in text documents stored in DB2 databases, you can also search in text documents stored in files.

The DB2 Image Extender defines a new data type and functions for images using DB2 UDB’s built-in support for user-defined types and user-defined functions. It also exploits DB2 UDB’s support for LOBs of up to 2 GB and uses DB2 UDB triggers to store and maintain, automatically, attribute information for images. The DB2 Image Extender supports a wide variety of image formats, such as GIF (including animated GIFs), JPEG, BMP, and TIFF.

The DB2 Audio Extender defines a new data type and functions for audio using DB2 UDB’s built-in support for user-defined types and user-defined functions. It also exploits DB2 UDB’s support for LOBs of up to 2 GB and uses DB2 UDB triggers to store and maintain, automatically, attribute information for audio objects. The DB2 Audio Extender supports a variety of audio file formats, such as WAVE, MIDI, MPEG1, and AU, and can work with different file-based audio servers.

The DB2 Video Extender defines a new data type and functions for video using DB2 UDB’s built-in support for user-defined types and user-defined functions. It also exploits DB2 UDB’s support for LOBs of up to 2 GB and uses DB2 UDB triggers to store and maintain, automatically, attribute information for video objects. The DB2 Video Extender supports a variety of video file formats, such as MPEG1, MPEG2, AVI, and QuickTime, and can work with different file-based video servers.

Traditional business applications can also profit from the new UDTs and UDFs provided in DB2 UDB for OS/390. Version 6. Distinct types allow your business model to expand beyond DB2’s built-in data types. For instance, a numeric field for currency value could be defined as a distinct type of currency, such as the Euro or U.S. dollars. Now, your application logic can be guarded against erroneously summing Euro currency with U.S. dollars. User-defined functions allow you to write your own extensions to the capability provided by SQL. UDFs are similar to stored procedures, written in high-level languages like COBOL, Java, C, and C++. They run in the stored procedures address space managed by the MVS™ Workload manager.

Triggers help you to bring application logic into the database. A trigger defines a set of actions to be executed when a specific SQL data change operation occurs. Uses for triggers include:

- Enforcing business rules such as restricting the range of change for a data value
- Updating summary data when changes occur in another table
- Initiation of “alerts” outside the database, such as e-mail notification or job scheduling
- Generating automatic values for newly inserted rows
**Universal Access**

Version 6 delivers universal access for e-business, Web, and other distributed network computing applications. In Version 5, DB2 added support for Java access via JDBC connectivity. Now combine the portability of Java application development with the performance advantage of using static Structured Query Language (SQL). What you get is SQLj, which is SQL embedded in the Java programming language. SQLj gives you more control over authorization checking, because now table privileges can be granted to the package owner. With dynamic SQL that JDBC uses, table privileges must be granted to each end user.

Distributed Relational Database Architecture™ (DRDA) includes support for three-part names. Applications using the private protocol to access distributed DB2 data on other MVS systems can now enjoy all the benefits of DRDA without having to make any program revisions.

StoredProcedure procedures are also enhanced for DB2 UDB for OS/390, Version 6. Easier management is afforded now through the use of CREATE, ALTER, GRANT, and REVOKE to manage your stored procedures. Use the Stored Procedures Builder tool to easily develop and deploy stored procedures from a graphical development environment. Additionally, a new register, CURRENT PATH, and the PATH bind option allow implicitly qualified stored procedure names in CALL statements. Stored procedures now permit nested calls by stored procedures and user-defined functions, and you can also use stored procedures for DB2 utility invocation. The Call Level Interface (CLI) introduced in Version 5 is enhanced to support the new object-relational functions:

- LOBs
- User-defined functions
- User-defined data types
- New built-in functions

CLI calls can now be issued from within a stored procedure. This can enhance portability of existing ODBC applications to the OS/390 platform.

DDF Connection Pooling can support thousands of TCP/IP or SNA connections to a small number of database access threads with much less storage than was required in previous releases.

The power of the SQL language is enhanced by the increase in SQL functions provided in Version 6. Now, scores of new built-in functions are available to permit you to obtain results such as absolute value, modulus, square root, standard deviation, or calendar conversions as part of your SQL operation. This extended list of functions contributes to increased compatibility among the DB2 UDB family, making your applications even more portable.

**Universal Scalability, Reliability, Availability**

In every release, DB2 provides more function to help you deliver mission-critical applications. With DB2 UDB for OS/390, Version 6, you can:

- Rebalance partitions more easily
- Run more queries and utilities in parallel
- Take advantage of more flexible page sizes
- Use the Workload Manager to balance priorities of stored procedures and user-defined functions

Unbalanced table spaces can be adjusted by altering the partitioning key for affected partitions, the rest of the table space can remain available to your application while the altered partitions are reorganized. Utility improvements include parallelism for COPY and RECOVER utilities so that a list of image copies can be processed in parallel and thus reduce the elapsed time of these jobs. REBUILD INDEX is the new name for REORG INDEX. Now the RECOVER utility can rebuild indexes and table spaces from one utility statement. For table spaces with more than one index, DB2 can sort, build, and rebuild indexes in parallel, thus saving elapsed time for LOAD, REORG, and REBUILD INDEX. Further elapsed time savings can occur by including RUNSTATS within the execution of:

- LOAD REPLACE
- REORG TABLESPACE
- REORG INDEX
- REBUILD INDEX

The in-line statistics eliminates the need for a separate RUNSTATS pass over the same data. A new option of REORG permits the discarding of data. The discarded data can be optionally saved to a file. You can avoid unnecessary execution of REORG by specifying threshold limits for relevant statistics from the DB2 catalog, which determine when the REORG will execute.

Restart and recovery is improved by permitting some of the backout work to be postponed until after system restart. When many backouts are required at restart, this will contribute to a significantly faster restart than was available with prior releases. Also, a faster log apply process can improve restart and recovery times with fewer I/O operations and with reduced CPU time.

Your largest applications and data warehouse projects can benefit from the expansion in table size. New individual tables can be defined to be up to 16 TB in size, adding an order of magnitude to your database capacity.

Query parallelism is extended to include more types of queries. Now with Version 6, outer joins, queries on nonpartitioned tables, and queries using IN list index access are eligible for parallel processing. Sysplex Query Parallelism is enhanced saving to a file any work on unpartitioned tables during the Sysplex reevaluation at run-time can redistribute work when the number of members has changed or there are shortages of buffer pool resource.

Several query improvements will be especially valuable for data warehousing and business intelligence applications. Join processing for columns of different length but same data types is improved. This will be especially important for joins of tables with a million or more rows. Outer-join and star-join processing are improved and enhanced.

DB2 UDB for OS/390, Version 6 gives you more choices for sizing your data pages. In addition to the previously supported 4 KB and 32 KB page sizes, you can now choose from 8 KB and 16 KB page sizes. You can store your data more efficiently and balance the I/O costs for random access processing.

New with DB2 UDB for OS/390, Version 6 is support for buffer pools in data spaces. Now, DB2 can manage buffer pools out of the DB2 address space into data spaces. This provides relief for applications facing virtual storage constraints. DB2 is positioned to take advantage of any future changes that would permit S/390 processors to expand beyond 2 GB of real memory.
Server Features

Expanding upon the server features delivered in Version 5, QMF, QMF HPO, QMF for Windows, DB2 DataPropagator, DB2 Administration Tool, and DB2 Buffer Pool Tool are now features of DB2 UDB Server for OS/390. These optional, priced features add query, administration, and data management services that extend the power and utility of DB2. All of the optional, priced features are shipped as a time-limited “Try and Buy” with DB2 UDB for OS/390. Install and try these features and discover the value they bring to your DB2. A full-use license may be obtained by ordering the “Buy” feature that delivers the key that removes the time restriction. The features of DB2 UDB Server for OS/390 were developed to work with Version 6 and have been tested to help assure they install and execute in an integrated environment. This can save you valuable install test time. For detailed descriptions of these optional features, plus Net.Data, DB2 PM, and the new DB2 Management Tools Package, refer to the Additional Features of DB2 UDB Server for OS/390 section.

Year 2000

This product is Year 2000 ready. When used in accordance with its associated documentation, it is capable of correctly processing, providing, and/or receiving date data within and between the twentieth and twenty-first centuries, provided that all products (hardware, software, and firmware) used with the product properly exchange accurate date data with it.

Product Positioning

DB2 UDB for OS/390 is the super-server of choice for the twenty-first century providing enterprise-wide data management for e-business, business intelligence, Enterprise Resource Planning applications such as Baan, PeopleSoft, and SAP R/3, and operational transaction processing. It offers large data capacity, high transaction performance, and extensive connectivity. It works with the DB2 UDB family to bring a full relational solution to the marketplace. DB2 supports transactions arising from CICS®, IMS® transaction management, MVS batch jobs, and via distributed connections from remote clients on numerous platforms.

DB2 UDB Server for OS/390 is the relational database server solution for OS/390. It combines the power and reliability of DB2 with additional features such as:

- DB2 Administration Tool
- DB2 Buffer Pool Tool
- DB2 DataPropagator
- Net.Data
- DB2 Performance Monitor
- QMF
- QMF for Windows
- DB2 Management Tools Package, including:
  - Control Center
  - DB2 Estimator for Windows
  - DB2 Installer
  - Stored Procedure Builder
  - Visual Explain

DB2 UDB for OS/390 extends the object-relational functions of DB2 UDB to the S/390 environment. Now the full power and capacity of OS/390 and Parallel Sysplex® are available to store object data, which can be delivered to applications originating on the S/390 or connected via DRDA from a remote requestor or from Internet and intranet applications.

Statement of General Direction

With DB2 for OS/390, Version 5, IBM delivered additional new function after availability. This function was delivered via service and was consolidated by periodic refreshes of DB2 for OS/390. IBM intends to deliver additional new function via this refresh process for DB2 UDB for OS/390, Version 6. Each refresh will undergo integration testing to assure you of a stable service level of DB2 for OS/390. You can subscribe to IBM’s information service “iSource”, to obtain e-mail notice of news about DB2 for OS/390, by pointing your browser to:

http://www.ibm.com/isource

IBM intends to deliver the Stored Procedure Builder Tool for the DB2 UDB Family. It will be initially available in a beta test format for use with DB2 UDB for OS/390. You can obtain it from the Web by linking to “Download” from:

http://www.software.ibm.com/db2os390/

 Stored Procedure Builder is planned to be incorporated into the DB2 Management Tools Package when Version 6 is refreshed.

IBM will probably remove support for the private-protocol access of the Distributed Data Facility in a future release of DB2 for OS/390. IBM has no plans for additional enhancements. DRDA replaces the private-protocol access. Private protocol does not support stored procedures and TCP/IP, both of which are available with DB2 for OS/390, Version 6. Private protocol also does not support the network computing enhancements in Version 6.

Recommendation: Convert your private-protocol applications to DRDA.

Hardware and Software Support Services

SmoothStart™/Installation Services

IBM Installation Services are provided for DB2 UDB for OS/390 by IBM Global Services or your IBM Business Partner at an additional cost. For additional information, contact your IBM representative and ask for Installation Services for DB2 UDB for OS/390.

Reference Information


Trademarks

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Additional Features of DB2 UDB Server for OS/390®

DB2® UDB Server for OS/390® expands the offering of features that combine with DB2 to enhance query access, management, and replication of your data. Features new in Version 6 include:

- QMF™, QMF/HPO, and QMF for Windows™
- DB2 DataPropagator™ for OS/390
- DB2 Administration Tool
- DB2 Buffer Pool Tool
- DB2 Management Tools Package

These features are in addition to the features added in Version 5:

- DB2 Performance Monitor
- Net.Data™

Following is a detailed description of each of these features.

**DB2 QMF Feature**

IBM Query Management Facility (QMF), the tightly integrated, powerful, reliable, query and reporting tool for IBM’s DB2 relational database Management System Family, provides new capabilities for the workstation environment and enhancements for the mainframe that help you access and present mission-critical data better than ever before. QMF Version 6 enables you to work with data all over the enterprise — from DB2 for OS/390 to DB2 for VSE and VM to workstation servers running OS/2®, Windows NT®, AIX®, and other UNIX® operating systems to massively parallel processors. QMF coupled with the DB2 DataJoiner® product allows access to non-relational and other vendor data sources as well.

The QMF Family consists of the following integrated tools:

- QMF for OS/390
- QMF High Performance Option (HPO) Feature
- QMF for Windows Feature

They offer a total solution that includes:

- Accessing large amounts of data
- Sharing central repositories of queries and enterprise reports
- Implementing tightly controlled distributed or client/server solutions

They also provide for report publishing to the Web for viewing with your favorite Web browser.

The components in QMF HPO Version 6 (QMF HPO/Manager and QMF HPO/Compiler) were available as QMF features that could be ordered separately in QMF Version 3.3. They are no longer available as separately ordered features in Version 6. QMF HPO/Complete is now simply called QMF HPO and includes the QMF HPO/Manager, QMF HPO/Compiler, and QMF for Windows as one comprehensive feature.

The QMF HPO/Compiler lets you convert automatically queries and reports into efficient programs in OS/VS COBOL or COBOL II. This reduces CPU consumption, DB2 catalog contention, DB2 Optimizer overhead, and security concerns as converted programs use static Structured Query Language (SQL) in place of dynamic SQL.

The QMF HPO/Manager consists of a group of functions that improves governing and object management capabilities, including a preemptive governor to analyze QMF queries. The governing capabilities allow you to establish controls that protect production applications, while delivering “on demand” information. Among the many conditions available for governing are:

- Time of day
- Day of week
- Maximum number of rows to fetch
- Allow/disallow SQL verbs and QMF commands
- Resource consumption based on the use of QMF commands and SQL statements

For customers with DB2 databases of many sizes, QMF for Windows provides a Windows-based, point-and-click query tool that provides many benefits, including an intuitive GUI “quick start” user interface. Using QMF for Windows you can automate tasks and develop powerful native Windows applications. The tool includes a robust Windows-based API to automate database querying, updating, and report distribution tasks, so you can centralize control over resource consumption. QMF for Windows also provides support for TCP/IP, static SQL, create and edit QMF forms and procedures, and a full screen table editor for updating enterprise data.

QMF for Windows can connect to the DB2 family of products including:

- DB2 UDB for OS/390
- DB2 UDB for AS/400®
- DB2 UDB on UNIX, Windows, and OS/2
- DB2 for VSE and VM

QMF for Windows connectivity options include SNA, TCP/IP, and CLI. Not all connection methods are available with all releases of DB2. Refer to *Installing and Managing QMF for Windows* (GC26-9583) for details.

QMF for Windows is available in three distinct ordering configurations:

1. Included with the QMF HPO feature at no additional charge
2. As a companion feature to provide workstation client access to the QMF feature
3. As a direct feature of DB2 for customers who do not require QMF for OS/390

This announcement is provided for your information only. For additional information, contact your IBM representative, call 800-IBM-4YOU, or visit the IBM home page at: http://www.ibm.com.
QMF Version 6 includes enhancements and support for:

- DB2 Universal Database®, including TCP/IP for DB2 for OS/390, Version 5 and DB2 UDB for OS/390, Version 6
- DB2 Version 6 predictive governor with a warning prompt to QMF users, or an error message, indicating the query could not be run as it exceeded the resource limit
- Additional DB2 special registers that allow QMF to maintain the same set of special registers values during a QMF-DB2 server connection for all updatable special registers on each DB2 product supported
- ISPF LIBDEF service that can now be used to allocate QMF program libraries
- New edit code (zero-suppression) to replace zeros with blanks in a QMF report
- LE/370 for QMF user-written edit codes
- User control of the QMF scroll amount default
- An enhanced SAVE command that enables QMF to default to the current object type (query, form, procedure)
- Column default for CHANGE mode in the QMF Table Editor
- The ability to erase an alias name
- Sample applications and examples in the QMF publications, updated and improved
- Euro currency symbol when formatting numbers
- The ability to use two different currency symbols in the same report

QMF For Windows, Version 6 enhancements include:

- DB2 stored procedures
- DB2 for OS/390 server load balancing
- DB2 Version 6 predictive governor so you can set QMF for Windows to block queries that exceed the thresholds set by the DB2 administrator
- Creating and running QMF linear procedures (QMF host and Windows)
- Command line parameters, which allow you to more easily automate start-up procedures and integration with other applications, such as Visual Warehouse
- Enhanced object tracking, which allows you to:
  - View a detailed history run for all QMF objects to locate unused objects
  - Determine frequently accessed data sources (tables/columns)
  - Spot potential problem areas
- Web publishing, which allows you to convert a standard QMF form to a full HTML format
- Specialized form variables for HTML publishing, which lets you build advanced Web features into your QMF report, such as:
  - Hyperlink
  - E-mail link
  - Embedding images in reports
    - Includes report preview feature
- Global Variables for use in QMF for Windows:
  - Procedures
  - Forms
  - Queries
  - Session variables
- QMF Form calculations (requires 32-bit QMF for Windows and IBM Object REXX)
- The most commonly used attributes of form components, now grouped together on a new form dialog for ease of use
- Custom edit codes that can be added to QMF (a sample user edit code routine that formats a social security number supplied)
- Euro currency symbol
- Control of formatting of data and time values in your QMF reports
- Multiple formatted reports displayed on your desktop at the same time, while performing other application functions
- Control over what tables and QMF objects are displayed when users view lists
- Import/Export data using the PC IXF format, which allows you to use your QMF query results to create new (or append to existing) DB2 workstation tables
- Users to change their passwords from within QMF for Windows
- Users to locate, run, create, and save reports from within Windows Explorer (32-bit only)
- CLI connectivity to DB2 Universal Database and DB2 for OS/390, which provides simplified connectivity for those customers who already have DB2 client configurations established for DB2 UDB and DB2 for OS/390 (via DB2 Connect®)
  - Requires the DB2 Universal Database Version 5.2 client
  - When connecting via CLI, users cannot execute a DB2 stored procedure that returns multiple result sets or bind static SQL
- Access to DB2 Personal Edition — now available with the new CLI support; completes accessibility to all of the current DB2 family platforms
- Access to DB2 UDB for AS/400, Version 4.3, or later — AS/400 access is available in QMF for Windows licensed for DB2 for OS/390, Version 6 or DB2 for VSE and VM, Version 6
- English Wizard from Linguistic Technologies, an IBM Business Partner, which provides a natural language query interface to QMF for Windows, if English Wizard is installed and licensed
- The SEND TO command, which allows you to send query and report results to any application in your Windows SEND TO folder (e-mail, fax program, word processor, spreadsheet, Web publishing wizard). For example:
  - To send reports, use the menu command or the procedure command SEND REPORT.
  - To send query results, use the menu command or the procedure command SEND DATA.

Users must refer to their Windows documentation to set up their Windows SEND TO folder.
The new DB2 DataLink data type, which allows you to return DataLink values in a query window and launch the URLs contained in those values.

Additional Export Data options — exporting data in the text format now allows you to optionally update the schema.ini file with pertinent data type information, for use by the Microsoft™ ODBC text driver.

Additionally, we also allow you to specify the format to use for date and time values.

Additional Bind options — the ability to specify a wide variety of Bind options is added for installing product packages at install time and when binding static queries.

QMF for Windows, Version 6 is only available on CD-ROM.

For more information on the QMF family of integrated tools, including a QMF family demo and a QMF for Windows Try and Buy download, access the QMF Web site at:

http://www.software.ibm.com/data/qmf

**DB2 DataPropagator Feature**

DB2 DataPropagator Version 6 provides read-only, update-anywhere, and on-demand replication between relational sources and targets and defines the architecture for the comprehensive IBM Data Replication solution.

The IBM DB2 DataPropagator consists of the following autonomous components/programs:

- Administration (Control Center)
- Capture
- Apply

The Administration component for the DB2 DataPropagator Version 6 is called the Control Center. The Control Center is the integrated administration tool for DB2 Universal Database Version 5 and includes replication administration. The Control Center runs on OS/2, Windows NT, and Windows 95 platforms and does not require a local DB2 database. The Control Center is used to:

- Define tables as sources, called replication sources
- Define views and joins views as replication sources
- Define target table definitions, called replication subscriptions
- Clone replication subscriptions to other servers
- Remove replication sources or subscriptions no longer needed

Whenever you submit a replication request from the Control Center, such as defining a replication source, the processing information is generated as SQL statements. You can choose to run the statements immediately, or you can save the SQL statements to a plain ASCII file, which you can edit and run at a later time from a replication folder object in the Control Center.

Deferred SQL files allow you to customize the replication tasks for your shop or application and give you the flexibility as to when and how you run the SQL files.

The Capture component captures changes made to data in tables defined as replication sources by reading the database log or journal — without causing any changes and running asynchronously to business applications. The captured changes are placed in staging tables. The IBM DB2 DataPropagator Capture for OS/390, Version 6 supports DB2 for MVS™, Version 3.1, or later. However, the following functions are available with DB2 for MVS, Version 4.1, or later:

- Reading data from archived logs in addition to active logs
- Compressed DB2 data tables as sources
- DB2 data sharing in a Sysplex environment

The Apply component reads the changed data, previously captured and stored in a staging table, and applies it to the target tables. Apply components can also read data, directly from source tables, for example, for a full refresh. Supporting update and refresh copying provides greater flexibility and automation in a replication environment. The Apply component also enhances the data to your specifications as it copies data to the targets. You can exploit the full power of SQL to:

- Create new columns
- Summarize data
- Translate data
- Join data

You can define run-time processing statements using SQL statements and stored procedures before and after the Apply program processes the replication subscription. The run-time processing statements can be run at the source server before the answer set is fetched, and at the target server before and after the answer set is applied. The stored procedures use the SQL CALL statement, newly supported by IBM Replication, without parameters. The run-time procedures are executed together in a single unit-of-work. Acceptable SQLSTATEs can be defined for each processing statement as well.

The Apply component allows you to create:

- Read-only copies
  - User copy tables, which represent source data at a particular point in time
  - Point-in-time tables, which represent source data at a particular point in time plus some overhead columns
  - History tables
  - Staging tables, which can be used as a source for further copies, without recapturing changes, supporting a consistent data environment and providing flexibility in data distribution across the network

- Updatable copies
  - Replica tables — updates to a Replica table are applied automatically to the original source table of the Replica, provided no conflicts are detected.

The Apply component, running at the replica site, detects update conflicts after they occur during the subscription cycle. When transactions are rejected, the Apply compensates the transactions at the replica site. During this process, the Apply inserts rejection codes for every rejected transaction in the control table. Conflict detection is provided at three levels: no detection, standard detection, and enhanced detection, specified while defining the replication source. When a conflict is detected and compensated, the replication subscription is considered failed. All related transactions are checked for conflicts and are also rejected.
After the Apply completes the subscription cycle, the ASNDONE exit notifies you the cycle is complete and whether there were conflicts. ASNDONE user exits can be used to manage recovery from conflicts.

You can subset data for distribution through column and row specifications, replicating only the data you need. Unique to DB2 DataPropagator is the ability to subselect for joins and unions, allowing you to subset according to a value not in the table being replicated. This can be a key requirement when replicating to mobile laptops from normalized databases where most values are not redundantly stored.

Finally, an Apply instance can process many subscriptions at a single site. Multiple Apply instances can run concurrently at different sites/platforms, each processing different numbers and types of subscriptions from the same source. Each subscription can have different definitions, refresh criteria, and timing.

The On-Demand replication capability offers a solution to the challenge of infrequent and unpredictable connections present in the mobile computing community. Data transfers are initiated from the mobile unit where control should be based. This implementation allows downloading from a central server (pulling), or uploading for consolidated processing (pushing).

DB2 DataPropagator Version 6 offers a highly efficient architecture for automatic capture and asynchronous propagation of data changes to the DB2 family of databases. It contains a high-performance, log-based change-capture component that captures all DB2 updates without response-time impact or requiring any user application changes. You can make powerful data enhancements using standard SQL including multitable joins and the use of stored procedures. There is support for full refresh and update change replication, including update of denormalized copies. DataPropagator supports seamless interoperability with DataPropagator NonRelational (IMS™), DataRefresher, DataJoiner, and Lotus NotesPump™ products to deliver robust, versatile replication among:

- IMS
- DB2
- Oracle
- Sybase
- Informix
- Microsoft SQL Server
- Lotus Notes®

There is easier, intuitive administration from the DB2 Universal Database Control Center running on OS/2, Windows NT, and Windows 95 platforms. Support exists for subscription sets allowing for transaction consistency. DB2 view-based replication, including join views, is supported as well as event-driven and continuous replication. Also supported is update-Anywhere replication with robust conflict detection and compensation, along with on-demand replication for occasionally connected and mobile systems. DB2 Catalog replication is now supported for speeding up of ODBC-based queries.

New with Version 6 for DB2 DataPropagator is the ability to replicate large objects (BLOB, CLOB and DBCLOB) as well as replication for ROWID, a new data type introduced in DB2 UDB for OS/390. Installation of DataPropagator is easier and integrated using the DB2 installer. Support for a mixed data sharing environment consisting of different versions of DB2 is now included as well as better resource utilization for continuous replication scenarios. Additional capturing choices are added allowing you to capture changes when any column changes or only when one of the registered columns changes. There is improved scalability, performance, and concurrency along with support for many popular versions of DB2 including:

- DB2 UDB for OS/390, Version 6
- DB2 for OS/390, Version 5.1
- DB2 for MVS/ESA™, Version 4.1

DB2 Administration Tool Feature

Use DB2 Administration Tool (DB2 Admin) to:

- Display and interpret objects in the DB2 catalog
- Execute dynamic SQL statements
- Generate JCL and run DB2 utilities
- Issue DB2 commands against databases and table spaces
- Manage SQLIDs
- Perform complex performance and space utilization queries
- Simplify system administration functions

As the number and complexity of DB2 applications and systems increase, having the right DB2 tools has never been more important.

DB2 Administration Tool is the right tool to help you get the most from your DB2 system. Its comprehensive set of database management functions helps DB2 systems personnel efficiently and effectively manage your DB2 environment by:

- Saving time in DB2 administration
- Simplifying routine day-to-day DB2 tasks
- Increasing knowledge and understanding of your DB2 system

DB2 Admin supports the functionality of DB2 Version 6 by providing panels and options allowing you to quickly see new pertinent catalog information. DB2 Admin works on a data sharing, group member level.

DB2 Admin provides usability enhancements, lower overhead costs, better error recovery, and more extensive online help. Highlights include:

- Calculation and display of the hit ratios of the buffer pools
- Display of all indexes and index columns for a table
- Improved DB2 Admin print capabilities
- EXPLAIN of long SQL statements
- Reuse of DB2 commands
- User initiated stopping of SQL processing

DB2 Admin offers a robust set of database management functions for DB2 MVS systems personnel. As your enterprise expands its DB2 usage and systems environment, you may need to manage multiple complex DB2 systems, perhaps in several locations. DB2 Admin simplifies database administration and allows you to manage these systems more efficiently and effectively.
DB2 Admin is an easy-to-use, ISPF panel driven tool, which overviews DB2 system tables and provides relevant DB2 catalog information in a logical format. Designed to be an interactive and intuitive tool to learn and use, DB2 Admin integrates with DB2 utilities and simplifies creation of DB2 utility jobs. Among DB2 Admin’s strengths is the extensive support to simplify understanding and analysis of the DB2 catalog and allow you to intelligently act on the information presented. The abundant DB2 catalog query capabilities in DB2 Admin include:

- Predefined select criteria (predicates) for most commonly used SELECTs on the catalog
- DB2 objects authorization and relationships that can be shown
- GRANT and REVOKE on the objects
- BIND, REBIND, and FREE for selected plans and packages
- Display of the static SQL for selected Database Request Modules (DBRMs) and packages

DB2 Admin’s power-packed functionality still includes:

- Display of the DDL for existing views
- Generation of DB2 utility jobs for selected objects (COPY, REORG, and RUNSTATS for selected TABLESPACES)
- Support of DB2 Distributed Database Facilities (DDF) including:
  - Remote DB2 catalog support
  - ALIAS support
  - Communications Data Base (CDB)
- Catalog functions optionally running on tables containing a copy of the system catalog
- Functions for administration of the Resource Limit tables (RLIMIT)
- Dynamic SQL statement execution without knowing the exact SQL syntax
- COMMIT/ROLLBACK issued before each display
- Ability to be extended to display/update any DB2 table (sample function provided with the product)
- Ability to issue any DB2 command (commands passed to IFI and the result shown in ISPF browse)
- A quick EXPLAIN function that can show the inserted rows in the PLAN_TABLE
- Ability to save results of a SQL SELECT as ISPF tables
- Ability to (re)display the saved tables
- Ability to print selected columns from the ISPF tables

With the power-packed capabilities of DB2 Admin, there’s never been a better time than now to consider ordering DB2 Admin.

**DB2 Buffer Pool Tool Feature**

While DB2 online performance monitors can tell you when something is wrong, it may be a difficult and time-consuming effort to determine what is the right corrective action to take. Take the guesswork out of tuning and avoid making costly mistakes with DB2 Buffer Pool Tool.

DB2 Buffer Pool Tool helps performance analysts evaluate tuning alternatives and achieve optimal performance with minimal effort. Accurate tuning of buffer pools is one of the single, most-critical factors to improving DB2 performance and getting the most out of your system resources. By now, we all know the best I/O is no I/O; however, eliminating I/O can be a challenging task.

DB2 Buffer Pool Tool gives you comprehensive statistical data and easy-to-read reports and graphs for all pools and objects. The type of information provided by DB2 Buffer Pool Tool is not available from any other monitor or tool in the industry.

DB2 Buffer Pool Tool provides the ability to simulate the effects of changing pool sizes and thresholds. It can also help you predict the effects of moving DB2 objects into different pools or into new pools that do not currently exist. This “what if” analysis allows you to make expert decisions on maximizing resource utilization and reducing elapsed time of your DB2 transactions through effective buffer pool usage. DB2 Buffer Pool Tool is the ultimate tuning aid. If you need a better way of realizing performance improvements, then consider the advantages DB2 Buffer Pool Tool can provide. DB2 Buffer Pool Tool makes it easier to maximize system resources and optimize DB2 performance. Eliminate I/O and realize better utilization of your existing expanded and real storage with DB2 Buffer Pool Tool. DB2 Buffer Pool Tool allows you to:

- Reduce CPU cycle
- Improve DB2 transaction and batch job elapsed times
- Save money

The DB2 Buffer Pool Tool provides the following advantages:

- **Low Overhead**
  The last thing you want to have is a performance tool that causes a performance problem because it uses too much overhead in collecting statistical information. The advantage of DB2 Buffer Pool Tool is it uses the IFI interface and its own data collection facility to avoid the costly overhead associated with other tools. Further, DB2 Buffer Pool Tool easily processes a statistically meaningful data collection interval (more than 30 minutes) other trace facilities cannot handle efficiently.

- **Unique Information**
  No other DB2 tool provides the level and type of statistical analysis available in DB2 Buffer Pool Tool. DB2 Buffer Pool Tool shows you exactly how the pool and objects are used. The extensive statistics include:
  - System and Application Hit Ratios
- Getpage Activity and I/O Rates
- Random Access Activity
- Prefetch (including Dynamic and List) Access Activity
- Read and Write I/O Activity
- Average and Maximum I/O Elapsed Times
- Random Page HiperPool Retrieval
- Average Page Residency Times
- Average Pages/Write

In addition, the statistical analysis is ranked for each object within each pool. Statistical object usage analysis is provided by Plan and AUTHID.

Expert Knowledge

Although this tool provides the most comprehensive set of data related to DB2 activity available today, DB2 Buffer Pool Tool synthesizes, summarizes, and analyzes this information so you won’t suffer from “information overload” or have “analysis paralysis,” which is common with other types of tuning aids. In addition, you can optionally adjust a threshold to bypass reporting for objects having very low usage rates.

DB2 Buffer Pool Tool makes it easy to clearly see which objects are the poorest and best performing and the impact each is having on its current pool. Look no further than DB2 Buffer Pool Tool output to determine which objects will obtain the greatest benefit from changes.

Not only does DB2 Buffer Pool Tool provide easy to read reports and graphs, it even offers general tuning advice based on information gathered from your environment. For example, these recommendations can range from separating indexes from table spaces to moving Sort Work objects into their own pool or to lowering virtual write threshold.

Additionally, as you move to a data sharing environment, DB2 Buffer Pool Tool can be invaluable in providing initial sizing specifications for the Coupling Facility structures.

Simulation Analysis

DB2 Buffer Pool Tool gives you powerful simulation capabilities to determine how to best optimize memory usage, eliminate I/O, and improve response times. DB2 Buffer Pool Tool turns tuning into a scientific process by allowing you to perform many “what if” analyses to evaluate various scenarios.

DB2 Buffer Pool Tool is superior solution since it can:
- Predict system performance levels at varying pool sizes
- Predict improved object performance within each pool
- Model VPSEQT or HPSEQT threshold adjustments

Further, DB2 Buffer Pool Tool is more effective and accurate than pool isolation tuning techniques because it shows the interaction between multiple objects within a pool.

DB2 Buffer Pool Tool gives you the advantage to completely model the effects that proposed changes may have without impacting the operating DB2 system. Up to eight simulation sizes for a pool can be done with one pass of the data.

DB2 Buffer Pool Tool gives you expert tuning knowledge and reduces the time and effort necessary to effectively tune your environment. Make informed decisions with confidence regarding performance improvements.

DB2 Management Tools Package Feature

The DB2 Management Tools Package is a new, no-charge feature of DB2 for OS/390, Version 6. The Management Tools Package is a collection of workstation-based tools you can use to work with and manage your DB2 for OS/390 environment. The elements of the DB2 Management Tools Package Feature are:

- DB2 UDB Control Center
- DB2 Stored Procedures Builder
- DB2 Installer
- DB2 Visual Explain
- DB2 Estimator

DB2 UDB Control Center: Users of DB2 for OS/390 can now manage data in a new way. The Control Center capability of DB2 Universal Database Version 6 for Windows, UNIX, and OS/2 now extends support to DB2 for OS/390, Version 6. As a Java™-based tool, the Control Center can run on many types of workstations and on many different operating systems. Users can now use the same tool, with its easy-to-use GUI, to manage DB2 databases on OS/390, as well as on workstation servers. The GUI supports DB2 for OS/390 SQL statements (such as CREATE and ALTER), DB2 commands (such as DISPLAY, START, and STOP), and utilities (such as REORG and LOAD).

With the Control Center, users can manage the family of DB2 databases on many different operating systems. DB2 for OS/390 objects are displayed on the Control Center main window along with objects of other members of the DB2 UDB family. To initiate an action or utility to manage these objects, users select the object. For example, a user can list the table spaces of a particular database and perform the following actions, and others, on one of the selected table spaces:

- Alter (ALTER TABLESPACE statement)
- Drop (DROP statement)
- Copy (COPY utility)
- Run statistics (RUNSTATS utility)
- Check data (CHECK DATA utility)
- Get a report (REPORT utility)
- Modify (MODIFY utility)
- Load data (LOAD utility)
- Reorganize (REORG utility)
- Recovery (RECOVER utility)
- Display (DISPLAY command)

The Control Center can run either as a Java application or as an application on your Web server that your Web browser can access. DB2 Control Center is part of the DB2 Software Developers Kit (SDK) on Windows, delivered with all editions of DB2 Universal Database and DB2 Connect products on Linux, OS/2, UNIX, and Windows. Because the Control Center requires DB2 Connect, the DB2 Management Tools Package provides a restricted-use copy of DB2 Connect Version 6 to satisfy this functional dependency.

The Control Center approach to managing DB2 is now extended to the System/390® platform. Sites that have multiple DB2 subsystems, on the same or different operating systems, can use the Control Center as a central point of administration. Users who are more experienced in the workstation environment can manage DB2 for OS/390 more easily as a result of the GUI.
The DB2 Stored Procedure Builder (SPB), an element of the DB2 Management Tools Package, provides an easy-to-use development environment for creating, installing, and testing stored procedures. With the DB2 Stored Procedure Builder, you can focus on creating your stored procedure logic rather than on the details of registering, building, and installing stored procedures on a DB2 server. The Stored Procedure Builder provides a single development environment that supports the entire DB2 family ranging from the workstation to System/390. With DB2 Stored Procedure Builder, you can develop stored procedures on one operating system and deploy them on other server operating systems.

The DB2 Stored Procedure Builder has a GUI that guides you through the tasks with the help of basic design patterns, SQL assistants, and costing information. Use the Stored Procedure Builder to perform a variety of tasks associated with stored procedures, such as:

- Viewing existing stored procedures
- Modifying existing stored procedures
- Creating new stored procedures
- Running existing stored procedures
- Copying and pasting stored procedures across connections
- One-step building of stored procedures on target databases
- Customizing the settings to enable remote debugging of installed stored procedures

DB2 Stored Procedure Builder support for DB2 for OS/390 is initially available in beta test mode. It can be obtained from the Web at:

http://www.software.ibm.com/db2os390/

DB2 Stored Procedure Builder is part of the DB2 SDK on Windows, delivered with all editions of DB2 Universal Database and DB2 Connect products on Linux, OS/2, UNIX, and Windows. Because the SPB requires DB2 Connect, the DB2 Management Tools Package provides a restricted-use copy of DB2 Connect Version 6 to satisfy this functional dependency.

DB2 Installer: DB2 Installer is a workstation client delivered as an element of the DB2 Management Tools Package. DB2 Installer enhances your productivity whether you are installing DB2 for OS/390 for the first time or you are an experienced installer. From your workstation, you can:

- Install, migrate, or update DB2 for OS/390 from a restricted-use copy of DB2 Connect Version 6 to satisfy this functional dependency.
- Specify your own qualifier for catalog tables. You can avoid using your DB2 catalog for Visual Explain queries by copying the catalog tables. Then you can specify your own qualifier to access the copied tables when Visual Explain retrieves DB2 catalog information.

DB2 Estimator: DB2 Estimator is an easy-to-use, stand-alone tool for estimating the performance of applications for DB2 for OS/390. DB2 Estimator is one of the elements of the DB2 Management Tools Package. Run it on your desktop personal computer, or take it with you on your portable notebook computer.

With DB2 Estimator, you can model a partial DB2 application or a complete real or planned DB2 application without requiring an actual DB2 system. From simple table sizings to a detailed performance analysis of an entire DB2 application, DB2 Estimator saves time, lowers costs, and reduces risk. You can use DB2 Estimator to investigate the impact to your production system of new or modified applications before you implement them. You can do what-if analysis to assess the impact of changes you're considering. Answer many questions, such as:

- What is the impact on my system if the transaction volume doubles?
- What is the impact if my databases increase in size?
- What is the effect on response time if I use a faster processor?
Use DB2 Estimator during all life-cycle phases of a DB2 application. During the initial design phase, you can easily:
- Determine whether your design is optimal and feasible
- Investigate alternative database designs
- Assess the impact of using triggers and different ways of structuring queries and transactions

When creating database objects, use the models you specified in DB2 Estimator as a guide for naming columns and for specifying attribute values. You can model your system using actual DB2 information by importing information from the DB2 catalog and, if available, from EXPLAIN or DB2 Performance Monitor. Eliminate problems early in the design phase.

When your application is in production, use DB2 Estimator with tools such as DB2 PM to solve application performance problems. You can evaluate alternative SQL designs, without any risk to your production environment, before changing any production database objects. DB2 Estimator also helps you determine the impact of hardware or workload changes.

You can use DB2 Estimator for Version 5 and Version 6 of DB2 for OS/390. It runs in any environment that supports Windows (Windows 3.1, Windows 95, Windows 98, and Windows NT). Use DB2 Estimator on any data imported from DB2 for OS/390, or you can model an application for which none of the tables, SQL, transactions, or configuration exist.

In Version 6, DB2 Estimator expands support for utilities and SQL statements to help you approximate your working environment more closely.

**DB2 PM Feature**

The DB2 PM Feature enables you to monitor, analyze, and optimize the performance of DB2 UDB for OS/390, Version 6 and its subsystems. It includes an online monitor to provide an immediate "snap-shot" view of DB2 for OS/390 activities and to allow for exception processing while the system is operational. In addition, it offers:
- A history facility to view events that happened recently and in a more distant past
- A wide variety of customizable reports for an in-depth performance analysis
- An EXPLAIN function to analyze and optimize SQL statements

Enhancements to DB2 PM Feature for Version 6 include:
- Comprehensive support of all DB2 Version 6 changes

The DB2 PM Feature supports all instrumentation, catalog, and PLAN_TABLE changes, introduced in DB2 Version 6. With DB2 PM, you can rely on a timely and comprehensive support of performance evaluation and analysis.

The DB2 PM Feature is the right solution for you, even if you have an environment of multiple DB2 releases. Ensuring protection of your investment, DB2 PM fully supports instrumentation, catalog, and PLAN_TABLE data from:
- DB2 UDB for OS/390, Version 6 (5645-DB2)
- DB2 for OS/390, Version 5 (5655-DB2)
- DB2 for MVS/ESA, Version 4 (5695-DB2)
• Enhancements for usability

Enhancements to the Net.Data macro language capability include the ability to receive multiple result sets from a stored procedure. Additional built-in functions allow Net.Data macros to manipulate the contents of table variables, to get and set Netscape cookies, and to send e-mail. Further, Net.Data can now execute as a servlet, which permits the execution of existing Net.Data macros in the WebSphere environment. This allows your Net.Data applications to coexist in the WebSphere Application Server environment. Net.Data Version 2.2 also supports DB2 large objects and the use of the Euro currency symbol.

• Enhancements for serviceability

Serviceability enhancements include the ability to trace the execution of a Net.Data request and the ability to log Net.Data error messages.

Refer to the Net.Data Web pages for documentation, sample programs, and customer applications. You can find the Net.Data home page at:

http://www.software.ibm.com/data/net.data/

Open Blueprint®

DB2 UDB for OS/390, Version 6 provides the relational database function described in the Open Blueprint. It provides the:

• SQL industry-standard interface from the International Organization for Standardization (ISO)
• SQL Call Level Interface (SQL CLI) industry-standard from the ISO

It supports the Distributed Relational Database Architecture™ (DRDA®) protocol from IBM to facilitate open, distributed, multivendor interoperability.

Open Enterprise

DB2 UDB for OS/390, Version 6 is developed at a lab where the quality management system is certified under ISO 9001.

DB2 UDB for OS/390, Version 6 conforms with the following national and international SQL standards:

• Federal Information Processing Standards (FIPS) publication 127-2, Database Language SQL. FIPS publication 127-2 announces ANSI (American National Standards Institute) X3.135-1992 as the standard for SQL, so conformance with FIPS publication 127-2 also means conformance with:
  - ANSI X3.135-1992, Database Language SQL
  - ISO 9075-1992, Database Language SQL

The above are referenced to collectively as the SQL92 standard. DB2 UDB for OS/390 conforms to SQL92 Entry Level.

DB2 UDB for OS/390, Version 6 is registered by IBM as Advanced ClusterProven. The IBM ClusterProven program introduces new high-availability requirements that may be applied to any combination of operating system, middleware, or end-user application. DB2 for OS/390 is a solution that satisfies the S/390® platform’s technical criteria and has been registered to receive ClusterProven status. Specifically, DB2 has obtained the status of Advanced ClusterProven by providing significant benefits above those inherent at the ClusterProven level. More information on ClusterProven is available on the Web at:

http://www.ibm.com/servers/clusters/

Technical Information

Specified Operating Environment

Hardware Requirements: DB2 for OS/390, Version 6 operates on any processor that is supported by OS/390 Version 1 Release 3, or subsequent releases. The processor must have enough real storage to satisfy the combined requirements of:

• DB2
• OS/390
• The appropriate Data Facility Product
• The appropriate access methods
• Telecommunications
• Batch
• Other customer-required applications

OS/390 runs on the following hardware:

• All models of the S/390 Parallel Enterprise Servers or S/390 Parallel Transaction Servers (IBM 9672)
• All models of the ES/9000® Processor Unit 9021, 9121, or 9221
• PC Server S/390 or RS/6000™ with S/390 Server-on-Board
• S/390 Multiprise™ 2000

The configuration must include sufficient I/O devices to support the requirements for system output, system residence, and system data sets. Sufficient direct access storage (DASD) 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.

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

Auxiliary Storage: DB2 is independent of DASD and tape device type. You can use any magnetic, optical, or tape device that is supported by the data facilities component of DFSMS/MVS® for the DB2 data sets. If these data sets are on DASD shared with other OS/390 systems, you should use global resource serialization to prevent concurrent access by more than one OS/390 system.

The minimum DASD space requirement, based on installing DB2 using the panel default values, is approximately 600 MB. Users need additional DASD space for their data.

If you use dual logging and tape for the log archiving device, you need at least two tape drives.

http://www.ibm.com/servers/clusters/
Data Communication Devices: Control DB2 operations from:

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

For information about the data communication devices supported by IMS/ESA Transaction Manager, CICS, and TSO, refer to the documentation for these products.

Function-Dependent Hardware Requirements: DB2 has the following function-dependent requirements:

- COPY and RECOVER INDEX: Use of the COPY utility to take DFSMS concurrent copies of indexes requires a 3390 Model 3 or 3990 Model 6 controller at the extended platform, attached to the DASD.

Use of the RECOVER utility to restore DFSMS concurrent copies of indexes also requires a 3390 Model 3 or 3990 Model 6 controller at the extended platform, attached to the DASD.

- DB2 Table Spaces Larger than 1 TB: DB2 table spaces that are larger than 1 TB require one of the following products:
  - 3990 Model 3 or Model 6 controllers with extended support
  - 9340 DASD array

Software Requirements

Operating System and Support Programs: For an OS/390 environment, DB2 requires the function provided by the following licensed programs or their equivalents; subsequent versions or releases of any product are acceptable.

- OS/390 Version 1 Release 3 Base Services (5645-001)
- OS/390 Version 1 Release 3 Application Enablement optional feature for DFSORT™

Function-Dependent Program Requirements: DB2 for OS/390 has the following function-specific program requirements. For specific software requirements for the required products, refer to the respective product announcements.

- User-defined functions: User-defined functions require you include Language Environment mapping macros and macros that generate a Language Environment-conforming prolog and epilog. Language Environment is part of the OS/390 Version 1 Release 3 Application Enablement base feature.

Refer to the Language Environment for OS/390 and VM Programming Guide for details.

- Predictive governing: To take full advantage of DB2 for OS/390, Version 6 predictive governing capabilities, DB2 Connect workstation clients require DB2 Connect Version 5.2 (with appropriate service applied).

- Language Environment built-in functions: Use of any of the following built-in functions requires OS/390 Version 2 Release 4 Application Enablement base element with APARs:
  - Language Environment built-in functions, including the following advanced math functions:
    - Trig functions (such as SIN and COS)
    - DEGREES and RADIANS
    - RAND
    - EXP and POWER
    - LOG10, LOG, and LN
  - DB2 built-in functions Upper, Lower, and Translate with locale

- More than 10,000 open data sets: Use of more than 10,000 open data sets requires OS/390 Version 2 Release 6.

- DB2 table spaces larger than 1 TB: DB2 table spaces that are larger than 1 TB require one of the following products:
  - VSAM Extended Addressability Linear Data Sets in OS/390 Version 2 Release 7 (5647-A01)
  - DFSMS Version 1 Release 5 (5695-DF1)

- Group buffer pool duplexing: Group buffer pool duplexing has the following requirements:
  - A minimum coupling facility architectural level of CFLEVEL=5
  - OS/390 Version 2 Release 6, or OS/390 Release 3, 4, or 5 with APAR; OS/390 Version 2 Release 6 and above do not require the APAR

- Open Database Connectivity: Open Database Connectivity (ODBC) functions have the following requirements:
  - Execution of ODBC component in the application address space requires OS/390 Version 1 Release 3 Application Enablement optional feature for C/C++
  - Customer applications are supported in the following compiler language levels, or later:
    - IBM C/C++ for MVS/ESA, Version 3 Release 2 (5655-121)
    - IBM SAA AD/Cycle® C/370™ Version 1 Release 2 (5688-194)

- Java Database Connectivity: Java Database Connectivity (JDBC) requires Java for OS/390 (6655-A46).


In addition, use of the DB2 Text Extender requires the IBM Text Search Engine Version 2 Release 1 (FMID HIMN210), or later. If you are running OS/390 Version 2 (Release 4, 5, or 6), download and install the IBM Text Search Engine in SMP/E format from the following Web site:

http://www.software.ibm.com/iminer/fortext/

OS/390 Release 8 includes the IBM Text Search Engine as a base element of that operating system.

- Sysplex workload balancing: For Sysplex workload balancing, workstation clients require one of the following products:
  - DB2 Connect Version 6 (strongly recommended)
  - DB2 Connect Version 5 Release 2

- IEEE floating-point: For DB2 for OS/390 to accept IEEE floating-point (also called binary floating-point) values in SQL statements or LOAD utility jobs, OS/390 Version 2 Release 6 is required.
Optional Programs: You can use the following optional licensed programs with DB2 for OS/390, Version 6. Unless otherwise specified, the release shown for a product and any subsequent release are acceptable. In some cases, earlier versions or releases of IBM licensed programs may also work with DB2 for OS/390, but IBM may not have tested them at the time this document was published. If you have questions, check with your IBM representative.

- Connectivity: In addition to any DRDA-compliant database management systems, DB2 for OS/390, Version 6 supports the following IBM relational database products:
  - DB2 Universal Database Extended — Enterprise Edition Version 5 with the DB2 Connect component installed
  - DB2 Universal Database Enterprise Edition Version 5 with the DB2 Connect component installed
  - DB2 Universal Database for AS/400, Version 4 Release 2
  - Operating System/400® (OS/400®) Version 4 Release 1 with DB2 for AS/400 (5769-SS1)
  - DB2 Server for VM and VSE, Version 5 (5648-158)
  - DB2 DataJoiner Version 2 Release 1.1 (5231-200)

Net.Data for OS/390, a feature of DB2 for OS/390, Version 6, provides connectivity to DB2 from the Web.

- Capacity planning: DB2 Estimator, a feature of DB2 for OS/390 Version 6, works with DB2 data to:
  - Estimate application feasibility
  - Model application cost and performance
  - Estimate required CPU and I/O capacity

- Transaction management: The following transaction management products work with DB2:
  - Information Management System (IMS)
    - Information Management System/ESA (IMS/ESA) Version 6 (5655-158)
    - Information Management System/ESA (IMS/ESA) Version 5 (5695-176)
  - Customer Information Control System (CICS)
    - CICS Transaction Server for OS/390, Release 1 (5655-147)
    - CICS/ESA® Version 4 (5655-018)

- Query support: The following query products work with DB2:
  - Query Management Facility (QMF), a feature of DB2 for OS/390, Version 6
  - QMF for Windows, a feature of DB2 for OS/390, Version 6
  - QMF High Performance Option, a feature of DB2 for OS/390, Version 6
  - The DB2 Extenders capability of DB2 for OS/390, Version 6

- Application development: The following application development programs work with DB2:
  - Application System (AS) Version 4 Release 2 (5648-092)

- Operational support: The following programs provide operational support for DB2:
  - DB2 PM, an optional feature of DB2 for OS/390, Version 6
  - OS/390 Version 1 Release 3 System Services optional feature for DFSMS features
  - OS/390 Version 1 Release 3 Security Server optional feature for RACF®
  - NetView® Version 3 for MVS/ESA (5655-007), or NetView Version 2 Release 4 (5685-111)
  - Performance Reporter for MVS, Version 1 Release 2 (5695-101)
  - Library Readers included on the CD-ROMs for BookManager® books

- Replication support: The following programs provide replication support for DB2:
  - DB2 DataPropagator, an optional feature of DB2 for OS/390, Version 6 or one or both of the following products:
    - DataPropagator Relational Apply for MVS, Version 5 Release 1 (5655-A22)
    - DataPropagator Relational Capture for MVS, Version 5 Release 1 (5655-A23)
    - DataPropagator NonRelational MVS/ESA Version 2 (5696-705)
    - IBM DataRefresher Version 1 (5696-703)

- Database administration and systems management support: The following programs support database systems management for DB2:
  - DB2 Automated Utility Generator (DB2AUG) Version 1 Release 2 (5695-077)
  - DB2 Administration Tool, a feature of DB2 for OS/390, Version 6
  - DB2 Buffer Pool Tool, a feature of DB2 for OS/390, Version 6
  - DB2 Control Center, an element of the DB2 Management Tools Package, which is a feature of DB2 for OS/390, Version 6
  - DB2 Installer, an element of the DB2 Management Tools Package, which is a feature of DB2 for OS/390, Version 6
  - Visual Explain, an element of the DB2 Management Tools Package, which is a feature of DB2 for OS/390, Version 6
  - DB2 Estimator, an element of the DB2 Management Tools Package, which is a feature of DB2 for OS/390, Version 6
• Programming languages: You can use the following programming languages (in addition to the High-Level Assembler, which is part of OS/390) to develop application programs for DB2 for OS/390, Version 6:
  - C
    -- IBM AD/Cycle C/370 Compiler Version 1 Release 2 (5688-216)
    -- IBM C/370 Library Version 2 Release 2 (5688-188)
  - C + +
    -- OS/390 Version 1 Release 3 Application Enablement optional feature C++
  - COBOL
    -- IBM COBOL for MVS and VM, Version 1 Release 2 (5688-197)
    -- IBM COBOL for OS/390 and VM, Version 2 Release 1 (5648-A25)
    -- VS COBOL II Compiler and Library Version 1 Release 4 (5688-958)
  - FORTRAN
    -- VS FORTRAN Compiler, Library, and Interactive Debugger Version 2 Release 6 (5688-806)
  - Java
    -- Java for OS/390 (5655-A46)
  - PL/I
    -- IBM PL/I for MVS and VM, Version 1 Release 1 (5688-235)
    -- OS PL/I Compiler, Library, and Interactive Test Facility Version 2 Release 3 (5688-909)
  - REXX
    -- IBM TSO Extensions for MVS REXX, which is part of OS/390
  - Smalltalk
    -- VisualAge Smalltalk Version 4 Release 5 (5655-B14 or 5602-AAR)

Virtual Storage Requirements: The amount of space needed for the common service area (CSA) below the 16 MB line is less than 40 KB for each DB2 subsystem and 24 KB for each IRLM when APAR PQ12390 and prior service is applied. High concurrent activity, parallelism, or high contention can require more CSA.

Most of the DB2 common data resides in the extended common service area (ECSA). Most modules, control blocks, and buffers reside in the extended private area. A DB2 subsystem with 200 concurrent users and 2,000 open data sets should need less than 2 MB of virtual storage below the 16 MB line.

Prerequisites of Features of DB2 UDB Server for OS/390: DB2 for OS/390, Version 6 includes many features, some of which have requirements of their own, above and beyond what DB2 for OS/390, Version 6 requires. This section identifies the requirements for using these features with DB2 for OS/390, Version 6, but it does not repeat those DB2 for OS/390 requirements that apply to the features. Also, some of these features can be used with prior releases of DB2; these requirements are not included in this section, but rather in the detailed installation information for the specific feature.

You can use subsequent versions or releases of the products mentioned in this section, unless otherwise noted.

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

DB2 Installer Requirements: DB2 Installer is an element of the DB2 Management Tools Package, which is a feature of DB2 for OS/390, Version 6. DB2 Installer has hardware and program requirements.

Hardware Requirements: DB2 Installer requires:
  - 20 MB disk memory on the target drive and 2 MB of disk space for each subsystem defined
  - A monitor capable of displaying 1024 x 768 resolution

Program Requirements: DB2 Installer can run in either of the following environments, each of which has its own requirements:
  - Windows NT, which requires Microsoft Windows NT Version 4.0
  - OS/2, which requires:
    - OS/2 Version 4
    - TCP/IP on OS/2, Version 3.0

Both environments require TCP/IP in any of the following circumstances:
  - To run jobs from the workstation
  - To use the copy jobs to host function from the workstation
  - To use all the functions of DB2 Installer

If you don’t have TCP/IP, you can use DB2 Installer to customize your installation jobs, but you need to use a method outside of DB2 Installer to move jobs from the workstation to OS/390 for execution.

Visual Explain Requirements: The Visual Explain element of the DB2 Management Tools Package has hardware and program requirements.

Hardware Requirements: The Visual Explain element of the DB2 Management Tools Package requires:
  - A workstation with either OS/2 Version 4 or Windows NT 4.0
  - Approximately 12 MB of hard disk space
  - A high-resolution monitor

Program Requirements: DB2 Visual Explain runs on Windows NT 4.0 or OS/2 Version 4. One of the following products must be installed on the DB2 Visual Explain workstation:
  - DB2 Connect Personal Edition Version 5.2
  - DB2 Client Application Enablers® (CAE) Version 5.2 connected to a server running DB2 Connect Enterprise Edition Version 5.2

In addition, DB2 Visual Explain requires one of the following communication protocols:
  - TCP/IP
• SNA communications using a product such as:
  - Communication Server 5.0
  - SNA Server Version 4.0
  - Integrated SNA support in DB2 Universal Database Personal Edition

Visual Explain includes a browser that lets users view current values of subsystem parameters. To use this browser, your DB2 subsystem must have:
- Stored procedures capability
- The DSNWZP stored procedure enabled

**DB2 Estimator Requirements:** The DB2 Estimator, which is an element of the DB2 Management Tools Package, operates in the following environments:
- OS/2 with WIN-OS/2
- Windows 3.1 and subsequent releases
- Windows 98
- Windows 95
- Windows NT

DB2 Estimator has no hardware requirements.

**Net.Data Requirements:** Net.Data for OS/390, Version 2 Release 2 requires an HTTP Web server that is installed on the same server as Net.Data and DB2 for OS/390. The Web server can be another HTTP-compliant Web server or one of the following servers:
- IBM Internet Connection Secure Server for OS/390, Version 2 Release 2 (5697-B14)
- Domino™ Go Webserver Version 4 Release 6 Modification 1 for OS/390 (5697-C58)

In addition, Net.Data servlets have the following requirements:
- OS/390 Version 2 Release 5 (5647-A01)
- Domino Go Webserver Version 5 (5697-D43) with Servlet Express

Net.Data for OS/390 has no hardware requirements.

**QMF Requirements:** QMF, which is a feature of DB2 for OS/390, Version 6, has hardware and program requirements.

**Hardware Requirements:** The following QMF features have hardware dependencies:
- QMF for OS/390 requires a display station supported by GDDM®
- QMF High Performance Option (HPO) requires a display station supported by ISPF
- QMF for Windows requires a workstation that supports:
  - A Windows (16-bit or 32-bit) operating system
  - Network connectivity
  - Approximately 10 MB of hard disk space

**Program Requirements:** The following QMF features have program dependencies:
  This requirement is satisfied by OS/390 Version 2.

Use of QMF forms calculations requires a Windows 32-bit operating system and IBM Object REXX Interpreter Edition Version 1.0 (5639-B73).

**QMF for Windows requires:**
- A Windows (16-bit or 32-bit) operating system
- Network communication software on each user machine, plus one or both of the following programs:
  - An SNA product that provides a CPI-C interface
  - A TCP/IP product that provides a WinSock Version 1.1 interface


The QMF for Windows Administrator module requires a Windows 32-bit operating system.

QMF for Windows for a DBCS language is 32-bit only and runs on Windows 95, Windows 98, and Windows NT.

QMF for Windows CLI connectivity to DB2 UDB on UNIX, Windows, and OS/2 requires DB2 Universal Database Version 5.2 client.

**DB2 PM Requirements:** DB2 PM, which is a feature of DB2 for OS/390, Version 6, has hardware and program requirements.

**Hardware Requirements:** DB2 PM has the following dependencies.
- For the host-based Online Monitor, a display station supported by Interactive System Productivity Facility (ISPF)
- For the host-based graphics facility, an IBM color graphics display station, or equivalent, supported by Graphical Data Display Manager (GDDM)

The DB2 PM Workstation-Based Online Monitor has the following dependencies:
- A high-resolution monitor
- A workstation that supports OS/2 Version 3 or Windows NT Version 4.0
- Approximately 20 MB of hard disk space

**Program Requirements:** For the host-based Online Monitor and host-based graphics facility, DB2 PM has no functional dependencies if you are monitoring DB2 for OS/390, Version 6. The DB2 PM feature supports an environment of multiple DB2 releases, namely instrumentation, catalog, and PLAN_TABLE data from:
- DB2 UDB for OS/390, Version 6 (5645-DB2)
- DB2 for OS/390, Version 5 (5655-DB2)
- DB2 for MVS/ESA, Version 4 (5695-DB2)

Refer to the software requirements for the specific version of DB2.

**Workstation-Based Analysis and Tuning:** The Workstation-Based Analysis and Tuning feature of DB2 for OS/390, Version 6 has hardware and program requirements.

**Hardware Requirements:** Workstation-Based Analysis and Tuning has the following hardware requirements:
- A high-resolution monitor
- A workstation that supports OS/2 Version 3 or Windows NT Version 4.0
- Approximately 20 MB of hard disk space
Program Requirements: Workstation-Based Analysis and Tuning requires one of the following operating systems:

- OS/2, which requires both:
  - OS/2 Version 3
  - Personal Communications AS/400 and 3270 Version 4.1 (5622-972)
- Windows NT Version 4.0.

Windows NT uses TCP/IP to communicate with the programs that run on OS/390, which requires TCP/IP for MVS, Version 3 Release 2 (5655-HAL).

Compatibility

DB2: DB2 UDB for OS/390, Version 6 is upwardly compatible with prior releases of DB2 for OS/390 and DB2 for MVS/ESA. Successful migration with full fallback protection requires customers to migrate DB2 releases sequentially. Thus, existing customers should ensure they are successfully running on DB2 for OS/390, Version 5 before migrating to DB2 UDB for OS/390, Version 6.

DB2 Performance Monitor Feature: The DB2 PM Feature supports an environment of multiple DB2 releases, namely instrumentation, catalog, and PLAN_TABLE data from:

- DB2 UDB for OS/390, Version 6 (5645-DB2)
- DB2 for OS/390, Version 5 (5655-DB2)
- DB2 for MVS/ESA, Version 4 (5695-DB2)

User Group Requirements: This announcement satisfies or partially satisfies 142 requirements from one or more of the worldwide user group communities, which include Australasian SHARE/GUIDE (ASG), COMMON, COMMON Europe, GUIDE International, G.U.I.D.E. Europe, Japan GUIDE/SHARE (JGS), Guide Latin American (LAG), SHARE EUROPE, and SHARE Incorporated.

Refer to the Sales Manual for a list of requirements satisfied. This list will be updated as required.

Planning Information

Customer Responsibilities: Customers should review the sections in this announcement that describe the hardware and software dependencies for DB2 UDB for OS/390, Version 6.

DB2 UDB for OS/390, Version 6 has support for migration from Version 5. Customers not yet on Version 5, should plan to migrate to DB2 for OS/390, Version 5 as preparation for a migration to Version 6.

Migration Considerations: IBM adds many universal database capabilities in DB2 UDB for OS/390, Version 6 and removes support for some functions. As you prepare to migrate your subsystems, you should be aware of the following changes:

- Type 1 indexes are no longer supported. DB2 for OS/390 requires type 2 indexes for every index. Convert all indexes to type 2 before migrating to Version 6.
- Data set password protection is no longer supported. DB2 subsystems should protect data sets by using a security subsystem, such as RACF, which is an element of the OS/390 Security Server, rather than by passwords. Remove all passwords from all indexes and table spaces before migrating to Version 6.
- Shared read-only data is replaced by more substantial, more usable data sharing. Another alternative is to use distributed data. Convert or drop all shared read-only databases before migrating to Version 6.
- Host variables in SQL statements now require a preceding colon. In previous releases of DB2 for OS/390, the colons are optional. Ensure all host variable references include a preceding colon before migrating to Version 6.
- RECOVER INDEX is renamed to REBUILD INDEX. Versions 4 and 5 of DB2 for OS/390 provide an alias REBUILD INDEX so you can prepare for the change. Convert utility jobs to use the REBUILD INDEX syntax before migrating to Version 6.
- Using prior releases of DB2 for OS/390, you register stored procedures in the SYSIBM.SYSPROCEDURES catalog table. You control access by using the AUTHID and LUNAME of the caller. Using Version 6, you register stored procedures in a new catalog table by using the CREATE PROCEDURE statement. You can map your stored procedure definitions that use AUTHID to the schema and CURRENT PATH support. You must eliminate rows that control access with LUNAME prior to migrating to Version 6.

For more detailed information on migrating to Version 6, refer to the DB2 UDB for OS/390, Version 6 Installation Guide (GC26-9018).

The QMF V3.3 Approach® 97 client available in Lotus® Approach 97 and SmartSuite® 97 is no longer supported. Approach can be accessed using the API for the QMF for Windows feature.

Installability: You should refer to the planning sections of the following publications available from an IBM representative, as well as the Program Directory shipped with the product:

- Release Planning Guide (SC26-9013)
- Installation Guide (GC26-9018)
- Data Sharing: Planning and Administration (SC26-9007)

Direct Customer Support: Direct customer support is provided by S/390 Support Line. This service can enhance your productivity by providing voice and electronic access into the IBM support organization. S/390 Support Line will help answer questions pertaining to usage, how to, and suspected software defects for eligible products.

Installation and technical support is provided by IBM Global Services. For more information on services, call 800-IBM-4YOU (426-4968).

Packaging: The DB2 UDB Server for OS/390, except as noted below, will be shipped on 9-track magnetic tapes (written at 6250 BPI), 3480 cartridges, or 4-mm DAT cartridges.

Also included will be a Program Directory, and under separate cover, one copy of the entitled publications.

The workstation client functions of DB2 Management Tools Package, DB2 Extenders, and Buffer Pool Tool will be shipped on CD-ROM.

The Workstation-Based Analysis and Tuning function will be shipped on the same media with the DB2 PM “Try” software.
Note: The components in QMF HPO Version 6 (QMF HPO/Manager and QMF HPO/Compiler) were available as QMF features that could be ordered separately in QMF Version 3.3. They are no longer available as separately ordered features in Version 6. QMF HPO/Complete is now simply called QMF HPO and includes the QMF HPO/Manager, QMF HPO/Compiler, and QMF for Windows as one comprehensive feature.

Security, Auditability, and Control

DB2 UDB for OS/390, Version 6 uses the security and auditability features of the host OS/390 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

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

Customer Financing

IBM Global Financing offers attractive financing to credit-qualified commercial and government customers and Business Partners in more than 40 countries around the world. IBM Global Financing is provided by the IBM Credit Corporation in the United States. Offerings, rates, terms, and availability may vary by country. Contact your local IBM Global Financing organization. Country organizations are listed on the Web at:

http://www.financing.ibm.com

Ordering Information

The following advance publications are available now. To order, contact your IBM representative.

<table>
<thead>
<tr>
<th>Title</th>
<th>Order Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB2 UDB Server for OS/390, Version 6 What’s New</td>
<td>GC26-9017</td>
</tr>
</tbody>
</table>

A DB2 Performance Monitor presentation is available through:

http://www.software.ibm.com/data/dbtools/db2n1mst.html

New Licensees

Orders for new licenses can be placed now.

Shipment will begin on June 25, 1999.

New users of DB2 UDB Server for OS/390 should specify:

- Type: 5645
- Model: DB2

Basic License: To order a basic license, specify the program number and feature number 9001 for asset registration.

Entry Support License (ESL): To order an ESL license, specify the program number, feature number 9001 for asset registration, and the applicable ESL OTC feature number. Also specify the feature number of the desired distribution medium.

<table>
<thead>
<tr>
<th>Description</th>
<th>Program Number</th>
<th>ESL OTC Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB2 UDB for OS/390</td>
<td>5645-DB2</td>
<td>3021</td>
</tr>
</tbody>
</table>

Optional Features:
- DB2 Administration Tool
- DB2 Buffer Pool Tool
- DB2 DataPropagator Apply
- DB2 DataPropagator Capture
- DB2 Performance Monitor
- QMF for OS/390
- QMF for Windows Feature of QMF
- QMF HPO
- QMF for Windows

New Application License (NALC): The NALC price is a monthly price per MSU of the processor to which the software is licensed. Order the quantity of features equal to the MSU rating of the processor.

<table>
<thead>
<tr>
<th>Description</th>
<th>Program Number</th>
<th>NALC Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB2 UDB for OS/390</td>
<td>5645-DB2</td>
<td>2004</td>
</tr>
</tbody>
</table>

Optional Features:
- DB2 Performance Monitor

Parallel Sysplex® License Charge (PSLC) Basic License: To order a basic license, specify the program number and feature number 9001 for asset registration. Specify the PSLC Base feature. If applicable, specify the PSLC Level A and PSLC Level B, and PSLC Level C 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.
### DB2 UDB for OS/390 (PSLC)

<table>
<thead>
<tr>
<th>Machine MSU Capacity</th>
<th>PSLC Feature Number</th>
<th>PSLC Basic License</th>
<th>MLC Feature Description</th>
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<tr>
<td>3</td>
<td>3002</td>
<td>PSLC Base, 3 MSUs</td>
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<td>4 — 45</td>
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<td></td>
<td></td>
<td>3012 PSLC Level D, 50 MSUs</td>
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</table>

**Example 1:** For a single machine with 11 MSUs, the PSLC features would be:

3002 — quantity 1
3003 — quantity 8

**Example 2:** For two machines in a Parallel Sysplex, which have an aggregation of 60 MSUs, the PSLC features would be:

- **PSLC chargeable license #1:**
  3002 — quantity 1
  3004 — quantity 1
  3005 — quantity 5
  3006 — quantity 1

- **PSLC no-charge license #2:**
  3013 — quantity 1

### DB2 Buffer Pool Tool Feature (PSLC)

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<td>3</td>
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<td>4 — 45</td>
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<tr>
<td>46 — 175</td>
<td>3049</td>
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<td></td>
<td></td>
<td>3050 PSLC Level B, 10 MSUs</td>
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**Example 1:** For a single machine with 11 MSUs, the PSLC features would be:

3046 — quantity 1
3047 — quantity 8

**Example 2:** For two machines in a Parallel Sysplex, which have an aggregation of 60 MSUs, the PSLC features would be:

- **PSLC chargeable license #1:**
  3046 — quantity 1
  3048 — quantity 1
  3049 — quantity 5
  3050 — quantity 1

- **PSLC no-charge license #2:**
  3057 — quantity 1

### DB2 Administration Tool Feature (PSLC)

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<td>3028 PSLC Level B, 10 MSUs</td>
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<tr>
<td>176 — 315</td>
<td>3030</td>
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<td>3031 PSLC Level C, 10 MSUs</td>
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**Example 1:** For a single machine with 11 MSUs, the PSLC features would be:

3024 — quantity 1
3025 — quantity 8

**Example 2:** For two machines in a Parallel Sysplex, which have an aggregation of 60 MSUs, the PSLC features would be:

- **PSLC chargeable license #1:**
  3024 — quantity 1
  3026 — quantity 1
  3027 — quantity 5
  3028 — quantity 1

- **PSLC no-charge license #2:**
  3035 — quantity 1
## DB2 DataPropagator Apply Feature (PSLC)

<table>
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</thead>
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<td>3</td>
<td>3068</td>
<td>PSLC Base, 3 MSUs</td>
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<tr>
<td>4 — 45</td>
<td>3069</td>
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<td></td>
<td>3070</td>
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<tr>
<td>46 — 175</td>
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<td></td>
<td>3073</td>
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<tr>
<td>176 — 315</td>
<td>3074</td>
<td>PSLC Level C, 1 MSU</td>
</tr>
<tr>
<td></td>
<td>3075</td>
<td>PSLC Level C, 2 MSUs</td>
</tr>
<tr>
<td></td>
<td>3076</td>
<td>PSLC Level C, 3 MSUs</td>
</tr>
<tr>
<td>316 or more</td>
<td>3077</td>
<td>PSLC Level D, 1 MSU</td>
</tr>
<tr>
<td></td>
<td>3078</td>
<td>PSLC Level D, 2 MSUs</td>
</tr>
<tr>
<td>NA</td>
<td>3079</td>
<td>PSLC NC Identifier</td>
</tr>
</tbody>
</table>

**Example 1:** For a single machine with 11 MSUs, the PSLC features would be:

- 3068 — quantity 1
- 3069 — quantity 8

**Example 2:** For two machines in a Parallel Sysplex, which have an aggregation of 60 MSUs, the PSLC features would be:

- PSLC chargeable license #1:
  - 3090 — quantity 1
  - 3091 — quantity 8

- PSLC no-charge license #2:
  - 3101 — quantity 1

## DB2 DataPropagator Capture Feature (PSLC)

<table>
<thead>
<tr>
<th>Machine MSU Capacity</th>
<th>PSLC Feature Number</th>
<th>PSLC Basic License MLC Feature Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3088</td>
<td>PSLC Base, 1 MSU</td>
</tr>
<tr>
<td>2</td>
<td>3089</td>
<td>PSLC Base, 2 MSUs</td>
</tr>
<tr>
<td>3</td>
<td>3090</td>
<td>PSLC Base, 3 MSUs</td>
</tr>
<tr>
<td>4 — 45</td>
<td>3091</td>
<td>PSLC Level A, 1 MSU</td>
</tr>
<tr>
<td></td>
<td>3092</td>
<td>PSLC Level A, 2 MSUs</td>
</tr>
<tr>
<td>46 — 175</td>
<td>3093</td>
<td>PSLC Level B, 1 MSU</td>
</tr>
<tr>
<td></td>
<td>3094</td>
<td>PSLC Level B, 2 MSUs</td>
</tr>
<tr>
<td></td>
<td>3095</td>
<td>PSLC Level B, 3 MSUs</td>
</tr>
<tr>
<td>176 — 315</td>
<td>3096</td>
<td>PSLC Level C, 1 MSU</td>
</tr>
<tr>
<td></td>
<td>3097</td>
<td>PSLC Level C, 2 MSUs</td>
</tr>
<tr>
<td></td>
<td>3098</td>
<td>PSLC Level C, 3 MSUs</td>
</tr>
<tr>
<td>316 or more</td>
<td>3099</td>
<td>PSLC Level D, 1 MSU</td>
</tr>
<tr>
<td></td>
<td>3100</td>
<td>PSLC Level D, 2 MSUs</td>
</tr>
<tr>
<td>NA</td>
<td>3101</td>
<td>PSLC NC Identifier</td>
</tr>
</tbody>
</table>

**Example 1:** For a single machine with 11 MSUs, the PSLC features would be:

- 3088 — quantity 1
- 3089 — quantity 8

**Example 2:** For two machines in a Parallel Sysplex, which have an aggregation of 60 MSUs, the PSLC features would be:

- PSLC chargeable license #1:
  - 3090 — quantity 1
  - 3092 — quantity 1
  - 3093 — quantity 5
  - 3094 — quantity 1

- PSLC no-charge license #2:
  - 3101 — quantity 1

## DB2 Performance Monitor Feature (PSLC)

<table>
<thead>
<tr>
<th>Machine MSU Capacity</th>
<th>PSLC Feature Number</th>
<th>PSLC Basic License MLC Feature Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3110</td>
<td>PSLC Base, 1 MSU</td>
</tr>
<tr>
<td>2</td>
<td>3111</td>
<td>PSLC Base, 2 MSUs</td>
</tr>
<tr>
<td>3</td>
<td>3112</td>
<td>PSLC Base, 3 MSUs</td>
</tr>
<tr>
<td>4 — 45</td>
<td>3113</td>
<td>PSLC Level A, 1 MSU</td>
</tr>
<tr>
<td></td>
<td>3114</td>
<td>PSLC Level A, 2 MSUs</td>
</tr>
<tr>
<td>46 — 175</td>
<td>3115</td>
<td>PSLC Level B, 1 MSU</td>
</tr>
<tr>
<td></td>
<td>3116</td>
<td>PSLC Level B, 2 MSUs</td>
</tr>
<tr>
<td></td>
<td>3117</td>
<td>PSLC Level B, 3 MSUs</td>
</tr>
<tr>
<td>176 — 315</td>
<td>3118</td>
<td>PSLC Level C, 1 MSU</td>
</tr>
<tr>
<td></td>
<td>3119</td>
<td>PSLC Level C, 2 MSUs</td>
</tr>
<tr>
<td></td>
<td>3120</td>
<td>PSLC Level C, 3 MSUs</td>
</tr>
<tr>
<td>316 or more</td>
<td>3121</td>
<td>PSLC Level D, 1 MSU</td>
</tr>
<tr>
<td></td>
<td>3122</td>
<td>PSLC Level D, 2 MSUs</td>
</tr>
<tr>
<td>NA</td>
<td>3123</td>
<td>PSLC NC Identifier</td>
</tr>
</tbody>
</table>

**Example 1:** For a single machine with 11 MSUs, the PSLC features would be:

- 3110 — quantity 1
- 3111 — quantity 8

**Example 2:** For two machines in a Parallel Sysplex, which have an aggregation of 60 MSUs, the PSLC features would be:

- PSLC chargeable license #1:
  - 3110 — quantity 1
  - 3111 — quantity 8

- PSLC no-charge license #2:
  - 3123 — quantity 1
<table>
<thead>
<tr>
<th>Machine MSU Capacity</th>
<th>PSLC Feature Number</th>
<th>PSLC Basic License MLC Feature Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 1</td>
<td>2016</td>
<td>PSLC Base, 1 MSU</td>
</tr>
<tr>
<td>2 2</td>
<td>2017</td>
<td>PSLC Base, 2 MSUs</td>
</tr>
<tr>
<td>3 3</td>
<td>2018</td>
<td>PSLC Base, 3 MSUs</td>
</tr>
<tr>
<td>4—45</td>
<td>2019, 2020</td>
<td>PSLC Level A, 1 MSU, 42 MSUs</td>
</tr>
<tr>
<td>46—175</td>
<td>2021, 2022, 2023</td>
<td>PSLC Level B, 1 MSU, 10 MSUs, 50 MSUs</td>
</tr>
<tr>
<td>176—315</td>
<td>2024, 2025, 2026</td>
<td>PSLC Level C, 1 MSU, 10 MSUs, 50 MSUs</td>
</tr>
<tr>
<td>316 or more</td>
<td>1001, 1003</td>
<td>PSLC Level D, 1 MSU, 50 MSUs</td>
</tr>
<tr>
<td>NA</td>
<td>2027</td>
<td>PSLC NC Identifier</td>
</tr>
</tbody>
</table>

Example 1: For a single machine with 11 MSUs, the PSLC features would be:
2018 — quantity 1
2019 — quantity 8

Example 2: For two machines in a Parallel Sysplex, which have an aggregation of 60 MSUs, the PSLC features would be:
• PSLC chargeable license #1:
  2018 — quantity 1
  2020 — quantity 1
  2021 — quantity 5
  2022 — quantity 1
• PSLC no-charge license #2:
  2953 — quantity 1

**QMF HPO Feature (PSLC): (Requires QMF for OS/390)**

<table>
<thead>
<tr>
<th>Machine MSU Capacity</th>
<th>PSLC Feature Number</th>
<th>PSLC Basic License MLC Feature Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 1</td>
<td>2956</td>
<td>PSLC Base, 1 MSU</td>
</tr>
<tr>
<td>2 2</td>
<td>2957</td>
<td>PSLC Base, 2 MSUs</td>
</tr>
<tr>
<td>3 3</td>
<td>2958</td>
<td>PSLC Base, 3 MSUs</td>
</tr>
<tr>
<td>4—45</td>
<td>2959</td>
<td>PSLC Level A, 1 MSU, 42 MSUs</td>
</tr>
<tr>
<td>46—175</td>
<td>2960, 2961, 2962</td>
<td>PSLC Level B, 1 MSU, 10 MSUs, 50 MSUs</td>
</tr>
<tr>
<td>176—315</td>
<td>2963, 2964, 2965</td>
<td>PSLC Level C, 1 MSU, 10 MSUs, 50 MSUs</td>
</tr>
<tr>
<td>316 or more</td>
<td>1008, 1009</td>
<td>PSLC Level D, 1 MSU, 50 MSUs</td>
</tr>
<tr>
<td>NA</td>
<td>2967</td>
<td>PSLC NC Identifier</td>
</tr>
</tbody>
</table>

Example 1: For a single machine with 11 MSUs, the PSLC features would be:
2956 — quantity 1
2957 — quantity 8

Example 2: For two machines in a Parallel Sysplex, which have an aggregation of 60 MSUs, the PSLC features would be:
• PSLC chargeable license #1:
  2956 — quantity 1
  2960 — quantity 1
  2961 — quantity 5
  2962 — quantity 1
• PSLC no-charge license #2:
  2967 — quantity 1

**QMF for Windows Feature of QMF (PSLC)**

(Requires QMF for OS/390)

<table>
<thead>
<tr>
<th>Machine MSU Capacity</th>
<th>PSLC Feature Number</th>
<th>PSLC Basic License MLC Feature Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 1</td>
<td>2942</td>
<td>PSLC Base, 1 MSU</td>
</tr>
<tr>
<td>2 2</td>
<td>2943</td>
<td>PSLC Base, 2 MSUs</td>
</tr>
<tr>
<td>3 3</td>
<td>2944</td>
<td>PSLC Base, 3 MSUs</td>
</tr>
<tr>
<td>4—45</td>
<td>2945, 2946</td>
<td>PSLC Level A, 1 MSU, 42 MSUs</td>
</tr>
<tr>
<td>46—175</td>
<td>2947, 2948, 2949</td>
<td>PSLC Level B, 1 MSU, 10 MSUs, 50 MSUs</td>
</tr>
<tr>
<td>176—315</td>
<td>2950, 2951, 2952</td>
<td>PSLC Level C, 1 MSU, 10 MSUs, 50 MSUs</td>
</tr>
<tr>
<td>316 or more</td>
<td>1006, 1007</td>
<td>PSLC Level D, 1 MSU, 50 MSUs</td>
</tr>
<tr>
<td>NA</td>
<td>2953</td>
<td>PSLC NC Identifier</td>
</tr>
</tbody>
</table>

Example 1: For a single machine with 11 MSUs, the PSLC features would be:
2942 — quantity 1
2943 — quantity 8

Example 2: For two machines in a Parallel Sysplex, which have an aggregation of 60 MSUs, the PSLC features would be:
• PSLC chargeable license #1:
  2942 — quantity 1
  2943 — quantity 1
  2944 — quantity 5
  2945 — quantity 1
• PSLC no-charge license #2:
  2953 — quantity 1
QMF for Windows Feature (PSLC): (Without QMF for OS/390 requirement)

<table>
<thead>
<tr>
<th>Machine MSU Capacity</th>
<th>PSLC Feature Number</th>
<th>PSLC Basic License Description</th>
<th>MLC Feature Number</th>
<th>MLC Feature Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2029</td>
<td>PSLC Base, 1 MSU</td>
<td>2029</td>
<td>quantity 1</td>
</tr>
<tr>
<td>2</td>
<td>2030</td>
<td>PSLC Base, 2 MSUs</td>
<td>2030</td>
<td>quantity 2</td>
</tr>
<tr>
<td>3</td>
<td>2031</td>
<td>PSLC Base, 3 MSUs</td>
<td>2031</td>
<td>quantity 5</td>
</tr>
<tr>
<td>4 – 45</td>
<td>2032</td>
<td>PSLC Level A, 1 MSU</td>
<td>2032</td>
<td>quantity 1</td>
</tr>
<tr>
<td>46 – 175</td>
<td>2034</td>
<td>PSLC Level B, 1 MSU</td>
<td>2034</td>
<td>quantity 1</td>
</tr>
<tr>
<td>176 – 315</td>
<td>2037</td>
<td>PSLC Level C, 1 MSU</td>
<td>2037</td>
<td>quantity 1</td>
</tr>
<tr>
<td>316 or more</td>
<td>1004</td>
<td>PSLC Level D, 1 MSU</td>
<td>1004</td>
<td>quantity 1</td>
</tr>
<tr>
<td>NA</td>
<td>2040</td>
<td>PSLC NC Identifier</td>
<td>2040</td>
<td>quantity 1</td>
</tr>
</tbody>
</table>

Example 1: For a single machine with 11 MSUs, the PSLC features would be:

- 2029 — quantity 1
- 2030 — quantity 8

Example 2: For two machines in a Parallel Sysplex, which have an aggregation of 60 MSUs, the PSLC features would be:

- PSLC chargeable license #1:
  - 2029 — quantity 1
  - 2031 — quantity 1
  - 2032 — quantity 5
  - 2033 — quantity 1
- PSLC no-charge license #2:
  - 2040 — quantity 1

S/390 Usage Pricing (Usage License Charge) Basic License: To order a basic license, specify the appropriate program and feature number, if required, for asset registration. Specify the applicable S/390 Usage Pricing feature. Also, specify the feature number of the desired distribution medium.

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:

- Feature 1 (if usage is below 0.25 MSU)
- Feature 2 (if usage is between 0.26 and 0.50)
- Feature 3 (if usage is between 0.51 and 1.0)
- Feature 3 + (number of MSUs from 2-11 times the charge associated with feature number 4)
  + (number of MSUs from 12-44 times the charge associated with feature number 5)
  + (number of MSUs above 44 times the charge associated with feature number 6 — if applicable)

DB2 UDB for OS/390

<table>
<thead>
<tr>
<th>Feature Number</th>
<th>Feature Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3014</td>
<td>0 to 0.25 MSU Base</td>
</tr>
<tr>
<td>3015</td>
<td>0.26 to 0.5 MSU Base</td>
</tr>
<tr>
<td>3016</td>
<td>0.51 to 1.0 MSU Base</td>
</tr>
<tr>
<td>3017</td>
<td>Level A Charge/MSU (2 to 11 MSUs)</td>
</tr>
<tr>
<td>3018</td>
<td>Level B Charge/MSU (12 to 44 MSUs)</td>
</tr>
<tr>
<td>3019</td>
<td>Level C Charge/MSU (45 to 78 MSUs)</td>
</tr>
<tr>
<td>3020</td>
<td>NC Identifier Feature</td>
</tr>
<tr>
<td>3036</td>
<td>0 to 0.25 MSU Base</td>
</tr>
<tr>
<td>3037</td>
<td>0.26 to 0.5 MSU Base</td>
</tr>
<tr>
<td>3038</td>
<td>0.51 to 1.0 MSU Base</td>
</tr>
<tr>
<td>3039</td>
<td>Level A Charge/MSU (2 to 11 MSUs)</td>
</tr>
<tr>
<td>3040</td>
<td>Level B Charge/MSU (12 to 44 MSUs)</td>
</tr>
<tr>
<td>3041</td>
<td>Level C Charge/MSU (45 to 78 MSUs)</td>
</tr>
<tr>
<td>3042</td>
<td>NC Identifier Feature</td>
</tr>
</tbody>
</table>

DB2 Administration Tool Feature

<table>
<thead>
<tr>
<th>Feature Number</th>
<th>Feature Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3080</td>
<td>0 to 0.25 MSU Base</td>
</tr>
<tr>
<td>3081</td>
<td>0.26 to 0.5 MSU Base</td>
</tr>
<tr>
<td>3082</td>
<td>0.51 to 1.0 MSU Base</td>
</tr>
<tr>
<td>3083</td>
<td>Level A Charge/MSU (2 to 11 MSUs)</td>
</tr>
<tr>
<td>3084</td>
<td>Level B Charge/MSU (12 to 44 MSUs)</td>
</tr>
<tr>
<td>3085</td>
<td>Level C Charge/MSU (45 to 78 MSUs)</td>
</tr>
<tr>
<td>3086</td>
<td>NC Identifier Feature</td>
</tr>
</tbody>
</table>

DB2 DataPropagator Apply Feature

<table>
<thead>
<tr>
<th>Feature Number</th>
<th>Feature Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3102</td>
<td>0 to 0.25 MSU Base</td>
</tr>
<tr>
<td>3103</td>
<td>0.26 to 0.5 MSU Base</td>
</tr>
<tr>
<td>3104</td>
<td>0.51 to 1.0 MSU Base</td>
</tr>
<tr>
<td>3105</td>
<td>Level A Charge/MSU (2 to 11 MSUs)</td>
</tr>
<tr>
<td>3106</td>
<td>Level B Charge/MSU (12 to 44 MSUs)</td>
</tr>
<tr>
<td>3107</td>
<td>Level C Charge/MSU (45 to 78 MSUs)</td>
</tr>
<tr>
<td>3108</td>
<td>NC Identifier Feature</td>
</tr>
</tbody>
</table>

DB2 DataPropagator Capture Feature

<table>
<thead>
<tr>
<th>Feature Number</th>
<th>Feature Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3122</td>
<td>0 to 0.25 MSU Base</td>
</tr>
<tr>
<td>3123</td>
<td>0.26 to 0.5 MSU Base</td>
</tr>
<tr>
<td>3124</td>
<td>0.51 to 1.0 MSU Base</td>
</tr>
<tr>
<td>3125</td>
<td>Level A Charge/MSU (2 to 11 MSUs)</td>
</tr>
<tr>
<td>3126</td>
<td>Level B Charge/MSU (12 to 44 MSUs)</td>
</tr>
<tr>
<td>3127</td>
<td>Level C Charge/MSU (45 to 78 MSUs)</td>
</tr>
<tr>
<td>3128</td>
<td>NC Identifier Feature</td>
</tr>
</tbody>
</table>
DB2 Performance Monitor Feature

<table>
<thead>
<tr>
<th>Description</th>
<th>Feature Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 0.25 MSU Base</td>
<td>3124</td>
</tr>
<tr>
<td>0.26 to 0.5 MSU Base</td>
<td>3125</td>
</tr>
<tr>
<td>0.51 to 1.0 MSU Base</td>
<td>3126</td>
</tr>
<tr>
<td>Level A Charge/MSU (2 to 11 MSUs)</td>
<td>3127</td>
</tr>
<tr>
<td>Level B Charge/MSU (12 to 44 MSUs)</td>
<td>3128</td>
</tr>
<tr>
<td>Level C Charge/MSU (45 to 78 MSUs)</td>
<td>3129</td>
</tr>
<tr>
<td>Level D Charge/MSU (above 78 MSUs)</td>
<td>2013</td>
</tr>
<tr>
<td>Level D Charge/50 MSUs (above 78 MSUs)</td>
<td>2014</td>
</tr>
<tr>
<td>NC Identifier Feature</td>
<td>3130</td>
</tr>
</tbody>
</table>

Examples for Ordering:

- A customer with a measured usage (from the IBM Measured Usage report) of 0.3 MSU would:
  - Order quantity 1 of the 0.26 to 0.5 MSU base feature

- 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

Single Version Charging: To elect single version charging, the customer must notify and identify to IBM the prior program and replacement program and the designated machine the programs are operating on.

Version-to-Version Upgrade Credit: To upgrade from a prior program acquired for a one-time charge (OTC) to a replacement program using a version-to-version upgrade credit, the customer must notify and identify to IBM the applicable prior program and replacement program participating in the upgrade credit.

Basic Machine-Readable Material

<table>
<thead>
<tr>
<th>Environment</th>
<th>Feature Distribution Number Medium</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB2 UDB for OS/390, Version 6 (Includes “Try” for all “Try and Buy” Features)</td>
<td>5822 3480 Cartridge, 6270 4-mm DAT Cartridge, 6271 9/6250 Magnetic Tape</td>
</tr>
<tr>
<td>DB2 Administration Tool “Buy” Feature</td>
<td>5892 3480 Cartridge, 5514 4-mm DAT Cartridge, 5851 9/6250 Magnetic Tape</td>
</tr>
</tbody>
</table>

Customization Options: Select the appropriate feature numbers to customize your order to specify the delivery options desired. These features can be specified on the initial or MES orders.

Example: If publications are not desired for the initial order, specify feature number 3444 to ship media only. For future updates, specify feature number 3480 to ship media updates only. If, in the future, publication updates are required, order an MES to remove feature number 3480; then, the publications will ship with the next release of the program.

Initial Shipments

<table>
<thead>
<tr>
<th>Description</th>
<th>Feature Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serial Number Only (suppresses shipment of media and documentation)</td>
<td>3444</td>
</tr>
<tr>
<td>Ship Media Only (suppresses initial shipment of documentation)</td>
<td>3470</td>
</tr>
<tr>
<td>Ship Documentation Only (suppresses initial shipment of media)</td>
<td>3471</td>
</tr>
</tbody>
</table>

Update Shipments

<table>
<thead>
<tr>
<th>Description</th>
<th>Feature Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ship Media Updates Only (suppresses update shipment of documentation)</td>
<td>3480</td>
</tr>
</tbody>
</table>
Ship Documentation Only (suppresses update shipment of media) 3481
Suppress Updates (suppresses update shipment of media and documentation) 3482

**Expedite Shipments**

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<tbody>
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<tr>
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<td>SC26-9575</td>
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<td>QMF for OS/390, Version 6 Introducing QMF</td>
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<td>DB2 UDB for OS/390, Version 6 Data Sharing Quick Reference</td>
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All of the above DB2 UDB for OS/390 publications can be ordered using bill-of-forms number SBOF-7413.

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**Usage Restriction Applies:** No

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**Volume Discount:** Not applicable.

**Version-to-Version Upgrade Credits Apply:** Yes

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<td>DB2 Version 4</td>
<td>DB2 UDB Version 6</td>
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**DB2 Performance Monitor Feature**

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**QMF Feature**

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**QMF for Windows Feature**

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**DB2 DataPropagator Feature**

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**DB2 Administration Tool Feature**

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**DB2 Buffer Pool Tool Feature**

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² Note 3 of DAWN-0040 applies

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- DB2 Administration Tool
- DB2 Buffer Pool Tool
- DB2 DataPropagator Apply
- DB2 DataPropagator Capture
- QMF For OS/390
  - QMF for Windows (Requires QMF for OS/390)
  - QMF HPO (Requires QMF for OS/390)
- QMF for Windows (Without QMF for OS/390 Requirement)
- DB2 Performance Monitor

These features may be installed and used on a trial basis for 90 days from the date of installation of the feature, except for the QMF for Windows Feature, which may be installed and used on a trial basis for 60 days from the date of installation. A full-use license for each of the above priced features may be obtained by ordering the appropriate billing feature number and media feature number, labeled as “Buy”, for the optional priced feature. The trial version of these priced features contain time disabling devices that will prevent their use upon expiration of the trial period.

**QMF Features — Additional Terms:** DB2 UDB Server for OS/390, Version 6 has four QMF features:

- QMF for OS/390
- QMF High Performance Option (HPO) — Requires QMF for OS/390
- QMF for Windows, Feature of QMF — Requires QMF for OS/390
- QMF for Windows — Without a requirement of QMF for OS/390

**Warranty Applies:** Yes

**Licensed Program Materials Availability**

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

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