

# Glossary



## A

### **access key**

A key pressed while holding down the ALT key that allows the user to open a menu, carry out a command, select an object, or move to an object. For example, ALT+F opens the **File** menu.

### **action query**

A query that copies or changes data. Action queries include append, delete, make-table, and update queries. Delete and update queries change existing data; append and make-table queries copy existing data. In contrast, select queries return data records. A SQL pass-through query may also be an action query.

### **active document**

An ActiveX document or a document that contains ActiveX controls, Java Applets, or VBScript. Includes Web pages that contain ActiveX components. See also ActiveX terms.

## active window

In an application, the window that appears in the foreground with a highlighted title bar or border to distinguish it from other visible windows.

## ActiveX

Microsoft's brand name for the technologies that enable interoperability using the Component Object Model (COM). See also ActiveX terms.

## ActiveX component

Physical file (for example, .exe, .dll, .ocx) that contains classes, which are definitions of objects. You can use these objects in your Visual Basic application.. See also ActiveX terms.

## ActiveX control

An object that you place on a form to enable or enhance a user's interaction with an application. ActiveX controls have events and can be incorporated into other controls. These controls have an .ocx file name extension. See also ActiveX terms.

## ActiveX designer

Visual designer that third party developers can create to use in Visual Basic's development environment. Examples include Forms<sup>3</sup> and the Connection Designer. See also ActiveX terms.

## ActiveX document

A Visual Basic application that can be viewed in another container provided by an application such as Internet Explorer (version 3.0 or later) or Microsoft Office Binder. Forms created with Visual Basic can be easily converted into ActiveX documents using the VB ActiveX Document Migration Wizard. See also ActiveX terms.

## ActiveX scripting

Microsoft technology for hosting scripts in Internet Explorer and other browsers. See also ActiveX terms.

## ActiveX terms

ActiveX has brought several new terms to Visual Basic programming, some of which replace terms you may have used in connection with OLE. Each of the new terms is defined in this glossary. The following table lists the *ActiveX* terms, and connects them with the OLE terms they may be replacing. Please see the listing under OLE for a list of *OLE* terms and their ActiveX equivalents:

<b>New ActiveX term</b>	<b>Old OLE term</b>
active document	No corresponding OLE term
ActiveX	No corresponding OLE term
ActiveX code component	OLE server, OLE Automation server
ActiveX component (umbrella term for ActiveX document, ActiveX control, and ActiveX code component)	OLE Automation server, OLE Component, OLE control, custom control, OLE ser
ActiveX control	OLE control, custom control
ActiveX designer	No corresponding OLE term
ActiveX document	No corresponding OLE term
ActiveX scripting	No corresponding OLE term
Automation	OLE Automation

In general, OLE terms related to drag and drop functionality remain the same. The following OLE terms do not change:

- compound document
- object linking and embedding
- OLE container control
- OLE drag and drop
- OLE object (for an object that can be linked and/or embedded)
- Remote Automation

### **add-in**

A customized tool that adds capabilities to the Visual Basic development environment. You select available add-ins using the Add-In Manager dialog box accessible from the Add-Ins menu.

### **aggregate function**

A function, such as **Sum**, **Count**, **Avg**, and **Var**, that you can use to calculate totals. In writing expressions and in programming, you can use SQL aggregate functions (including the four listed here) and domain aggregate functions to determine various statistics.

### **Alias**

In Visual Basic, an alternate name you give to an external procedure to avoid conflict with a Visual Basic keyword, global variable, constant, or a name not allowed by the standard naming conventions.

In SQL, an alternate name you give to a column or expression in a SELECT statement, to make it shorter or more meaningful, or to prevent name conflicts when performing SQL queries using expressions that don't return names, or in a query that references the same table more than once.

### **ANSI Character Set**

American National Standards Institute (ANSI) 8-bit character set used to represent up to 256 characters (0 – 255) using your keyboard. The first 128 characters (0 – 127) correspond to the letters and symbols on a standard U.S. keyboard. The second 128 characters (128 – 255) represent special characters, such as letters in international alphabets, accents, currency symbols, and fractions.

### **API**

Application programming interface. The set of commands that an application uses to request and carry out lower-level services performed by a computer's operating system.

### **append query**

An action query that adds new records to the end of an existing table or query. Append queries don't return records (rows).

### **application**

A collection of one or more components that includes at least one process and may also include a graphical user interface; use multiple, external components; support multiple, concurrent users; distribute work across multiple machines; and use one or more external data sources.

### **application model**

A notation and rules for expressing the conceptual and implementation architectures of an application.

An application model is to application design and development as a data model is to database design and development.

## **argument**

A constant, variable, or expression that supplies additional information to an action, procedure, or method. You use an argument with an operand in an expression to supply additional information required by some action.

## **array**

A set of sequentially indexed elements having the same intrinsic data type. Each element of an array has a unique identifying index number. Changes made to one element of an array don't affect the other elements.

## **ASCII character set**

American Standard Code for Information Interchange (ASCII) 7-bit character set widely used to represent letters and symbols found on a standard U.S. keyboard. The ASCII character set is the same as the first 128 characters (0 – 127) in the ANSI character set.

## **assignment statement**

A statement, for example `Text1.Text = "My Name, "` that assigns a value to a variable or property. You must use the **Set** statement to assign an object reference.

## **asterisk**

A character (\*) used as a wildcard in SQL LIKE expressions to accept any string of characters. For example, the expression `LIKE "**town**"` returns records containing the string "town" followed by zero or more characters.

When you create a query or enter an SQL statement, use the asterisk to include all the fields that currently exist in the underlying table or query. For example, `SELECT * FROM MyTable` returns all fields (columns) from the table.

## **asynchronous processing**

A type of I/O (input/output) in which some file I/O functions return immediately, even though an I/O request is still pending. This enables an application to continue with other processing and wait for the I/O to finish at a later time. Database operations can also be run asynchronously, with control returned to the procedure before a query has been completed.

## **attached table**

A table in one database is linked to another database. Data for attached tables remains in the external database where it may be manipulated by other applications.

## **authentication**

The level of data integrity guaranteed for communication between two computers across the network.

## **automatic formatting**

A feature that automatically formats code as you enter it by capitalizing the first letter for keywords, standardizing spacing, adding punctuation, and setting the foreground and background colors.

## **automatic synchronization**

Synchronization that is accomplished automatically by SQL Server. A snapshot is taken of the table schema and data, and that snapshot is written to files for transfer. The job to copy the table schema and data is transferred like any other replication job, via the distribution database. No operator intervention is required.

## **Automation**

A technology that enables applications to provide objects in a consistent way to other applications, development tools, and macro languages. Formerly known as OLE Automation.

## **AutoNumber data type**

A field attribute that automatically stores a unique number for each record as it's added to a table. An AutoNumber field uses the **Long** data type and has its **Attributes** property set to **dbAutoIncrement**. Numbers generated by an AutoNumber field can't be modified. (Also known as a Counter.)

**Note** For replicated tables in replicated databases, an AutoNumber field is not incremented by 1. Instead, it is assigned a random value between -2,000,000,000 and 2,000,000,000.

## **AutoNumber field**

A field data type that automatically stores a unique number for each record as it's added to a table. An AutoNumber field always uses the **Long** data type, and numbers generated by an AutoNumber field can't be modified. (Also known as a Counter field.)

## **B**

### **back-end data**

Any data residing on a remote server.

### **base class**

Original class from which other classes can be derived by inheritance.

### **base computer**

A computer used in a star topology. A replica is copied from the hub server and placed on the base computer. This replica can be used to make additional replicas for other computers. See also hub server, star topology.

### **base table**

A table in a local or remote database. A table defines the structure of a relational database, and is an object that stores data in records and fields. You can manipulate the structure of a base table by using the DAO objects or data definition SQL statements, and you can modify data in a base table by using **Recordset** or **rdoResultset** objects or action queries.

### **batch update**

A cursor model for clients that work with cursors but don't hold locks on the server or issue updates by row. Instead, the client updates many rows that are buffered locally, and then it issues a batch update. This cursor model also allows the client to drop the connection to the server and re-establish it with the same server or even a different server.

### **benchmark**

A type of test used to measure hardware and software performance. Benchmark tests for software determine the efficiency, accuracy, or speed of a program in performing a particular task, such as

recalculating data in a spreadsheet.

## **Big Integer data type**

A data type that stores a signed, exact numeric value with precision 19 (signed) or 20 (unsigned), scale 0 (signed:  $-263 \leq n \leq 263-1$ ; unsigned:  $0 \leq n \leq 264-1$ ).

## **Binary data type**

A data type that stores fixed-length binary data. The maximum length is 255 bytes.

## **binary format**

Machine-readable form. This format is different from ASCII or ANSI formats, which encode data as text.

## **binding**

The process of putting an object into the running state so that operations supplied by the object's application (such as edit or play) can be invoked. The type of binding determines the speed with which an object's methods are accessed using the object variable. See also early bound, late bound.

## **bit**

A binary digit; the smallest unit of data a computer can store. Bits are expressed as 1 or 0.

## **bitmap**

An image represented by pixels and stored as a collection of bits in which each bit corresponds to one pixel. On color systems, more than one bit corresponds to each pixel. A bitmap usually has a .bmp file name extension.

## **bitmask**

A value used with bit-wise operators (**And**, **Eqv**, **Imp**, **Not**, **Or**, **Xor**) to test, set, or reset the state of individual bits in a bit-field value.

## **bitwise comparison**

A bit-by-bit comparison between identically positioned bits in two numeric expressions.

## **black box**

A unit whose internal structure is unknown but whose function is documented. The internal mechanics of the function don't matter to a designer who uses a black box to obtain that function.

## **bookmark**

In data access, a property of the Recordset object that contains a binary string identifying the current record. If you assign the Bookmark value to a variable and then move to another record, you can make the earlier record current again by setting the Bookmark property to that string variable.

For the Internet, a saved reference (in the form of a URL or hyperlink) to a particular location, page, or site, making it easy to return to.

## **Boolean data type**

A data type with only two possible values, True (-1) or False (0). Boolean variables are stored as 16-bit (2-byte) numbers.

## **Boolean expression**

An expression that evaluates to either True or False.

## **bound control**

A data-aware control that can provide access to a specific column or columns in a data source through a RemoteData or Data control. A data-aware control can be bound to a RemoteData or Data control through its DataSource and DataField properties. When a RemoteData or Data control moves from one row to the next, all bound controls connected to the RemoteData or Data control change to display data from columns in the current row. When users change data in a bound control and then move to a different row, the changes are automatically saved in the data source.

## **break mode**

Temporary suspension of program execution in the development environment. In break mode, you can examine, debug, reset, step through, or continue program execution. You enter break mode when you:

- Encounter a breakpoint during program execution.
- Press CTRL+BREAK during program execution.
- Encounter a **Stop** statement or untrapped run-time error during program execution.
- Add a **Break When True** watch expression. Execution stops when the value of the watch changes and evaluates to **True**.
- Add a **Break When Changed** watch expression. Execution stops when the value of the watch changes.

## **breakpoint**

A selected program line at which execution automatically stops. Breakpoints are not saved with your code.

## **browser**

Software that interprets the markup of HTML, formats it into Web pages, and displays it to the user. Some browsers can also contain ActiveX components, and make it possible to play sound or video files.

## **buffer**

A temporary holding area in memory where information can be stored.

## **business object**

Representations of the nature and behavior of real-world things or concepts in terms that are meaningful to the business. For example, in an application, a customer, order, product, or invoice can be represented as a business object encapsulated for manipulation by users.

## **business rule**

The combination of validation edits, login verifications, database lookups, policies, and algorithmic transformations which constitute an enterprise's way of doing business. Also known as business logic.

## **business services**

The logical layer between user and data services, and a collection of business rules and functions that generate and operate upon information. They accomplish this through business rules, which can

change frequently, and are thus encapsulated into components that are physically separate from the application logic itself.

### **by reference**

A way of passing the address of an argument to a procedure instead of passing the value. This allows the procedure to access the actual variable. As a result, the variable's actual value can be changed by the procedure to which it is passed. Unless otherwise specified, arguments are passed by reference.

### **by value**

A way of passing the value of an argument to a procedure instead of passing the address. This allows the procedure to access a copy of the variable. As a result, the variable's actual value can't be changed by the procedure to which it is passed.

### **Byte array**

A flat structure that is treated as a string of characters and is not subject to Unicode machinations.

### **Byte data type**

A data type used to hold positive integer numbers ranging from 0 – 255. Byte variables are stored as single, unsigned 8-bit (1-byte) numbers.

## **C**

### **cache**

A special memory subsystem in which frequently used data values are duplicated for quick access. A memory cache stores the contents of frequently accessed RAM locations and the addresses where these data items are stored.

### **Cartesian product**

The result of joining two relational tables, producing all possible ordered combinations of rows from the first table with all rows from the second table.

Generally, a Cartesian product results from executing an SQL SELECT statement referencing two or more tables in the FROM clause and not including a WHERE or JOIN clause that indicates how the tables are to be joined.

### **cascade**

The process of one action triggering another action. For example, when a cascading update relationship is defined for two (or more) tables, an update to the primary key in the primary table automatically triggers (cascades) changes to the foreign table.

### **cascading delete**

For relationships that enforce referential integrity between tables, an option that causes the deletion of a record from the primary table to automatically delete all related records in the related foreign table or tables.

For example, suppose you establish a relationship between a Customers (primary) table and an Orders (foreign) table with the cascading delete option enabled. When a record in the Customers table is deleted, all orders associated with that customer would also be deleted in the foreign Orders table.

## **cascading event**

A sequence of events caused by an event procedure directly or indirectly calling itself; also referred to as an event cascade or recursion. Cascading event procedures often result in run-time errors, such as stack overflow.

## **cascading update**

For relationships enforcing referential integrity between tables, an option that causes a change to the primary key in a record in the primary table to automatically update the foreign key in all related records in the related foreign table or tables.

For example, suppose you establish a relationship between a Customers (primary) table and an Orders (foreign) table with the cascading update option enabled. When the primary key in a record in the Customers table is changed, all orders associated with that customer would also be changed in the foreign Orders table.

## **case-sensitive**

Capable of distinguishing between uppercase and lowercase letters. A case-sensitive search finds only text that is an exact match of uppercase and lowercase letters. Such a search would, for instance, treat "ZeroLengthStr" and "zerolengthstr" as different. Microsoft Jet database operations are not case-sensitive. However, case sensitivity is a feature of some other database management systems.

## **certificate authority**

A third-party that issues digital certificates, which provide your application with a digital signature, and handles legal and liability issues for broken security.

## **Char data type**

A data type that stores a fixed-length character string. The length is set by the **Size** property.

## **character code**

A number that represents a particular character in a set, such as the ANSI character set.

## **class**

The formal definition of an object. The class acts as the template from which an instance of an object is created at run time. The class defines the properties of the object and the methods used to control the object's behavior.

## **class module**

A module containing the definition of a class (its property and method definitions).

## **client**

Any application or component that accesses or otherwise makes use of services provided by components.

## **client batch cursor library**

A library that provides client-side cursor support for ODBCDirect database applications. This library supports all four types of cursors (keyset, static, dynamic, and forward-only) and provides a number of other features including the ability to dissociate connections and perform optimistic batch updates.

## **client computer**

A computer that accesses shared network resources provided by another computer (called a server). Also referred to as a workstation or client machine. See also server.

## **client/server**

A term generally applied to a software architecture in which processing functions are segmented into independent collections of services and requestors on a single machine or segmented among several machines. One or more processing servers provide a set of services to other clients on the same or across multiple platforms. A server completely encapsulates its processing and presents a well-defined interface for clients.

## **CLSID**

Class identifier. A unique identifier (UUID) that identifies an object. An object registers its CLSID in the system registration database so that it can be loaded and programmed by other applications.

## **clustered index**

The physical order of rows is the same as the indexed order of rows.

## **code component**

An .exe or .dll file that provides objects created from one of the classes the component provides. Formerly OLE server and OLE Automation server.

## **code module**

A module containing public code that can be shared among all modules in a project. A code module is referred to as a standard module in later versions of Visual Basic.

## **code pane**

A pane contained in a code window that is used for entering and editing code. A code window can contain one or more code panes.

## **code signing**

A means to certify that code downloaded over the Internet has not been tampered with. Also known as digital signing.

## **collection**

An object that contains a set of related objects. For example, a collection named Tax Preparation Objects might contain the names of objects such as EndOfYear, RoyaltyCalc, and ExemptionCalc. An object's position in the collection can change whenever a change occurs in the collection; therefore, the position of any specific object in the collection may vary.

## **collection list**

A list of named groups of related collections. For example, Tested Components might be a list of all components that have been tested.

## **collision**

A conflict that occurs during a batch update.

A collision occurs when a client reads data from the server and then attempts to modify that data in a batch update, but before the update attempt is actually executed another client changes the original

server data. In this situation, the first client is attempting to modify server data without knowing what data actually exists on the server.

## **column**

The visual representation of a field in a grid. A column defines the data type, size, and other attributes of one field of a row (record) of data. All columns taken as a set define a row (record) in the database. An individual column contains data related in type and purpose throughout the table; that is, a column's definition doesn't change from row to row.

## **column properties**

Attributes of a column that describe the data it contains. **Size** and **Type** are examples.

## **COM**

Component Object Model. An industry-standard architecture for object-oriented development. The Component Object Model defines interfaces on which ActiveX components are built.

## **command line**

The path, file name, and argument information provided by the user to run a program.

## **comment**

Text added to code that explains how the code works. In Visual Basic, a comment line can start with either an apostrophe (') or with the **Rem** keyword followed by a space.

## **commit**

To accept a pending transaction. If you use transaction processing and begin a transaction, none of the changes made in the transaction will be written to the data source until you commit (accept) the transaction.

## **compaction**

A process that gathers or packs memory or storage into as small a space as possible. In the case of databases, compaction is the process of removing deleted rows from the database.

## **comparison operator**

A character or symbol indicating a relationship between two or more values or expressions. These operators include less than (<), less than or equal to (<=), greater than (>), greater than or equal to (>=), not equal (<>), and equal (=). Additional comparison operators include **Is** and **Like**. Note that **Is** and **Like** can't be used as comparison operators in a **Select Case** statement.

## **compile error**

An error that occurs during compile time as the result of incorrectly constructed code.

## **compile time**

The period during which source code is translated to executable code.

## **compiler directive**

A command used to alter the action of the compiler.

## **component**

Any software that supports Automation (formerly called OLE Automation), which means it can be used programmatically in a custom solution. This includes ActiveX controls (.ocx files), ActiveX documents, and ActiveX code components.

### **component catalog**

A sharable database of information that describes and manages components – generally ActiveX components (formerly called OLE servers). A component catalog does not contain the objects themselves, but contains references to where the objects reside on a computer or network.

### **compound document**

A document that can support linked or embedded objects, as well as its own data.

### **compound query**

A query that is composed of at least one action query (a query that copies or changes data) and at least one select query (a query that returns a **Recordset** without changing data). In DAO, a compound query is created by putting two or more SQL statements (separated by semicolons) in the **SQL** property of a **QueryDef** object.

### **conditional compiler constant**

A Visual Basic identifier that is defined using the **Const** compiler directive or defined in the host application and used by other compiler directives to determine when or if certain blocks of Visual Basic code are compiled.

### **conflict table**

A table that is generated when a synchronization conflict occurs between two replicas. The conflict table appears only in the replica with rejected changes.

### **connect string**

A string used to specify a data source and other information, such as user name and password. The connect string is usually assigned to the **Connect** property of an **rdoConnection** object or **RemoteData** control, or as an argument to the **OpenConnection** method.

### **connection**

A link to a data source.

### **connection handle**

Identifies memory storage for information about a particular connection. RDO will request a connection handle prior to connecting to a data source; RDO manages connection handles automatically through the **rdoConnection** object. Each connection handle is associated with an environment handle. An environment handle can have multiple connection handles associated with it, and there can be multiple environments.

### **connection string**

A string used to define the source of data for an external database. The connection string is usually assigned to the **Connect** property of a **QueryDef**, **TableDef**, **Connection**, or **Database** object or as an argument to the **OpenDatabase** method.

### **consistent**

The state of a multiple-table **Recordset** object that allows you to perform only updates that result in a

consistent view of the data. For example, in a **Recordset** that is a join of two or more tables (a one-to-many relationship), a consistent query would not allow you to set the many-side key to a value that isn't in the one-side table.

## **constant**

A named item that retains a constant value throughout the execution of a program. A constant can be a string or numeric literal, another constant, or any combination that includes arithmetic or logical operators except **Is** and exponentiation. Each host application can define its own set of constants. Additional constants can be defined by the user with the **Const** statement. You can use constants anywhere in your code in place of actual values.

## **constraint**

An expression bound to a field or row that provides data integrity checking by restricting values.

## **container**

An application or object that can contain other objects.

## **context menu**

A floating menu that is displayed over a form, independent of the menu bar by right-clicking the mouse. The items on the menu depend on the pointer location when the menu is displayed. Also called a pop-up menu.

## **control**

An object you can place on a form that has its own set of recognized properties, methods, and events. You use controls to receive user input, display output, and trigger event procedures. You can manipulate most controls using methods. Some controls are interactive (responsive to user actions), while others are static (accessible only through code).

## **control array**

A group of controls that share a common name, type, and event procedures. Each control in an array has a unique index number that can be used to determine which control recognizes an event.

## **control character**

Any key combination that begins with the CTRL or ESC key.

## **copy buffer**

A location created by the Microsoft Jet database engine or **rdoResultset** object for the contents of a record or row that is open for editing. The **Edit** method copies the current record to the copy buffer; the **AddNew** method clears the buffer for a new record and sets the default values; and the **Update** method saves the data from the copy buffer to the database, replacing the current record or inserting the new record. Any statement that resets or moves the current record pointer discards the copy buffer. For example, using the **MoveNext** method or changing the **Index** property of a table would discard the contents of the copy buffer.

## **create an instance**

To create an instance of a class (instantiate); that is, to allocate and initialize an object's data structures in memory.

## **criteria**

A set of limiting conditions, such as = "Denmark" (meaning equal to Denmark) or > 30000, used in creating a query or filter to show a specific set of records or rows.

### **crosstab query**

A query that calculates a sum, average, count, or other type of total on records, and then groups the result by two types of information – one down the left side of a grid (row headings) and the other across the top (column headings).

### **Currency data type**

A data type that is useful for calculations involving money or for fixed-point calculations in which accuracy is extremely important. This data type is used to store numbers with up to 15 digits to the left of the decimal point and 4 digits to the right. Because the **Currency** data type uses discrete values for all amounts, binary round-off isn't a factor when calculating totals.

### **current database**

The **Database** object returned by the **CurrentDB( )** function. A reference of `DBEngine.Workspaces(0).Databases(0)` returns the first database opened. This concept applies only to Microsoft Access.

### **current index**

For an indexed table-type **Recordset** object, the index most recently set with the **Index** property. This index is the basis for ordering records in a table-type **Recordset**, and is used by the **Seek** method to locate records. A **Recordset** object can have more than one index but can use only one index at a time (although a **TableDef** object may have several indexes defined on it). The Microsoft Jet database engine may use more than one index to evaluate a query.

### **current record**

The record in a **Recordset** object that you can use to modify or examine data. Use the Move methods to reposition the current record in a recordset. Use the Find methods (with a dynaset- or snapshot-type **Recordset** object) or the **Seek** method (with a table-type **Recordset** object) to change the current record position according to specific criteria.

Only one record in a **Recordset** can be the current record; however, a **Recordset** may have no current record. For example, after a dynaset-type **Recordset** record has been deleted, or when a **Recordset** has no records, the current record is undefined. In this case, operations that refer to the current record result in a trappable error.

### **current row**

The row currently pointed to by the cursor. Positioned operations act on the current row.

### **current transaction**

All changes made to a **Recordset** or **rdoResultset** object after you use the last **BeginTrans** method and before you use the **Rollback** (**RollbackTrans** for RDO) or **CommitTrans** method.

### **cursor**

Keeps track of the driver's position in the result set. The cursor is so named because it indicates the current position in the result set, just as the cursor on a CRT screen indicates current position. Cursors let the user scroll through and update a result set with fewer restrictions than browse mode.

### **custom control**

Now called ActiveX control. An object that you place on a form to enable or enhance a user's interaction with an application. ActiveX controls have events and can be incorporated into other controls. These controls have an .ocx file name extension. See also ActiveX terms.

## **D**

### **DAO object**

An object that is defined by the Data Access Objects (DAO) library. You can use DAO objects, such as the **Database**, **TableDef**, **Recordset**, and **QueryDef** objects, to represent objects that are used to organize and manipulate data, such as tables and queries, in code.

### **Data Access Objects (DAO)**

Objects that are defined by the Microsoft Jet database engine. You use data access objects, such as the **Database**, **TableDef**, **Recordset**, and **QueryDef** objects, to represent objects that are used to organize and manipulate data in code.

### **data manipulation language (DML)**

The SQL statement properties and methods you use to write applications or queries that access and manipulate the data in existing databases. This includes facilities for querying the database, navigating through its tables, performing updates, and adding or deleting rows.

### **data model**

A model that consists of two elements, the logical and the physical. These elements include (1) a mathematical notation for expressing data and relationships, and (2) operations on the data that serve to express queries and other manipulations of the data.

### **data page**

A portion of the database in which row data is stored. Depending on the size of the rows, a data page may contain more than one row. A data page in most remote databases is 2K bytes.

### **data pipelining**

A process that uses batch optimistic updating to cache server data in a local cursor, close the server connection, open a new connection to another server with the same information schema, and then store the data on the new server.

### **data services**

A concept supporting the lowest visible level of abstraction used for manipulating data within an application. This support implies the ability to define, maintain, access, and update data. Data services manage and satisfy requests for data generated by business services, and are often implemented as stored procedures or ActiveX components.

### **data source**

The data the user wants to access and its associated operating system, DBMS, and network platform (if any).

### **data source name**

DSN. Name of a registered data source.

### **data type**

The characteristics of a variable that determine what kind of data the variable can hold. Data types include **Big Integer**, **Binary**, **Byte**, **Boolean**, **Char**, **Currency**, **Date**, **Decimal**, **Double**, **Float**, **GUID**, **Integer**, **Long**, **Long Binary (OLE Object)**, **Memo**, **Numeric**, **Single**, **String**, **Text**, **Time**, **TimeStamp**, **VarBinary**, **Variant** (default), user-defined types (created with the **Type** statement), and object data types, which include host-defined object data types and DAO object types.

## **database**

A set of data related to a particular topic or purpose. A database contains tables and can also contain queries and table relationships, as well as table and column validation criteria.

## **database administration**

Activities required to create, manage and preserve the integrity and security of a database, such as maintaining user permissions and backing up and repairing the database.

## **database engine**

That part of the database system that retrieves data from and stores data in user and system databases.

## **database management system (DBMS)**

Software used to organize, analyze, and modify information stored in a database. Microsoft SQL Server is an example of a database management system.

## **database model**

The logical and/or physical view of the corporate data store generalized to support all user and business needs. Ideally, the user is insulated from this model through well-generalized services.

## **database replication**

The process of reproducing a database so that two or more copies (replicas) of the same database can stay synchronized. Changes to the data in a replicated table in one replica are sent and applied to the other replicas in the replica set.

## **data-definition query**

An SQL-specific query that can create, alter, or delete a table, or create or delete an index in a database.

## **Date data type**

A data type used to store dates and times as a real number. Date variables are stored as 64-bit (8-byte) numbers. The value to the left of the decimal represents a date, and the value to the right of the decimal represents a time.

## **date expression**

Any expression that can be interpreted as a date, including date literals, numbers that look like dates, strings that look like dates, and dates returned from functions. A date expression is limited to numbers or strings, in any combination, that can represent a date from January 1, 100 – December 31, 9999.

Dates are stored as part of a real number. Values to the left of the decimal represent the date; values to the right of the decimal represent the time. Negative numbers represent dates prior to December 30, 1899.

## **date literal**



## **declaration**

Nonexecutable code that names a constant, variable, or procedure, and specifies its characteristics, such as data type. For DLL procedures, declarations specify names, libraries, and arguments.

## **default synchronization partner**

A Synchronizer that is used to automatically synchronize a replica with other replicas in the set. When a replica is created, the Synchronizer managing the source replica becomes the default synchronization partner for the new replica.

## **default synchronization schedule**

A template used by a Synchronizer to define a schedule between a newly managed replica and its default synchronization partner, when the newly managed replica has no existing synchronization schedule. Once the schedule is defined, you can change the schedule.

## **default workspace**

The **Workspace** object that DAO automatically establishes when your application first references any DAO object. This **Workspace** is referenced by `DBEngine.Workspaces(0)` or simply `Workspaces(0)`.

## **delete query**

An action query that deletes a set of rows that match the criteria you specify. A delete query doesn't return rows.

## **design time**

The time during which you build an application in the development environment by adding controls, setting control or form properties, and so on. In contrast, during run time, you interact with the application as a user would.

## **destination field**

A field in a query that will contain the results of your query.

## **development environment**

The part of the application where you write code, create controls, set control and form properties, and so on. This contrasts with running the application.

## **device context**

A link between a Windows-based application, a device driver, and an output device such as a display, printer, or plotter.

## **dialog box**

A special window displayed by the system or application to solicit a response from or provide information to the user.

## **digital signing**

A means to certify that code downloaded over the Internet has not been tampered with. Also known as code signing.

## **direct synchronization**

A type of synchronization that occurs when the two replicas can be opened simultaneously during the synchronization process.

### **dissociate result set**

An **rdoResultset** object which is not associated with a specific connection. Basically, a dissociate result set becomes a static snapshot of data. It is updatable, but changes are not posted to the remote database until the **rdoResultset** is re-associated with a specific connection.

### **distributed object system**

A system in which objects located on different machines cooperate to accomplish a common task. Any distributed system with different processes executing and communicating across a network may be called a distributed object system depending on the definition of "object" being used. In this sense, a distributed object system can be more narrowly defined as a set of two or more component objects that are running on different physical computers, but which are cooperating through interfaces as if they were on a single machine.

### **DLL (dynamic-link library)**

A set of routines that can be called from procedures and are loaded in process and linked into your application at run time.

### **docked window**

A window that is attached to the frame of the main window.

### **document**

Any self-contained work created with an application and given a unique file name.

### **domain**

In Windows NT security, a domain is a collection of computers that are grouped for viewing and administrative purposes, and that share a common security database.

### **domain-managed security**

Security that is managed by the Windows NT domain in cooperation with SQL Server security. Only one user ID/password set is required to gain access to the servers on the domain.

### **Double data type**

A data type that holds double-precision floating-point numbers as 64-bit numbers in the range -1.79769313486232E308 to -4.94065645841247E-324 for negative values; 4.94065645841247E-324 to 1.79769313486232E308 for positive values. The number sign ( ) type-declaration character represents the **Double** in Visual Basic.

### **drag-and-drop operation**

A combination of features that allow the user to drag an object and drop it onto a form or other object using the mouse. An object can be a source (an item the user drags) or a target (an item on which the user drops a source).

### **dropbox folder**

The shared network location where a Synchronizer can leave or pick up design and data changes.

### **dynamic array**

An array whose size can change at run time.

### **dynamic cursor**

A cursor where committed changes made by anyone and uncommitted changes made by the cursor owner become visible the next time the user scrolls. Changes include inserts and deletes as well as changes in order and membership.

### **dynamic-link library (DLL)**

A library of routines loaded and linked to applications at run time.

### **dynaset**

A type of **Recordset** object that returns a dynamic set of pointers to live database data. Like a table- or a snapshot-type **Recordset**, a dynaset returns data in records (rows) and fields (columns). Unlike a table-type **Recordset**, a dynaset-type **Recordset** can be the result of a query that joins two or more tables. The records in a dynaset-type **Recordset** object are updatable if the **Updatable** property of the **Recordset** is **True**, the **Field** being changed is updatable, and the data page containing the current record isn't locked. The data page is locked when the **Update** method is used (when the **LockEdits** property is **False**), or the **Edit** method is used (when the **LockEdits** property is **True**).

## **E**

### **early bound**

A form of binding where object variables are declared as variables of a specific class. Object references that use early-bound variables usually run faster than those that use late-bound variables.

### **editing key**

The INSERT, DELETE, or BACKSPACE key.

### **embedded object**

An object whose data is stored along with that of its container but that runs in the process space of its server. Contrast with linked object.

### **Empty**

Indicates that no beginning value has been assigned to a **Variant** variable. An **Empty** variable is represented as 0 in a numeric context or a zero-length string ("") in a string context.

### **encapsulation**

The ability to contain and hide information about an object, such as internal data structures and code. Encapsulation isolates the internal complexity of an object's operation from the rest of the application. For example, a client component asking for net revenue from a business object need not know the data's origin.

### **environment handle**

Identifies memory storage for global information, including the valid connection handles and current active connection handle. RDO will request this handle prior to connecting to a data source. The remote data objects manage environment handles automatically through the **rdoEnvironment** object.

### **equi-join**

A join in which records from two tables are combined and added to the **Recordset** object only when

there are equal values in the joined fields.

## **error log**

SQL Server error log records status and error information from SQL Server. It can be viewed using SQL Enterprise Manager or any text editor. When SQL Server is configured to use its error log, each SQL Server session creates a new log, and SQL Server retains the last six logs created.

## **error number**

A whole number in the range 0 – 65,535, that corresponds to the **Number** property setting of the **Err** object. When combined with the **Name** property setting of the **Err** object, this number represents a particular error message.

## **error trapping**

The process of intercepting an error using error-handling features in Visual Basic.

## **escape codes**

Allow you to specify a value such as a date or time, in a data-independent way. For example, {d 'value'} allows you to specify the date (SELECT \* FROM table WHERE DateField = {d "2/17/94"}). When this query is submitted to the ODBC driver, it will scan the string and replace the escape clause with the date in the proper form for the specific ODBC driver you are using.

## **event**

An action recognized by an object, such as clicking the mouse or pressing a key, and for which you can write code to respond. Events can occur as a result of a user action or program code, or they can be triggered by the system.

## **event procedure**

A procedure automatically invoked in response to an event initiated by the user, program code, or system. Event procedures are private by default.

## **event source object**

An object that is the source of events that occur in response to an action. An event source object is returned by a property. For example, the **CommandBarEvents** property returns the **CommandBarEvents** object.

## **exclusive**

A type of access that protects data in a database shared over a network. When you open a database in exclusive mode, you prevent others from opening the database.

## **executable file**

A Windows-based application that can run outside the development environment. An executable file has an .exe file name extension.

## **expose**

To make an object's services publicly available, particularly for programming.

## **expression**

Any combination of operators, constants, literal values, functions, and names of fields, controls, and

properties that evaluates to a single value. You can use expressions as settings for many properties and action arguments, to set criteria, or define calculated fields in queries.

### **external database**

Either an ODBC database such as Microsoft SQL Server that resides on a remote server, or one of the external databases such as Paradox, dBASE, FoxPro, Microsoft Excel, Microsoft Access, Lotus 1-2-3, HTML, and Text.

### **external table**

A table in a database outside the open Microsoft Jet database. An external table may take the form of another file or it may be a table in another relational database.

## **F**

### **feature team**

In the team model, a team led by a program manager and consisting of team members who perform different tasks and roles. Feature teams are often organized around product feature sets.

### **fetch-buffer locking**

Locking where the set of rows currently in the client buffer is locked when they are fetched inside a user-initiated transaction. No other user can update or read these rows. Updates issued by the cursor owner are guaranteed to succeed.

### **field**

A category of information stored in a table in a database – a column of data. An element of a database table that contains a specific item of information, such as last name.

### **field properties**

Attributes of a field that determine what kind of data it contains. **Size** and **Type** are examples.

### **file number**

Number used in the **Open** statement to open a file. Use file numbers in the range 1 – 255, inclusive, for files not accessible to other applications. Use file numbers in the range 256 – 511 for files accessible from other applications.

### **fill factor**

Determines how full SQL Server makes each page when it is creating a new index on existing data.

### **filter**

A set of criteria applied to rows in order to create a subset of the rows.

### **flag**

A variable you use to keep track of a condition in your application. You can set a flag using a constant or combination of constants.

### **flat file**

A filing system with no hierarchical structure. Flat file systems use either fixed- or variable-length records that are accessed through separate index structures or by simply reading the file from top to

bottom.

## **Float data type**

A data type that stores a signed, approximate numeric value with mantissa precision 15 (zero or absolute value 10-308 to 10308).

## **focus**

The ability to receive mouse clicks or keyboard input at any one time. In the Microsoft Windows environment, only one window, form, or control can have this ability at a time. The object that "has the focus" is normally indicated by a highlighted caption or title bar. The focus can be set by the user or by the application.

## **foreign key**

One or more table fields that refer to the primary key field or fields in another table. A foreign key indicates how the tables are related – the data in the foreign key and primary key fields must match. For example, a list of valid part numbers would contain a foreign key to an inventory table containing references to valid part numbers. Used when establishing referential integrity for a database.

## **foreign table**

A table that provides a foreign key to another table in the database. Generally, you use a foreign table to establish or enforce referential integrity. The foreign table is usually on the "many" side of a one-to-many relationship. An example of a foreign table is a table of customer orders.

## **form**

A window or dialog box. Forms are containers for controls. A multiple-document interface (MDI) form can also act as a container for child forms and some controls.

## **form module**

A file in a Visual Basic project with an .frm file name extension that can contain graphical descriptions of a form; its controls and their property settings; form-level declarations of constants, variables, and external procedures; and event and general procedures.

## **forward scroll**

Move toward the end (EOF) of a **Recordset** or **rdoResultset** object.

## **forward-only cursor**

A result set where the current position can only move forward by a specified number of records, or to the very last record. The current position cannot be moved back to the beginning of the result set or to previous records. The cursor membership, order, and values are generally fixed when the cursor is opened. If other users update, delete, or insert rows, the cursor doesn't reflect these changes until you close and reopen it.

## **forward-only – type Recordset or rdoResultset**

A **Recordset** or **rdoResultset** object in which records can be searched only from beginning to end; the current record position can't be moved back to the first record. Forward-only – type recordsets reduce processing overhead on remote databases. For example, you can use a forward-only – type **Recordset** or **rdoResultset** on a linked remote table to quickly process data in one pass, such as when you're building a customized report.

## FTP

File Transfer Protocol. A protocol that makes it possible for a user to transfer files from one location to another over the Internet. URLs of files on FTP servers begin with **ftp://**.

## function key

Any of the keys labeled F1 through F12. Function keys often provide shortcuts for frequently carried out commands and actions. You can assign a function key as a shortcut key.

## Function procedure

A procedure that performs a specific task within a Visual Basic program and returns a value. A **Function** procedure begins with a **Function** statement and ends with an **End Function** statement.

## G

### general procedure

A procedure that must be explicitly called by another procedure. In contrast, an event procedure is invoked automatically in response to a user or system action.

### .gif

Graphics Interchange Format file. A graphics file format that many World Wide Web browsers can display as inline graphics. GIF was developed specifically for transmitting images over the Internet. It is best used for graphics with few colors, such as cartoons or line drawings. GIF files are compressed bitmaps.

### gopher

A distributed information service that makes available hierarchical collections of information across the Internet. Gopher uses a simple protocol that allows a single Gopher client to access information from any accessible Gopher server.

### graphics method

A method that operates on an object such as a **Form**, **PictureBox**, or **Printer**, and performs run-time drawing operations such as animation or simulation. The graphics methods are **Circle**, **Cls**, **Line**, **PaintPicture**, **Point**, **Print**, and **PSet**.

### group

A collection of user accounts in a **Workgroup** object, identified by group name and personal identifier (PID). Permissions assigned to a group apply to all users in the group.

## GUID

Globally unique identifier used to precisely identify objects and interfaces.

### GUID data type

Globally Unique Identifier/Universally Unique Identifier. A unique identification string used with remote procedure calls. Every interface and object class uses a **GUID** for identification. A **GUID** is a 128-bit value. For example, 12345678-1234-1234-1234-123456789ABC is a syntactically correct **GUID**. The **GUIDs** on the client and server must match for the client and server to bind. Vendors of objects can request that Microsoft allocate one or more sets of 256 **GUIDs** for their exclusive use. Alternatively, if you have a network card, you can run a tool named Uuidgen.exe, which provides a set of 256 **GUIDs** based on the time of day, the date, and a unique number contained in your network card.

## H

### handle

When performing an operation, a handle provides addressibility to structures created by the ODBC APIs used to store parameters, errors, and returned arguments. With the ODBC API, you can have environment, connection, and statement handles.

### HTML

Hypertext Markup Language. The language in which Web documents are written. This includes intranet and Internet pages.

### HTTP

Hypertext Transfer Protocol. The behind-the-scenes Internet protocol that delivers information by way of a Web. The protocol makes it possible for a user to use a client program to enter a URL (or click a hyperlink) and retrieve text, graphics, sound, and other digital information from a Web server. URLs of files on Web servers begin with **http://**.

### hub server

A computer used in a star topology. A replica residing on this computer can be used as a synchronization partner with other replicas. See also base computer, satellite computer, or star topology.

### hyperlink

Spot from which a user can go to another page or location. Includes both the visible text (generally in color and underlined) and the URL of the destination.

### hyperlink data type

A field data type you use for fields that will store hyperlinks. Hyperlink fields contain text or combinations of text and numbers stored as text that are used as a hyperlink address. A hyperlink address can have up to three parts (each part can contain up to 2048 characters and uses the syntax: *displaytextaddresssubaddress*)

## I

### icon

A graphical representation of an object or concept; commonly used to represent minimized applications in Microsoft Windows. An icon is a bitmap with a maximum size of 32 x 32 pixels. Icons have an .ico file name extension.

### identifier

In Visual Basic, an element of an expression that refers to a constant or variable.

In data access, an element of an expression that refers to the value of a column or property.

### in-place activation

The process of activating an object provided by an ActiveX component. By double-clicking the object, a user can interact with the application supplying the object without switching to a different application or window. Also called visual editing.

## **in process**

Running in the same address space as an application.

## **inconsistent**

The state of a multiple-table **Recordset** object that enables you to update all fields (columns). For example, in a **Recordset** created by joining two tables in a one-to-many join (as in a Customers and Orders table), you can update `Orders.CustomerID` so that it doesn't match `Customers.CustomerID`, unless referential integrity disables the update.

## **index**

In Visual Basic, a number that identifies an element in an array, control array, or collection.

In data access, a dynamic cross-reference of one or more table data fields (columns) that permits faster retrieval of specific records (rows) from a table. As records are added, changed, or deleted, the database management system automatically updates the index to reflect the changes.

## **indirect synchronization**

A type of synchronization that occurs when one Synchronizer leaves changes in a dropbox folder for another Synchronizer to pick up and apply to the replica it manages.

## **inheritance**

The passing of properties from a class to its descendants.

## **initialization file**

An ASCII text file used to contain parameters for configuring Windows-based applications or Microsoft Windows itself. Generally, an initialization file uses the extension `.ini` and is named after the executable program that uses it. For example, a program named `Testing.exe` would expect an initialization file called `Testing.ini`.

## **inner join**

A join in which records from two tables are combined and added to a **Recordset** only if the values of the joined fields meet a specified condition. For instance, an equi-join is an inner join in which the values of the joined fields must be equal.

## **in-place activation**

The process of editing an embedded object within the window of its container, using tools provided by its server. Also called visual editing. Note that linked objects do not support in-place activation; they are always edited in the windows of their servers.

## **insertable object**

An application object that is a type of custom control, such as a Microsoft Excel worksheet.

## **installable ISAM**

A driver you can specify that allows access to external database formats such as dBASE, Microsoft Excel, and Paradox. ISAM is an acronym for Indexed Sequential Access Method. The Microsoft Jet database engine installs (loads) these ISAM drivers when referenced by your application. The location of these drivers is maintained in the Microsoft Windows Registry.

## **instance**

Any one of a set of objects sharing the same class. For example, multiple instances of a **Form** class share the same code and are loaded with the same controls with which the **Form** class was designed. During run time, the individual properties of controls on each instance can be set to different values.

## **Integer data type**

A data type that holds integer variables stored as 2-byte whole numbers in the range -32,768 to 32,767. The **Integer** data type is also used to represent enumerated values. The percent sign (%) type-declaration character represents an **Integer** in Visual Basic.

## **integrated security**

Allows a SQL Server to use Windows NT authentication mechanisms to validate logins for all connections. Only trusted (multi-protocol or named pipes) connections are allowed. Also known as domain-managed security.

## **internal area**

The area in a multiple-document interface (MDI) form used to display MDI child forms. The internal area excludes the MDI form's title bar, border, menu bar, and aligned controls on the MDI form. Also called the client area.

## **Internet**

A worldwide network of thousands of smaller computer networks and millions of commercial, educational, government, and personal computers. The Internet is like an electronic city with virtual libraries, storefronts, business offices, art galleries, and so on.

## **Internet component download**

A means to download and register ActiveX components using an Internet browser such as Internet Explorer. Through Internet component download, components can be reached from a Web page and installed without use of a setup program.

## **intranet**

A network within an organization that uses Internet technologies (such as the HTTP or FTP protocols). You can use an intranet to navigate between objects, documents, Web pages, and other destinations using hyperlinks.

## **intrinsic constant**

A constant provided by an application. Visual Basic constants are listed in the Visual Basic (VB) object library and can be viewed using the Object Browser.

## **IP**

Internet Protocol. The network layer for the TCP/IP protocol suite.

## **IP address**

A 32-bit network address that uniquely identifies a system or device on an intranet or the Internet.

## **J**

### **Jet**

See Microsoft Jet database engine.

## join

A database operation that combines some or all records from two or more tables, such as an equi-join, outer join, or self-join. Generally, a join refers to an association between a field in one table and a field of the same data type in another table. You create a join with an SQL statement.

When you define a relationship between two tables, you create a join by specifying the primary and foreign table fields. When you add a table to a query, you need to create a join between appropriate fields in the SQL statement that defines the query.

## .jpg

Joint Photographic Experts Group (JPEG) file. A graphics file format supported by many World Wide Web browsers. JPEG was developed for compressing and storing photographic images and is best used for graphics containing many colors, such as scanned photos. JPEG files, which have a .jpg extension in Windows, are compressed bitmaps.

## K

### keyset

A set of values used to access specific rows (records) in a database. A keyset may include row pointers or bookmarks that refer to all rows returned by a query, or to a subset of those rows. Different types of cursors use keysets to permit random access to logical sets of data based on an SQL query.

### keyset cursor

A set of rows that you can use to add, change, or delete rows from an underlying database table or tables. Movement within the keyset is unrestricted. A keyset cursor can contain columns from one or more tables in a database. Membership is fixed.

### keyset-type **rdoResultset**

The result of a query that can have updatable rows. Movement within the keyset is unrestricted. A keyset-type **rdoResultset** is a set of rows that you can use to add, change, or delete rows from an underlying database table or tables. A keyset-type **rdoResultset** can contain columns from one or more tables in a database. Membership in a keyset **rdoResultset** is fixed.

## keyword

A word or symbol recognized as part of the Visual Basic programming language; for example, a statement, function name, or operator.

## L

### late bound

Object references are late-bound if they use object variables declared as variables of the generic Object class. Late-bound binding is the slowest form of binding, because Visual Basic must determine at run time whether or not that object will actually have the properties and methods you used in your code.

### left join

A left outer join includes all of the records from the first (left) of two tables, even if there are no matching values for records in the second (right) table.

### left outer join

An outer join in which all the records from the left side of the LEFT JOIN operation in the query's SQL statement are added to the **Recordset** object, even if there are no matching values in the joined field from the table on the right. Records from the table on the right are combined with those from the table on the left only when there are matching values in the joined fields. When a left-side record has no match, a row of **Null** values is joined on the right side.

## **legacy system**

Typically a client/server system that uses mainframes, which you will migrate to a PC-based client/server architecture.

## **line label**

Used to identify a single line of code. A line label can be any combination of characters that starts with a letter and ends with a colon (:). Line labels are not case sensitive and must begin in the first column.

## **line number**

Used to identify a single line of code. A line number can be any combination of digits that is unique within the module where it is used. Line numbers must begin in the first column.

## **line-continuation character**

The combination of a space followed by an underscore ( `_` ) used in the development environment to extend a single logical line of code to two or more physical lines. However, you can't use a line-continuation character to continue a line of code within a string expression.

## **linked object**

An object that is created in another application and linked to a Visual Basic application. When you link an object, you insert a placeholder in your application. Unlike an embedded object, a linked object's data is actually stored in and managed by the application that created it.

## **linked table**

A table in another database linked to a Microsoft Jet database. Data for linked tables remains in the external database where it can be manipulated by other applications. (Formerly known as *attached tables*.)

## **linked window**

A window that is joined to another window other than the main window.

## **linked window frame**

A window frame containing multiple windows that have been linked together.

## **live lock**

Where a request for an exclusive lock (one granting read/write access to a data page) is repeatedly denied because a series of overlapping shared locks (which are read-only) keep interfering. Only one user at a time can hold an exclusive lock on a data page.

## **local data**

Data that exists on a local client computer.

## **local object**

A table, query, form, report, macro, or module that remains in the replica where it was created. Neither the object nor changes to the object are dispersed to other members in the replica set.

## locale

The set of information that corresponds to a given language and country. The code locale setting affects the language of terms such as keywords and defines locale-specific settings such as the decimal and list separators, date formats, and character sorting order.

The system locale setting affects the way locale-aware functionality behaves, for example, when you display numbers or convert strings to dates. You set the system locale using the **Control Panel** utilities provided by the operating system.

Although the code locale and system locale are generally set to the same setting, they may differ in some situations. For example, in Visual Basic, Standard Edition and Visual Basic, Professional Edition, the code is not translated from English-U.S. The system locale can be set to the user's language and country, but the code locale is always set to English-U.S. and can't be changed. In this case, the English-U.S. separators, format placeholders, and sorting order are used.

## locked

The condition of a data page, row, **Recordset** object, or **Database** object that makes it read-only to all users except the one who is currently entering data in it.

## logic error

A programming error that can cause code to produce incorrect results or stop execution. For example, a logic error can be caused by incorrect variable names, incorrect variable types, endless loops, flaws in comparisons, or array problems.

## logical data page

Space within each database is considered to be an array of fixed length: In Microsoft SQL Server and Microsoft Jet databases, logical data pages are two kilobytes long. The pages for each database are numbered consecutively beginning with zero, and are mapped to actual byte positions in one or more physical files.

## Long Binary data type

A type of field that can hold 1.2 GB of data. Long Binary fields can contain any type of binary data. (Also known as an *OLE Object* data type in Microsoft Access).

## Long data type

A 4-byte integer ranging in value from -2,147,483,648 to 2,147,483,647. The ampersand (&) type-declaration character represents a **Long** in Visual Basic.

## M

### make table query

An action query that creates a new table from the **Recordset** object of an existing query.

### managed replicas

A replica with an assigned Synchronizer. The Synchronizer delivers changes to and receives changes from other replicas in the set.

**Note** If you don't assign a Synchronizer to a replica, you can still synchronize it in your application's code or by using another Synchronizer. However, you can't set synchronization schedules from this

replica unless you assign a Synchronizer to the replica.

### **manual-commit mode**

A transaction consists of one or more statements. In manual-commit mode, when an application submits an SQL statement and no transaction is open, the driver implicitly begins a transaction. The transaction remains open until the application commits or rolls back the transaction using transaction methods or a SQL transaction statement.

### **many-only table**

A table that doesn't appear as the "one" side of any join in a query.

### **margin indicator**

An icon displayed in the **Margin Indicator** bar in the **Code** window. Margin indicators provide visual cues during code editing.

### **marshaling**

The processing of packaging and sending interface parameters across process boundaries.

### **master copy**

The most recent version of a file stored in the version control program's database, as opposed to the local copy of a file in your working directory.

### **MDI child**

A form contained within an MDI form in a multiple-document interface (MDI) application. To create a child form, set its **MDIChild** property to **True**.

### **MDI form**

A window that makes up the background of a multiple-document interface (MDI) application. The MDI form is the container for any MDI child forms in the application.

### **member**

An element of a collection, object, or user-defined type.

### **Memo data type**

A field data type. Such fields can contain up to 1.2 GB of text data.

### **memory object**

A block of memory allocated using the Windows API GlobalAlloc() that contains data in a format indicated by the **Format** property setting of the **OLE** container control.

### **menu negotiation**

The ability to merge menus with those of another application. For example, the menu of an ActiveX document can be merged with the browser's.

### **message**

A packet of information passed from one application to another.

## **meta data**

Data that contains information about the structure, composition, or schema of other data. Result set data that describes the result set, such as number of columns in the result set, data types of those columns, and so forth.

## **metafile**

A file that stores an image as graphical objects such as lines, circles, and polygons rather than as pixels. There are two types of metafiles, standard and enhanced. Standard metafiles usually have a .wmf file name extension. Enhanced metafiles usually have a .emf file name extension. Metafiles preserve an image more accurately than pixels when the image is resized.

## **method**

A procedure that acts on an object.

## **Microsoft Jet-connected ODBC data source**

An ODBC data source that is accessed by using Data Access Objects (DAO) and the Microsoft Jet database engine.

## **Microsoft Jet database**

A database created with the Microsoft Jet database engine. The file name extension for a Microsoft Jet database is .mdb.

## **Microsoft Jet database engine**

A database management system that retrieves data from and stores data in user and system databases. The Microsoft Jet database engine can be thought of as a data manager component with which other data access systems, such as Microsoft Access and Visual Basic, are built.

## **Microsoft Jet workspace**

A workspace that uses the Microsoft Jet database engine to access a data source. The data source can be a Microsoft Jet database file (.mdb), an ODBC database, such as a Paradox database, or an ISAM database.

## **mixed cursor**

A keyset/dynamic cursor in which the keyset is smaller than the result set, but larger than the rowset. When a mixed cursor scrolls beyond the boundaries of the keyset, it becomes dynamic, that is, the driver simply retrieves the next rowset.

## **mixed security**

Allows login requests to be validated using either integrated or standard security. Trusted connections (as used by integrated security) and nontrusted connections (as used by standard security) can be established.

## **modal**

Describes a window or dialog box that requires the user to take some action before the focus can switch to another form or dialog box.

## **modeless**

Describes a window or dialog box that does not require user action before the focus can be switched

to another form or dialog box.

## **module**

A set of declarations followed by procedures.

## **module level**

Describes code in the Declarations section of a module. Any code outside a procedure is referred to as module-level code. Declarations must be listed first, followed by procedures.

## **module variable**

A variable declared outside **Function**, **Sub**, or **Property** procedure code. Module variables must be declared outside any procedures in the module. They exist while the module is loaded and are visible in all procedures in the module.

## **multiple document interface (MDI)**

An application that can support multiple documents from one application instance. MDI object applications can simultaneously service a user and one or more embedding containers.

## **multiple resultset query**

A query that contains more than one select query and returns more than a single set of results. Multiple resultset queries can also contain a combination of select and action queries.

## **multiuser database**

A database that permits more than one user to access and modify the same set of data at the same time. In some cases, the additional "user" may be another instance of your application or another application running on your system that accesses the same data as some other application.

## **N**

### **named argument**

An argument that has a name that is predefined in the object library. Instead of providing a value for each argument in a specified order expected by the syntax, you can use named arguments to assign values in any order. For example, suppose a method accepts three arguments:

**DoSomething *namedarg1, namedarg2, namedarg3***

By assigning values to named arguments, you can use the following statement:

```
DoSomething namedarg3 := 4, namedarg2 := 5, namedarg1 := 20
```

Note that the named arguments don't have to appear in the normal positional order in the syntax.

### **native error**

An error generated and returned from the database management system of the data source on a given connection.

### **normalize**

To minimize the duplication of information in a relational database through effective table design.

## **Null**

A value that indicates missing or unknown data. **Null** values can be entered in fields for which information is unknown and in expressions and queries. In Visual Basic, the **Null** keyword indicates a **Null** value. Some fields, such as those defined as containing the primary key, can't contain **Null** values.

### **null column**

A column containing no characters or values. A null column isn't the same as a zero-length string ("") or a column with a value of 0. A column is set to null when the content of the column is unknown. For example, a Date\_Completed column in a task table would be left null until a task is completed.

### **null field**

A field containing no characters or values. A null field isn't the same as a zero-length string ("") or a field with a value of 0. A field is set to null when the content of the field is unknown. For example, a Date Completed field in a task table would be left null until a task is completed.

### **Numeric data type**

A data type that stores a signed, exact numeric value with precision p and scale s ( $1 \leq p \leq 15$ ;  $0 \leq s \leq p$ ). See also numeric type.

### **numeric expression**

Any expression that can be evaluated as a number. Elements of the expression can include any combination of keywords, variables, constants, and operators that result in a number.

### **numeric type**

Any intrinsic numeric data type (**Byte**, **Boolean**, **Integer**, **Long**, **Currency**, **Single**, **Double**, or **Date**) or any **Variant** numeric subtype (**Empty**, **Integer**, **Long**, **Single**, **Double**, **Currency**, **Decimal**, **Date**, **Error**, **Boolean**, or **Byte**).

## **O**

### **object**

A combination of code and data that can be treated as a unit, for example, a control, form, or application component. Each object is defined by a class.

### **Object box**

A list box at the upper-left corner of the **Code** window that lists the form and controls in the form to which the code is attached, or a list box located at the top of the **Properties** window that lists the form and its controls.

### **Object Browser**

A dialog box in which you can examine the contents of an object library to get information about the objects provided.

### **Object data type**

A data type that represents any **Object** reference. **Object** variables are stored as 32-bit (4-byte) addresses that refer to objects.

### **object expression**

An expression that specifies a particular object. This expression can include any of the object's

containers. For example, if your application has an **Application** object that contains a **Document** object that contains a **Text** object, the following are valid object expressions:

```
Application.Document.Text  
Application.Text  
Document.Text  
Text
```

## object library

A dynamic-link library (DLL) with one or more type library resources that typically has the extension .olb. You can use the Object Browser to examine the contents of an object library to get information about the objects provided.

## object module

A module that contains code specific to an object, for example, class module, form module, and document module. Object modules contain the code behind their associated objects. The rules for object modules differ from those for standard modules.

## object-oriented programming

In contrast with procedural programming, involves the use of both object-oriented design and an object-oriented programming language. Instead of consisting of sets of data loosely coupled to many different procedures, object-oriented programs consist of software modules called objects that encapsulate both data and processing while hiding their inner complexities from programmers and hence from other objects.

## object replication

The process of reproducing an object (table, query, report, form, macro, or module) so that two or more copies of the same object are synchronized.

## object type

A type of object exposed by an application through Automation, for example, **Application**, **File**, **Range**, and **Sheet**. Use the **Object Browser** or refer to the application's documentation for a complete listing of available objects.

## object variable

A variable that contains a reference to an object.

## ODBC (Open Database Connectivity)

A standard protocol that permits applications to connect to a variety of external database servers or files. ODBC drivers used by the ODBC driver manager permit access to SQL Server and several other data sources, including text files and Microsoft Excel spreadsheets.

The ODBC application programming interface (API) may also be used to access ODBC drivers and the databases they connect to without using the Microsoft Jet database engine.

## ODBC data source

A term used to refer to a database or database server used as a source of data. ODBC data sources are referred to by their Data Source Name (DSN). Data sources can be created by using the Windows Control Panel or the **RegisterDatabase** or **rdoRegisterDataSource** method.

## ODBC driver

A dynamic-link library (.dll) used to connect a specific Open Database Connectivity data source with another (client) application.

## **ODBC Driver Manager**

An application that manages connections between ODBC-enabled data sources and the drivers used to access them.

## **ODBCDirect**

A technology that allows you to access ODBC data sources directly by using DAO features that bypass the Microsoft Jet database engine and map DAO objects to RDO objects.

## **OLE**

Object linking and embedding. A special case of ActiveX that enables you to create applications that contain components from various other applications.

## **OLE Object data type**

A field data type you use for objects created in other applications that can be linked or embedded in a Microsoft Jet database. For example, you could use an OLE Object field to store a collection of pictures.

## **OLE server**

See code component.

## **OLE terms**

ActiveX has brought several new terms to Visual Basic programming, some of which replace terms you may have used in connection with OLE. Each of the new terms is defined in this glossary. The following table lists the *OLE* terms, and connects them with the ActiveX terms that may be replacing them. Please see the listing under ActiveX for a list of *ActiveX* terms and their OLE equivalents:

<b>Old OLE term</b>	<b>New ActiveX term</b>
custom control	ActiveX control
OLE Automation	Automation
OLE Automation server	ActiveX code component
OLE Component	ActiveX code component
OLE control	ActiveX control
OLE server	ActiveX code component

In general, OLE terms related to drag and drop functionality remain the same. The following OLE terms do not change:

- compound document
- object linking and embedding
- OLE container control
- OLE drag and drop
- OLE object (for an object that can be linked and/or embedded)
- Remote Automation

## **on-demand synchronization**

The exchange of data between two replicas that occurs at the explicit request of the user.

## one-to-many relationship

An association between two tables in which:

- The primary key value of each record in the primary table corresponds to the value in the matching field or fields of many records in the related table.
- The primary key value of each record in the related table corresponds to the value in the matching field or fields of one and only one record in the primary table.

## one-to-one relationship

An association between two tables in which:

- The primary key value of each record in the primary table corresponds to the value in the matching field or fields of one and only one record in the related table.
- The primary key value of each record in the related table corresponds to the value in the matching field or fields of one and only one record in the primary table.

## optimistic

A type of locking in which the data page containing one or more records, including the record being edited, is unavailable to other users only while the record is being updated by the **Update** method, but is available between the **Edit** and **Update** methods. Optimistic locking is used when accessing ODBC databases or when the **LockEdits** property of the **Recordset** object is set to **False**.

## optimistic (Remote Data)

A type of locking in which the data page containing one or more rows, including the row being edited, is unavailable to other users only while the row is being updated by the **Update** method, but is available between the **Edit** and **Update** methods. Optimistic locking is used when the **rdConcurRowver** or **rdConcurValues LockType** is used when opening an **rdoResultset**.

## optimistic batch

An optimistic batch is a set of rows submitted to the remote server for processing as a unit of work. In this case it is assumed that there is little possibility of update or insert collisions.

## outer join

A join in which all the records from one table are added to the **Recordset** object, even if there are no matching values in the joined field from the second table. Records from the second table are combined with those from the first table only when there are matching values in the joined fields. Null records are joined when there is no match.

## P

## page

A portion of the database in which record data is stored. Depending on the size of the records, a page may contain more than one record. In Microsoft Jet databases (.mdb), a page is 2048 (2K) bytes in length.

## parameter

An element containing a value that you can change to affect the results of the query. For example, a query returning data about an employee might have a parameter for the employee's name.

## parameter query

A query that requires you to provide one or more criteria values, such as Redmond for City, before the query is run. A parameter query isn't, strictly speaking, a separate kind of query; rather, it extends the flexibility of other queries.

### **Parameterized Queries**

A query that requires one or more parameters or arguments before execution. For example, an SQL statement that refers to a specific part number as supplied by the user would use a parameterized query to insert the user-provided number into the SQL statement before execution so that the query references that specific part.

### **parent form**

A form containing controls.

### **parse**

To identify the parts of a statement or expression and then validate those parts against the appropriate language rules.

### **partial replica**

A database that contains only a subset of the records in a full replica. With a partial replica, you can set filters and identify relationships that define which subset of the records in the full replica should be present in the database.

### **partitioning**

A means of encapsulating and deploying application functionality. In a three-tiered architecture, partitioned applications can be deployed across a network through independent components rendering user, business, and data services.

### **pass-through query**

An SQL-specific query you use to send commands directly to a SQL database server (such as Microsoft SQL Server). With pass-through queries, you work with the tables on the server instead of linking them. Pass-through queries are used to execute SQL queries and system-specific commands written by using SQL dialects known only to the server. A pass-through query may or may not return records. If it does, they are always returned in a snapshot.

### **pen**

The graphical characteristics, such as color, specified by a **Line**, **Point**, or **Circle** statement or by the current **ForeColor** or **FillColor** setting.

### **permission**

One or more attributes that specify what kind of access a user has to data or objects in a database. For example, if a user has read data permission for a table or query, the user can view or retrieve but not edit data in the table or query.

### **persistent graphic**

The output from a graphics method that is stored in memory. Persistent graphics are automatically retained when certain kinds of screen events occur, for example, when a form is redisplayed after being hidden behind another window. Graphics are persistent if they are drawn when the **AutoRedraw** property is set to **True**.

## **persistent object**

An object stored in the database; for example, a database table or **QueryDef** object. Dynaset-type or snapshot-type **Recordset** objects are not considered persistent objects because they are created in memory as needed.

## **personal identifier (PID)**

A case-sensitive alphanumeric string 4-20 characters long that the Microsoft Jet database engine uses in combination with the account name to identify a user or group in a **Workgroup** object. You provide the PID and the account name when you create a new user or group.

## **pessimistic**

A type of locking in which the page containing one or more records (rows) (including the record or row being edited) is unavailable to other users when a user edits a record and remains unavailable until the user performs an update operation.

## **pixel**

Short for 'picture element,' a dot that represents the smallest graphic unit of measurement on a screen. A pixel is screen-dependent; that is, the dimensions of screen elements vary with the display system and resolution.

## **point**

In typography, a point is 1/72 of an inch. The size of a font is usually expressed in points.

## **polymorphism**

In an object-oriented programming language, the ability to redefine a routine in a derived class (a class that inherited its data structures and routines from another class). Polymorphism allows the programmer to define a base class that includes routines that perform standard operations on groups of related objects, without regard to the exact type of each object. The programmer can redefine the routines, taking into account the type of the object, in the derived classes for each of the types.

## **pop-up menu**

A floating menu that is displayed over a form, independent of the menu bar by right-clicking the mouse. The items on the menu depend on the pointer location when the menu is displayed. Also called a context menu.

## **position indicator**

An indicator that shows the position of the selected form or control relative to its container. For forms, position is always shown in twips. For controls, position is shown in the units of measure specified in the **ScaleMode** property of the container.

## **primary key**

One or more fields whose value or values uniquely identify each record in a table. In a relationship, a primary key is used to refer to specific records in one table from another table. A primary key is called a foreign key when it is referred to from another table. You can have only one primary key. An Employees table, for example, could use the social security number for the primary key.

## **primary table**

The "one" side of two related tables in a one-to-many relationship with a foreign table. Generally, a primary key table is used to establish or enforce referential integrity.

## **print zone**

Print zones begin every 14 columns. The width of each column is an average of the width of all characters in the point size for the selected font.

## **Private**

Variables that are visible only to the module in which they are declared.

## **procedural query**

An SQL query that executes a stored procedure.

## **procedure**

A named sequence of statements executed as a unit. For example, **Function**, **Property**, and **Sub** are types of procedures. A procedure name is always defined at module level. All executable code must be contained in a procedure. Procedures can't be nested within other procedures.

## **Procedure box**

A list box at the upper-right corner of the **Code** window and the **Debug** window that displays the procedures recognized for the object displayed in the **Object** box.

## **procedure call**

A statement in code that tells Visual Basic to execute a procedure.

## **procedure level**

Describes statements located within a **Function**, **Property**, or **Sub** procedure. Declarations are usually listed first, followed by assignments and other executable code.

## **procedure template**

The beginning and ending statements that are automatically inserted in the Code window when you specify a **Sub**, **Function**, or **Property** procedure in the Insert Procedure dialog box.

## **process model**

An iterative, milestone-based approach to the development process. The way in which activities in a systems development life cycle are sequenced, and the time and formality committed to each life-cycle stage. The combination of clearly defined life cycle model, project team roles, delivery milestones, and solution development principles.

## **project**

A set of modules.

## **Project Explorer window**

A window that displays a list of files associated with a Visual Basic project or project group; references in your project. Files with .ocx and .vbx file name extensions aren't displayed in the **Project** window.

## **project file**

A file with a .vbp filename extension that keeps track of the files, objects, project options, environment options, EXE options, and references associated with a project.

## Properties window

A window used to display or change properties of a selected form or control at design time. Some custom controls have customized **Properties** windows.

## property

A named attribute of an object. Properties define object characteristics such as size, color, and screen location, or the state of an object, such as enabled or disabled.

## PropertyBag

An object used to save and retrieve property values. The PropertyBag is provided as a standard interface for saving property values, independent of the data format the container uses to save its source data.

## Property list

A two-column list in the Properties window that shows all the properties and their current settings for the selected object.

## property page

A grouping of properties presented as a tabbed page of a property sheet.

## Property procedure

A procedure that creates and manipulates properties for a class module. A **Property** procedure begins with a **Property Let**, **Property Get**, or **Property Set** statement and ends with an **End Property** statement.

## proxy

An interface-specific object that packages parameters for that interface in preparation for a remote method call. A proxy runs in the address space of the sender and communicates with a corresponding stub in the receiver's address space.

## proxy server

A way to protect your local area network from being accessed by others on the Internet. The proxy server acts as a security barrier between your internal network and the Internet, keeping others on the Internet from accessing confidential information on your internal network. The server also minimizes network traffic by caching frequently used documents and storing them locally.

## pseudo index

A dynamic cross-reference of one or more table data fields (columns) that permits an ODBC table (server table) without a unique index to be edited. A pseudo index is not an actual index on the server table, but a cross-reference that the Microsoft Jet database engine can use to support table updates. A pseudo index is necessary only if an ODBC table doesn't have a unique index, which allows the table to be updated. You don't need a pseudo index if the table already has a unique index or if there is no need to update the table. (Tables cannot have a unique index if they were intended to be read-only.) In previous versions, pseudo indexes were called *index specifications*.

## Public

Variables declared using the **Public** statement are visible to all procedures in all modules in all applications unless **Option Private Module** is in effect. In that case, the variables are public only within the project in which they reside.

## Q

### query

A formalized instruction to a database to either return a set of records or perform a specified action on a set of records as specified in the query. For example, the following SQL query statement returns records:

```
SELECT CompanyName FROM Publishers WHERE Region = 'NY'
```

You can create and run select, action, crosstab, parameter, and SQL-specific queries.

### query definition

A formalized instruction to a database to either return a set of records or perform a specified action on a set of records as specified in the query. For example, the following SQL query statement returns records:

```
SELECT CompanyName FROM Publishers WHERE State = 'NY'
```

## R

### read-only

A type of access to data whereby information can be retrieved but not modified. This will provide better performance in most cases.

### record

A set of related data about a person, place, event, or some other item. Table data is stored in records (rows) in the database. Each record is composed of a set of related fields (columns) – each field defining one attribute of information for the record. Taken together, a record defines one specific unit of retrievable information in a database.

### record source

The underlying source of data (a table, query, or SQL statement) for a form or report.

### recursion

The process that occurs when a procedure calls itself. Uncontrolled recursion usually results in an `Out of stack space` error message.

### reentrancy

Reentrant code is written so that it can be shared by several programs (or processes within a single program) at the same time. When a program is executing reentrant code, another program or process can interrupt the execution and can then start or continue execution of that same code.

### referenced project

The project you directly create a link to from the current project you are working on. A project referenced by one of the current project's directly referenced projects is called an indirectly referenced project. Its **Public** variables are not accessible to the current project except through qualification with its project name. Any combination of direct and indirect references between projects is valid as long as they do not result in a complete cycle.

### referencing project

The current project. How you create a link to a project depends on the host application. For example, to directly reference a project in Microsoft Excel, select the project from the **References** dialog box of the **Tools** menu. **Public** variables in a directly referenced project are visible to the directly referencing project, but **Public** variables in a directly referencing project are not visible to a directly referenced project.

## referential integrity

Rules that you set to establish and preserve relationships between tables when you add, change, or delete records. Enforcing referential integrity prohibits users from adding records to a joined table for which there is no primary key, changing values in a primary table that would result in orphaned records in a joined table, and deleting records from a primary table when there are matching related records.

## registry

In Microsoft Windows version 3.1, registration information and file associations are stored in the registration database, and program settings are stored in Windows system initialization (.ini) files. In Microsoft Windows 95, the Windows registry serves as a central configuration database for user, application, and computer-specific information, including the information previously contained in both the Windows version 3.1 registration database and .ini files.

## relational

A type of database. A relational database stores information in tables — rows and columns of data — and conducts searches by using data in specified columns of one table to find additional data in another table.

## relationship

An association established between common fields (columns) in two tables. A relationship can be one-to-one, many-to-many, or one-to-many.

## Remote Automation

A technology that allows access to an ActiveX component on a remote machine. This is possible through the implementation of a combination of local proxies and a remote Automation Manager.

## remote data

Data stored on a server.

## RemoteData control

Provides access to data stored in a remote ODBC data source. The RemoteData control allows you to move from row to row in a result set and to display and manipulate data from the rows using bound controls.

## remote data object

An object, such as **rdoConnection**, **rdoTable**, **rdoResultset**, or **rdoQuery**, that represents an object used to organize and manipulate data in code.

## Remote Data Objects (RDO)

Provide an information model for accessing remote data sources through ODBC. RDO offers a set of objects that make it easy to connect to a database, execute queries and stored procedures, manipulate results, and commit changes to the server.

## **replica**

A copy of a database, including its tables, queries, forms, reports, macros, and modules. A replica is a member of a replica set and can be synchronized with other replicas in the set. Changes to the data in a replicated table in one replica are sent and applied to the other members in the replica set.

## **replica set**

Replicas that share the same database design and unique replica set identifier. Synchronization occurs between replica set members.

## **replica set member**

A replica that belongs to a replica set. Members of a replica set share the same database design and can be synchronized with one another.

## **replica set topology**

The order in which changes are propagated from replica to replica. Topology is important because it determines how quickly changes in another replica appear in your replica.

## **replicate**

Produce a replica, or copy, of something – for example, a database.

## **replicated database**

A database to which additional tables, fields, and properties have been added to record information about changes to data and the design of replicated objects in the database.

## **replicated object**

A table, query, form, report, macro, or module that is in all replicas in the replica set.

## **replication**

The process of creating and synchronizing replicas in separate locations. Replication adds system fields, system tables, and replication properties to a database so that changes made to the data in or to the design of a database are sent and applied to all the members of the replica set.

## **requery**

To rerun a query to reflect changes to the records, retrieve newly added records, and eliminate deleted records.

## **resource file**

A file in a Visual Basic project with an .res file name extension that can contain bitmaps, text strings, or other data. By storing this data in a separate file, you can change the information without editing your code. Only one resource file can be associated with a project.

## **restricted keyword**

A word that Visual Basic uses as part of its language. This includes predefined statements (such as If and Loop), functions (such as Len and Abs), and operators (such as Or and Mod). It should not be used to name a variable, method, or procedure.

## **result set**

The results of a query. Result sets might contain rows when a query contains a SELECT statement. Action queries do not return rows but do return result sets that contain information about the operation, such as rows affected.

## **retention period**

The number of days the system will retain certain replication system information for a replica. If the retention period expires before a replica is synchronized, the synchronization will fail.

## **right join**

A right outer join includes all of the records from the second (right) of two tables, even if there are no matching values for records in the first (left) table. For example, you could use LEFT JOIN with the Departments (left) and Employees (right) tables to select all departments, including those that have no employees assigned to them. To select all employees, including those who aren't assigned to a department, you would use RIGHT JOIN.

## **right outer join**

An outer join in which all the records from the right side of the RIGHT JOIN operation in the query's SQL statement are added to the **Recordset** object, even if there are no matching values in the joined field from the left table. Records from the left table are combined with those from the right table only when there are matching values in the joined fields.

## **row**

A set of related data about a person, place, event, or some other item. Table data is stored in rows in the database. Each row is composed of a set of related columns — each column defining one attribute of information for the row. Taken together, a row defines one specific unit of retrievable information in a database.

## **rowset population**

The process of loading **rdoResultset** rows into memory.

The **rdoResultset** objects populate the number of rows defined by the **RowsetSize** attribute. If you are using server-side cursors, only this number of rows is present in memory at any given time.

## **RPC (remote procedure call)**

A mechanism through which applications can invoke procedures and object methods remotely across a network. Using RPC, an application on one machine can call a routine or invoke a method belonging to an application running on another machine.

## **run time**

The time when an application is running. During run time, you interact with the code as a user would, so you can't edit the code. In contrast, design time is when the application is developed, and break mode is when your running code is paused so that you can set breakpoints, step through code, edit code, and continue.

## **run-time error**

An error that occurs when code is running. A run-time error results when a statement attempts an invalid operation.

## **S**

## satellite computer

In a star topology, a computer on which a replica resides. This replica is copied from the base computer and synchronizes with a replica on the hub server by default. See also base computer, hub server, star topology.

## schedule

The times when the Synchronizer will initiate synchronization with other replicas. The minimum increment of time between scheduled synchronizations is 15 minutes. You can set different schedules between any two Synchronizers.

## scheduled synchronization

An exchange of data between two replicas that occurs at a predetermined time.

## scope

The attribute of a variable or procedure that determines which sections of which modules recognize it. There are three levels of scope: public, module, and procedure. Variables that you declare with **Public** can be accessed by any module, while variables that you declare in a specific module can be used only within that module. Also, variables that you declare in a **Sub** or **Function** procedure can be used only in that particular procedure and lose their value between calls unless they are declared **Static**.

## secure workgroup

A Microsoft Jet database **Workgroup** object to which users log on with a user name and password and in which access to database objects is restricted according to permissions specified for user accounts and groups.

## security

A set of features used to specify or restrict the access that specified users or user groups have to data and objects in a database.

## seed

An initial value used to generate pseudorandom numbers. For example, the **Randomize** statement creates a seed number used by the **Rnd** function to create unique pseudorandom number sequences.

## select query

A query that asks a question about the data stored in your tables and returns a **Recordset** or **rdoResultset** object without changing the data. Once the **Recordset** or **rdoResultset** data is retrieved, you can examine and make changes to the data in the underlying tables. In contrast, action queries can make changes to your data, but they don't return data records.

## self-join

A join in which records from a table are combined with other records from the same table when there are matching values in the joined fields. A self-join can be an inner join or an outer join. A self-join is useful when you ask hierarchical questions, such as a query that shows all the managers and the people who report to them.

## server

The system designed to share data with client applications; servers and clients are often connected

over a network. A server can simply share files or resources (such as printers), or act as host for a database management system designed to provide logical access to a database. A database server usually contains and manages a central repository of data that remote client applications can retrieve and manipulate.

### **server-side cursor**

Cursors that reside on the server, as opposed to residing on the client computer. While client-side cursors copy the cursor to the workstation, server-side cursors use the resources of the database server to maintain the cursors.

### **service**

A collection of related features that respond to requests for specific activities and/or yield information, based on a published specification of interface or behavior, and accessed through a consistent interface that encapsulates its implementation.

### **services model**

A way of viewing applications as a set of features or services that are used to fulfill consumer requests. By encouraging the developer to model an application as a collection of discrete services, features and functionality can be packaged for reuse, sharing, and distribution across functional boundaries.

### **session**

A session begins when a user logs on and ends when a user logs off. All operations performed during a session form one transaction scope and are subject to permissions determined by the logon user name and password. Sessions are implemented as objects by DAO or RDO.

### **shadowing**

The act of being accessed in preference to something else. For example, when two variables have the same name but different scopes, the more local variable always shadows the less local variable.

### **shared network folder**

See dropbox folder.

### **Short data type**

A Microsoft Jet database engine fundamental data type that corresponds to the **Integer** data type defined by Visual Basic for Applications. A **Short** variable is stored as a 16-bit (2-byte) number ranging in value from -32,768 to 32,767.

### **shortcut key**

A function key or key combination (such as F5 or CTRL+A) that executes a command. You can set shortcut keys in the Menu Editor.

### **Single data type**

A data type that stores single-precision floating-point variables as 32-bit (2-byte) floating-point numbers, ranging in value from -3.402823E38 to -1.401298E-45 for negative values, and 1.401298E-45 to 3.402823E38 for positive values. The exclamation point (!) type-declaration character represents a **Single** in Visual Basic.

### **single document interface (SDI)**

An application that can support only one document at a time. Multiple instances of an SDI application must be started to service both an embedded object and a user.

### **size indicator**

The indicator that shows the size of a selected form or control. For forms, size is always shown in twips. For controls, size is shown in the units of measure specified in the **ScaleMode** property of the container.

### **snapshot**

A fixed copy of a set of records retrieved from the database and copied into memory. A snapshot derived from a Microsoft Jet-connected data source can't be updated. Snapshot-type **Recordset** objects can be created from a base table, a query, or another **Recordset**. All SQL pass-through queries return snapshots.

### **sort order**

A sequencing principle used to order data, alphabetically or numerically. The sort order can be either ascending or descending.

### **source code control**

The management of a file's history and the file's relation to a larger grouping of related files known as a project. Source code control is a vital part of the efficient development of software applications.

### **SQL database**

A database that can be accessed through the use of Open Database Connectivity (ODBC) data sources or another interface native to the database. Also known as a relational database.

### **SQL Server**

A relational database management system that is capable — depending on your application and hardware environment — of supporting hundreds of simultaneous users.

### **SQL-specific query**

A query that can be created only by writing an SQL statement. Subqueries and pass-through, union, and data-definition queries are SQL-specific queries.

### **SQL statement**

A complete phrase in SQL that begins with a keyword and completely describes an action to be taken. For example, `SELECT * FROM Orders`. SQL statements should not be confused with statements.

### **SQL view**

SQL views are similar to queries: both allow you to limit the rows and columns displayed from one or more tables, and both provide similar functionality. SQL views are logical sets of rows where a table represents the actual rows.

### **stack**

A fixed amount of memory used by Visual Basic to preserve local variables and arguments during procedure calls.

### **stand-alone object**

In RDO, you can create **rdoConnection** and **rdoQuery** objects using:

```
Dim X as New rdoxxxx
```

When this is done, a stand-alone object is created. Those object properties that do not depend on access to a connection or other objects can be manipulated.

### **standard control**

A control included in the Toolbox and contained within the Visual Basic .exe file; for example, a **CommandButton** or **Frame** control. Standard controls are always included in the toolbox, unlike ActiveX controls or insertable objects, which can be removed from or added to the Toolbox.

### **standard deviation**

A parameter that indicates the way in which a probability function is centered around its mean and that is equal to the square root of the moment in which the deviation from the mean is squared. Used to describe sets of values to determine how far the value varies from the arithmetic mean or average.

### **standard module**

A module containing only procedure, type, and data declarations and definitions. Module-level declarations and definitions in a standard module are **Public** by default. A standard module is referred to as a code module in earlier versions of Visual Basic.

### **star topology**

A type of organizational map for networked computers. For replication, it refers to a hub server, base computer, and the distribution of members of the replica set on other satellite computers. Topology is important for determining synchronization schedules.

### **startup object**

The first form displayed in your application, which is usually the first form you create in the development environment. You can change the startup form using the Startup Object option on the General tab of the Project Properties dialog box.

### **statement**

A syntactically complete unit that expresses one kind of action, declaration, or definition. A statement generally occupies a single line, although you can use a colon (:) to include more than one statement on a line. You can also use a line-continuation character ( \_ ) to continue a single logical line onto a second physical line.

### **statement handle**

Used by the ODBC driver to reference storage for names, parameter and binding information, error messages, and other information related to a statement processing stream. The **hStmt** property of the **rdoResultset** is an ODBC statement handle.

### **Static**

A Visual Basic keyword you can use to preserve the value of a local variable.

### **static cursor**

A type of cursor in which neither the cursor owner nor any other user can change the result set while the cursor is open. Values, membership, and order remain fixed until the cursor is closed. You can either take a "snapshot" (temporary table) of the result set, or you can lock the entire result set to prevent updates. When you take a snapshot of the result set, the result set diverges increasingly from

the snapshot as updates are made.

### **stored procedure**

A precompiled procedure stored in a data source, available to be called from an application as needed. Predefined queries reduce the overhead of repeatedly specifying the same selection criteria, and are much faster than submitting an ad-hoc query.

### **string comparison**

The use of an operator to determine whether one string is greater than or equal to another string. If you use **Option Compare Text** in the Declarations section of a module, string comparisons are not case-sensitive. If you use **Option Compare Binary**, comparisons are case-sensitive. If you use **Option Compare Database**, the comparison method is set by the current database.

### **string constant**

Any constant (defined using the **Const** keyword) consisting of a sequence of contiguous characters interpreted as the characters themselves rather than as a numeric value.

### **String data type**

A data type consisting of a sequence of contiguous characters that represent the characters themselves rather than their numeric values. A **String** can include letters, numbers, spaces, and punctuation. The **String** data type can store fixed-length strings ranging in length from 0 to approximately 63K characters and dynamic strings ranging in length from 0 to approximately 2 billion characters. The dollar sign (\$) type-declaration character represents a **String** in Visual Basic.

### **string expression**

Any expression that evaluates to a sequence of contiguous characters. Elements of the expression can include a function that returns a string, a string literal, a string constant, a string variable, a string **Variant**, or a function that returns a string **Variant (VarType 8)**.

### **string literal**

Any expression consisting of a sequence of contiguous characters surrounded by quotation marks that is literally interpreted as the characters within the quotation marks.

### **Structured Query Language (SQL)**

A language used in querying, updating, and managing relational databases. SQL can be used to retrieve, sort, and filter specific data to be extracted from the database.

### **stub**

An interface-specific object that unpackages the parameters for that interface after they are marshaled across the process boundary, and makes the requested method call. The stub runs in the address space of the receiver and communicates with a corresponding proxy in the sender's address space.

### **Sub procedure**

A procedure that performs a specific task within a program, but returns no explicit value. A **Sub** procedure begins with a **Sub** statement and ends with an **End Sub** statement.

### **submenu**

A menu opened from another menu that displays its own list of commands.

## **subquery**

A subquery is a SELECT statement nested inside a SELECT, SELECT...INTO, INSERT...INTO, DELETE, or UPDATE statement or inside another subquery.

## **synchronization**

The process of updating two replicas in which all updated records and objects are exchanged. The exchange of data between two replicas can be one-way or two-way and may be handled by a Synchronizer.

## **synchronization conflict**

A situation in which users of two replicas have changed the same record. One of the updated records is selected as the "winner," and the record in the "losing" replica is updated to contain this data. The other updated record is placed in a conflict table in the losing replica.

## **synchronization error**

A problem that occurs during synchronization that prevents changes to a record from being completed successfully. This is more serious than a conflict and should be resolved as soon as possible.

## **synchronous processing**

When the data interface blocks until an operation is complete or at least until the first row of the results is ready. Opposite of asynchronous processing.

## **syntax**

The prescribed order and punctuation for putting programming language elements into statements that are meaningful to Visual Basic.

## **syntax checking**

A feature that checks your code for correct syntax. If the syntax checking feature is enabled, a message is displayed when you enter code that contains a syntax error and the suspect code is highlighted.

## **syntax error**

An error that occurs when you enter a line of code that Visual Basic doesn't recognize.

## **system modal**

Describes a window or dialog box that requires the user to take some action. This term means the same as "modal" except that the focus can't switch to any other form or dialog box in any other running applications.

## **T**

## **tab order**

The order in which the focus moves from one field to the next as you press TAB or SHIFT+TAB.

## **table**

The basic unit of data storage in a relational database. A table stores data in records (rows) and fields (columns) and is usually about a particular category of things, such as employees or parts. Also called a base table. A table-type **Recordset** is a logical representation of a base table in a database.

## **tag**

An association between a component and the property values of a catalog. For example, a component named TaxPreparation might have the Royalty Calculations search tag value for the Calculation property.

## **TCP/IP**

Transmission Control Protocol/Internet Protocol. Internet standard for transferring data among networked computers.

## **TEMP**

A TEMP environment variable is set by your autoexec.bat file when you start your system. Generally, TEMP points to an area on your hard disk used by Microsoft Windows and other programs, like the Microsoft Jet database engine, to store information that doesn't need to be saved after you shut down your system. For example, the following line in your autoexec.bat file points the TEMP environment variable to the D:\TempArea folder:

```
SET TEMP=D:\TempArea
```

## **temporary disk**

The directory identified by the TEMP operating system environment variable. Also known as temporary drive. Although the TEMP environment variable may point to a RAM disk, this isn't recommended.

## **Text data type**

A field data type. Text fields can contain up to 255 characters or the number of characters specified by the **Size** property of the **Field** object, whichever is less. If the **Size** property of the text field is set to 0, the text field can hold up to 255 characters of data.

## **three-tiered architecture**

A logical application model in which the business application's features are expressed in terms of three categories of services: user services, business services, and data services. This is a conceptual architecture describing the functionality the application is designed to deliver, rather than its implementation in a physical package.

## **Time data type**

A data type that stores a time value. The value is dependent on the clock setting of the data source.

## **time expression**

Any expression that can be interpreted as a time. This includes any combination of time literals, numbers that look like times, strings that look like times, and times returned from functions.

## **TimeStamp data type**

A data type that stores a TimeStamp. The value is dependent on the clock setting of the data source.

## **Timestamp data**

Contains a unique value that is updated automatically whenever a row is updated.

## **transaction**

A unit of work that is done as an atomic operation — that is, the operation succeeds or fails as a

whole.

## **transaction log**

A reserved area of the database in which a log of all changes to the database is recorded. It is stored in the syslogs system table and is used by SQL Server during automatic recovery.

## **trigger**

Row-level event code that runs before an insert, update, or delete operation is committed. Different actions can be attached to the different events. Triggers run last, after rules, and don't run during buffered updates. They are most often used for cross-table integrity.

## **trusted connections**

Integrated security requires network protocols that support authenticated connections between clients and servers. These are referred to as trusted connections. The multi-protocol and named pipe protocols provide trusted connections.

## **twip**

A screen-independent unit used to ensure that placement and proportion of screen elements in your screen application are the same on all display systems. A twip is a unit of screen measurement equal to 1/20 of a printer's point. There are approximately 1440 twips to a logical inch or 567 twips to a logical centimeter (the length of a screen item measuring one inch or one centimeter when printed).

## **two-phase commit**

Allows an application to coordinate updates among multiple SQL servers. This implementation of distributed transactions treats transactions on separate SQL servers as a single transaction. The service uses one SQL server, the commit server, as a record keeper that helps the application determine whether to commit or to roll back transactions. Thus, the two-phase commit guarantees that either all the databases on the participating servers are updated or that none of them are.

## **two's complement**

A type of base-2 notation used to represent positive and negative in which negative values are formed by complementing all bits and adding 1 to the result. Complementing is done by changing all 1s to 0, and all 0s to 1.

## **type library**

A file or component within another file that contains standard descriptions of exposed objects, properties, and methods that are available for Automation. Object library files (.olb) contain type libraries.

## **type-declaration character**

A character appended to a variable name indicating the variable's data type. By default, variables are of type **VARIANT** unless a corresponding **DefType** statement is present in the module.

## **U**

### **UDP**

User Datagram Protocol. A standard Internet transport layer protocol that is connectionless, which adds a level of reliability and multiplexing to IP.

## **unattended execution**

Where no user interaction is required.

## **Unicode**

International Standards Organization (ISO) character standard. Unicode uses a 16-bit (2-byte) coding scheme that allows for 65,536 distinct character spaces. Unicode includes representations for punctuation marks, mathematical symbols, and dingbats, with substantial room for future expansion.

## **union query**

An SQL-specific select query that creates a snapshot-type **Recordset** object containing data from all specified records in two or more tables with any duplicate records removed. To include the duplicates, add the keyword ALL.

For instance, a union query of the Customers table and the Suppliers table results in a snapshot-type **Recordset** that contains all suppliers that are also customers.

## **universal date format**

The universal date format is `yyyy-mm-dd hh:mm:ss`. However, both the date component (`yyyy-mm-dd`) and the time component (`hh:mm:ss`) can be represented separately.

## **unmanaged replica**

A replica that is not managed by a Synchronizer. Unmanaged replicas appear on the Synchronization window with a special icon. You cannot set synchronization schedules from an unmanaged replica, although they can be synchronized by another Synchronizer or through DAO code.

## **update**

The process that saves changes to data in a record. Until the record is saved, changes are stored in a temporary record called the copy buffer. The UPDATE clause in an SQL statement changes data values in one or more records (rows) in a database table.

## **update query**

An action query that changes a set of records according to criteria you specify. An update query doesn't return any rows/records.

## **URL**

Uniform Resource Locator. An address to an object, document, or page or other destination (for example, a newsgroup or a World Wide Web page) on the Internet or an intranet. A URL expresses the protocol (such as FTP or HTTP) to be accessed and where the destination is located. A URL may also specify an Internet e-mail address. Some examples of URLs are:

`http://www.someones.homepage/default.html`

`ftp://ftp.server.somewhere/ftp.file`

`news:alt.hypertext`

## **user account**

An account identified by a user name and password that is created to manage access to objects in a remote database.

## **user-defined type**

Any data type defined using the **Type** statement. User-defined data types can contain one or more elements of any data type. Arrays of user-defined and other data types are created using the **Dim** statement. Arrays of any type can be included within user-defined types.

### **user-interface negotiation**

The process of placing the menus and toolbars of a Visual Basic application (or Automation controller) and those of an ActiveX component together on a container form.

### **user services**

Provide the visual interface for presenting information and gathering data. They also secure the business services needed to deliver the required business capabilities and integrate the user with the application to perform a business process.

## **V**

### **validation**

The process of checking whether entered data meets certain conditions or limitations.

### **validation properties**

Properties used to set conditions on table fields and records. Validation properties include **ValidationRule**, **Required**, and **AllowZeroLength**.

### **validation rule**

A rule that sets limits or conditions on what can be entered in one or more fields. Validation rules can be set for a **Field** or **TableDef** object. Validation rules are checked when you update a record containing fields requiring validation. If the rule is violated, a trappable error results.

### **VarBinary data type**

A data type that stores variable-length binary data. The maximum length is 255 bytes.

### **variable**

A named storage location that can contain data that can be modified during program execution. Each variable has a name that uniquely identifies it within its scope. A data type can be specified or not. Variable names must begin with an alphabetic character, must be unique within the same scope, can't be longer than 255 characters, and can't contain an embedded period or type-declaration character.

### **variance**

The square of the standard deviation. It is a measure of the amount by which all values in a group vary from the average value of the group.

### **Variant data type**

A special data type that can contain numeric, string, or date data as well as the special values **Empty** and **Null**. The **Variant** data type has a numeric storage size of 16 bytes and can contain data up to the range of a **Decimal**, or a character storage size of 22 bytes (plus string length), and can store any character text. The **VarType** function defines how the data in a **Variant** is treated. All variables become **Variant** data types if not explicitly declared as some other data type.

### **variant expression**

Any expression that can evaluate to numeric, string, or date data as well as the special values **Empty**

and **Null**.

## Visual Basic Script (VBScript)

Microsoft Visual Basic, Scripting Edition. Microsoft's Visual Basic–based Internet scripting technology.

### verb

Specifies an action that can be performed on an object, such as Edit.

### visual editing

The process of activating an object provided by an ActiveX component (formerly called an OLE server). By double-clicking the object on a container form, a user can interact with the application supplying the object without switching to a different application or window. Also called in-place activation.

## W

### watch expression

A user-defined expression that enables you to observe the behavior of a variable or expression. Watch expressions appear in the **Watch** window of the **Visual Basic Editor** and are automatically updated when you enter break mode. The **Watch** window displays the value of an expression within a given context. Watch expressions are not saved with your code.

### WHERE clause

The part of an SQL statement that specifies which rows to retrieve. The WHERE clause limits the scope of the query and specifies which columns are used to join multiple tables.

### wildcard characters

The asterisk (\*), question mark (?), number sign (#), exclamation point (!), hyphen (-), and brackets ([ ]) are wildcard characters. You can use these characters in queries and expressions to include all records, file names, or other items that begin with specific characters or match a certain pattern. You can also use wildcard characters and matching characters to further refine a search when using an SQL statement.

Symbol	Example	Usage
*	<i>wh*</i> finds what, white, and why <i>*at</i> finds cat, bat, and what	Matches any number of characters, and can be used anywhere in the character string.
?	<i>b?ll</i> finds ball, bell, and bill	Matches any single character.
#	<i>1#3</i> finds 103, 113, 123	Matches any single digit.
[ ]	<i>b[ae]ll</i> finds ball and bell but not bill	Matches any single character within the brackets.
!	<i>b![ae]ll</i> finds bill and bull but not bell or ball	Matches any character not in the list.
-	<i>b[a-c]d</i> finds bad, bbd, and bcd	Matches any one of a range of characters.

**Note** The wildcard characters \* (asterisk), ? (question mark), # (number sign), and [ (opening

bracket) can match themselves only if enclosed in brackets.

## **Windows API**

The Windows API (Application Programming Interface) consists of the functions, messages, data structures, data types, and statements you can use in creating applications that run under Microsoft Windows. The parts of the API you use most are code elements for calling API functions from Windows. These include procedure declarations (for the Windows functions), user-defined type definitions (for data structures passed to those functions), and constant declarations (for values passed to and returned from those functions).

## **WinSock**

Windows Sockets is a standard way for Windows-based programs to work with TCP/IP. You can use WinSock if you use SLIP to connect to the Internet.

## **wizard**

A tool that helps you create an executable file by asking you questions and then creating a file based on your answers.

## **workgroup**

A group of users in a multiuser environment who share data and the same workgroup information file (typically the System.mdw file).

## **workgroup administrator**

A member of the group Admins in a Microsoft Jet database **Workgroup** object. A workgroup administrator can always obtain full permissions for any database object created in the **Workgroup**.

## **working directory**

A specified directory on your local computer used to store files when they are checked out of the version control program's database. You make changes to files in the working directory, then check the modified files back into the version control program for version tracking.

## **World Wide Web**

A system for navigating the Internet by using hyperlinks. When you use a Web browser, such as Internet Explorer, the Web appears as a collection of documents, controls, pictures, sounds, and digital movies.

## **X**

## **Y**

## **Yes/No data type**

A column data type that contains a **Boolean** (**True/False** or yes/no) value.

## **Z**

## **zero-length string**

A string containing no characters ("" ). The **Len** function of a zero-length string returns 0.

## **z-order**

The visual layering of controls on a form along the form's z-axis (depth). The z-order determines which controls are in front of other controls.

