# DAL: Basic Technology Concepts

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TOPIC -----------------------------------------------------------

This article describes the basic technology concepts behind Data Access Language (DAL).

DISCUSSION -----------------------------------------------------

Databases have become an essential part of most small and large business operations. It is in a database that information about customer payments, outstanding orders, and manufacturing information is stored, updated, and queried.

Databases follow several standard formats: hierarchical, network, and relational. Hierarchical and network databases have defined relationship paths which must be known and used to search for data. A relational database has no predefined access path, but can be queried in almost any way as defined by the user. The flexibility offered by relational databases comes about because of Database Management System (DBMS) design and industry-standard query languages, such as SQL.

Files are containers of data that are controlled by the host Operating System (OS). The most common file type is a flat file. Flat files have no defined access paths and require scanning the entire file to locate the desired data. Some DBMS can access both databases and flat files.

DBMSs that use SQL to access relational databases have appeared from many vendors in the last decade. These include Oracle, The Ask Group Ingres Products, Sybase, Informix, IBM's DB2 and SQL/DS, DEC's Rdb, Netware SQL, and Tandem's NonStop SQL. These products provide access to different database structures running on different vendor hardware using vendor supplied host operating systems. Each product uses a different "client-server" model with different application programming interfaces (APIs) for client applications running in personal computers. The connection matrix is further complicated by the variety of connectivity options available to PC users: LAN, TCP/IP, 3270, APPC, and asynchronous to name a few.

Ease of access to database information is a major product differentiator for vendors of personal computers. The vendor who can offer a universal client-

server solution which uses a common interface across a large number of hosts and desktop platforms clearly has a selling advantage in business markets.

Apple's Data Access Language (DAL) product, available since 1988, offers a solution that has been embraced by many businesses worldwide. DAL creates a complete client-server environment with both DAL client software running in personal a computer (Macintosh or DOS) and DAL server software running on the host system, where the data and the DBMS reside. The DAL environment can be partitioned into four specific areas: Client machine, physical network, host system, and the databases. The Client machine contains the DAL client, which offers a standard API to either commercially available or in-house developed client (end-user) applications. The DAL client software handles working with the underlying network drivers (APPC, 3270, TCP/IP, or ADSP) to establish connection through the physical network.

The host system issues are taken care of by the Apple-supplied DAL server. The DAL server is a program, running on the host system, which translates the DAL formulated request (sent by the client) into the specific dialect of SQL of the target DBMS. The DAL server tasks include doing the translation, communicating the request to the target DBMS, processing the results provided by the DBMS, and sending them back to the client. The databases are all accessed through the DBMS running on the host system. DAL is especially interesting to customers with multiple DBMS running on the same hosts or on different hosts in the same corporation. DAL provides the same standard interface and method of operation to the client user, no matter which DBMS is actually running on the host system.

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