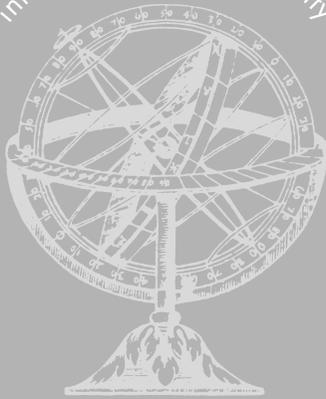32-bit

cross-platform

client/server

relational

database

management

system

ACI 4D Server

4D SERVER is the cross-platform data and application server for 4th Dimension (4D). Any 4D application created for Windows 95, Windows NT, Macintosh, or Power Macintosh easily scales to a workgroup client/server solution using 4D Server.

4D Server provides a fully integrated architecture in which both client and server use a single 4D application. 4D Server frees developers from the need to design separate front-end and back-end applications. In addition, 4D Server is a "zero admin" server. It is easy to install, use, and administer, and it enables creation of extremely cost-effective solutions.

4D Server fills the gap between low-end file-sharing-based systems and complex SQL-based RDBMS systems. Any 4D Server application smoothly interfaces with existing enterprise databases (ORACLE, Sybase, or any ODBC-compatible server) with 4D Connectivity Plug-ins. 4D Server addresses the needs of workgroups in businesses of all sizes. 4D Server is accessible to users of all levels of expertise.

Because the same tool can be utilized in many situations, companies that use 4D Server save the time and cost associated with maintaining multiple development environments.
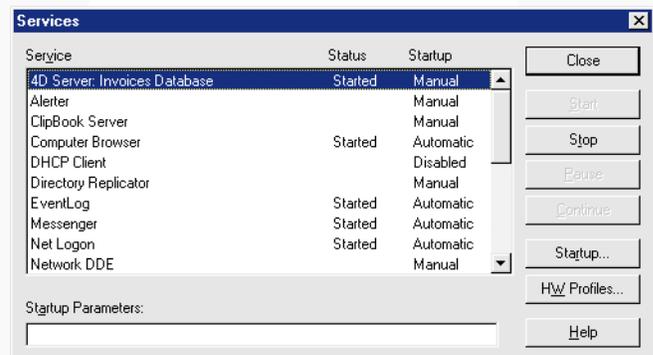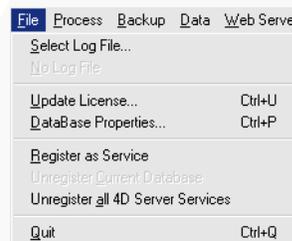
INTEGRATED BACK-END AND FRONT-END ARCHITECTURE

With 4D Server, the front-end and back-end applications are one and the same. The client software and server application are two faces of the same product, 4th Dimension.

No additional middleware or development are required to operate in a client/server environment. 4D, 4D Client, and 4D Server share the same interface tools, the same language, and the same information management system.

Any single-user application easily scales to a workgroup client/server solution. Conversely, any application created with 4D Server automatically scales down to a stand-alone application.
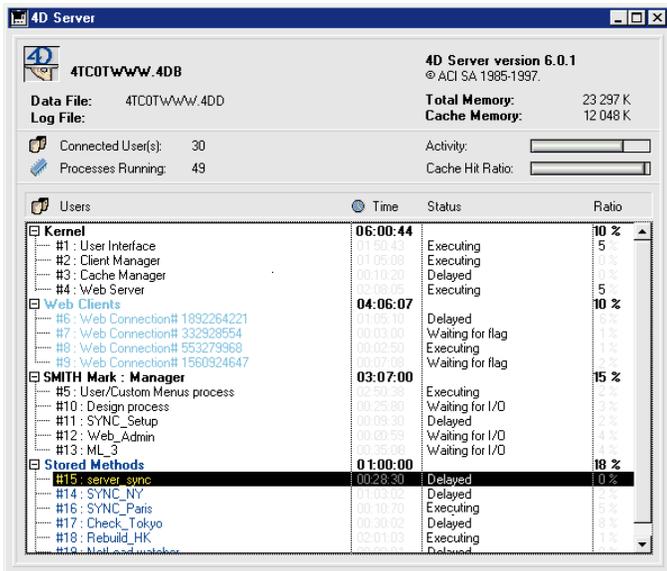
Registering 4D Server as a Windows NT service

"ZERO ADMIN" DATA AND APPLICATION SERVER

4D Server benefits from the user-focused heritage of 4D.
As a result, 4D Server is a complete plug-and-play (PNP) system.

Graphical administration of 4D Server

Simple on-line graphical centralized information

The 4D Server main window automatically displays important information: total memory allocated to 4D Server, data cache, number and name of connected users, number of processes and their status, server activity, and cache hit ratio.

Auto-configuration and scalability

4D Server is designed to support the addition of new protocols, new clients, and new plug-ins and to interface with other systems without any reconfiguration or re-engineering.

Automatic and dynamic update and version control of client workstations

All 4D clients are automatically and dynamically updated if the database is modified or if a plug-in is added, removed, or modified.

Automatic asynchronous connections to both local and remote mixed network protocols

4D Server includes an integrated virtual network manager, allowing easy installation and simultaneous use of multiple protocols.

Automatic session and state maintenance for 4D Client and Web connections

The 4D Server database engine automatically creates and maintains a current working environment for each table/process/user combination. This session-based architecture allows each process for each user to manipulate data independently and concurrently. 4D Server automatically delivers all client/server capabilities to Web browsers.

Automatic record locking

4D Server provides automatic record locking and release, avoiding common problems associated with modification of "in-use" records. Record locking also eliminates problems associated with page or file locking.
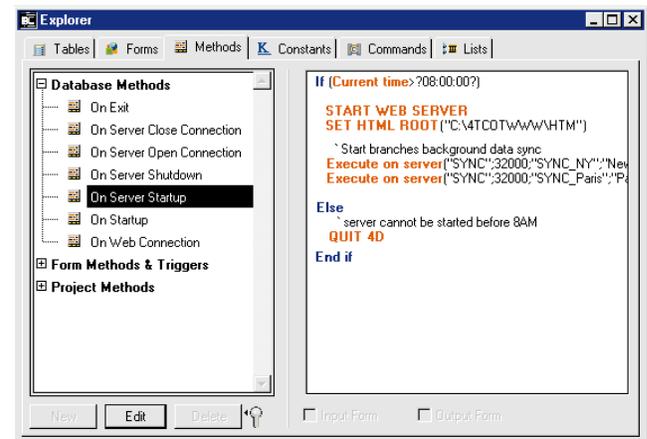
Integrated user-interface messaging system

Having originated in the desktop arena, 4D Server provides all user interface aspects associated with modern integrated development environments. For instance, 4D Server is capable of informing clients of administrative actions such as scheduled disconnection, backups, and more.

Automated start-up and disconnection methods

4D Server automatically invokes five server database methods in response to specific events: On Server Startup, On Server Shutdown, On Server Open Connection, On Server Close Connection, and On Web Connection. The On Server Startup method can automatically initialize and load any objects which may be needed throughout the rest of the session.

Taking advantage of 4D Server database methods

INTEGRATED WEB SERVER

4D Server includes an integrated Web server. 4D Server applications can be published directly on the Web. No CGI is required. 4D Server intelligently allows users to access data using standard browsers such as Microsoft Internet Explorer and Netscape Navigator.

On-line, transparent HTML translation

4D Server transparently and dynamically translates forms and design components into HTML pages. These new HTML pages become instantaneously available to Web browsers.

Dynamic access to records and data

4D Server handles Web browsers as standard clients of the database engine. Records do not need to be re-processed for HTML publishing.

Session maintenance and database context

The 4D Web server engine includes built-in session and database context maintenance, ensuring complete synchronization between the current Web page displayed in the browser and the context of the 4D Server database connection.

Transparent multi-user maintenance and transaction management

Web users benefit from all 4D Server built-in transaction management capabilities. If errors are encountered during data manipulation, changes are canceled automatically by the 4D Server rollback-management system.

Web process maintenance

The 4D Server built-in Web server process handles Web connection attempts. After a Web browser is granted access to the database, the Web connection automatically runs as a separate process.

Optimized Web server architecture

The 4D Web server engine has the same capabilities as the 4D Server database engine. For example, if you load a series of record values into arrays, the operation is performed on the 4D Web server machine. In addition, because a Web connection results in a standard full-featured 4D process, you can execute methods that interact with the Web user.

HTML and JavaScript encapsulation

Although 4D Server performs almost everything you need to publish databases on the Web, you can encapsulate HTML and JavaScript code to customize your development. 4D Server provides a simple, built-in scheme for binding HTML objects to 4D variables—your objects only need to have the same name.
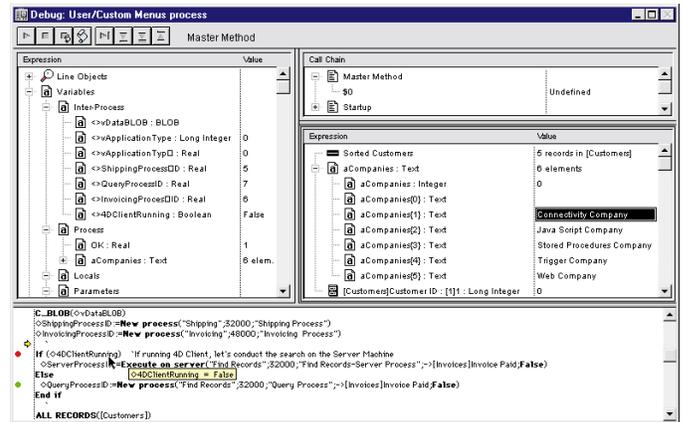
DEVELOPMENT SERVER

4D Server is a complete multi-user RAD environment benefiting from all the built-in 4D features:

▶ 4D automatically manages check-in and check-out of all database objects and version control. Database modifications are reflected in real time for each developer on the team. No synchronization is required. 4D updates are immediately available to all programmers as soon as they are committed.

▶ Objects previously checked out by other programmers can still be viewed and manipulated in a read-only state.

▶ Because 4D Server integrates a multi-user development environment with its database engine, developers can program test, and debug simultaneously.

▶ Multi-process debugging is allowed on the client and server machines. The 4D debugger allows you to simultaneously execute and debug a process, and each thread of execution can have its own debug window.

Troubleshooting source code with the efficient 4D Server debugger

▶ All tools available for 4D also work for 4D Server.

4D Compiler is a true machine-language compiler optimized to support a wide range of processors: Intel 80386, 80486, and Pentium; Motorola 68020 to 68040, including math co-processors; and PowerPC 601 to 604.

4D Insider is a point-and-click code servicing system enabling component builders and users to modularize or merge existing applications and to cross-reference all database objects and their dependencies.

▶ Like 4D, 4D Server allows for unlimited extensibility. 4D Server supports many plug-ins. In addition, 4D Server supports a native API (4D Open) which provides the highest-performance connections.

TRANSPARENT APPLICATION PARTITIONING AND SERVICING

With multi-process management at both server and client levels, multi-process stored procedures, and an interprocess management system, 4D Server permits sophisticated application partitioning and scaling and enables IS managers to continuously monitor their database applications. Also, the 4D Server programming architecture allows applications to grow as business needs change, eliminating the need to redesign systems.
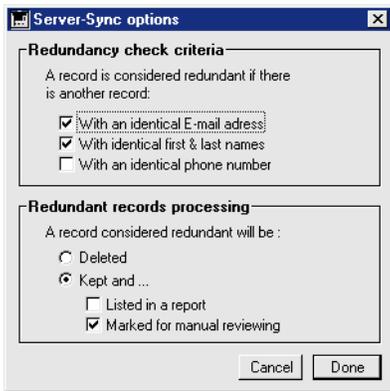
4D Server stored procedures

4D Server allows you to create an unlimited number of stored procedures running independently and concurrently. Since a method runs within an asynchronous process, distribution of tasks,

roles, and rules within the database can be performed easily and transparently. Stored procedures can be started by both the client and the server. 4D Server stored procedures can be activated, delayed, paused, or resumed at will, allowing many fine-tuning controls such as configurable load balancing.

Customizing operations across servers

Client/server bi-directional communication system

Interprocess communication is ensured through interprocess variables and commands on client and server machines. Since stored procedures can be started by both client and server, 4D Server allows a very flexible approach to defining their respective roles. As a result, creating a thin, fat, or middle-weight client is a matter of choice in development strategy.

Remote procedure calls

Remote procedure calls can be started at any time by any client. Any series of actions can be asynchronously executed when needed. Thanks to "get" and "set" process variables, information about the action being performed can be controlled by and displayed from the client.

n-Tiered architecture

Because the 4D Server multi-user development system provides simultaneous development and testing with no constraining middleware involved, 4D Server allows implementation of a wide variety of logical database models which can be reorganized for efficiency or practical purposes.

The range of 4D Server multi-tiered application control is virtually unlimited, since it includes capabilities such as:

▶ Coupling 4D Server with other 4D Servers or SQL databases. Combined with the 4D Connectivity Plug-ins, 4D Server is an ideal way to maintain three-tiered or n-tiered architectures, transforming 4D Server into a powerful multi-database management system. 4D Server is a transparent gateway to corporate information repositories and allows spanning and populating mixed data sources transparently. Data can be accessed either through a regular client or through any Web
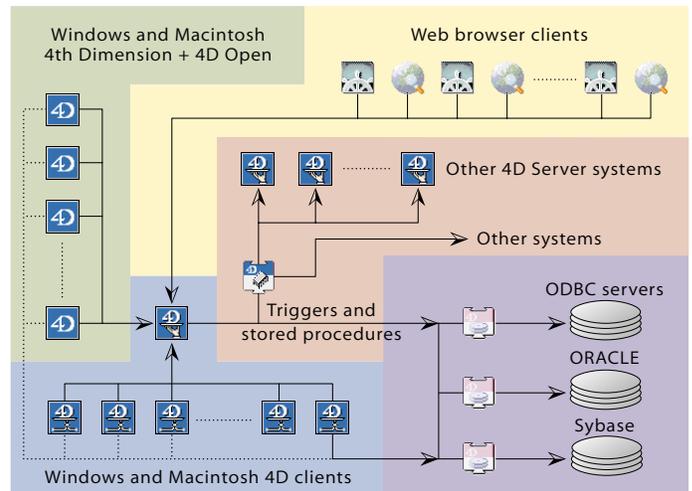
browser connected to 4D Server. Using 4D Server built-in Web services is the fastest way to serve SQL data on the Web.

▶ Coupling 4D Server with an FTP server. For example, you can generate documents such as PDF catalogs from your 4D Server inventory database and send them to your FTP server.

▶ Coupling 4D Server with an existing file server. For example, you can track documents in 4D Server while storing them externally on a file server.

Data switchboard

Combining various elements of the 4D architecture allows connections between disparate systems. For example, incoming orders from Web users can be monitored and intelligently dispatched to regular 4D Clients for immediate fulfillment, invoicing, and shipping.

Extending 4D Server workgroup and Web architecture to enterprise-wide systems

ADDITIONAL RESOURCES

For more information about the complete 4D Product Line, please consult the following white papers from ACI US:

Introducing ACI 4th Dimension Version 6

ACI 4th Dimension: The widest scope of built-in database features

4th Dimension: The new dimension of Internet database access and publishing

ACI 4D Insider: The new dimension of efficient code management

ACI 4D Compiler: The new dimension of fast, cross-platform development

ACI 4D Productivity Plug-ins: The office system inside 4D and 4D Server