December 1998

Building Internet Database Applications

Wallace Growney
Susquehanna University

Andrea Growney
Susquehanna University

Building Internet Database Applications

Wallace J. Growney
Andrea E. Growney
Susquehanna University

Abstract

Now that the Internet has exploded in popularity on a world wide scale, Internet database applications represent an important new paradigm for on-line computing. In this demonstration we will show several applications we have developed and describe how to create them using technologies such as the World Wide Web, HTML, database publishing, SQL, Windows CGI, Visual Basic, Cold Fusion and other third party products with little or no coding. This tutorial will show how to develop Internet database applications in a public way so anyone with Web access can run them and also in a more proprietary way which uses the Internet's communications infrastructure but doesn't leave the application open to all Web users. A key theme is that one can use Windows 95 or NT without having to install and learn UNIX, Perl or C.

Why Internet Database Applications?

Probably the most important applications relate to database publishing, information delivery, marketing, and communications. In the past, where we've had to rely on hard-copy or CD-ROM, now we can publish on the Web for much less cost, update it frequently and not have to rely on a publishing house. While it's easy to design publishing applications, database interactivity adds substantial value to a Web-based application. Consider: (a) an *on-line registration/reservation system* that queries for space availability and sends back a confirmation, (b) an *on-line ordering system* that checks inventory availability and initiates order fulfillment, (c) a *real-estate system* returning pictures of properties meeting parameters submitted over the Web, (d) an *executive information system* that allows one to click on a map and see corresponding financial, marketing or other results for that region. Until recently, database examples such as these have been difficult to implement on the Internet with traditional tools.

How Does It Work?

It's easiest to think of the Internet as a shared set of communications protocols and addressing schemes and the Web as a graphical interface for any (multimedia) data one might wish to make available. Content is put on the Web (as a "home page" and related pages) by placing a properly formatted HTML document on a Web server. Internet users can read the content with client resident "browser" software, e.g., Netscape Navigator or Microsoft Internet Explorer, capable of interpreting the HTML code. To link Web users with a relational database you need server software that translates information requests into SQL queries, passes them to a back-end database, formats query results as an HTML document and then returns it to the Web browser.

Agenda
Authoring Web Documents

Initially, we'll outline how to set up Windows NT-based Internet servers and clients and discuss Web site infrastructure matters. Then we'll take a quick look at HTML authoring tools and review the basics of that language. Whatever the limitations of HTML and static web documents, you'll see the huge advantages of using it; viz., that HTML is easy and virtually everyone with Internet access can see your site. Specific techniques will be shown with special attention given to tables and forms.

Database Publishing on the Web

Many organizations have data contained within proprietary databases that would be valuable to share with customers, vendors or other business partners. To publish database data on the Web one needs a program that creates HTML tags. Knowing the basics of HTML, you'll see this is a straightforward program to write. Examples will be given from Microsoft Access and Visual Basic.

Interactive Database Applications on the Web

An *interactive* application means a client-based HTML form sends data to a server which processes it and returns HTML formatted results to the client. First we'll review SQL and show Cold Fusion, an award winning tool from Allaire Corporation which enables development of interactive database applications by embedding SQL within HTML pages without having to write cumbersome code. Then we'll show how to enhance these applications with client-side scripting using JavaScript or VBScript. Finally, we'll show how to use the CGI32.BAS library to build Windows CGI programs quickly in Visual Basic.

Proprietary Internet Database Applications

With content in HTML format anyone with net access can see it. What really don't want open access? Then you may still use the Internet, but not the Web, for your application. Since Visual Basic can access *WinSock* and communicate via TCP/IP one can use custom controls such as dsSocket from Dolphin Systems, Inc. or SocketTools from Catalyst Development which insulate you from having to write complicated WinSock code directly.