# Making the Right Connection With Web-to-Host Solutions

BY JERRY RACKLEY

Are your users inside or outside your organization? Are they familiar with host access paradigms? The path to successful web-to-host integration begins with knowing who and where those users are. A complete understanding of the answers to these two questions will allow you to confidently select from the different implementation alternatives.
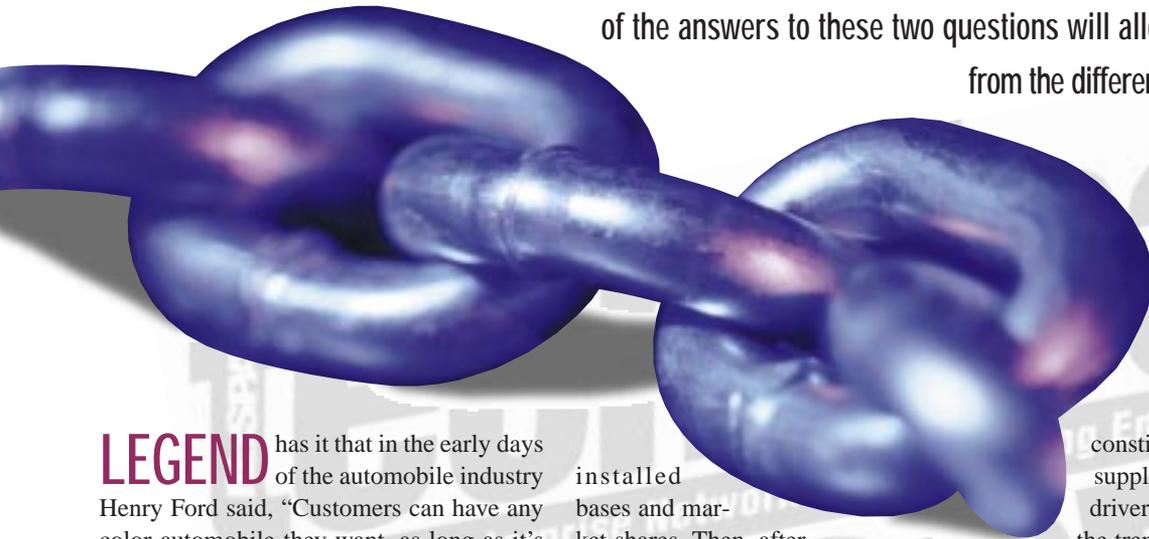
LEGEND has it that in the early days of the automobile industry Henry Ford said, "Customers can have any color automobile they want, as long as it's black." That lack of choice wouldn't suit us today, but it would surely simplify decision making. Over the years, manufacturers in all industries have gotten in touch with the desires and preferences of their customers and have come to offer a dizzying array of product choices, options, colors, sizes, and flavors. Fast forward to today's high-tech business and consider the customer's plight: Vendors are delivering a myriad of innovative new products much faster than customers can adopt them.

The web-to-host connectivity market is a case in point. Since the first web-to-host product came on the market in November 1995, the market has witnessed a flurry of new product announcements. According to Robert Shavell, technology analyst with Datamonitor, vendors have introduced more than 35 products that provide some sort of browser-to-mainframe integration. "All TN-based vendors have web-to-host solutions if you are just talking about the web market," Shavell states. "I'd estimate that the top five vendors make up the majority of this emerging segment, with another 10 vendors with key products but smaller installed bases and market shares. Then, after that, there are at least another 20 point solutions that are either highly targeted with very little exposure or coming from outside-in and piggybacking on someone else's TN server engine."

If you're confused, you're in good company. While "web-to-host" loosely conveys what the technology is about, it is a low-resolution term when it comes to understanding the solutions in the market. It can be a challenge to sort through the marketing rhetoric and technical specifications to determine which problems are solved by which products. Web-to-host can include technology for accessing legacy applications, for mining data stored in host databases, or for distributing legacy documents. This article, however, focuses on web technology for accessing legacy 3270 applications.

WHAT'S DRIVING YOU?

Looking at what is driving the business and technical markets for web-to-host is a good place to start to understand what differentiates product offerings. Business drivers include radically improved customer service and broader access to key constituencies: customers, distributors, suppliers, or other partners. Technical drivers include lower cost of ownership, the trend toward thin clients, and just the sheer momentum of Internet technology. These are not two sides of the same coin, but scenarios that represent the extremes with respect to motivation for implementing web-to-host solutions; there are many variations in between. As you move from one end of this spectrum to the other, the requirements change and you find significant differences between end users, desktop configurations, security considerations, usage patterns, and other issues. Product attributes, like whether a given solution uses Hyper-Text Markup Language (HTML), Java or ActiveX controls to implement web-to-host connectivity, are secondary to these primary requirements when considering web-to-host solutions.

KNOW THY USER

While product attributes are important, product implementation techniques and technology do not represent "square one" when you attempt to select an appropriate web-to-host solution. In the web-to-host game, end users are the key to smart decisions. Making faulty assumptions about end users is planning to fail.

It's easy to look past the differences among end users because with respect to web-to-host connectivity, they all have one thing in common: They will use a browser to gain access to host applications. The browser has accomplished something unique in the history of interactive computing: It is the touchstone of computing in the 1990s. It has placed all users, regardless of skill level, on the same learning curve. But, just because everyone can now use a browser to access all kinds of applications doesn't mean they all have the same understanding of the applications. Web-to-host implementations must accommodate this broad and diverse base of potential end users. To factor end-user differences into your planning, two key questions must be answered: Who are the users and where are the users?

WHO ARE THE USERS?

Understanding who your users are is the first milestone on the critical path to successfully implementing web-to-host connectivity. We can cleanly divide web-to-host end users into two categories: legacy users and non-legacy users.

Legacy Users: These individuals are veterans at accessing host applications, either through fixed function terminals or terminal emulation products. If your users know all the default definitions for PF keys within ISPF, then they qualify as legacy users. Likewise, if they know what the "X-Clock" symbol means and where it appears, they're legacy users.

Most legacy users are adept at interacting with host applications. They've learned all the shortcuts and techniques that allow them to be extremely efficient at using host applications. Typically they are heavy users, perhaps being logged on to host applications for several hours each day. They value fast response time and terminal emulation solutions that provide the highest degree of fidelity to the true 3270 or 5250 experience.

Non-legacy Users: These individuals may be veteran computer users, but they're not savvy users of legacy applications. They've never climbed the 3270 or 5250 learning curve, and they don't want to. Their experience, if they have one, is with nice, friendly, graphical interfaces. Or, they may not be computer users at all.

Most anyone who has been around the glass-house for any length of time can share stories about trying to give the uninitiated a

> **Understanding who your users are is the first milestone on the critical path to successfully implementing web-to-host connectivity.**

lesson in host application access. For such users, the learning curve is so steep that it can be the biggest single obstacle to broader host application access. Even though their application access tends to be occasional or infrequent, non-legacy users must climb this learning curve. And if they can, the help desk is likely to be buried in the process. Yet when non-legacy users require access to host applications, the reasons why are usually very compelling. Since most of these users are familiar with web browsing, they value access solutions that provide a web-like interface.

WHERE ARE THE USERS?

Understanding where your users reside is the second milestone on the critical path to successfully implementing web-to-host connectivity.

Inside the Enterprise: We can make more accurate assumptions about what is on the desktop of users within the enterprise and how it will impact web-to-host connectivity: What version of browser is in use? Does it support Java? What version of Windows is in use? How are they connected to the intranet/Internet? More importantly, these attributes are not just known, they can be controlled. If, for example, a prerequisite piece of software requires an upgrade before users can exploit web-to-host connectivity, you have a reasonable chance of seeing it done. These conditions give you more license as to the types of web-to-host technologies you can consider.

It is also important to remember that users within an enterprise aren't necessarily within the technical boundaries of the organization. When users are geographically dispersed, in physically separate establishments, communication may pass through one or more firewalls or "trusted" users may bypass the firewall altogether by dialing into a secure number. Employees who work from home or mobile workers are examples. Where end users are with respect to fire-

walls is an important consideration when selecting technology.

The security considerations for intranet-only web-to-host implementations are not as stringent as for Internet implementations. It should come as no surprise that different web-to-host vendors have different views on security and offer different features. If you have a requirement to let web-to-host traffic pass through a firewall or proxy server, don't pick a web-to-host solution that compromises your firewall by using non-standard ports or protocols.

Outside the Enterprise: When users are outside the enterprise, you can make no assumptions about what they have on their desktop. To provide these users with usable web-to-host connections, you'll have to accommodate the presence of many different operating systems and browsers. Some will support Java, others won't. Some will access the Internet through a high-speed Internet connection, others will dial-in through an Enhanced Service Provider or an Internet Service Provider. In other words, you're dealing with the broadest possible set of end users who will, through a diverse set of technologies, access your host applications. To successfully provide web-to-host connectivity to these users, deliver it to them in a form every browser can understand: HTML.

When extending access to outsiders, the security of the web-to-host connection is no trivial matter. Letting outsiders into your host applications through the web is a completely different proposition than providing internal employees access through an intranet. There is usually one and often two firewalls that web-to-host traffic must pass through. Proxy servers can be involved as well. The industry standards in place for encryption and authentication, Secure Sockets Layer 3.0 (SSL) or Hyper-Text Transfer Protocol Secure (HTTPS), are very good. Support for these standards should be a prerequisite for consideration of any solution that will provide access to outside users. The solution you choose should also be "firewall friendly," using only standard ports and protocols to support web-to-host traffic.

A WEB-TO-HOST FRAMEWORK

The matrix in Figure 1 presents two key questions that are the basis for a framework to help assess web-to-host requirements. Using this matrix as a reference, we'll examine the drivers, requirements and

types of solutions that are best for legacy or non-legacy users who are internal or external to the enterprise.

Quadrant #1: Providing access for non-legacy users external to the enterprise is frequently driven by economic factors. Common implementations of web-to-host connectivity in this quadrant seek to connect customers or business partners to host applications to enable some form of electronic commerce. An example would be a manufacturer who provides distributors access to an online catalog and order entry application. The genesis of such implementations usually occurs within a line-of-business organization, with the IS group getting involved later. The motivation for implementing web-to-host connectivity can be any of the following:

◆ increase revenue
◆ increase cash flow
◆ reduce inventory
◆ increase customer satisfaction

The ideal web-to-host solution for this quadrant is one that does dynamic translation of host data streams, 5250 or 3270, into HTML. These solutions allow you to present a true web page to the user, completely masking the existence of a host application. In addition, customization facilities allow you to reengineer the way the host application data is presented by blending it with graphics, controls, or anything else your users might expect find on a web page.

Security is one of the biggest concerns when implementing web-to-host access for users outside the enterprise. But you can deploy web-to-host technology with confidence as long as it supports either SSL or HTTPS for encryption and authentication, and is "firewall friendly," using only standard ports and protocols to support web-to-host traffic.

Quadrant #2: Providing access to non-legacy users internal to the enterprise is very similar to quadrant #1. Since we're dealing with access inside the firewall, security is not as great a concern. Implementations of web-to-host in this quadrant usually impact employee productivity or provide easier, more timely access to data. An example would be a corporation that provides access to host-based benefits data. Typically, vaccess in this quadrant is something that has been considered for a long time but has

Figure 1: A Web–to–Host Framework
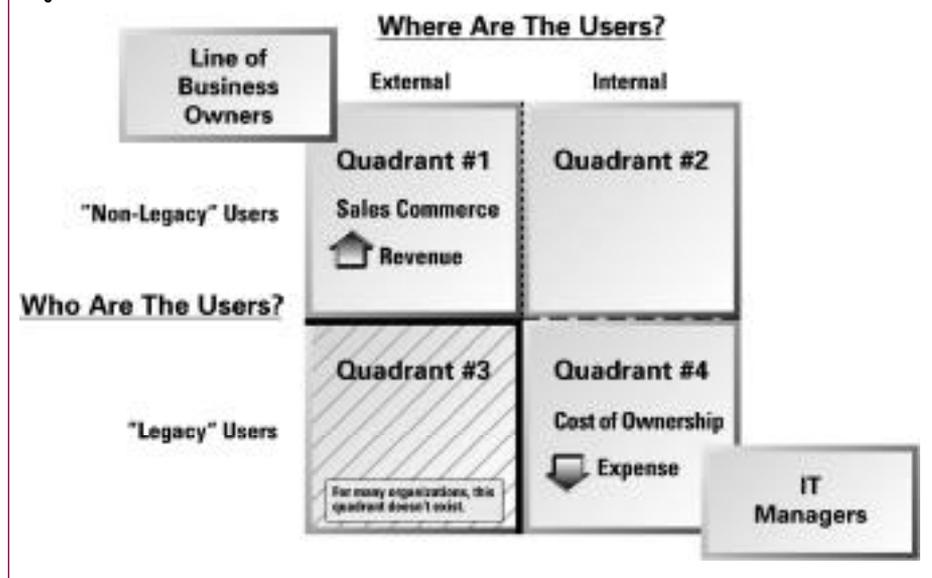
Quadrant #1: A Case Study

NERAC, an information retrieval company based in Tolland, Conn., provides vital information on technology, competitors, industry trends, patents and trademarks to its clients who are engineers, scientists, and researchers. NERAC's mainframe computer system holds more than 3TB of the top engineering, scientific, and business databases available worldwide. To speed the process of getting this vital host-based information to their customers, NERAC recently implemented some web-based services.

NERAC provides access to this information through a staff of more than 75 industry-trained, in-house engineers and scientists. The process of providing this information begins when a NERAC technical specialist has a discussion with the client and begins an investigation using NERAC's extensive store of host database resources. The result of this investigation is a list of abstracts, compiled from multiple sources, from which the client can select specific citations to review.

Before implementing web-to-host connectivity, NERAC would ship investigation results via fax, email or mail. The customer then called back after reviewing them to refine their request or make specific selections. NERAC implemented Electronic Select, a new interface to NERAC's host application, using Teubner & Associates' Corridor to dynamically transform host screens into HTML. Customers can now view the results of an investigation through the Internet and make selections immediately. This web-to-host application gets the customer more involved in the selection process and brings the process to closure more quickly.

Electronic Select is a hit with NERAC's customers. In the six months it has been available, usage has doubled. Today, host application data is being transformed into about 4,500 web pages each day, being reviewed by hundreds of NERAC customers. At any given time, there will be between 15 and 18 customers logged into Electronic Select.

Patent ordering is another service NERAC has web-enabled. Patent documents can be key sources of information to corporate researchers and scientists since 80 percent of the technical details of patents are not found in other documents. NERAC customers can order any patent from 1974 forward, worldwide. Currently, several thousand patents per month are ordered through the web.

By linking their legacy applications to the web, NERAC is enabling their customers to spend less time searching for vital information and more time on product innovation and development. For NERAC, web-to-host technology has been a cost-effective way to provide better customer service and gain a competitive advantage as a result.

been ruled out as unfeasible because of the difficulties involved in training large numbers of users. As in quadrant #1, web-to-host solutions that perform dynamic translation of host data streams into HTML work well. Java-based solutions that run terminal emulation within the browser window can also be deployed effectively, provided they allow for customization of the presentation of host screens. The key requirement is still to create an experience that is as web-like as possible.

Quadrant #3: Providing access to legacy users who are external to the enterprise is the least active segment of the web-to-host market. The number of users who fall into this quadrant is relatively small and vendors don't seem to be paying much attention to this quadrant. For the most part, their access needs are being met in other ways, although web-to-host access might provide some savings. If you are considering web-to-host access, you will need a solution that provides adequate security since your end users will be coming in via the Internet. Since they are familiar with emulation, they will probably favor a solution that presents the 3270 or 5250 datastream unaltered. Server-based solutions may not be economically justified depending on the size of the workgroup. Given these factors, Java-based emulation solutions would probably be the best choice for these users.

Quadrant #4: Providing access to legacy users who are part of the enterprise is frequently driven by technical factors. Many implementations of web-to-host connectivity in this quadrant seek to provide well-trained, regular users of host applications with browser access to those applications. An example would be a securities firm that provides brokers access to host-based customer, market,

and trading data. The genesis of such implementations usually occurs within the IS organization. The motivation for implementing web-to-host connectivity is to lower the cost of ownership. Web-to-host solutions are less expensive and easier to administer than client-based terminal emulation.

The ideal web-to-host solution for this quadrant is one that provides terminal emulation within the browser window. A majority of these solutions are Java-based and download a terminal emulation applet to the client. They allow the user to stay in the familiar world of terminal emulation while eliminating the need to install software on each individual workstation requiring access.

SUMMARY OF QUADRANTS

Most of the current market activity and implementation work seems to be focused in quadrants #1 and #4. The accompanying sidebars present case studies of users from these two quadrants who are implementing web-to-host technology.

CONCLUSION

The web presents an opportunity for organizations to exploit the value of host data and applications by making them accessible to a broader range of users.

Today's web-to-host market offers some solutions that facilitate a tight electronic connection with key constituencies outside the enterprise. Other solutions eliminate the need to extend access to host applications

Quadrant #4: A Case Study

3M is a $14 billion company that serves a very diverse set of markets. With more than 70,000 employees who create, manufacture and sell 50,000 products in 200 countries around the world, they have a large user base for their suite of corporate applications. 3M has launched a two-part pilot project, choosing WRQ's Reflection EnterView, a Java-based host access product to provide host access to end users while holding application ownership costs down.

"We consider the web — the intranet, extranet, and Internet — to be the next vehicle for corporate information management," says Pete Daniels, senior design analyst at 3M. "We want to use the web to give us a common format for acquiring data no matter what platform that data is on."

Initially, 3M will target two groups for rolling out web-to-host connectivity: the mobile sales force and employees who work from home. Though both groups had access to host information in the past, downloading emulation software over 3M's internal network was prohibitively time-consuming — sometimes taking up to four hours over a 28.8K modem.

In the first stage of the pilot, both groups will use EnterView as a familiar interface to host data, with minimal impact on their PCs. Since the applet runs in the Java Virtual Machine native to 3M's two most-used browsers — Netscape Communicator and Microsoft Internet Explorer — both deployment and access will be simplified. This approach will reduce some of the overhead that more traditional client software has required. Users will connect to the server via an Internet Service Provider (ISP) or the corporate LAN access tools, and download the applet, which can then connect to any 3M host. They will be presented with a familiar format using the web browser for a typical emulation session. Through the ISP they will be able to get access to 3M's internal network and to the distributed platforms.

In the second stage, 3M will design a new front-end to provide easier access to data by a broader user base. Daniels sees this new technology as a way to more easily and quickly design front-ends to all the information the company has in its data warehouses. "If people don't know how to get to the data, or if getting to it is cumbersome, then it might as well not be there," says Daniels.

via terminal emulation for internal users. Whether your users are inside or outside your organization, familiar or unfamiliar with host access paradigms, the path to successful web-to-host integration begins with knowing who and where those users are. A complete understanding of the answers to these two questions will allow you to confidently select from the different implementation alternatives. **ts**

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