

IBM Host Integration Solution Products: Extending AS/400 Applications for e-business

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Executive Summary

The explosion of interest in the Internet and the limitless business opportunities it offers have sent most companies scrambling—at the very least—to create a Web presence and—at most—to convert entire businesses into e-businesses. These new e-businesses are transforming all aspects of companies’ interactions with their customers, suppliers, internal users, and other companies into online transactions accessible through the Web. And, what seems most perplexing is that this transformation is happening in Web years¹, enabled by technologies that are changing at ever-increasing rates of speed. The time needed to recreate all the necessary business applications, especially when all the new functionality that is demanded is factored in, simply does not exist.

This raises the question: can traditional businesses compete in this new virtual world? The answer is probably not—unless they undergo part of the transformation themselves. But just how radical does the transformation need to be, and how many of their existing processes can they preserve? If businesses can preserve the bulk of their core business expertise and directly leverage and extend it, they should be able to succeed against nimble new startup companies with little or no experience.

To fully leverage and extend a traditional business over the Internet, the applications supporting that business need to

¹ Typically, a Web year is defined as having the duration of three months.

be leveraged and extended. Enabling existing applications for access anywhere, anytime, and/or for conducting end-to-end e-business is a critical, but daunting task, for growing companies. In coining the term *e-business*, IBM set out to develop and offer a number of solutions—both hardware and software—to its customers to help them get their businesses Web enabled so that they can remain competitive as they enter the new millennium.

On the hardware side, IBM has transformed its AS/400 into an e-business server that has, over the last twelve years, developed an almost cult-like following. Over 700,000 have been shipped, and AS/400 loyalists would rather fight than switch—their server. The AS/400's innovative architecture and unique characteristics make it a smart choice for e-application serving. It also allows customers to continue running applications that were developed over a decade ago without rewriting or modifying them. AS/400 customers can easily upgrade their hardware to the latest technology and run a competitive mixture of old and new applications.

On the software side, the options are far more numerous and somewhat more complex. AS/400 customers can reengineer their existing applications from scratch, link into them from separate Web servers, supplement the core business applications with off-the-shelf tools like Net.Commerce, or convert to brand new application suites. In more and more cases, customers can even select an application service provider (ASP) to remotely host all, or portions of, their critical applications and data so that the customer no longer has to deal directly with the system infrastructure (i.e., operations, hardware, systems management issues, etc.). Of course, just understanding all the options well enough to select among them is an almost impossible task by itself, especially for customers who haven't already started experimenting and deploying these new technologies.

Fortunately, IBM is now providing a set of Web-enabling products for AS/400 called the *Host Integration Solution*, which enables users to front-end their business applications with usable Internet access capabilities without having to change their application logic or reengineer their business processes. Host Integra-

tion Solution products are an integral part of the IBM application framework for e-business. This framework provides integrated directory capabilities built on the LDAP model, network connectivity (between both SNA and TCP/IP), and security between users and applications so that they can conduct e-business with full privacy.

The Host Integration Solution consists of a number of tools that help companies reduce the costs and minimize the complexity and risks associated with exploiting Internet technologies. While the Host Integration Solution for AS/400 also includes the Personal Communications product, the trilogy of products that will be discussed in this report include:

1. *Host On-Demand*, which is a Java-based 5250 screen emulator with a Windows look and feel. It is paired with *Database On-Demand*, which allows you to create and distribute queries to those who need information from the system.
2. *Screen Customizer*, which is a Java-based application rejuvenator that allows you to create graphical representations for your 5250 screens, making them more usable and friendly.
3. *Host Publisher*, which allows you to integrate both your back-end applications and data into HTML to form competitive and maintainable Web sites.

In this paper we will discuss and evaluate these three Host Integration Solution products for use in Web-to-Host accessing—when the host is AS/400. We will evaluate them against a number of business criteria including ease of installation, implementation, use, and the ability to leverage existing investment, cost, risk, and security. In addition, we will examine the business case for Web-to-Host accessing and e-business, and discuss why AS/400 is a best-of-breed e-business server. We will also review some of the current limitations of the Host Integration Solution products to help you assess when you will need to supplement your toolset with other Web-enabling products as well as determine how long you can leverage your core applications before you consider replacing them with something more modern. Finally, URLs will be provided so that you can visit the IBM Host Integration Solution Web sites for more information.

The Business Case for Web-to-Host Access

In the race to become Web enabled, those companies that have paid attention to the following criteria have tended to be the most successful:

- *Speed of e-business deployment.* In this case, the early bird gets the worm. Those companies that have been the quickest to deploy their applications on the Web, in a manner that is both intuitive and user friendly, have benefited significantly.
 - *Cost effectiveness of deployment.* While speed of deployment is important, companies do not and should not have to spend a great deal of resources Web-enabling their applications. For example, rewriting existing applications from scratch or trying to change back-end applications often results in errors, lost time, and great cost with little gain. Additionally, a requirement for deploying and maintaining portions of the application on users' workstations can create huge management headaches. Companies are learning that host-based solutions are more manageable and economical than distributed solutions.
 - *Attention to refitting applications for e-business.* Web-enabling business applications can often create confusion for customers who should not have to navigate through the same screens that company employees do. For example, order entry applications, used by customer service employees, should not be
- deployed to the Web in the manner in which they currently exist for potential customers to use. They should be either redesigned or *rejuvenated* for simplicity and ease of use.
 - *Manner of application delivery to the Web.* The method of delivering applications—whether via intranet, extranet, or the Internet—needs to be both fast and economical.
 - *Having a continuously secure, reliable, and available server.* Whether providing extranet access for business and supply chain partners or allowing customers to conduct business over the Internet, it is essential that the server hosting the applications be available on a 24x7 basis and that transactions can be conducted securely and privately. Otherwise, customers will go elsewhere, and credibility with trading partners could be compromised.
 - *Integration between the core business and Web applications.* The level of integration between Web applications and core business applications is often the barometer of successful Web projects. Without the right links, online customers can be promised parts that aren't in stock, suppliers can get the wrong orders, deliveries can accidentally be delayed, or duplicate work can inadvertently be generated.

AS/400: A Key Player in Web-to-Host Access

When IBM developed the Host Integration Solution, the associated products became available first on Intel-based and Unix servers. The goal, however, was to extend the usage of these products to mainframe (i.e., S/390) and AS/400 servers. This is because the majority of business-critical information still resides on mainframe, Unix, and AS/400 servers. Our focus here will be on the AS/400 value proposition for the Host Integration Solution.

In recent years, AS/400 servers have undergone tremendous improvements that have made them not only more scalable and highly available, but also perfectly suited for Java and OO application development, openness standards, Web serving, the ASP environment, and Lotus Domino development, integration, and

deployment. Those who are familiar with AS/400 architecture and employ AS/400 servers in their IT environments have quietly taken advantage of these changes, much to the benefit of their IT departments and their companies. Those who do not understand AS/400's value proposition, unfortunately, are still laboring under the impression that it is outdated and green screen with a proprietary operating system—and certainly not a player in the WWW arena. Nothing could be further from the truth, and the availability of the Host Integration Solution on AS/400 should further dispel any lingering misconceptions.

Let's take a look at the AS/400 value proposition for IBM e-business. AS/400 brings the following server characteristics to the Web-to-Host access arena:

- *Performance.* Over the last few years, performance on AS/400 has ceased to be an issue, especially for OO languages. New, and future, processor technology will keep AS/400 performance competitive with, if not superior to, other server types.
- *Server cost.* Among the misconceptions about AS/400 is that it is expensive. While it is true that, at one time, AS/400 hardware sold at a premium compared to Intel-based and Unix servers, that premium has largely disappeared. The cost of server computers, in general, and the AS/400 in particular has diminished and will continue to diminish over time.
- *Client cost.* Traditionally, AS/400 shops have attached PCs as the preferred desktops, installing Client Access 400 (CA/400) and other PC connectivity products to provide integrated solutions. The cost to install and maintain code on each PC in the enterprise tends to increase with time. By leveraging the Host Integration Solution products, which are enabled through browsers, customers can leverage both off-the-shelf PCs and network computers, even via corporate intranets, and avoid the need for separately configuring and maintaining PCs for each user.
- *Scalability.* The innovative AS/400 architecture, its 64-bit processing capabilities, and its ability to cluster up to 32 high-end systems for a total of 128 terabytes of disk make AS/400 a prime candidate for handling unpredictable Web traffic and transaction workload volumes.
- *Availability.* AS/400 has been a leader in reliability for many years with over 700,000 systems shipped worldwide. In computing environments that require 24x7 availability, AS/400, with 99.9+% uptime, is still the most reliable server in its market.
- *Accessibility.* Host Integration Solution products on AS/400 servers can be easily accessed from virtually anywhere. Internal users can maintain an AS/400 access configuration that is accessible from the Internet, a dial-in from a remote location, a company intranet, as well as from a business-to-business extranet.
- *Security.* Perhaps the most daunting concern and, hence, task for companies that wish to Web-enable their applications is security. The AS/400's security model is one of its most competitive advantages. There has never been a report of an AS/400-based virus and AS/400 server computers, when setup properly, are virtually hacker resistant. IBM security products enhance and optimize the AS/400 security model by offering an extra layer of user identification and tracking, as well as leveraging the new Secure Sockets Layer (SSL) and providing improved options for working with firewalls.
- *Ease of use.* There are no other servers that match the ease of installation, set up, and operation of AS/400 servers. This advantage comes from the fully integrated system software that is preloaded on AS/400 servers before they ship. The most frequently heard complaint about AS/400 is that the green-screen menus look old, ugly, and awkward. By pairing AS/400 with the Host Integration Solution products, the system can be easily deployed into the Web environment with a very competitive look and feel. Additionally, different levels of screen enhancements can easily be developed to provide optimal usability for both expert users and novices.
- *Technical support.* One of the biggest problems companies face today is finding and keeping technical talent. AS/400 is easy to own and operate, and it requires less technical support than other servers.

With Host Integration Solution products, existing AS/400 applications and data can be easily and rapidly delivered to:

- Employees via a corporate intranet.
- Business and supply chain partners via an extranet.
- Customers via the Internet.

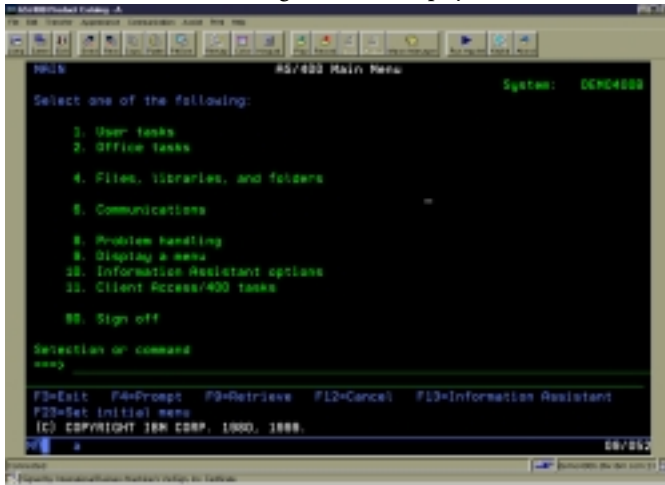
The Host Integration Solution

In this section, we will discuss in detail what each of the Host Integration Solution products is and what it does. The three products are Host On-Demand, Screen Customizer, and Host Publisher. Host Publisher will become available on AS/400 in February 2000.

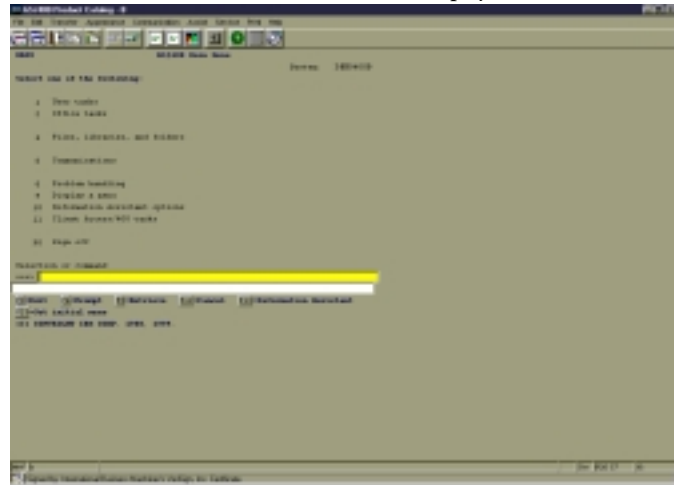
Host On-Demand

Host On-Demand is a Java-based terminal emulator product with 5250, 3270, and virtual terminal (VT) connectivity. It provides a 5250 display with a Windows look and feel inside a browser. Users can customize the fonts, the colors, and the

Screen 1: Host On-Demand green screen display



Screen 2: Host On-Demand standard GUI display



keyboard, just as they can with a PC-based 5250 emulator. Additionally, with Host On-Demand you can provide both a green screen and a standard GUI look and feel to users. (*Please see Screens 1 and 2*).

Another important feature of Host On-Demand is that it is installed on the server—in this case AS/400, using the native AS/400 install process—and not on individual PCs. Users are then given a URL, which they can add to their list of bookmarks in their favorite browser. Any browser with a functional Java Virtual Machine (JVM) can be used; no client-based installation is required. Host On-Demand essentially transforms a browser window into an AS/400 application display.

With Host On-Demand, users' configuration information (such as screen colors, keyboard maps, etc.) is stored on the server. Therefore, when users access their profiles from different PCs (such as in a new work area, remotely from a laptop or guest PC, or from home), any changes that were made to the configuration information will still apply—anywhere and from virtually any client. This is especially advantageous when users' PCs are replaced or upgraded; they won't need to rely on memory, nor will they waste any time trying to get their configurations reset to the way they liked them.

In addition to providing access to AS/400 applications, users can also:

- Upload and download files.
- Run queries (that they define, or that are created for them).
- Route printing from the AS/400 server to their local printer.

Licensing for the product is server based. Since no code is installed on users' PCs, providing access to users in other locations

or in other companies is much more practical than with any of the PC-based emulators on the market. The concern with whether or not it is legal for a company to maintain a license for software that is deployed in other enterprises is completely eliminated!

All of the Host On-Demand functions can be easily maintained by a system administrator who has full control over which users can access the system through the product and what options are authorized for each of those users. Each option can be individually set and locked in the users' host-based profiles. Therefore, one user may have a simple screen interface without any extra options at all other than one predefined query, while another user can run certain applications and reconfigure fonts and colors, but not upload files. And, a third user can have up to seven configurable sessions and be authorized to create a preset number of individual queries.

The administrator also maintains user profiles and passwords for each of the users who accesses the AS/400. This creates a separate control and logging point, which is especially important if access to multiple AS/400s or other hosts is being provided.

The impact of running a Host On-Demand server on one of the new AS/400 server models with V4R4 is fairly minimal. Performance on an older system could be more problematic. Fortunately, the Host On-Demand server doesn't have to be the same AS/400 that is running the applications and/or serving the data or printouts. The Host On-Demand code could be served from a separate AS/400 or from an RS/6000 or Netfinity server. The ability to put Host On-Demand on a separate server also provides some good options for positioning firewalls, which enhance security, and setting up remote servers as well as remote users.

Setting up and administering Host On-Demand takes far less expertise than setting up and administering CA/400, mostly because the administrator doesn't have to deal with, or understand, each individual PC's configuration. There are some new skills required in the area of setting up and monitoring HTTP servers. Anyone looking at moving into the world of e-business on AS/400 will find that this is a good first step as the same skills will be needed in follow-on e-business projects. You will also need to spend some time dealing with client performance issues. And, because the client piece is delivered with a fairly substantial amount of Java code, you will need to help users configure their workstations with permanent cache areas.

In summary, Host On-Demand delivers a full-function 5250 emulator and access to AS/400 printers and files without any of the headaches associated with installing and maintaining code on each user's desktop. It is an ideal step for deploying AS/400 solutions in an intranet environment. As you move towards full Internet solutions with external users, you will need to consider Host Publisher as an alternative.

Screen Customizer

Screen Customizer is a companion product to Host On-Demand that lets you tailor the look and feel of the screens that users will see on their PCs. Currently, Screen Customizer requires that either Host On-Demand or IBM Personal Communications be installed because it does not work as a standalone product. In February 2000, Screen Customizer will also work with CA/400.

As we mentioned in the last section, Host On-Demand produces either 5250 green screens or standard GUI displays, but does not allow you to customize screens. Host On-Demand also requires that users have a basic understanding of how to manipulate a 5250 application. With the Screen Customizer product, however, you can create push buttons, hot spots, radio buttons, and/or other special features so that users can deal more intuitively with the screens. Screen Customizer also allows you to enhance screens by hiding fields or combining fields from different panels onto one screen. (*Please see Screen 3*).

In addition to reformatting the screens with a more user-friendly graphical look and feel, Screen Customizer also allows you to:

- Add help text.
- Customize field defaults.
- Create drop-down list boxes for fields.
- Create better links from panel to panel to make real ease-of-use enhancements.

Screen 3: A customized screen created with Screen Customizer



- Quickly set up a consistent look and feel that spans all the applications the users access regardless of whether those applications are from the same source or from a number of different software vendors.
- Spend more time tailoring specific areas that need additional work without having to modify or customize every screen.

IBM calls the process of graphically enhancing your business applications *application rejuvenation* because you can create screens that are designed to fit the needs and comfort level of your employees, potential customers, and/or business partners. Screen Customizer tends to support this process far less resource-intensively than screen-scraping products that include a full build-and-development cycle, such as Seagull's J-Walk or Jacada's Jacada product. Newlook's Look product can be used dynamically, just like the Screen Customizer, but can't be deployed over the Web as easily.

Screen Customizer can be used with IBM's Personal Communications and CA/400 products. Therefore, if you need to support a mixture of users—some of whom want high-performance PC products that access the system directly and others who want to work through browsers and not deal with their own configurations—you can support both communities with one enhanced look and feel.

With Screen Customizer you can take a complex screen and simplify it by hiding fields that are not necessary for extending the application to new users. However, Screen Customizer was not designed to completely replace an existing application. Rather it allows you to simplify or customize complex screens to provide only the data necessary for end users to do their jobs. For example, an inquiry screen for a product may have both list

price and cost data. If you only want the user to see the list price, you can hide the cost field. Screen Customizer allows you to customize the application without changing it.

It is important to remember, however, that while Screen Customizer works reasonably well if the screens to your applications are laid out logically and the application flow was in good shape from the start, it will not fix applications that were poorly written. For example, an application that has screens modeled after the AS/400 operating system—with menus and clearly laid out panels—will be easy to enhance and customize. But, an application with screens that are esoteric and difficult for users to navigate will be difficult to convert into a usable view and may require redesign. An application in which users had difficulty navigating through 20 required screens and had to fill in every field to complete an order will still be viewed as unfriendly even after those 20 screens and input fields are given a new graphical look.

If you discover that almost all your screens need rearrangement, then a different product may be more suitable. While Screen Customizer does permit you to combine data from two different screens² into one Web page or to navigate under the covers through several panels, it is recommended that you only do these sorts of things occasionally because the more work Screen Customizer has to do behind the scenes to access and retrieve the data that is required, the longer it takes for the user to get a response. Therefore, if there are too many cases in which multiple screens have to be combined to make the application usable, you should consider redesigning the base application.

One advantage you will find with Screen Customizer is that you can very quickly prototype a new look and feel for your application set. If you discover the application needs to be redesigned, you won't have invested months of development time, and it will be relatively easy to adjust to a new level of Screen Customizer when the redesigned application is available. Also, because you don't have to change the base applications at all, you can build a common look and feel that spans both the application modules you own and those you purchased from someone else.

Screen Customizer is a nice approach to making an existing application more friendly and accessible. In most cases, however,

² It should be noted that while Screen Customizer allows you to combine data from two different screens that are located on the same server, it does not easily allow you to combine two different screens from two different servers. This is one of the areas that the Host Publisher product addresses.

it won't be the right answer for moving into full e-business. For example, in a retail business, the ordering process is technically the same whether an order is entered through the Web by a customer or internally by a customer service representative. The representative can be trained to access the order entry program and fill out all the correct inputs. Customers, on the other hand, are more likely inclined to access a shopping cart interface with pictures of what they are buying and cumulative orders. To fully support customers' needs, a new and full Web-based application should be considered—one that supports all the shopping functions and is then integrated into the order entry and inventory systems at the back end. This is one of the areas in which the Host Publisher product is well suited.

Host Publisher

Host Publisher on AS/400 will be available to customers beginning in February 2000. The product is comprised of two pieces: the Studio and Server. The Studio portion runs on any Wintel client (i.e., clients running Microsoft Windows 95, 98, or NT) and is the same product regardless of the server platform.

Host Publisher allows you to build HTML pages with integrated access to host applications and data using 5250, 3270, and VT protocols as well as relational databases and Java applets. These HTML pages are generated using a default look and feel that can be enhanced using any standard HTML page builder. Host Publisher also allows you to encapsulate screens or data access requests into Java beans that are accessed through Java Server Pages (JSPs) in WebSphere. The generated pages are accessible from any browser, and a Java Virtual Machine (JVM) is no longer required on the clients. As a result, performance becomes much easier to manage.

Host Publisher makes it practical to integrate traditional Web functions with access to information and applications on AS/400. Instead of completely transforming the browser window into a view of AS/400, information from AS/400 and bits and pieces of AS/400 panels can be pulled into browser pages that include lots of other information as well. For example, if you want to create a Web site that explains how wonderful your company is and lets the user run several predefined queries on last month's sales patterns, you could do that by designing your pages with Host Publisher and integrating data retrieved from the database using the JDBC driver that is provided. Or, if you wanted to build a system operator remote-monitoring facility, you could create a Web site that transparently signs onto AS/400 and pulls up a nicely customized copy of the command *Work with Active Jobs* (WRKACTJOB) under one of the Web buttons.

Host Publisher provides two major advantages over Host On-Demand. First, you can be much more selective about which AS/400 functions are being delivered. Second, all the Java code is deployed on the host rather than on the client; so performance is more manageable. By eliminating the need for Java support on the client, Host Publisher also enables organizations to reach a broader range of users over the Internet—this includes potential new customers. An HTML editor can safely manipulate pages created with Host Publisher in case you need the added functionality of a product like IBM's WebSphere Studio or Microsoft's FrontPage. A third advantage delivered by Host Publisher is the ease of accessing multiple systems (e.g., AS/400, S/390, etc.). Host Publisher allows you to create an HTML page that would allow a user to perform both a look-

up—on S/390—and then place an order—on AS/400—all on one screen without ever alerting the user to the fact that there were two servers behind the scene.

Performance and security both become important considerations when you leverage Host Publisher to build Internet applications for e-business or other e-business functions. Therefore, we don't recommend deploying Host Publisher and WebSphere on your mission-critical AS/400. Instead, serve the Host Publisher code from a separate AS/400, or from an RS/6000 or Netfinity server, and position a firewall between it and the mission-critical system for extra protection.

What are the Limitations of the Host Integration Solution?

Installing and implementing the Host On-Demand and Host Publisher products are not without some challenges. The following is a list of some of the problems we encountered and how we resolved them:

1. *Installation on AS/400 can be somewhat slow.* Since the AS/400 installation CD comes separately from the NT product (NT is where you design what users who access the AS/400 screens will see), it would be preferable to have an install process that leverages use of AS/400 Save Files. Fortunately, this is a short-term limitation because the products only need to be installed once.
2. *Administration of user profiles is awkward.* While the support for another layer of user profiles and passwords might be useful in a shop with multiple AS/400 systems, it acts as an extra irritant in a single-system shop that already has user profiles and passwords set up for each of the users. We suggest the creation of a batch process for creating profiles for all the users on a system. Setting them up individually through the browser interface is time consuming—especially on a system with hundreds of users.
3. *Administration of Secure Sockets Layer (SSL) is not user friendly.* This portion of the installation involves having to work through an esoteric list of Java commands that is both difficult and tedious. The administration interface needs to be enhanced with a direct way to create and maintain certificates for users

as well as provide accurate instructions as to how to fix the product when the certificates expire. Admittedly, the AS/400 implementation of SSL is not a user-friendly process from the start. And, when you move on to augment your e-business application portfolio with other products, you'll need to know how to deal with SSL directly. So, once you become more familiar with the AS/400 Java environment, it won't seem quite so esoteric. Our recommendation is to leave SSL for the later stages of your implementation. Don't deal with it at the beginning!

4. *Keyboard mapping is awkward.* It would be very helpful, especially in large shops, if there was a way to import a keyboard map from Personal Communications. Setting each key independently is not only tedious, but also prone to error. We found ourselves using the Screen Customizer to mitigate the need for keyboard mapping, which is probably the best long-term strategy anyway.
5. *Performance on a dial-in line needs to be optimized.* There needs to be a set of very clear instructions for optimizing performance on a remote line, including what line speeds are required to download Host On-Demand in a reasonable amount of time. For example, Host On-Demand is the type of product that systems operators may use on their laptops when working from home. Our recommendation is to be sure that the product is downloaded to the laptop while operators are at work and can take advantage of higher-speed lines

versus trying to download the product from home using an analog line. Otherwise, it would be best to install and leverage Host Publisher.

6. *No mass customization feature.* After configurations have been created for users, changes must be made manually to each

configuration. This gets tedious. Spend time with a few users so you know what you need in each configuration before you start building a lot of them. Hopefully by the time you need to do a mass change, there will be a tool available!

Wrap Up

The Host Integration Solution product trilogy provides a proactive, full-function step for an AS/400 shop to take into the world of the Web. It leverages both the existing AS/400 skill base and the existing solutions. It is somewhat easier to deal with than CA/400 and far more straightforward than setting up and maintaining a separate NT or Unix system as a server. Sometimes it is tempting to hire a college student or Web consultant to define and install a completely separate Web server system. The challenge tends to occur when access is needed between the Web site and the business system. While it is possible to print forms submitted to the Web server and key them manually into the business system, that method tends to be prone to error and subject to delays. A Web site with direct interfaces into the business system will be much better for the long term.

We recommend that you begin leveraging this trilogy of products with an internal project that will be deployed over a company intranet. That will give you time to refine your techniques and determine what is user friendly and what internal users deem is unfriendly—before you extend applications to your business partners and/or customers.

Before extending application access to the Internet and making it available to external users, plan to do a full security audit of your system. While the Host Integration Solution products will not add to your security exposures, they will not identify or close any security loopholes that already exist.

Because the product set is relatively inexpensive and easy to set up and use, you may want to order the Host Integration Solution products and experiment with them in a test environment. This will still be a useful experience even if you decide to move on to a more complex toolset. And, if you discover that the trio does meet your immediate needs, then it should be well worth the monetary investment.

Just be careful to keep your expectations realistic. If your existing applications are relatively usable and your databases are logically laid out with well-labeled understandable definitions, then the Host Integration Solution product trio will surprise you with how easily both your applications and data can be extended to users on PCs. Those users might not be much more productive than they were before the change, but they won't be any less productive—and they might be a lot happier.

On the other hand, if your application set did not already provide a reasonable set of features and functions, then the Host Integration Solution trio probably will not help and could potentially aggravate the situation with additional complexity. The basic rule is: if you start with a good application, then the Host Integration Solution products can help you quickly transform it into a suitable Web-enabled application. However, if you start with a bad application, the Host Integration Solution products will not magically transform it into a good application—just into a prettier bad one!

Also, do not assume that IBM's Host Integration products will be the end of the road for your foray into e-business. You may, at some point, buy or build a new WebSphere and/or Domino e-business application. Because the Host Integration Solution products are integrated with the WebSphere product, these solutions will be compatible and interoperable.

Remember, if the application interfaces are well designed, and transition pages are built to ease the flow, a user will not be able to tell the difference between new Web-based applications and the old RPG or COBOL application that has been front-ended with the Host Integration Solution trio. The system administrator will have a little more knowledge of which is which and should be able to easily provide operations support for all three products without too much difficulty.

Where to Go From Here

The following URLs will provide additional information as well as the pricing structure for the Host Integration Solution products:

- www.ibm.com/software/secureway
- www.ibm.com/software/network/hostintegration
- www.ibm.com/software/network/hostondemand
- www.ibm.com/software/network/screencustomizer
- www.ibm.com/software/network/hostpublisher

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