

**THE BENEFITS OF WEB-ENABLED  
APPLICATION PUBLISHING  
IN A TIGHT ECONOMY.**



**Access to Applications Anywhere.**

## EXECUTIVE SUMMARY

Faced with continued difficult economic realities and reduced budgets, corporate Information Technology (IT) departments are searching for ways to derive additional value from their investments in existing Windows and UNIX software applications. Organizations are looking to lower their Total Cost of Ownership (TCO) and accelerate their Return on Investment (ROI), yet still provide cost-effective, responsive access to applications for an increasingly mobile and distributed user base.

Likewise, Independent Software Vendors (ISVs) have invested heavily in traditional Windows and UNIX applications and have a pressing need to Web-enable these applications in order to stay competitive, expand their markets, and generate additional revenues under difficult market conditions. Reduced revenues and increasing time-to-market pressures mean that ISVs cannot usually afford the time and money it would take to reengineer their applications in order to create native Web-based solutions.

A cost-effective alternative for both of these market segments is to centrally deploy existing applications via a server-based application publishing solution. With server-based computing, mission-critical applications can be deployed, managed and supported from a centralized server and accessed by heterogeneous PCs and other mobile devices – without the need to rewrite the applications. Server-based, Web-enabled solutions have proven to be a reliable way to reduce the complexity and cost of enterprise computing, while increasing overall efficiency.

This paper will review the business challenges faced by the enterprise and the ISV, review the various alternatives for application publishing and server-based computing, compare the pros and cons of Web-based vs. Web-enabled applications, and review the leading solutions available on the market today.

## BUSINESS CHALLENGES

Corporate IT departments and ISVs alike are faced with a number of business challenges relating to today's tight economic conditions.

### Lowering Total Cost of Ownership

PC application software has grown dramatically in size and complexity in recent years. As a result, the cost of supporting and maintaining PC desktops has increased substantially. With IT budget pressures showing no real signs of easing up in the near future, IT departments today recognize that the total cost of ownership for the traditional distributed PC – taking into account the recurring cost of technical support, administration and user down time – has become unacceptably high.

### Serving Remote and Mobile Users

Today, remote and mobile users make up the fastest growing segment of computer users. Freed from the constraints of the traditional office, these users expect to access corporate information and applications from anywhere in the world, any time of day, from virtually any type of device. Instant communications among employees, customers, suppliers, and other strategic partners – no matter where they are – is becoming increasingly critical. With the rise in popularity of Internet-connected laptop computers – and the emergence of new wireless devices – users can choose from a wide selection of cheaper, simpler and more convenient devices for handling corporate and personal information. The challenge for IT and ISVs is how to quickly and cost-effectively extend existing applications to this new class of user, given current fiscal constraints.

### Deriving Additional Value of Existing Investments

IT has evolved over the past 50 years from being technology-centric to user-driven. Now, IT must transition from being a cost center to a value center in order to gain visibility and added funding within the enterprise. According to a 2002 research report from Robert Frances Group: “Traditionally, IT has been viewed as overhead versus a revenue-generating business unit such as sales... Now, IT executives are realizing that if there is not a shift in thinking and an ability to demonstrate the tangible business value contributed by IT services, their departments will be further scrutinized, and their budgets continually reduced.”

One important way for IT departments to show their value to the enterprise is to derive additional benefits from existing application investments. Giga Information group reports that most enterprises have dozens if not hundreds of traditional Windows and UNIX applications. By extending these applications to additional employees – as well as new users such as customers and partners – these users will have the resources they need to contribute to the company’s bottom line. By quickly and cost-effectively reaching new audiences, the enterprise will profit from new revenue opportunities – and will be well positioned to take advantage for future economic upswings.

### Providing Enterprise-Wide, Cross-Platform Application Access

Most enterprises contain a diverse collection of desktop computers, each with its own particular operating system, processing power and connection type. Windows desktops are the most prominent, but even here, different versions of Windows do not always support the same application. This is particularly true with custom applications. Also, UNIX desktops can frequently be found in engineering departments, while Mac desktops often populate the marketing department. Add to this the growing popularity of Linux, and the cross-platform access problem becomes ever more complex.

Consequently, it is becoming increasingly difficult to provide universal desktop access to business-critical applications across the entire enterprise. As a result, some organizations have resorted to desktop emulation software, new hardware or costly application reengineering in order to provide universal desktop access. However, most organizations today do not have the luxury of such open-ended spending.

As an example, a typical cross-platform problem for the enterprise is the need to access legacy UNIX applications from a Windows desktop. The primary solution to date has been to install local X Server software on the PC desktops. However, X Server software is difficult to install, configure and maintain – and requires substantial memory and processing resources on the desktop. Therefore, enterprises today are increasingly looking for cost-effective UNIX connectivity solutions for PCs and non-PC desktops that is easier and less expensive to administer and maintain.

## EVALUATING THE ALTERNATIVES

To meet these critical challenges and extend an existing application to corporate networks and the Web, several alternatives are available to the IT departments or the ISV:

- Reengineer the application for each of the different platforms (Windows, UNIX, Linux, Mac, etc.) and deploy a traditional distributed implementation for each one.
- Reengineer the application and create a native Web-based solution.
- Web-enable the application and publishing it via a centralized, server-based solution.

While the first option may have been viable in the go-go days of the 1990s, given today’s budget realities, it can effectively be ruled out for most organizations today due to the time and cost that would be involved in such a huge undertaking. That leaves the remaining question: “Which is better: Web-based or Web-enabled?”

### Web-Based vs. Web-Enabled Deployments

At first glance, rewriting the application for the Web may seem to be the desirable alternative – and currently some companies are following this route. Rewriting the application as a Web-based solution lets the enterprise or ISV preserve the application branding and the relationship with the end-users. However, reengineering an existing, stable application with an existing installed base is not always the best solution. This method can be a very costly undertaking – a serious problem in times of limited IT spending.

Rewriting an application also has the potential for introducing instability and added complexities into an otherwise stable program. What’s more, rewriting applications for the Web can mean introducing a static front-end to the application, sacrificing the rich interactive experience users have come to expect. This in turn usually leads to the need for additional user training to learn the new software interface. The greatest problem, however, may be the very long development and quality assurance time that re-engineered applications take – sometimes delaying the solution for years.

Web-enabled solutions, on the other hand, can be deployed without the need to rewrite or even modify existing applications (see Sidebar #1 entitled *The Server-Based Computing Market*). Instead, the application runs on a central server (hence the name “server-based computing”) and is published (or “served up”) over the corporate network or the Internet to remote devices such as terminals, PCs, workstations, notebooks, wireless devices, and systems configured with minimal memory.

As outlined in Sidebar #2 entitled *The Benefits of Server-Based Application Publishing*, server-based computing is a reliable, fast and efficient way to publish applications while reducing the complexity and cost of enterprise computing. The application itself executes completely on the server, guaranteeing high application performance for all users, including those accessing over low-bandwidth connections.

Giga Information Group concludes that: “Although Web-based computing has captured the mindset of developers and the market, the tremendous installed base of 32-bit client applications cannot be converted all that quickly. . . [Web-enabled] server-based computing will continue to have broad appeal as organizations attempt to simplify their IT environments.”

### Alternative Solutions for Web-Enabled Application Publishing

Many enterprises and ISVs have determined that the fastest, most cost-effective solution involves Web-enabled application publishing. Two of the more well-known solutions in this market segment are Microsoft Windows Terminal Services and Citrix MetaFrame.

- **Windows Terminal Services (WTS)** is a restrictive solution that provides multi-user remote access Windows applications only. It does not publish UNIX or Linux applications, nor does it support UNIX, Mac or Java clients. WTS remotes a new session of the Windows operating system for each new user, which can consume more system resources per server and lead to decreased scalability. The licensing of WTS is also restrictive. Users are typically licensed per user or device. This can lead to substantially higher costs for environments incorporating a large number of occasional users. WTS supports only limited concurrent license scenarios and can be expensive to implement.
- **Citrix MetaFrame**, on the other hand, is a highly complex, high-level, costly solution that introduces an entirely new level of application management infrastructure and complexity that must be deployed, monitored and maintained. This solution is not for everyone, and can be overkill for many applications. It typically requires additional user training, as well as added IT administrative resources. Citrix layers on top of WTS, which means it is subject to some of the same restrictions inherent in WTS. Furthermore, Citrix requires the licensing of both WTS and Citrix.

Due to these complexities and shortcomings, many IT departments and ISVs have expressed a desire for a solution that falls somewhere in between the extremes of WTS and Citrix MetaFrame. They report that what they really need is an application-centric, cost-effective solution that allows them to

easily and quickly publish applications to the corporate network or the Web without added complications. Such a simplified solution is available in the form of GO-Global from GraphOn Corporation.

### SIDEBAR #1: THE SERVER-BASED COMPUTING MARKET

*A recent 2003 market study by Giga Information Group predicts continued market growth and vitality for the server-based computing market segment. Giga cites the technology's ability to help enterprises immediately extend existing investments in traditional applications, reduce IT management costs, and eliminate the need to reengineer applications in order to create native Web-based deployments. According to Giga:*

*“Although pressure to reduce spending has led companies to carefully evaluate all IT investment decisions, SBC [server-based computing] can drive significant cost savings for application deployment and management, especially in distributed environments. Remote workers, telecommuters and mobile workers can benefit significantly by gaining access to desktop applications from a wide range of devices and connectivity options.”*

*Application publishing via server-based computing solutions can drive significant savings and benefits with a Return on Investment (ROI) of 25 to 45% compared to traditional distributed desktop environments in the following areas, according to Giga:*

- *Remote access to rich desktop applications, particularly from non-company-owned equipment (i.e., from partner and customer locations).*
- *Deployment of existing desktop applications in a distributed environment, particularly where IT resources at remote sites are scarce.*
- *Mobile applications access from wireless laptops, tablet PCs, and other full-form factor devices that can display desktop application screens.*

**SIDEBAR #2: THE BENEFITS OF SERVER-BASED APPLICATION PUBLISHING**

**Improved Management and Control:**

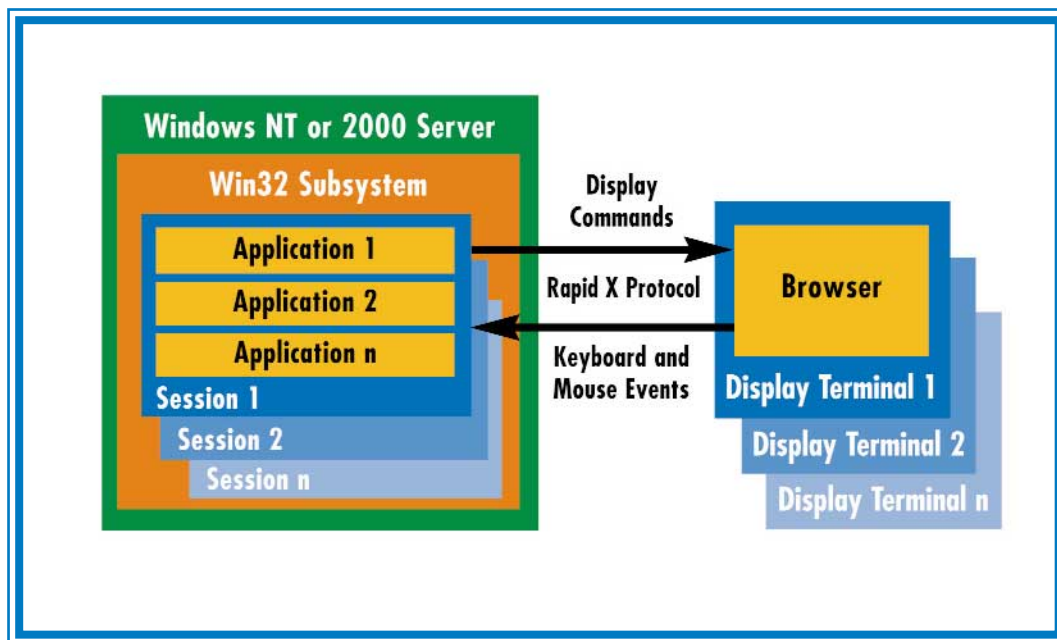
- All users run the same version of the identical application
- Mission-critical information remains secure on a central server behind the corporate firewall
- Application upgrades occur simultaneously from a central location
- Potential software bugs and viruses can be quarantined on affected servers
- Provides very rapid time-to-market

**Reduced Costs:**

- Elimination of reengineering costs
- Elimination of support travel time and related expenses
- Reduced hardware requirements (memory, processor speeds, etc.) for remote desktop configurations
- Standardized application deployment saves money on software licenses

**User Benefits**

- Instant access to applications from any platform
- Retrieve mission-critical information from anywhere
- Zero or near-zero client footprint



*Figure 1. GO-Global Application Publishing in a Windows Environment.*

*Unlike WTS, multiple GO-Global Windows sessions can run with a single instance of the Win32 subsystem. What's more, GO-Global publishes only the application's user interface, not the entire Windows desktop.*

## GO-GLOBAL: AN APPLICATION-CENTRIC SOLUTION

GO-Global is a cost-effective, application-centric solution that publishes Windows, UNIX and Linux applications to any client device, regardless of platform, operating system, device or location. Unlike Citrix MetaFrame, GO-Global does not require the installation and maintenance of WTS.

GO-Global is ideally suited for ISVs and enterprises that want a quick time-to-market, cost-effective solution to create cross-platform, Web-enabled versions of their existing applications. No extensions, add-ons, or code rewrites are required to run applications on Macintosh, Windows, UNIX, Linux, or Java-enabled Web browser-based desktops.

### How GO-Global Works

GO-Global is a straightforward solution consisting of three key components:

- The GO-Global server component runs on a central Windows or UNIX server alongside the server-based application and is responsible for intercepting user-specific information for display at the desktop.
- The GO-Global desktop component is extremely thin (virtually a zero-footprint client). It is responsible for sending keystrokes and mouse motion events to the server. It also presents the application interface to the desktop user. This keeps the desktop

very simple, as well as independent of application requirements for resources, processing power and operating system.

- The GO-Global Rapid X protocol enables efficient communication over fast networks or slow dial-up connections. It allows applications to be accessed from remote locations with local area network-like performance and responsiveness.

Unlike WTS, multiple GO-Global Windows sessions can run with a single instance of the Win32 subsystem. And GO-Global publishes only the application's user interface, not the entire Windows desktop. Publication of multiple Windows applications with GO-Global is illustrated in Figure 1.

## GO-GLOBAL ADVANTAGES

GO-Global enables IT departments and ISVs to publish Web-enabled applications quickly and cost-effectively without the need for additional infrastructure and complexity. It is an ideal solution in times of tight IT budgetary constraints. GO-Global benefits include:

### Lower Total Cost of Ownership.

GO-Global's server-based architecture lowers the enterprise's TCO by centralizing application deployment and management, improving security and virus protection, refining application license management, and increasing the productivity of administrators and end-users alike.

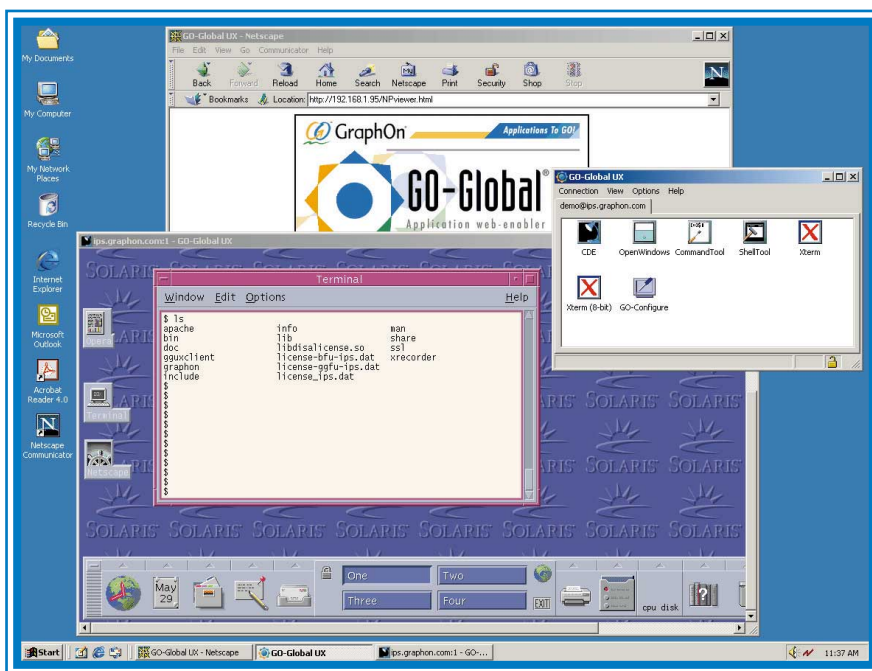


Figure 2. UNIX Applications Running on a Windows Desktop.

### Added Value and Expanded Opportunities.

GO-Global extends the value of existing applications. Web-enabled applications provide employees, partners and customers with the information they need to do their jobs and improve the bottom line. GO-Global also allows the enterprise or ISV to quickly and cost-effectively reach new audiences and profit from new revenue channels.

### Client Integration.

Applications published through GO-Global are seamlessly integrated with the user's desktop. Although applications are installed on a server, they look, feel, and perform as if installed locally on the client machine. Applications are accessed in their native format, with 100% of their existing features and functionality.

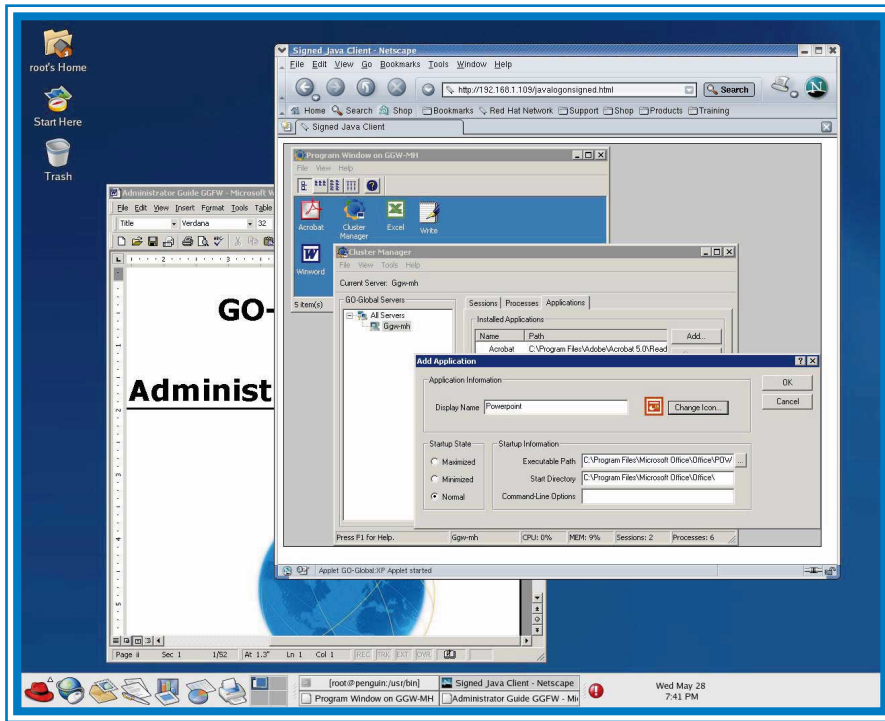


Figure 3. Windows Applications Running on a UNIX Desktop.

**Cross Platform Compatibility.**

With GO-Global, the enterprise can publish the same set of applications to all users, regardless of remote device hardware, operating platform, or network connection. For example, GO-Global publishes UNIX and Linux applications to Windows and Mac desktops without the need for local X Server software (see Figure 2). It publishes Windows applications to UNIX desktops without the need for WTS (see Figure 3). And it publishes Windows applications to Windows desktops which are running versions of the Windows OS not otherwise compatible with the application.

**Reduced Complexity.**

GO-Global is the simple solution with easy user administration. The GO-Global Server component requires less than one hour to install. As discussed above, the solution eliminates the complexities of WTS and Citrix MetaFrame. In UNIX environments, GO-Global eliminates the complexities of deploying and managing local and local X Server software (see Figure 4).

**Fast Remote Access.**

GO-Global's unique Rapid X protocol provides fast, efficient, local area network-like performance over all network connections, including low-bandwidth links and latency-intensive Web connections. The protocol efficiently extends the reach of

mission-critical applications to branch offices, telecommuters, and remote users.

**Increasing Efficiency.**

Unlike WTS, multiple GO-Global sessions can run with a single instance of the Win32 subsystem. Also, GO-Global publishes only the application's user interface, not the entire desktop.

**The Invisible Solution.**

GO-Global is totally invisible to end users. Web-enabled applications look and feel exactly the same as natively running applications. Without the need to rewrite applications, the IT department or ISV can easily private label the solution to promote existing ownership and branding.

**The Secure Solution.**

Unlike distributed applications, GO-Global's architecture retains applications and mission-critical data secure on the server behind the corporate firewall. Only the application's user interface is transmitted to remote devices. All GO-Global transmissions are fully encrypted.

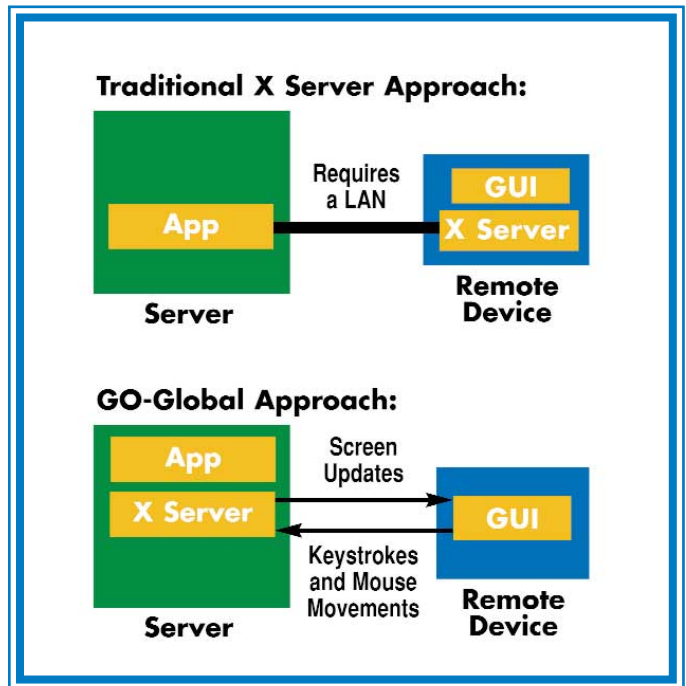


Figure 4. In UNIX Environments, GO-Global Eliminates the Need to Deploy and Manage Local X Server Software.

## CONCLUSION

This white paper has identified a number of ways to address the application publishing challenges faced by IT organizations and ISVs during times of economic downturns. Some involve lengthy reengineering efforts while others offer more immediate results. Since each real-world situation will be different – encompassing diverse computing environments, business requirements and fiscal constraints – the reader is encouraged to more fully explore all of the alternatives discussed herein before selecting a final solution. For more information on GO-Global, visit [www.graphon.com](http://www.graphon.com) or call 1.800.GRAPHON.



**Access to Applications Anywhere.**

400 Cochrane Circle, Morgan Hill, CA 95037 USA  
Phone: 1.800.GRAPHON or 603.225.3525  
Fax: 408.776.8448 • Email: [sales@graphon.com](mailto:sales@graphon.com)

**Europe:** GraphOn Ltd.  
Building A, Trinity Court, Wokingham Road  
Bracknell, Berkshire, England RG42 1PL  
Phone: +44.1344. 668534 • Fax: + 44 1344 668222

© 2003 GraphOn Corporation. All rights reserved. GraphOn, the GO logo, and GO-Global are trademarks or registered trademarks of GraphOn Corp. All other trademarks belong to their respective owners.