IBM
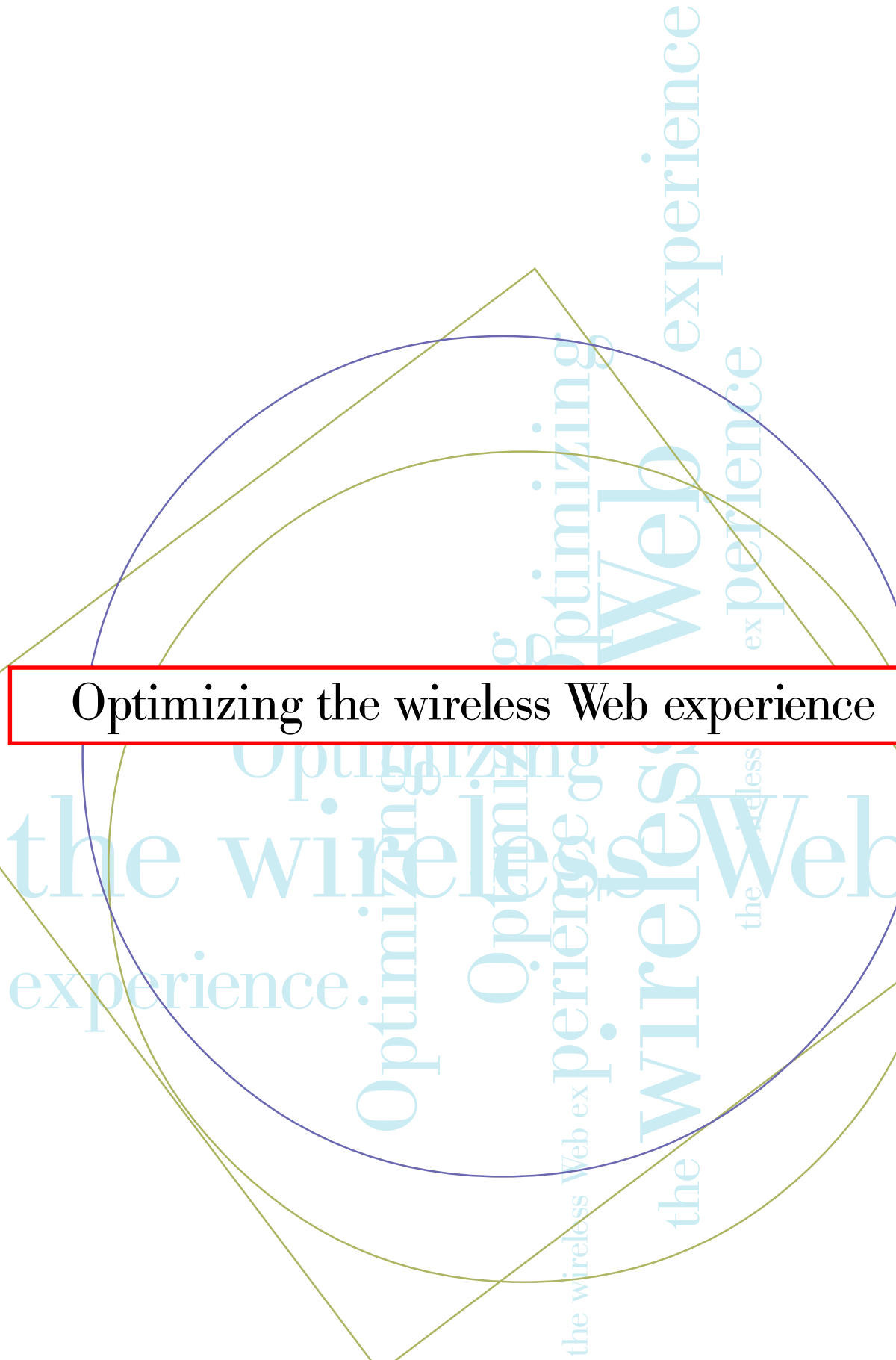
Optimizing the wireless Web experience

Computers have long been used to get information and perform business functions. When the Internet was adopted by the everyday computer user, the opportunity to communicate and interact for business and personal use exploded, to almost unbelievable levels. Now, that opportunity has gone a step further with the advent of pervasive devices, such as cell phones and personal digital assistants. The potential to do business and to share ideas is tremendous.

According to a forecast by International Data Corporation (IDC), by the end of 2002, the world will have more wireless subscribers capable of Internet access than it will have wired users. In fact, IDC predicts that almost 1.3 billion people worldwide will be plugged-in to Web-capable phones by 2004, compared to just 700 million people with ordinary Net connections.

However, the chief obstacle to ubiquitous computing comes from the technology itself. Multiple formats, markup languages, device capabilities and network constraints threaten to limit the promise of pervasive computing. The potential of e-business will be realized only when there is a way to bridge disparate data seamlessly, transcending multiple data protocols, devices and users.

IBM® WebSphere® Transcoding Publisher is the computer software solution to help simplify the complexity of the wireless Internet and enable universal access. Transcoding Publisher makes e-business fast, friendly and efficient.

Original image on Web site

Transcoded image

Original image on Web site

Transcoded image
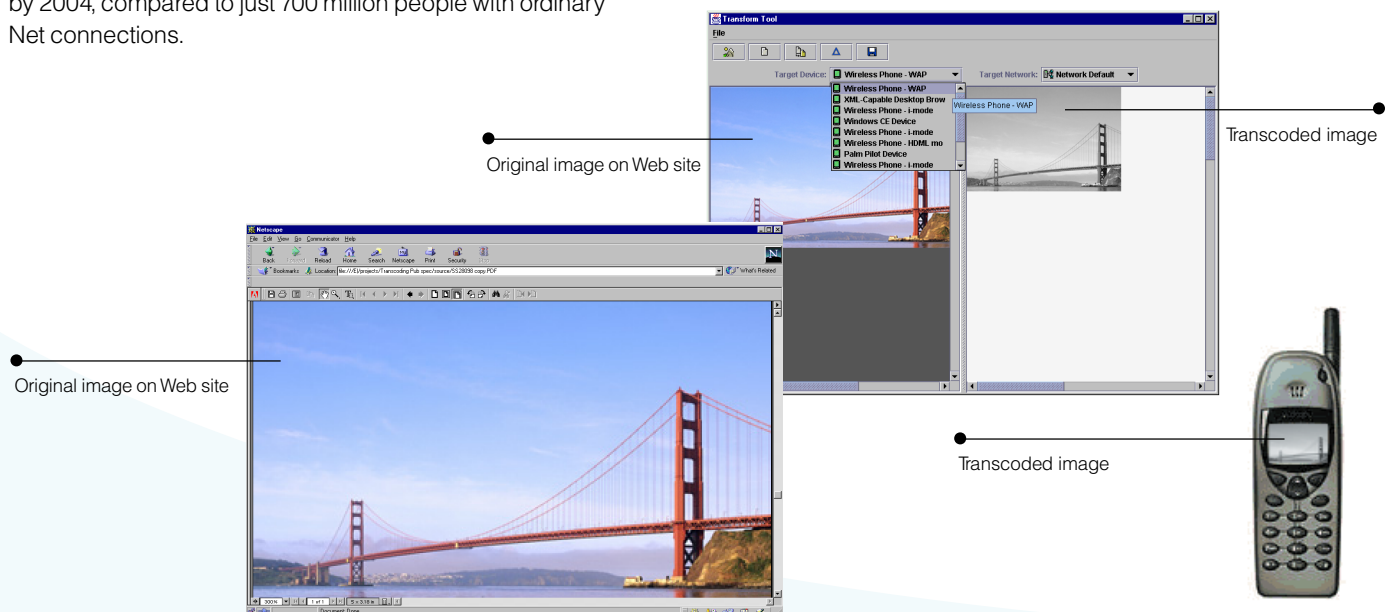
With IBM WebSphere Transcoding Publisher, you can dynamically adapt the content of your Web site for a wide variety of pervasive devices.

Extend the reach of content

WebSphere Transcoding Publisher propels your business to the second wave of the Internet — the wireless Internet — and helps ensure that your data and applications continue to reach customers in tomorrow's environments.

Transcoding Publisher helps manage the complexity of new devices and markup languages, allowing businesses to focus on their core functions. This flexible solution provides an easy-to-use, simple way for handheld devices, traditional personal computers and back-end systems to communicate and readily exchange data. By dynamically adapting existing content and transforming it for new environments, Transcoding Publisher:
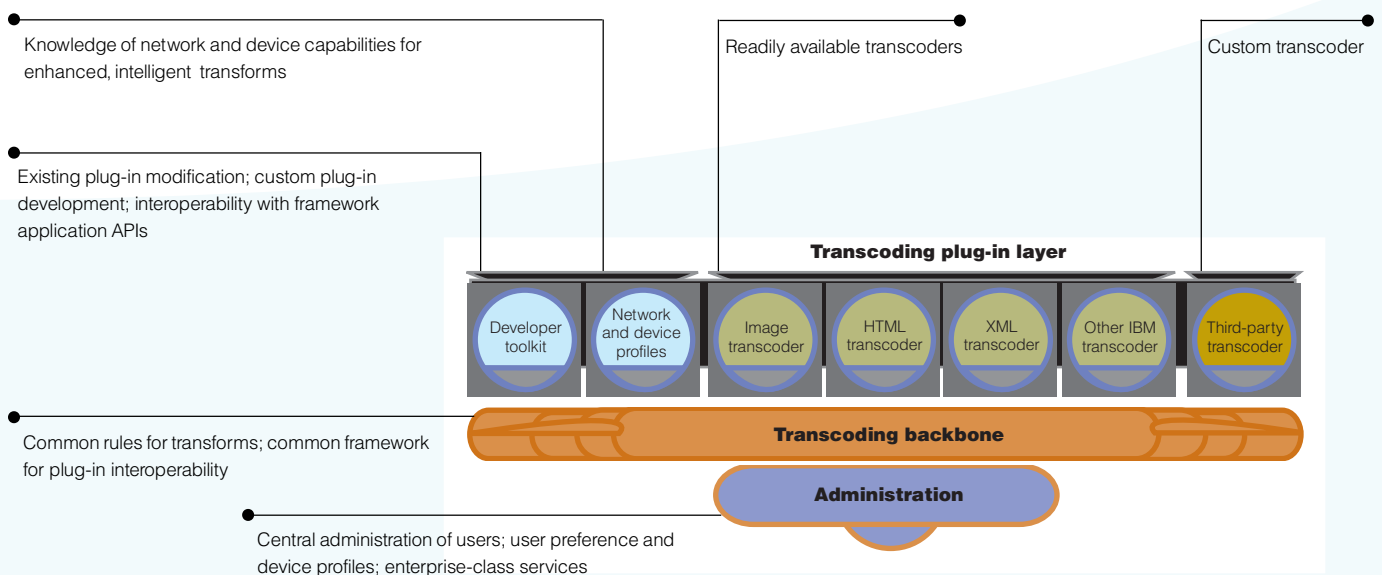
- Extends existing Web content to new devices, allowing you to reach new markets and provide new services without reauthoring

- Streamlines delivery so that content is provided efficiently to a variety of users across wireless networks

- Customizes content presentation for end users and helps enable more effective interaction with customers, partners and employees

Today, data is available from many sources, including host and Web applications, but the lack of a universal data exchange format limits companies and consumers from exploiting the true value of the information. Transcoding Publisher extends the reach of content by dynamically transforming data so that it is tailored for new environments, including the wireless Internet.

Enterprise content

There is substantial opportunity to extend the use of enterprise data by transcoding the formats and bringing the data out from behind host protocols, such as IBM 3270. As enterprises expand to new e-business markets and as their work forces become more mobile and widespread, easy access to enterprise data becomes even more critical.

With up to 80 percent of all business data residing on main-frames and other host systems, growing e-businesses need quick, easy and efficient ways to extend their data to Web users and to users on the new breed of pervasive devices. The answer is Transcoding Publisher, coupled with IBM WebSphere Host Publisher. IBM Host Publisher lets you implement Web applications, such as Web self-service, from existing 3270, 5250, virtual terminal, Java™ and JDBC™ host applications without modifying the host applications. Then, Transcoding Publisher takes that data and extends the reach to handheld devices by dynamically adjusting the data structures, formats and representation of the content. This IBM solution helps you leverage your existing IT assets, reach new markets and customers and to minimize costly development expenses or time-to-market delays.

Knowledge of network and device capabilities for enhanced, intelligent transforms

Readily available transcoders

Custom transcoder

Existing plug-in modification; custom plug-in development; interoperability with framework application APIs

Transcoding plug-in layer

Developer toolkit

Network and device profiles

Image transcoder

HTML transcoder

XML transcoder

Other IBM transcoder

Third-party transcoder

Common rules for transforms; common framework for plug-in interoperability

Transcoding backbone

Administration

Central administration of users; user preference and device profiles; enterprise-class services

Web content

The latest e-business trends require that your Web content be integrated, part of a larger solution that may include Web-based data from partners and suppliers. The challenge is that not all Web pages are created equally. Because HTML allows for variation in structure and language dialect, integrating Web-based information from multiple sources can be challenging and could involve a substantial amount of rewriting and reprogramming.

It is absolutely imperative to extend the reach of your Web content to users on nontraditional clients. Consider the mobile user who wants to get weather updates or perform bank transactions from a pervasive device, such as a cell phone or an automobile-based browser. The challenge is that Web content is written in HTML, not the specialized markup languages required by the new pervasive devices. The Web-savvy customer expects a solution today that provides a user-friendly experience and convenient access to information.

Transcoding Publisher solves this problem by dynamically bridging the different HTML structures, tailoring the content to the specific device—whether it is a PC on a low-bandwidth network, a cell phone or a Palm Pilot—and conveniently delivering the customized content to the user.

The standard transcoders that come with Transcoding Publisher handle the following transformations:

- HTML to Wireless Markup Language (WML)
- HTML to iMode (a variant of compact HTML)
- HTML to Handheld Device Markup Language (HDML)
- XML to XML variants through the use of XSL stylesheets
- JPEG images to GIF and wireless bitmap
- GIF images to JPEG and wireless bitmap

The standard Transcoding Publisher transcoders can be used independently or in conjunction with one another for more complex content transforms. Additional transcoders can be added, from third-party vendors, future IBM releases or customized in-house transcoders. The toolkit provides samples and documentation to allow developers to write easily pluggable transcoders.

For an overall Web serving solution, Transcoding Publisher is a natural complement to the IBM WebSphere Application Server. IBM WebSphere Application Server and related products are built on open, reusable technologies that can leverage your existing resources, shorten development cycles and ease your administrative burden. Together, Transcoding Publisher and WebSphere Application Server can deliver robust Web application solutions that can reach nontraditional clients, such as cell phones.

Transcoding Publisher is also a lead product component within the IBM comprehensive pervasive computing solution, WebSphere Everyplace Suite. Everyplace Suite combines into one package the necessary software ingredients that businesses, application developers and Web integrators want to accommodate the special needs of new devices and the end-to-end pervasive computing requirements. By integrating all the necessary software as part of an easy-to-install-and-deploy solution, WebSphere Everyplace Suite helps mask many of the complexities of supporting pervasive devices, allowing organizations to focus on what matters most to them.

Streamline the delivery

WebSphere Transcoding Publisher helps make accessing content across the wireless Internet quicker, easier and cost-effective by delivering only what you need, when you need it.

The new pervasive devices include cell phones, screen phones, voice-capable browsers and personal digital assistants, such as the Palm Pilot, IBM WorkPad® and handheld Microsoft® Windows® CE devices. Industry reports predict that the adoption rate for these devices will continue to rise at an accelerated pace. Both business and consumer users are quickly integrating these devices as part of their everyday business and leisure habits. In other words, it can no longer be assumed that a customer is using a traditional computer to access data and applications. To reach the same customer tomorrow, you may need to enable your applications and content for pervasive devices.

The challenge is to not only deliver data and applications in an e-business world filled with countless variables (nonstandard device types and markup languages) but also to deliver the content efficiently across the network. After all, the value of data in the mobile computing world is directly tied to the timelines and convenience of accessing the information. In addition, certain business realities, unique to the wireless Internet, must be taken into account. For example, it currently costs $3.47 (U.S.) to send a megabyte of data over the cellular network, compared with $0.013 (U.S.) over wired phone lines, according to the Mobile Wireless Internet Forum Coalition. Does this mean that users will prefer the wired Internet because of costs? No. The convenience and future potential of the wireless Internet is strongly compelling and end users continue to migrate to the wireless Internet in unprecedented numbers.

However, businesses need to streamline the delivery of their content to the mobile user so that the information is provided in a time-efficient and cost-effective manner. Businesses need to consider certain variables, such as:

- Network bandwidth (LAN, phone line, wireless)
- Network architecture and configuration
- Size of the data packet
- Ease of integration with other software applications

The capacity of the network influences the amount of content that is most efficient to send to the mobile user, for example. The specific network infrastructure will determine where and how the content transformation technology should be deployed in the network. The size of the data packet impacts the timeliness of the content delivery. And, the ease of integration with existing software applications affects the response time and effectiveness of the overall content delivery solution. All these factors point to the importance of a streamlined content delivery mechanism.

Japan's NTT DoCoMO, the country's largest phone carrier, has 12.6 million people using its iMode wireless data service, which already offers color and video over many phones.
– NTT DoCoMo Web site, *http:www.nttdocomo.com* 9/00

Customize presentation for end users

WebSphere Transcoding Publisher helps make communication across the wireless Internet more targeted, convenient and personalized.

Transcoding Publisher can help solve these challenges by streamlining delivery in the following ways:

- Converting HTML to simplified HTML
  Converting images to links to retrieve images; converting simple tables to bulleted lists; removing features not supported by a device, such as JavaScript™ or applets of Shockware files

- Reducing image scale and/or color level to make images smaller, easier to transfer and quicker to render on constrained devices

- Responding to the limited storage capacity of many WML, HDML and iMode phones by subdividing content into small sections that can be viewed more effectively on such phones — a process known as deck fragmentation

- Tracking network profiles so that the content can be transcoded according to network constraints

- Offering several flexible deployment options along the network (details follow)

- Allowing for quick extensibility as new standards, protocols, languages and devices continue to emerge, and with the open, pluggable framework of Transcoding Publisher, allowing for virtually seamless integration and continued ubiquitous data interchange

Not only does Transcoding Publisher extend content, but it also customizes end-user experience so that information is received effectively and in the most user-friendly fashion. Why is it so important to deliver a personalized view of content to the end user? The GartnerGroup predicts that by 2003, more than 30 percent of consumer-facing, application user interfaces will be designed to favor emotional experience over user efficiency. In other words, pervasive computing isn't about browsing the Internet but is about delivering unique content that is optimized for wireless devices and personalized for wireless Internet users. The primary driver for a wireless Internet user is time and convenience. Receiving only the information needed in a friendly, personalized manner is the ultimate objective of the wireless Internet user.

Transcoding Publisher helps enable you to customize the content that is delivered to end users in the following ways:

- Content selection
  Clipping. With some custom Java programming, clippers can be written to extract, or clip, select content to be delivered to the device. This allows a cell phone user to retrieve only the relevant portion of a Web page, such as the daily stock price from a corporate home page filled with other links.

  Annotation. Annotation makes it possible to tailor Web pages for a device without programming by using an XML-compliant annotation language for selecting and tailoring content.

- Stylesheets. With the application of XSL stylesheets, the specific XML content to be delivered to the pervasive device and the content view can be customized for the end-user environment. This helps facilitate business-to-business information interchange.

- Device profiles. A breadth of device profiles allows for more detailed device-level personalization of content. For example, Transcoding Publisher can recognize devices and respond accordingly with content that has the optimal format, size, resolution and so on, for each device.

IBM WebSphere Transcoding Publisher components

Developed from cutting-edge technology at IBM research labs, Transcoding Publisher consists of interrelated components that provide an open, extendable, standards-based platform for adapting data to the pervasive environment. The primary components include:

• A set of standard content transformations or transcoders

• An administration console with the ability to control device profiles and decision criteria for intelligent content modification

• A developer's toolkit that provides specific GUI-based tools, sample programs and detailed documentation to help the IBM customer add or build custom transformations

• A pluggable infrastructure that allows transcoders to leverage the same core services and enables new plug-ins to be quickly integrated as part of the product.

Transcoding Publisher runs on IBM AIX®, Windows NT®, Windows 2000, Sun Solaris™ and Linux®. It can be deployed in the following ways:

• A proxy or network server. This configuration can transform content coming from many different Web servers. The proxy configuration includes HTTP support because the proxy is intercepting HTTP requests and responses as they flow between the user and the Web server. This configuration cannot tailor content that is encrypted between the user and the Web server.

• A reverse proxy. This configuration can transform content coming from many different Web servers. It solves the difficulty of supporting devices that do not have a means for specifying a proxy.

• A servlet running on IBM WebSphere Application Server. This configuration associates Transcoding Publisher with content generated by a single Web server. The configuration does not include HTTP support because the Web server takes care of the HTTP protocol. It can tailor content before the content is encrypted and sent to a user. In this model, Transcoding Publisher can help deliver transformed content that is encrypted.

• A set of JavaBeans™. The JavaBeans configuration is the most flexible in the sense that it can run in essentially any Java environment.

The configuration flexibility allows Transcoding Publisher to be deployed at several points along a customer's network. Depending on the specific application and network configuration, one of these deployment options will prove to be more advantageous than the others. The following questions can help determine which deployment configuration is best suited for a particular environment.

Question	Answer	Configuration to use
Need to transcode from multiple sources?	Yes	The proxy configuration, as described above, can support standard HTTP requests and therefore can support content from numerous sources.
Need content transcoded in a secured environment?	Yes	The servlet configuration transforms content before it is encrypted and therefore supports existing security mechanisms.
Writing your own Java code?	Yes	Java programmers will want to take advantage of the JavaBeans configuration so that the transcoding functionality can be delivered in multiple applications and environments.
Need to reach devices that can't configure a proxy?	Yes	The reverse proxy configuration helps solve this difficulty.

Solutions

The value of Transcoding Publisher applies across numerous industries and company types. The following list represents some examples of how Transcoding Publisher can be applied.

- *Financial services delivered to handheld devices*
  Banking and finance companies delivering online fund transfer, stock brokerage services and account management services to customers on mobile devices.

- *Realtime travel itinerary updates*
  Airlines delivering realtime itinerary updates to travelers en route. The logical assumption is that these customers are mobile and that mobile, handheld devices are the most effective way to communicate with these users.

- *Enabling mobile employees*
  Sales representatives who work in the field accessing the same information that is provided on the company intranet and entering valuable data from the field.

- *Customized content services option provided by telcos or Internet service providers*
  Service providers attracting customers by providing mobile access to information. WebSphere Transcoding Publisher provides virtually seamless access to Web content from handheld devices. In addition, Transcoding Publisher adapts the data so that it is presented in a user-friendly fashion.

Outlook

Transcoding Publisher incorporates cutting-edge technology from renowned IBM research labs, including Almaden, CA, Hawthorne, NY and Tokyo. As e-business evolves, the need for such solutions will only grow. For example, research on voice conversion and machine translation is already opening up new possibilities. The ever-changing pervasive computing world requires a flexible solution, such as Transcoding Publisher.

For more information

To learn more about WebSphere Transcoding Publisher, visit the product Web site at

ibm.com/websphere/transcoding

IBM