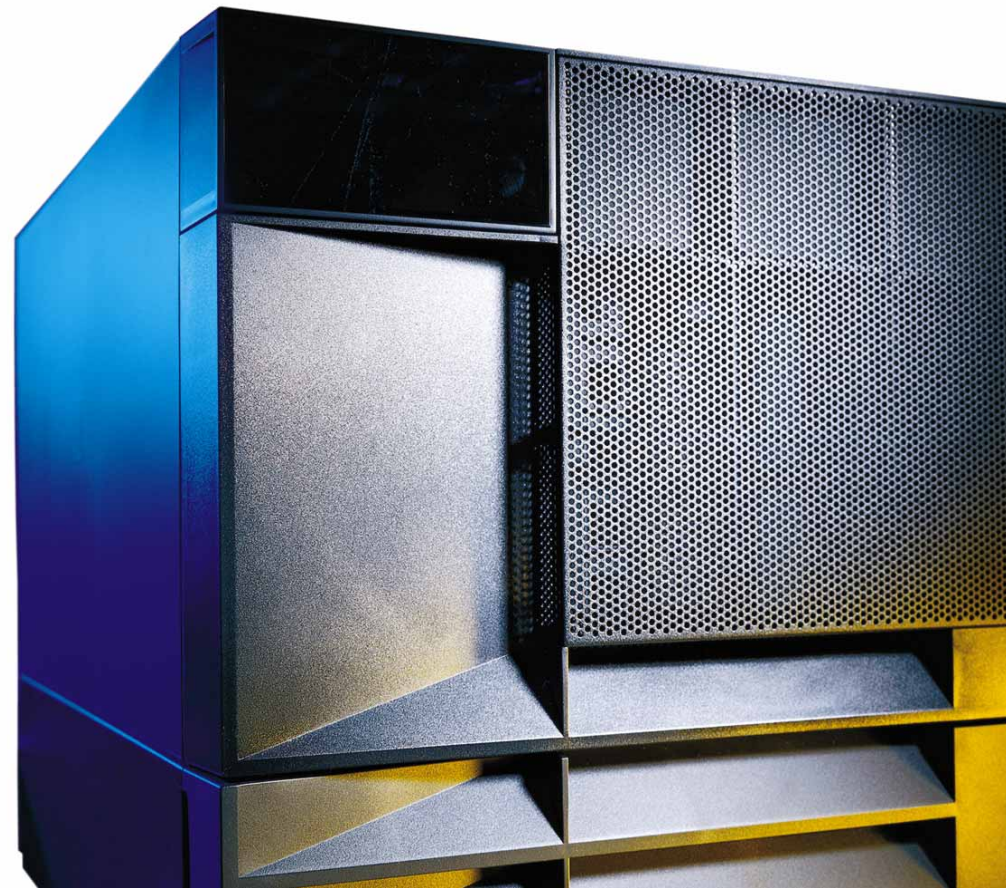
Special Report

IBM transcoding solution and service

Extending the reach and exploiting the value of data



e-business

Transcoding extends the reach and exploits the value of data across multiple platforms, computer languages and information appliances.

As e-business evolves, we constantly see new opportunities to leverage its potential. Today, data is available from both legacy systems, like IBM® 3270, IBM 5250 and IBM CICS®, as well as from Web servers. But because there is no universal interchange data format, companies and consumers are often prevented from exploiting the true value of this rich data. Businesses are searching for a way to make disparate data seamlessly integrate into and transcend multiple data protocols, languages, devices and users.

To facilitate data communications, we need to have a mechanism that enables universal access. This mechanism is IBM transcoding solution and service. Transcoding makes e-business faster and friendlier, improving the way we do business.

So far, e-business has meant Web transactions that take place on laptops and desktops. But with the advent of pervasive computing, e-business is being conducted from many kinds of devices. Personal digital assistants. Cell phones. Smart phones. Screen phones. Auto PCs. So, the need to manipulate and access all types of existing enterprise data from everywhere, with every kind of device, becomes more and more crucial to successful e-business. The ability to deliver data and applications to these devices helps companies expand their customer bases, improve processes and streamline supply chains. Transcoding enables enterprises, telephone service providers and Internet Service Providers (ISPs) to leverage all of their data assets—regardless of disparate protocols, languages and formats—so e-business content can be delivered effectively, efficiently and economically, to anywhere, and to any device.

What is transcoding?

Computers, of course, are not inherently intelligent; they need to be told exactly *what* things are, *how* they are related and *how* to deal with them. Clearly, a simple way for computers to communicate and readily exchange data is needed. And transcoding is a key element in that solution. Transcoding is the process of transforming the format and representation of content. Enterprise and Web content may be filtered, transformed, converted or reformatted to make it universally accessible by a plethora of devices, to exploit specific application requirements for customized content and to personalize general content. What all of this means is that enterprise data and applications or Web-based data can be leveraged by multiple users with multiple devices in a manner that's seamless across the network and is tailored to the specific user and device.

Transcoding can extend the reach and value of data in the following domains:

Enterprise data: There is a vast repository of data available on the Web; there is an even larger repository of business information, such as enterprise data, available on legacy systems. There is a substantial opportunity to extend the use of enterprise data by transcoding the formats—bringing it out from behind legacy protocols. As enterprises expand into new e-business markets and as their workforces become more mobile and widespread, easy access to legacy data becomes even more critical.

Pervasive devices: The devices that belong to the pervasive computing class include: PDA devices such as 3COM Palm Pilots, IBM WorkPad® and handheld Microsoft® Windows® CE devices; and other devices like smart phones, screen phones and voice-driven car browsers. These devices vary in terms of their input and output interfaces, screen real estate and processing capabilities. Transcoding is needed to tailor data to these constrained devices and reach a growing number of users—corporate and consumer—who are incorporating these devices into their work and purchasing habits.

Personalization: With the proliferation of tailored Web pages, users have become accustomed to particular interfaces, presentations and preferences. Transcoding applies user and device preferences, taking into account the various computer and network environments and devices. As a result, personalized transcoding increases the user's comfort level, efficiency and productivity.

New standards: As new standards, protocols, languages and devices continue to emerge, the open, pluggable framework of transcoding will allow for seamless integration and continued ubiquitous data interchange.

The challenge is to deliver data and applications in an e-business world filled with countless variables, including:

- Enterprise data
- Network bandwidth (LAN, phone line, wireless)
- Network latency (milliseconds to seconds)
- Computational power (CPU speed, available memory)
- Device output capabilities (small screen size, gray-scale screens, speech, full displays)
- User input capabilities (none, voice, pen, buttons, keyboard)
- A wide range of application markup languages (HTML, industry dialects of XML, WML)

IBM transcoding service is a server-side infrastructure that modifies content presented to users based on data protocols, computer languages, device constraints, network constraints, user preferences and organizational policies. The transcoding service not only transforms the data format but tailors content to match device and network constraints; it also considers user preferences and organizational policies to deliver personalized content.

The transcoding service contains:

- A set of basic content transformations or transcoders
- Centralized control of user profiles and preferences for intelligent content modification
- A developer toolkit for adding custom transformations, reducing the need to maintain multiple versions of data or applications for multiple devices types
- A pluggable framework so that custom transformations work with existing ones and leverage the same core services

Content transformation mechanisms

The transcoding service comes with a set of basic content transformation mechanisms that include:

- Modifying HTML documents, such as converting images to links to retrieve images; converting simple tables to bulleted lists; removing features not supported by a device, such as Java™ script, applets or Shockwave files; removing references to image types not supported by a device; and removing comments
- Transcoding GIF and JPEG images by reducing scale and/or color level to make images smaller, easier to transfer and quicker to render on constrained devices
- Converting JPEG images to GIF images for devices that only support GIF images
- Translating from one XML DTD to another by specifying the input DTD, output DTD and an XSL stylesheet. This facilitates business-to-business information interchange as well as support for pervasive devices by translating from industry-specific DTDs, such as a real estate XML DTD, to standard formats, such as WML, appropriate for display on a smartphone
- Defining profiles for preferred transcoding services for an initial set of devices, such as the 3COM Palm Pilot III using versions of HandWEB, handheld Windows CE devices using Pocket Internet Explorer and WAP-enabled phones using WML viewers

Other content transformation mechanisms could include:

- Sophisticated content analysis (for example, type and purpose detection)
- Sophisticated content selection (selecting content based on authoring intention, device constraints and additional policies adminstered by the server/proxy)

- Video skimming (2-hour to 10 minutes), video-to-image/key frame conversions
- Text-to-speech synthesis, speech recognition
- Text summarization
- Language translations

The transcoding service is currently being tested on Windows NT® and IBM AIX®. Platforms we intend to consider in the future include Sun Solaris, Linux and IBM S/390®.*

Customized transformation mechanisms

In response to the tremendous variations in device types, network types and application markup languages, the transcoding service needs a toolkit to allow businesses to develop customized transformations. For example, they may want to:

- Define profiles for additional devices, such as speech browsers or screenphones
- Transcode image types other than GIFs or JPEGs, or transcode images in different ways
- Transcode additional MIME types, such as video and audio clips
- Add new source and target XML DTD combinations with associated XSL style sheets
- Convert from additional input markup languages, such as proprietary markup languages
- Convert to different output markup languages, such as Compact-HTML or speech markup languages
- Add transformations for specific HTML or XML tags as element or tag handlers

Device manufacturers can use the toolkit to add support for new devices; application providers to add custom mechanisms unique to their applications; and solution providers to help enterprises deploy e-business applications to users with an array of different devices.

Transcoding service deployment
The transcoding service can be deployed as :

- A proxy or network intermediary. This allows a single transcoding service to tailor content coming from many different Web servers. This configuration includes HTTP support, since the proxy is intercepting HTTP requests and responses as they flow between the user and Web server. This configuration cannot tailor content that is encrypted between the user and the Web server.

- A servlet running in a Web application server, such as IBM WebSphere™ Application Server. This configuration associates the transcoding service with the content generated by a single Web server. This configuration does not include HTTP support, since the Web server takes care of the HTTP protocol. It can tailor content before the content is encrypted and sent to a user.

Additional configurations being looked at include*:

- Proxy implementations with the transcoding service integrated with the Apache Web server or Web Traffic Express proxy.

- Replacement of the HTTP protocol component by alternative protocol implementations, such as an implementation of the POP3 mail protocol.

Synergies of IBM offerings
IBM transcoding service leverages IBM SecureWay® On-Demand Server to manage and acquire configuration information, user preferences and organizational policies. It can be configured and administered from the On-Demand Server console. A standalone OEM package will also be available.

For more information
To learn more about IBM transcoding solution and service, contact Carol Dullmeyer at 919 254-2584 or e-mail cdullmey@us.ibm.com

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