

tificates are discussed. This section also stipulates that organizational requirements must specify independence, third party character and specialization.

SERVICE REQUIREMENTS

This section specifies requirements for guaranteeing security relating to five services that constitute the certificate management service, which is the basic service of CAs: management of the keys of CAs, issuance of certificates, registration and publicizing of certificates, storage and management of certificates, and revocation of certificates. For example, in view of the serious consequences of leakage or theft, private keys of CAs must be stored in an independent special module with high storage capacity, and in an environment that does not allow illegal removal of the storage module. Auditing of certificate issuance are also discussed. The personal verification of the applicant must be divided into three levels and that personal verifications should be conducted according to these levels.

FACILITIES AND SYSTEM REQUIREMENTS

This section specifies that requirements conform to measures classified under group A of the "Information Systems Security Measures Standards", which were announced by MITI in August 1995 and the instruction manual was published by the Information Service Industry Association in October 1996. Group A requirements relate to information systems that affect people's lives, the property of others, privacy and other social elements.

FORTHCOMING SCHEDULE

ECOM is requesting that member companies and other relevant parties offer their comments regarding this guidelines draft. At the same time, the guidelines will be applied to the electronic commerce tested projects sponsored by MITI (Ministry of International Trade & Industry), with the results of these test operations to be incorporated in the guidelines. The final version, based on opinions obtained from various sectors, is scheduled to be prepared and announced by March 1998.

PLATFORM TO PUBLISH AND RETRIEVE MULTILINGUAL INFORMATION ON THE WWW

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ABSTRACT

Asia, today, is the fastest growing economic region in the world. With the booming economy in Asia, there is a growing demand for IT and the use of the Internet/World Wide Web in the region. Although over 80% of all content presently on the Internet and World Wide Web are western-focused, a few - but growing explosively - web sites which host native languages (Chinese, Japanese, Korean) are now emerging. As more and more end-users in this region are introduced to the Internet, inevitably there will be a stronger demand for non-English information online. Star+Globe Technologies, Pte. Ltd., is a Singapore software company with a mission to be the preferred supplier of multilingual products to information providers and consumers to enable information sharing and retrieval in a multitude of languages.

This paper will examine the technology components, the users' and the providers' needs, benefits derived from multilingual information, and the business climate which stimulates this growing segment of WWW information processing.

INTRODUCTION

The adoption of Internet in Asia is accelerating. In a recent April '96 survey by Survey Research Singapore, 291,000 people use the Internet, and this number will double in the next 12-15 months. Similar Internet growth rates are currently in countries where Internet services are privatized, and will occur in countries as they begin to offer Internet to the masses.

The explosive growth of World Wide Web from both information providers and users has created a new means of disseminating and acquiring information from all corners of the world in a highly efficient way. It also represents a new way for peo-

ple to communicate with one another using many different languages, though English is still the main language used. The Internet is virtually a global village where distance is no longer an issue, and people all over the world are interacting with one another. Today, any single home page may be viewed by an American, a Chinese, a Japanese, a Korean, a Thai, a French, an Italian, an Indian, etc. While it is not practical to provide a same piece of information in hundreds of languages, it is desirable to address an audience with his preferred languages. Thus, it is the desire of information providers to deliver information in as many languages as possible to appeal to a larger audience on the Internet.

Of course, in Singapore and in Hong Kong, the Chinese language is very relevant. In just the ASEAN region, there are over 49.3 Million Chinese speakers in this region. That's a big number, by anybody's standards. This number is even more impressive if we add in the Chinese speakers in PRC, in Europe, and in the U.S. Publishing and retrieving Chinese information on the WWW is possible, but there are a number of challenges related to the display, inputs, and the character set support of the publishing platform and the retrieval platform. Challenges in dealing with both the simplified and traditional written scripts and the efficient delivery of this information to reach the greatest number of audiences must be addressed. How do people retrieve information off the network in their native language?

One solution, of course, is to use the localized version of the Operating System. Microsoft and other system vendors release special language-specific versions of their operating system software for native markets to enable processing of information in that native language. These re-

leases track fairly close to the original English versions of the operating systems and enables Chinese speakers to retrieve Chinese information, Japanese speakers to retrieve Japanese, etc.

Fortunately, a better solution is now available, from various Multilingual Technology software vendors worldwide, including Singapore's own homegrown Star+Globe Technologies. Star+Globe Technologies, and others like it in this field, offer 'enabling software' which transform your PC desktop into a full multilingual PC, without installation of special, localized versions of the operating system. This important technology element is important to the PC user and to business worldwide. Star+Globe also offers product solutions to address the needs of the information providers, to enable Chinese and other non-English information to be published on the WWW.

PUBLISHING CHINESE INFORMATION

A key element to address when publishing multilingual information is the issue of Character Sets. Today, on-line Chinese information is encoded in a variety of code pages including Big5 for Traditional Chinese and GB for Simplified Chinese. In addition, a new universal character set called Unicode is endorsed by major computer vendors worldwide including IBM, Microsoft, Sun, Apple, etc. Unicode, as its name implies, is an international standard for a universal character set capable of encoding over 150 different scripts from the world, including both Chinese languages. Hence, a platform for publishing Chinese information must address Big5 and UTF8 (Unicode) for Traditional Chinese, and GB and UTF8 for Simplified Chinese.

Star+Globe Technologies has developed a full range of tools to enable information providers to publish multilingual information. One of Star+Globe's clients, the World Chinese Business Network, has used these tools to create a World Wide Web application which provides the information completely in English, Simplified

Chinese and Traditional Chinese. World Chinese Business Network was created by the Singapore Chinese Chamber of Commerce and Industry, in collaboration with many regional Chambers of Commerce.

WORLD CHINESE BUSINESS NETWORK (WCBN)

The main objectives of the World Chinese Business Network are as follows:

- ◆ to provide easy access to a vast variety of up-to-date on-line World Chinese business information which is essential for a successful business;
- ◆ to provide the same piece of information in different languages - according to the user's preferences - in a multilingual environment to appeal to a larger set of web users;
- ◆ to provide a flexible and intelligent retrieval mechanism for the users to get the right information at the right time in their preferred language.

Figure 1 shows the World Chinese Business Network and its URL location.

The World Chinese Business Network had to consider the following issues: firstly, the tools used to create the homepages; secondly, how to handle multiple internal codes for both browsing and data entry for multiple languages; lastly, the language switching control. WCBN has chosen Star+Globe's multilingual tools to implement their Chinese information publishing platform.

The Multilingual Application Support Service (xMASS) on Unix and its Windows version WinMASS from Star+Globe, provide Unicode support on Unix, Windows 3.11 and Windows 95 platforms. xMASS provides a comprehensive code conversion engine to convert from Unicode to many existing code standards, and vice versa. Since the web server for WCBN is



Figure 1
World Chinese Business Network

Downloaded By: [Schmellech, Volker] At: 10:56 11 March 2010



Figure 2
WCBN in English, Traditional Chinese and Simplified Chinese

on Unix, xMASS was chosen as the multilingual support tool to create and auto-generate homepages in different code standards. On the users' side, WinMASS provides browsing support for information presented in Unicode and other code standards on the Windows platform. In the Windows environment with WinMASS running, users are able to view homepages in Simplified Chinese and Traditional Chinese concurrently if UTF8 is selected. Figure 2 shows the main home page of WCBN in English, Traditional Chinese and Simplified Chinese.

As mentioned in the beginning, many existing code standards and new code standards such as Unicode will co-exist for the foreseeable future. It is therefore necessary to design web pages to address backward compatibility issues. Users with a system which supports older encoding need to be able to view the Unicode web pages. Users with systems which support Unicode need a browser with richer capabilities to enjoy mixing and switching of language information on the same web page. Therefore, an effective Chinese publishing platform must use Unicode (in UTF8 format) for both Simplified Chinese and Traditional Chinese, and also GB and Big5 for Simplified Chinese and Traditional Chinese respectively.

Star+Globe's unique solution provides for the ability for the information provider to create only a single master copy of the Chinese pages to cover all the above permutations. The information server uses the xMASS code conversion and script conversion (from Simplified Chinese to Traditional Chinese) engines to auto-generate Simplified Chinese in UTF8 and GB and also Traditional Chinese in UTF8 and Big5 from the Master Copy.

In addition to addressing the major challenges of having web pages in multiple character encoding and a variety of issues including unconvertible characters and language input, xMASS also addresses the problem of script conversion with 1 to N mapping. This particular prob-

lem deserves special mention since the Traditional Chinese and Simplified Chinese conversion topic is of particular relevance here as 1997 approaches.

SCRIPT CONVERSION WITH 1 TO N MAPPING

When generating the Traditional Chinese pages from a single master copy, which is in Simplified Chinese, there is a 1 to N mapping problem. MASS script conversion converts Simplified Chinese to Traditional Chinese and vice versa. This script conversion is an intelligent conversion which will pick the correct mapping according to the phrases. For example, the 发 (hair and happen), they are 髮 and 發 respectively in Traditional Chinese.

Finally, an effective publishing platform must also address the retrieval needs of the users. A simple mechanism which allows the user to designate which language in which character set to retrieve the information is necessary as the ability to view the information is dependent on the language capability of the user's platform. Star+Globe's xMASS toolkit is bundled with a language menu to allow the information to be retrieved in the necessary format and language accessible by the user's choice.

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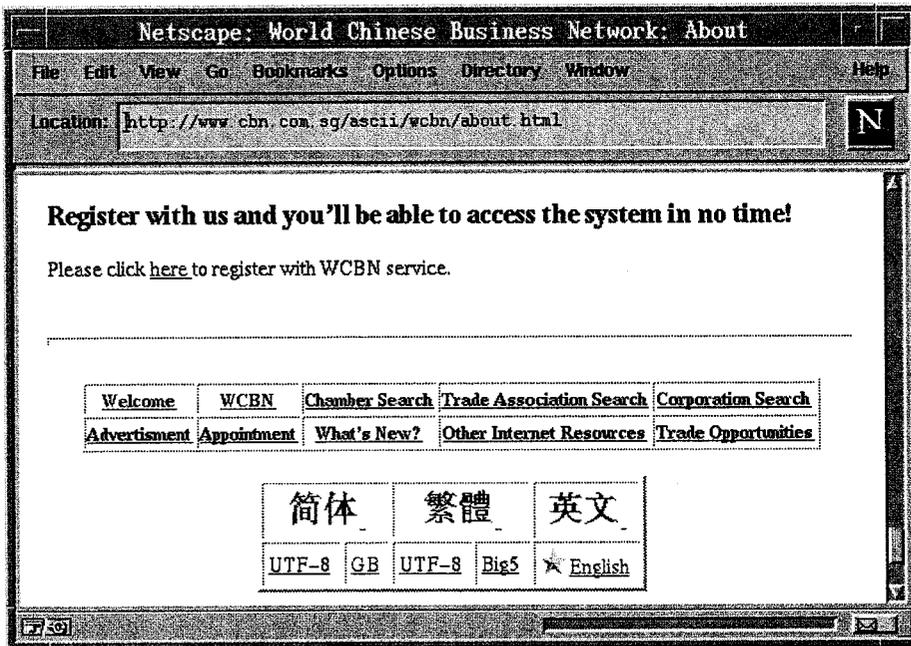


Figure 3
WCBN Language Menu

When providing pages in different languages, it is also necessary to provide a mechanism which allows the users to switch the languages easily from any page. In WCBN, there is one language menu at the bottom of every page, as shown in Figure 3. In Figure 3, we can see that the language menu allows the users to switch to UTF8 or GB Simplified Chinese, or UTF8 or Big5 Traditional Chinese pages. A golden star clearly indicates the current selection.

HOW TO RETRIEVE THE CHINESE PAGES

Users will also need a WWW browser which can support the browsing of the WWW in the languages they want. For subscribers, besides the language support system and the browser, information providers can also equip them with a set of applications, which can provide another means of browsing or getting multilingual information.

Star+Globe Technologies offers a complete range of end-user products which add an enabling layer to the user's PC computing platform to allow multilingual information to be retrieved in the user's browser of choice. Our end-user product deployed in the WCBN is the WinMASS Lite product. The product is capable of browsing

multilingual information, including Chinese (both traditional and simplified), Japanese, Korean, and of course, the Western languages. In addition, the product contains input method support for both Traditional and Simplified Chinese. It is used as an enabling layer to all the popular Microsoft Windows applications including Netscape Navigator, Microsoft Internet Explorer, and Microsoft Word. This paper, with the Chinese characters, is created using Microsoft Word and WinMASS which enables Word to input, display, and print the Chinese characters.

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Republic of Singapore. She held various senior management positions at Unisys Corporation for over 15 years, most recently as Director of Technology. Ms Cha has a B.S in Information Computer Science from the University of Hawaii and speaks Cantonese, Mandarin, and Thai in addition to English.

CONCLUSION

Web page information providers must address the following needs when creating and publishing multilingual information:

1. Character Sets
2. Language Pairs
3. Conversion and Translation
4. Retrieval Platforms

Star+Globe Technologies supplies xMASS and WinMASS products which address both the information server's needs and the client browser's needs in publishing and retrieving multilingual information on the WWW.

xMASS solves the following challenges for the information provider:

- ◆ Data Entry for Multiple Languages
- ◆ Multiple Internal Codes
- ◆ Unicode
- ◆ Code Conversion
- ◆ Script Conversion
- ◆ 1-N Mapping
- ◆ Language Menu

WinMASS solves the following challenges for the information user:

- ◆ Browsing
- ◆ Input Method Support
- ◆ Enabling Layer for Popular Microsoft Windows Applications