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## **A historical background, current activities and issues of Internationalized Domain Names**

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### Summary

As far back as 1996, we have documented evidence of public technical discussions of the internationalization of domain names (IDN) where issues of how to upgrade the Domain Name System (DNS) to support multilingual multiscrypt characters were discussed. In 1998, based on the IETF draft by Martin Duerst, I implemented a proof of concept to demonstrate that the theoretical aspects of the UTF5 proposal can become a technically feasible and deployable system. This primitive implementation which did not require the modification of client or server and made use of a proxy server system to intercept non-ASCII domain name queries from applications and convert them into a format accepted to conventional ASCII-only domain name server software such as BIND.

Following the success of this proof of concept, I mooted and implemented an Asia Pacific Testbed under the auspices of the Asia Pacific Networking Group (APNG) by the end of 1998. By 1999, after presentations at international conferences by our efforts, the IETF was finally abuzz with the issue of internationalization of domain names, but no concrete effort was made yet. ICANN was just formed, and was and is still grappling with teething problems, and could not at that time deal with the issue of IDN. Nevertheless, the IT industry rapidly took up this idea. Company after multilingual domain name companies, starting with a spinoff company from my university (i-DNS.net International) were formed to commercialise the concept and to provide services. Multilingual domain names in various languages were launched much to the delight of non-English speaking users. It proved to the Western-dominated Internet community then, that there was not only IDN technology that could work, but that there were vendors willing to offer and support these services, and most importantly of all, that there was a strong, urgent and large demand for domain names and names associated with domain names eg. Web and Email addresses, in the scripts of languages other than those supported by ASCII characters.

By early 2000, a IETF IDN working group was formed with a good following. By mid 2000, the Multilingual Internet Names Consortium (MINC) was founded to pursue progress and coordination, and support this new industry. Its charter included the promotion of both domain names as well as keywords, and their internationalization to enable multilingual and multiscrypt support. Meanwhile, ICANN continued to struggle with the ASCII domain names and failed to unify the ccTLDs under its DNSO umbrella. To date, it has still not successfully done so in a highly fractious ccTLD environment. It was only starting to look at issues related to expanding the gTLDs in ASCII.

MINC pushed ahead with various working groups and set up language specific groups to spearhead the promotion of IDNs. The Arabic and Tamil groups were successfully formalized by 2001, namely the Arabic Internet Names Consortium and the International Forum for IT in Tamil. The latter had a much wider scope but IDN formed the charter of one working group. Both groups

signed MoUs of cooperation with MINC recognizing its coordination and founding role. In the wake of competition, the Chinese speaking community formed their own grouping, the CDNC comprising a limited number of ccTLDs in the Greater China area. The Japanese community led the initiative to avoid collisions in the Han character set by creating the JET and played a key role in producing the non-proprietary open source mDNS kit. Subsequently, JDNA was formed to pursue the agenda of Japanese domain names more aggressively. Urdu and Russian Cyrillic groups were formed. More recently EuroIinc to promote European Internet names was formed.

Faced with the groundswell of interest, Verisign which had acquired Network Solutions, started to launch their multilingual strategy, by using the original I-DNS.net technology within their backend. Other companies formed during 1999 to 2002 included Neteka with their own technology, Walid which is now dormant, NativeNames, which is dormant of late, WorldNames and .NU domain, which has left the IDN arena. Keyword companies such as the now defunct Realnames, and the Korean Netpia, started to stray into the IDN area by masquerading keywords in the location bar of web browsers as domain name alternatives, or worse, as domain names themselves.

Early offerings included ML.ML but did not take off because of the failure of the industry to converge towards a universal standard, and because of fierce competition in the absence of any IETF standards (which to date is still not forthcoming), and largely because of ICANN's tardiness in coming to grips with the new technology. By 2001 only seven new gTLDs were offered by ICANN. IDN gTLDs such as those offered by the industry were nowhere in the horizon of approval. Faced with a fear that balkanization might break out, IETF hurriedly issued a proscription of alternative roots and emphasized the sanctity of a universal unique root.

Meanwhile, companies started to offer mixed ML.ASCII domain names using currently existing ASCII gTLDs to kickstart universal resolution of domain names in non-ASCII characters. The most aggressive attempt was by Verisign which unilaterally declared the launches of ML.com in a widespread matter. This caused much controversy till today. Its ML.ML initiative was delayed till end 2002 or early 2003. Internet standards, Internet governance and Internet industry could not converge in their technical and policy implementation. This has led to a serious disservice to widespread communities locked out of the benefits of the Internet because of the requirement to master ASCII characters first before being able to use the Internet comfortably. Nevertheless, large communities are starting to overcome this setback in the adoption of the Internet and e-commerce in spite of this setback.

The spirit of goodwill and cooperation which characterized the early Internet, that largely drove the success of the Internet as a global information infrastructure disappeared from the IDN arena. Whether in industry, in technical standardization, in governance amongst the various coordination group, IDN is still a controversial issue. New technical issues such as alternative proposals to IDN such as additional layers on top of the DNS to fulfill multilingual needs have been proposed to bypass IDN but have failed so far because of strong industry demand. Alternative roots to the ICANN root for hosting ML.MLs have not gained widespread following yet, despite efforts such as New.net. New issues such as folding and localization issues have crept up the technical agenda. ICANN itself, plagued with mission creep and the inability to handle international issues, is trapped in a new reform, and barely made it to a one-year extension of its agreement with the US government of another new lease of authority till 2003. The dot.com crash and technology stock slump, the Sep 11 incident, and uncertainties of war in 2002, combined to put all IDN companies into economic difficulty. MINC membership indicates such a serious impact against a previously strong demand and strong supply situation blocked by a lack of leadership and a lack of ability to respond rapidly to industry needs by the appropriate authorities entrusted to stimulate Internet growth and development.

Today, the technical issues include the following:

- a. IDN using Unicode and IDNA/Nameprep/ACE is not yet approved by IETF (as at Sep 2002) because of failure of consensus
- b. Case "folding" in different languages and scripts

- c. Overlapping of script with language in Unicode such as Arabic and Han characters
- d. Implementation of IDNA requires changes in all affected applications, which is widespread and difficult to test interoperability.

While extremely effective before with other standards, the IETF and the IETF process have proven to have failed in the standardization process in terms of a timely response to the needs of Internet users. Its Western-based orientation, strong-backward compatibility and protectionist mindset has prevented new innovation at the fundamental level of Internet infrastructure. An alternative model is likely to be needed to meet the Internet consumer demand. The IETF IDN WG itself has recognized that it has taken way too much time to reach where it is today, and still without standardization consensus. The rough consensus model which had served the IETF and the Internet seems to be failing to be effective for IDN where the community involved is culturally more heterogeneous, and where the technical issues seemingly more intractable. For any progress in this direction, there will probably have to be some serious thinking-out-of-the-conventional-box!

The governance issues include the following:

- a. Governance structures to handle cross sovereignty issues pertaining to use of language are not developed at all
- b. The ICANN IDN committee's proposal is incremental in its ability to cope with the diversity and complexity of the real world of multilingual and multiscrypt situation. Its one-size-fits-all model has not proven to work yet.
- c. No workable model of administration of IDNs has emerged from ICANN.

In this regard, ICANN has proven over the past four years of its existence to be incapable of meeting the IDN requirement in a timely manner. Often it seems to the bystander, that ICANN appears to be hoping that the issue will go away when the IETF IDN WG fails to come to consensus.

MINC as an IDN-promotion and coordination organization is thus faced with a serious challenge ahead. Sandwiched by IETF's non-consensus technical divergence, and ICANN's incapability to provide leadership, MINC has been severely constrained. MINC's efforts at linking up with international organizations have been initiated with WIPO and ITU (successful joint meeting in December 2002) and with FIAM (invitation to panel forum). A new MINC Board is in the process of being formed. It is hoped that a new vision for MINC will be achieved in the next year as MINC plays an increasingly lead role to fill the vacuum created by ICANN and IETF.

Will ICANN and IETF block the occupation of the vacuum and prevent others from attempting success where they have failed? Whether this potential problem happens or not remains to be seen. Whatever the case, the signs seem to indicate that the hope of achieving IDN expeditiously will not come from the IETF or from a reformed new ICANN. Rather, IDN success is likely to hinge around industry consensus and industry leadership through co-operation in competition – "coopetition". IDN success will also come from sources that can address localization issues to the satisfaction of local users and provide bold and imaginative initiatives that will recapture the mindshare of a large user population disillusioned by delay and division. The new MINC could well be one of the sources of success as it seeks to analyse the current situation and provide a common platform for industry players to communicate and cooperate with each other.

*[Disclaimer: The above opinions are entirely of the author and does not reflect the position of his employer or the organizations which he is associated with.]*