IDN - these days

Hiro Hotta
Japan Registry Services, Co., Ltd. (JPRS)
http://jprs.jp/
http://日本レジストリサービス.jp/
hotta@jprs.o.jp
Hello, this is me.
History of IDN (Technology)

- Late 1990s
  - Developed at the National University of Singapore
- July 1998
  - Asia Pacific Networking Group
    - experimental implementation of IDN
    - creation of a testbed in Asia Pacific countries
- 1998-1999
  - Prototypes demonstrated in international conferences
  - BoFs held in international conferences (APRICOT, INET)
- Nov. 1999 -
  - BoF in IETF
  - IDN Working Group in IETF
- Mar. 2003
  - Standardization of basic protocols (RFCs) in IETF
    - STRINGPREP (RFC3454)
    - IDNA (RFC3490)
    - NAMEPREP (RFC3491)
    - Punycode (RFC3492)
History of IDN (deployment)

- End of 1999
  - Several companies began commercialization of the multilingual domain name technology
  - Several testbeds emerged

- 2000 -
  - JET (Joint Engineering Team)
    - joint engineering project team: CN, JP, KR, TW ccTLDs
  - MINC (Multilingual Domain Names Consortium)
    - promotion of the multilingualization of Internet names
  - Country/regional organizations
    - AINC (Arabic Internet Names Consortium)
    - CDNC (Chinese Domain Name Consortium)
    - INFITT (International Forum for IT in Tamil)
    - JDNA (Japanese Domain Names Association)

- Now
  - The number of registries that provide IDNs is growing
History of IDN (ICANN)

• March 2001
  – IDN Working Group in ICANN Board
    • Fact finding survey concerning technical, policy, and service aspects
    • Survey report of market demand and issue list (Sept. 2001)
• Sept. 2001 -
  – ICANN IDN Committee
    • recommends solutions of non-technical issues (July 2002)
• Dec. 2002 -
  – ICANN IDN Registry Implementation Committee
    • Guidelines for the Implementation of Internationalized Domain Names Version1.0 (June 2003)
• Aug. 2005 –
  – TLD registries working group
    • Draft revision of Guideline Version2.0
    • Board endorsed the draft and Version2.0 was finalized (Nov. 2005)
• Nov. 2005 –
  – President's Advisory Committee for IDNs
    • analyzing various issues
    • implementation opportunities for internationalized top level domains
Basic mechanisms of IDN

**NAMEPREP**

- **original string**
  - ABC カンパニー .JP
  - A B Cカンパニー .JP
  - A B Cカンパニー .JP

**unification of the strings considered to be the same**

**normalized string**

- ABC カンパニー .JP

**Punycode**

- conversion to an ASCII string

**ASCII string**

- XN--ABC-MJ4B9F9A7RSC.JP

**Internet (based on ASCII)**
IANA Registry of IDN Language Tables

http://www.iana.org/assignments/idn/registered.htm
as of December 1, 2005

.biz German Language
.cn Chinese Language
.br Portuguese Language
.info German Language
.jp Japanese Language
.kr Korean Language
.museum Danish Language
.museum Icelandic Language
.museum Norwegian Language
.museum Swedish Language
.org Danish Language
.org German Language
.org Hungarian Language
.org Icelandic Language
.org Korean Language
.org Latvian Language
.org Lithuanian Language
.org Polish Language
.org Swedish Language
.pl Albanian Language
.pl Belarusian Language
.pl Bulgarian Language
.pl Catalan Language
.pl Croatian Language
.pl Czech Language
.pl Danish Language
.pl Dutch Language
.pl Esperanto Language
.pl Estonian Language
.pl Finnish Language
.pl French Language
.pl German Language
.pl Hebrew Language
.pl Hungarian Language
.pl Greek Language
.pl Icelandic Language
.pl Irish Language
.pl Italian Language
.pl Latvian Language
.pl Lithuanian Language
.pl Luxembourgish Language
.pl Macedonian Language
.pl Maltese Language
.pl Moldavian Language
.pl Norwegian Language
.pl Polish Language
.pl Portuguese Language
.pl Romanian Language
.pl Russian Language
.pl Serbian Language
.pl Slovak Language
.pl Slovenian Language
.pl Spanish Language
.pl Swedish Language
.pl Turkish Language
.pl Ukrainian Language
.th Thai Language
.tw Traditional Chinese Language

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Relevant Issues

• Homograph Attacks
• Registry Implementation Guidelines
• IDN-aware Environments
• Internationalized TLD
• More Consideration on IPR
Homograph Attacks

- Similar-looking domain names can be used for phishing
- ASCII domain names
  - 0 and O are similar-looking
  - 1 and l and I are similar-looking
  - paypal vs. paypa1
    - Picked up as an phishing example in Feb.2005
- IDNs
  - more characters are similar-looking in general
    - IDN has security problem !?
  - ‘paypal’ vs. ‘p a y p a l ’
  - ‘domain/subdomain’ vs. ‘domain / subdomain’
Example

http://www.paypal.com/

http://www.paypal.com/
UNICODE Security Considerations

• Unicode Technical Report #36 (UTR#36)
  – http://www.unicode.org/reports/tr36/

• Recommendations (example)
  – Registries: Block visually confusable domain labels (at least from different registrants)
  – Registrars: show the reason to the registrant if a domain name application is rejected
  – Applications
    • Highlight the ‘core’ domain name part
      – Eg. http://abc/def/ghi
    • Highlight risky strings defined in UTR#36
      – Eg. a string of 2 digits, each from different script
Registry Implementation Guidelines

• June 2003 - V1.0
  – Concept of Language
    • defined character code set
    • Symbols and punctuations not allowed
  – Definition of Variants

• Nov. 2005 - V2.0
  – Concept of language and script
  – Definition of variants
  – Special focus on anti-phishing
    • Characters in a label are from ‘one script’
    • ‘visually confusable characters’ from different scripts are not allowed in a label
      – Unicode Technical Report #36
**IDN-aware Web browsers and e-mail software**

- **Web browser**
  - Native
    - Firefox
  - With Plug-in
    - Internet Explorer

- **E-mail software**
  - Foxmail
  - Kmail
  - Opera M2
  - Outlook/OutlookExpress with Plug-in

(example)

(Native version - Coming soon)
Internationalized TLD (IDN TLD)

• Demand shown
• Issues being identified
  – Technical issues
    • Load for root servers
    • Various issues depending on Policy/Managerial decision
  – Policy/Managerial issues
    • Combination of TLD and language
    • Equivalency of name spaces (e.g., .jp and .日本)
    • Visually confusable TLDs
    • Reserved domain names
• President's Advisory Committee for IDNs
More Consideration on IPR

• More sensitivity on IPR
  – Trademarks are often in its own language/script rather than in English alphabets
  – Names such as personal names, government organization names, and geographical names are in its own language

• More complexity in dispute resolution
  – Looks alike or not
  – Transliteration

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