Internationalized Domain Names

Doug Brent
Chief Operating Officer

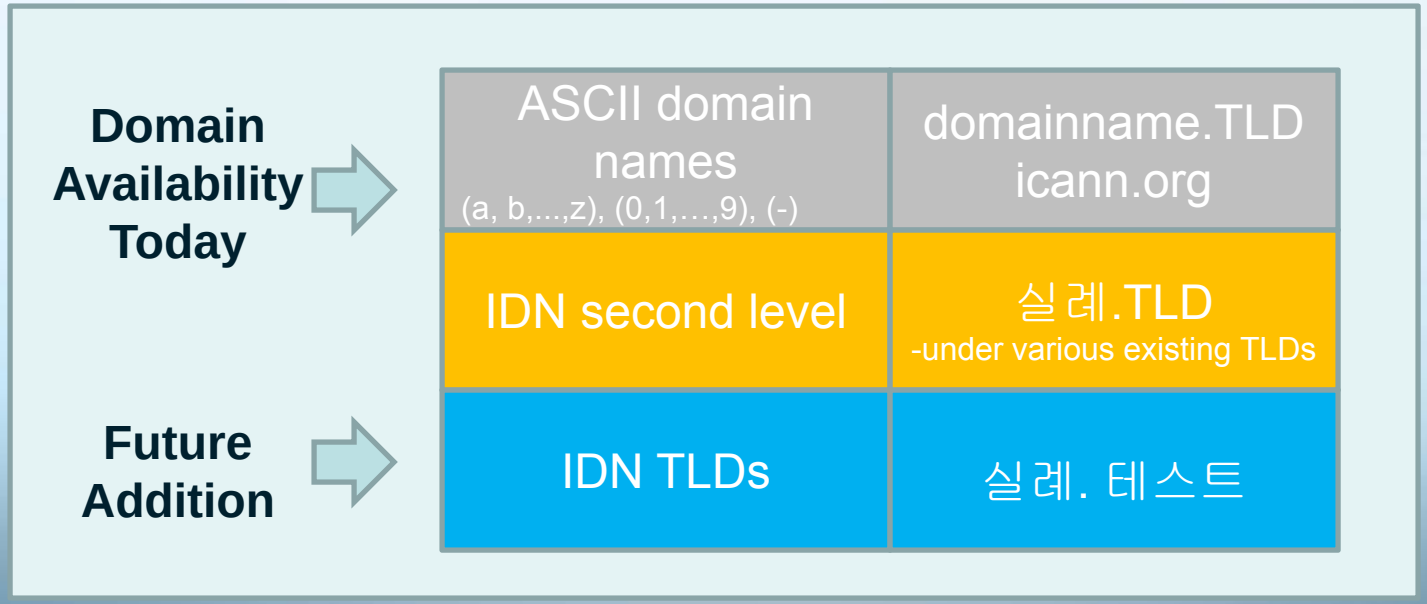
Hong Kong
24 July 2009

Agenda

- Internationalized Domain Names (IDNs) defined
- How IDNs work
- IDN confusability
  - Issues and solutions
- Remaining technically-related issues
- IDN processes at ICANN

What we have / what we need

- IDNs have existed at the second level since 2003
  - under web protocol standards (under revision)
  - email protocol standards are underway (IETF)
- We also need IDN top level domains (TLDs)
  - 北京.中国; [xn--1lq90i. xn--fiqs8s]



Characters in the DNS

- The DNS can handle all US-ASCII characters
  - Examples:
    - (a…z), (0…9), (-)
    - ( ) SPACE
    - (!) EXCLAMATION MARK
    - (") QUOTATION MARK
    - (#) NUMBER SIGN
    - ($) DOLLAR SIGN
    - (%) PERCENT SIGN
    - (&) AMPERSAND
    - (') APOSTROPHE

Characters, DNS, and domain names…

- All TLD registries have implemented the LDH (letter digit hyphen) rule
  - Domain names can only contain:
    - (a,b,…z)
    - (0,1,…9)
    - (-)
- ….before internationalization….

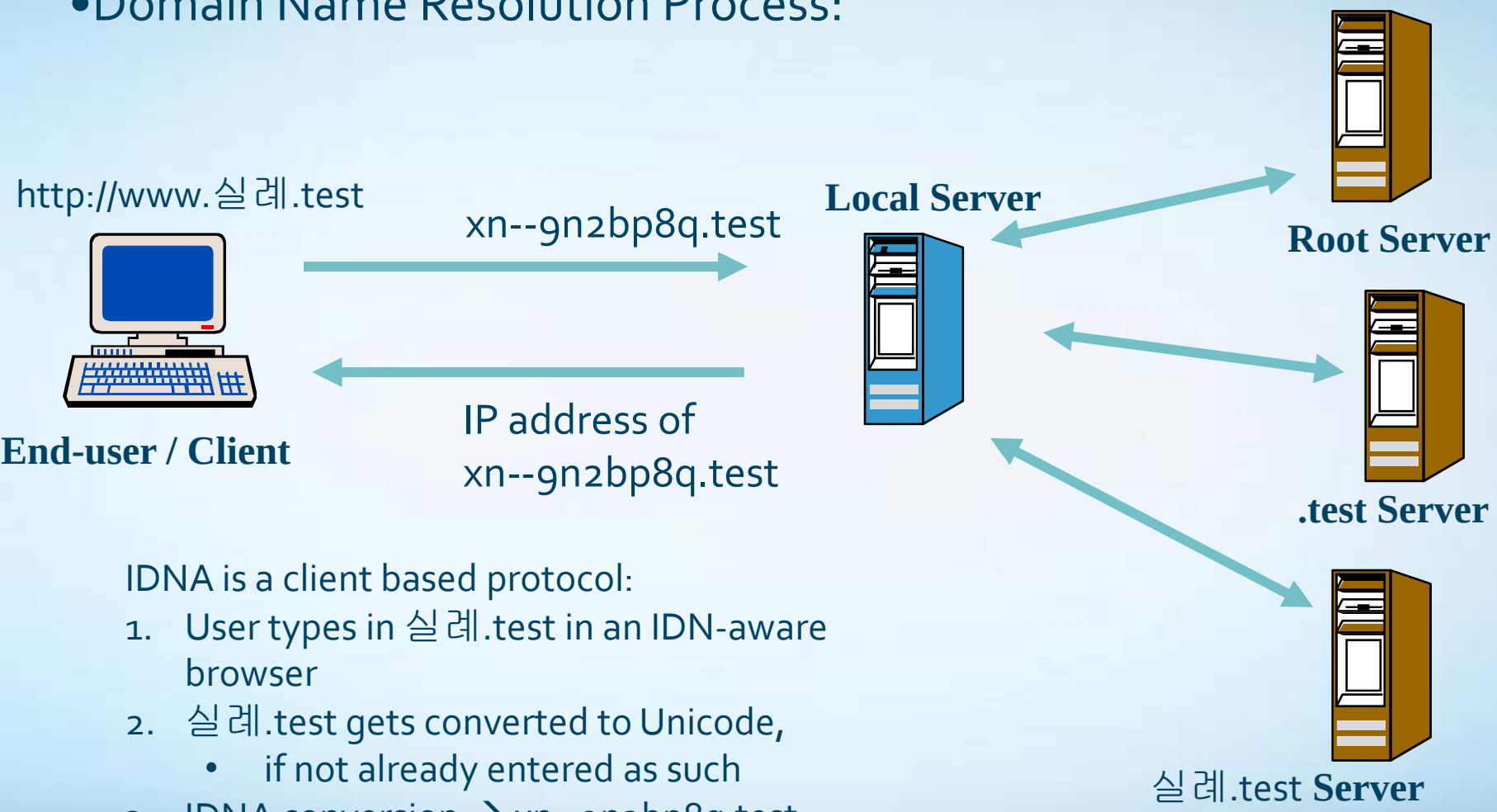
IDN Definitions

- Internationalized domain names are:
  - Names with characters other than the standard ASCII (a,b,…z), (0,1,…9), (-)
- Example:

  ñandú.cl → xn--and-6ma2c.cl
- IDNs offer localized solutions…
  - …but need to be ‘internationalized’ due to the global nature of the Internet

IDNA – Protocol Functionality

- Domain Name Resolution Process:



IDNA is a client based protocol:

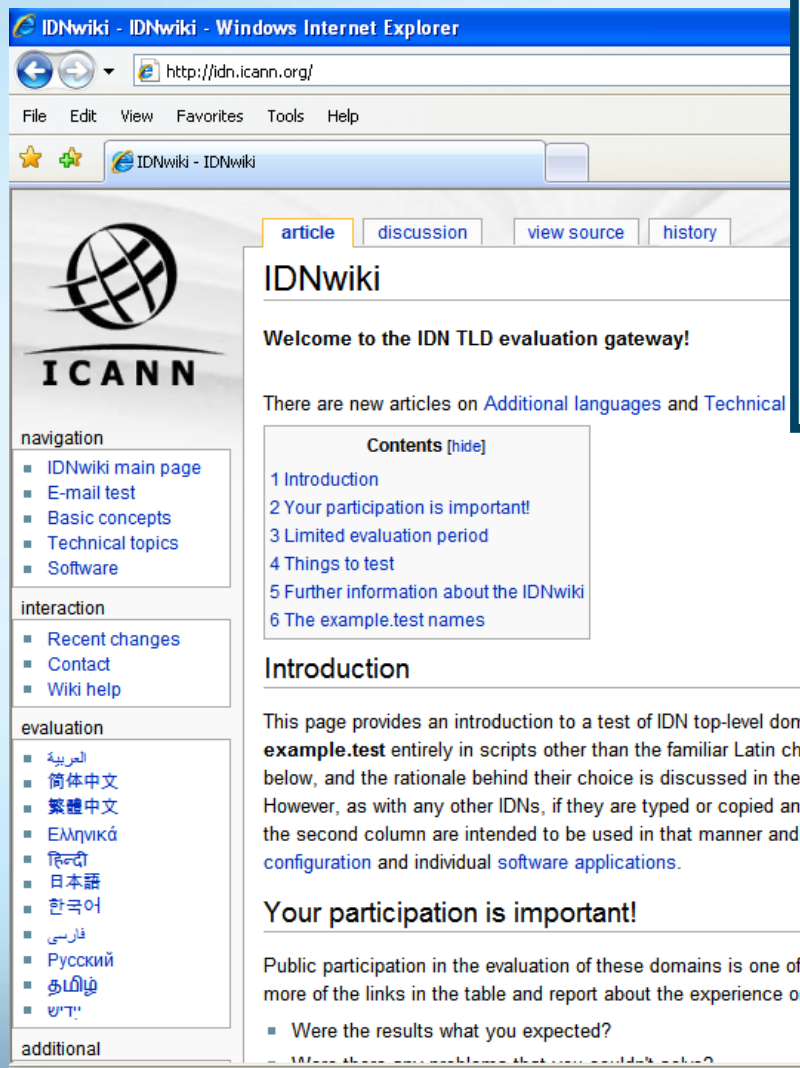
1. User types in 실례.test in an IDN-aware browser
2. 실례.test gets converted to Unicode,
   - if not already entered as such
3. IDNA conversion → xn--9n2bp8q.test
4. DNS resolution proceeds in the same way as an ordinary ASCII string

Client Software Still Maturing

- Not all browsers handle IDN strings in the same way
- Email protocol for IDNs still in definition
- Beyond desktop software, need to consider behavior of mobile and embedded clients
- Key is early testing and awareness
  - Many regional Asian efforts in this regard
  - ICANN has contributed through ICANN wiki ".test" effort

IDN wiki

Script	Language	SLD.TLD U-labels	SLD A-label	TLD A-label
Arabic	Arabic	مثال.إختبار	xn--mgbh0fb	xn--kgbechtv
Arabic	Persian	مثال.آزمایشی	xn--mgbh0fb	xn--hgbk6aj7f53bba
Chinese, simplified	Chinese	例子.测试	xn--fsqu00a	xn--0zwm56d
Chinese, traditional	Chinese	例子.測試	xn--fsqu00a	xn--g6w251d
Cyrillic	Russian	пример.испытание	xn--e1afmkfd	xn--80akhbyknj4f
Devanagari	Hindi	उदाहरण.परीक्षा	xn--p1b6ci4b4b3a	xn--11b5bs3a9aj6g
Greek	Greek	παράδειγμα.δοκιμή	xn--hxajbheg2az3al	xn--jxalpdlp
Hangul	Korean	실례.테스트	xn--9n2bp8q	xn--9t4b11yi5a
Hebrew	Yiddish	טעסט.בײשפּיל	xn--fdbk5d8ap9b8a8d	xn--deba0ad
Kanji Hirigana, and Katakana	Japanese	例え.テスト	xn--r8jz45g	xn--zckzah
Tamil	Tamil	உதாரணம்.பரிட்சை	xn--zkc6cc5bi7f6e	xn--hlcj6aya9esc7a



IDN Confusability

- Not a new topic
  - “0” looks like “o” and “1” looks like “l”
- Increased problem with increased number of characters in use, and length of strings
  - ASCII: 37 characters used in domain names
  - IDNs -> approximately 100.000 characters available
- Well known examples:
  - “paypal” and “paypal”
  - “py” and “py”
- Some problems solved in the IDN Guidelines
  - Preventing mixing of scripts unless a linguistic need

Preventing confusability - IDN Tables

- IDN tables are developed by registry managers to
  - Inform users which characters are available
  - Eliminate confusability by listing variant characters
- IDN tables are used both on second level and top level
  - Strongly urging collaboration across language communities when potential for confusion exists
    - Languages using the same script
    - Scripts that have similar appearance (e.g. Cyrillic, Greek, Latin)

IDNA Protocol Revision

- IDNA provides the technical specification for IDN strings:
  - The label must be a valid internationalized domain name, as specified in technical standards http://www.icann.org/en/topics/idn/rfcs.htm.
- Protocol revision is ongoing in the IETF
  - Progress expected at the IETF meeting next week

IDN TLDs – issues remain

- Request from many that multiple “variant” top level domain names behave as one
  - A variant is where two strings use different characters, but are the same words
    - for example: Pakistan: پاکستان and پاکستان
    - no existing technical solution to this at root level
  - May be addressed through name reservation or blocking; local technical solutions
- Number of characters in a label
    - ccTLDs 2 char labels → 2+char
    - gTLDs 3+char →1char, 2char, 3char, and 3+char ?
    - Usability and acceptability across applications

IDN Processes at ICANN

IDNs essential to two aspects of ICANN's work

- IDN ccTLDs (IDN country code top level domains)
  - Country code registries (e.g. .cn, .in, .eg) may want to offer IDN versions
  - Particularly pressing in parts of the world that don't use Latin characters
- New gTLDs
  - New IDN names are envisioned to be available at the launch of the new gTLD process

Current IDN Processes at ICANN

Implementation: IDN ccTLDs Fast Track Process

- to introduce a limited number of IDN ccTLDs
- non-Latin scripts only, matching ISO3166 list
- will match country/territory names

Policy Development: IDN ccTLDs – Long Term

- Full policy that caters for all
- Follows the ccNSO Policy Development Process

Implementation: New gTLDs

- Includes internationalized domains
- IDN technical requirements same as Fast Track
- Focus on non-ASCII squatting & confusingly similarity solutions

IDN ccTLD Fast Track: Key Remaining Issues

- Technical concerns mentioned previously:
  - IDNA protocol finalization
  - Handling of variant strings
  - Issues associated with the number of characters in a name
- Broad agreement by all on need to adhere to technical standards in this still-evolving area; form of agreement not yet decided
- Suitable, fair mechanism for cost recovery

IDN ccTLD Fast Track Progress

- Active project for past 18 months at ICANN
  - Active engagement with many potential requestors, several drafts of plan, community consultation
- Operational elements and processing details to be finalized by Q4 2009
  - Goal is to launch Fast Track process by year end
  - Like new gTLD process, will require community support and Board approval

IDNs in New gTLDs

- Shares same technical issues as the IDN ccTLD Fast Track program
- Will launch along with overall new gTLD program

Internationalization of the internet means that the internet is equally accessible from all languages and scripts.

ICANN is working to support that objective