Universal Acceptance of All Top-Level Domains

What's a TLD?

A top-level domain (TLD) is the suffix at the end of a domain name, such as ".com", ".uk" and ".nz". It represents the highest level division of the Domain Name System (DNS) hierarchy.

What's the problem with acceptance of all TLDs?

The Internet is growing. In the 1980s and 1990s, the format of domain names followed a simple pattern. All domains ended with a small number of common 3 character long endings like ".com" and ".net", or a two-letter code that represented a country like ".de" and ".uk".

Times have changed. Since 2001, TLDs comprised of more than 3 characters long (think of ".info" or ".museum") were introduced, and since 2010, non-Latin strings – known as internationalized domain names (IDNs) – have been added to the root zone. The ICANN Board's approval of the new gTLD program in 2011 will allow for hundreds of additional TLDs to be added. This means that the variety of domain names will expand even further.

Software vendors, web site developers, and others might limit what they allow as a valid domain name in their applications. This might constrain the Internet's growth, consumer choice and promotion of market competition on-line. The effort toward universal acceptance of domains seeks to ensure that the systems that perform domain name validation do it in a correct way that allows for all valid domains to function correctly. Domains should work regardless of the script they are written in or the time they were implemented: 20 years ago or yesterday.

To properly support today's DNS, implementers need to deploy software and solutions that cater to all of these developments. Software needs to fully accept all the variety of domain names. This includes domain endings containing 4 or more characters and internationalized domain names.

What has changed?

No predetermined length. Until 2001, TLDs were either 2 or 3 characters long. This is no longer true. Does your software limit domain endings to a certain number of characters?

No fixed set of TLDs. In 2001, there were about 250 such endings. Now there are over 300. This will grow at a greater rate starting in 2013 as a result of the new gTLD program. Hundreds more TLDs are likely to be added to the root zone in the following years. Does your software have a hard-coded list of valid TLDs that it checks against? Is it regularly updated? Or does your application have a fixed drop-down box?

Non-Latin domains. Fields that accept domain names as input (such as email addresses, URLs, etc.) need to accept not just Latin but other encodings to work properly. Can your software correctly accept "испытание" if entered into a domain-related field?

Multiple representations. Non-Latin domains introduce a new idea – presentation and wire formats are different. For example, "xn--zckzah" and "テスト" are the exact same domain. Would your software know to treat them the same?

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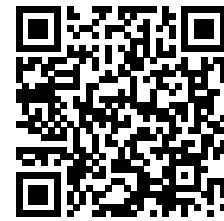
Do*s* and Don't*s*

✘ **Don't check domain validity if you don't need to.** A lot of applications don't need to constrain the domain field, so unless you have a compelling reason to constrain it, leave it open.

✘ **Don't check the length of a domain to determine validity.** You can no longer assume domain endings will be 2 or 3 characters long. They potentially can be between 1 and 63 characters long.

✔ **Do use an IDN library to properly convert domain names if they are received in multiple formats.** There are many libraries (a lot of them are free) that are used by major software vendors to implement this functionality. Make sure the library supports the most current ("IDNA2008") standard, as the older standard introduces compatibility issues.

✘ **Don't use a hard-coded list of domains in your application.** If you need to check if a domain exists, the best way to do it is using the DNS protocol. A live DNS query happens quickly and will provide your application with the most up-to-date data available.

✔ **If you require a hard-coded list, do make sure it is regularly updated** (e.g., daily) using an appropriate methodology. ICANN provides some sample toolkits on how this might be done.

✔ **Do ask questions if you are not sure.** ICANN is happy to help provide advice to software developers and implementers on what is needed. Contact us at: *tld-acceptance@icann.org*.

✔ **Do report websites or software that has problems accepting newer domains.** If you notice a website that has problems, let us know and we'll try to reach out to the operators to encourage them to follow these guidelines.

Sample toolkit - TLD verification tool

The primary method of correctly checking if a domain is valid is to use the DNS. If the application has access to the Internet (most applications do), the best way is simply to perform a DNS query. This ensures the most accurate and up-to-date data is returned from the most authoritative source – the DNS itself.

In some rare cases, it is not possible to use the DNS protocol. When software programs need to check whether a top-level domain is valid, but is not able to perform an online check, ICANN provides guidance on alternate methods. In particular, the program may need to use a regularly updated list of valid top-level domains to perform its checking. ICANN has put together sample programming code that software developers can use. The code is available under an open source license at: *https://github.com/icann*.

More information

To learn more about the effort, visit us at: *http://www.icann.org/en/resources/tld-acceptance*.

To share your ideas and suggestions on the topic or to submit an acceptance issue report, email us at: *tld-acceptance@icann.org*.

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