IDN TLD Variants Implementation Guideline

draft-yao-dnsop-idntld-implementation-01.txt

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IDN TLD Variants Problem

- ICANN is pushing the IDN TLD into the root server.
- ICANN Seoul meeting has approved the IDN ccTLD fast track.
- In ASCII letters, the upper case "A" and lower case 'a' are same in the meaning. In many cases, the upper case "A" and lower case 'a' are exchangeable. We can regard the upper case "A" as the variant of the lower case 'a'.
- Many non-ASCII languages or scripts have some variant characters (ouser vs user)
• If Internationalized Domain Label " or "IDL" are composed of variant characters, we regard this kind of IDL as the IDL variant.

• If these IDL variants are put into the root, they are regarded as the IDN TLD variants.

  ✓ For example, if the IDL “China” ickness (U+4E2D U+56FD) and its IDL variant ickness (U+4E2D U+570B) are put into the root, the first one is called as the original IDN TLD and the second one is called as the IDN TLD variant.

• In ideal way, the original IDN TLD and its IDN TLD variant SHOULD be identical in the DNS resolution. For example, the ".com" is identical to ".COM" in the DNS resolution.
The Security Concern of IDN TLD Variants

usabank. com VS usabank. COM

bank. VS bank.

bank. A 192. 168. 1. 1
bank. A 192. 168. 252. 252

• GOOD: bank. and bank. belongs to the same registrant and gets the same DNS resolution

• Not bad: bank. VS bank. belongs to the same registrants and gets the different DNS resolution

• Danger: bank. VS bank. belongs to the different registrants and gets the different DNS resolution
The principle of IDN TLD variants implementation

- Same or identical DNS resolution to the names under the original IDN TLD and its variants
- The same names under the original IDN TLD and its variants belong to the same registrant
- Any policy or technology SHOULD be used to guarantee that the IDN TLD and its variant SHOULD belong to the same registry; the DNS administrators SHOULD try their best to make the IDN TLD and its variants be identical in the DNS resolution.
The requirement of the root server operation

- [RFC2870] points out that the root domain name servers are seen as a crucial part of the correct, safe, reliable, and secure operation of the internet infrastructure.
- The root server should run as stable as possible.
- Any change or update to the root servers should be done in caution.
Solution 1

- In root, Configuration format

  <the IDN TLD variants> TTL IN DNAME <its original one>

- Advantages:
  - Redirection the whole sub-tree of IDN TLD variants tree to its original IDN TLD

- Problem
  - Dname-ware resolvers or recursive servers will directly go to the root for answers since TTL for the synthesized CNAME is zero
  - May cause much traffic to the root server
  - May cause the root servers to be unstable (May 19 incidents to China Telecom caused the network collapse)
  - The DNAMEed domain name is not a normal domain name
Solution 2

Put NS in the root and apply DNAME to all the names under the IDN TLD variant

```
Zone.

.DNAME

NS 192.168.1.1
NS 192.168.9.9
root
```

```
Zone.

bank.
A 192.168.1.159
A 192.168.2.7
```
**Advantages:**

- Redirect the whole sub-tree of IDN TLD variants tree to its original IDN TLD
- Comparing to solution 1, distribute the traffic supposed to go to the root to the IDN TLD variants server due to the synthesized CNAME ZERO TTL problem

**Problem**

- Dname-unaware resolvers or recursive servers will directly go to the IDN TLD variants servers for answers since TTL for the synthesized CNAME is zero
- May cause much traffic to the IDN TLD variants server
- The DNAMEed domain name is not a normal domain name
Put NS in the root and apply DNAME to some names under the IDN TLD variant requested by the registrant

\[
\begin{align*}
&. \quad \text{NS} \quad 192.168.1.1 \\
&. \quad \text{NS} \quad 192.168.9.9 \\
&\text{root}
\end{align*}
\]

Zone .

bank. \quad \text{DNAME} \quad \text{bank.} \\
\quad \text{A} \quad 192.168.2.7

Zone .

a.bank. \quad \text{A} \quad 192.168.1.159 \\
\quad \text{A} \quad 192.168.2.7
• **Advantages:**
  ✓ Selection of DNAME is user preference based

• **Problem**
  ✓ Some may still prefer NS RR; Some policy is requested to make the data consistency
  ✓ Since the DNAME does not direct itself (the owner name), some other resource records such as A or MX are still needed to be configured at the IDN TLD variant zone.
  ✓ The management of zone will become complex
Solution 4

Put NS in the root and apply NS to the names under the IDN TLD variant while requested by the registrant.

```
 NS 192.168.1.1
 NS 192.168.9.9
 root
```

```
 Zone .
 example.
 NS a.example.cn
 bank.
 NS b.example.cn
 .
 NS c.example.cn
```

```
 Zone .
 example.
 NS a.example.cn
 bank.
 NS b.example.cn
 .
 NS c.example.cn
```
• **Advantages:**
  - There are a lot of practice about NS RR
  - The internet user can use the name under the IDN TLD variants as the normal domain name while the DNAMEed domain name cannot configure the Resource Record directly

• **Problem**
  - Registration policy should guarantee that the names under the IDN TLD and its variants belong to the same registrant
  - Some policy is requested to make the data consistency
  - If failed, some data inconsistency may happen
Security Considerations

- If IDN TLD variants are implemented, this guideline is suggested to be used to avoid the possible phishing.
- If we apply NS both to IDN TLD variants in the root and to the second level names in the IDN TLD variants, we can not guarantee that every level of domain names under the IDN TLD and its variants are configured to be same.
- We can only specify some policy to make the same name under the IDN TLD and its variants to be owned by the same registrant.
- The registrant is unlikely to phishing itself via the name under the IDN TLD and its variants.
Discussion results

Through the discussion in the DNSOP WG list and DNS-CARC meeting,

- Many think that we should separate the technical issues from the policy issues in this draft.
- Many prefer the solution 1 (put the \texttt{dname} into the root directly for the IDN TLD variant);
- Many can accept the solution 2 (Put the \texttt{NS} into the root for IDN TLD variant and apply the \texttt{DNAME} to all names in the Apex of delegated IDN TLD variant zone.).
- Solution 3 and solution 4 may cause the potential data inconsistencies in the IDN TLD variant zone since the policy can not be granted in all the levels.
According to the ICAANN IDN ccTLD fast track, the IDN TLD and its variant will be allocated to the same registry.

IDN TLD Registry applies DNAME to all the names under its IDN TLD variant.

Does not impact the root stable since we still put the NS in the root.

Just require IDN TLD variants operator to configure DNAME; does not require other level domain name administrator to follow some policy.
• The aim of this draft is to identify the problem and find the possible solutions.
• Based on my understanding, the WG seems to agree the following updating to the draft if we hope it to be an item of WG:
  1. suggest to use the solution 1 and 2 and analyze these 2 solutions.
  2. remove the solution 3 and 4
  3. remove most contents about the policy
Questions

- How many have read this draft?
- Do you think that this topic is an interesting topic?
- Do you think that this topic should be solved in this way?
- Which solution is your favorite? Solution 1, 2, 3, 4 or other?
- Any suggestion to this draft in the next step?
More comments

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