

Scaling Up The Root Zone

The Good, The Bad and The Scary

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The Root Zone

- ...has so far been a very small, very static zone
- This has various advantages:
 - low churn rate enables careful verification of every change
 - easy to distribute (also in new ways)
 - easy to sign
 - at least **technically** easy to sign...
- We know that it works, and we have always aimed for **robustness** at every turn

Large Scale Expansion of the Root Zone

- The ICANN Board decided in June 2008 to change the previous policy of being restrictive with new TLDs
 - the new plan is that basically anyone will be able to get a TLD
 - as long as they pay for it
 - potentially it will even be possible for enterprises to have their own TLD
 - not sure, but I think there are a lot more enterprises than potential registries out there

Demand for new TLDs

- Demand...
 - ask anyone who have ever bought a domain name if they would rather have a TLD with the same name (or even a different name)
 - it is probably a safe assumption to say that the “demand is large”
- Hence expansion will **always** be about controlling demand
 - holding back. Not losing control. Curbing growth. Be able to say “no”

Demand, cont'd

- Is there really a market for a very large number of TLD registries?
 - probably not
- But there is a market for a very large number of TLDs for **enterprises** and **IPR** owners
 - and they are likely to fund their own TLD as a marketing expense
 - and when Company A has a TLD, then ...
- BTW, non-registry TLDs are talked about
 - this is called “innovation in the name space”

Would a Large Root Be Bad?

- The present DNS hierarchy makes it easy for recursive servers to cache all the referrals to “important TLDs”
 - usually “neighbour ccTLDs” + a limited number of gTLDs is all that’s needed
- This makes the root “less important”:
 - moves traffic further down in the hierarchy
 - makes attacking the root more difficult
- It also enables us to have root servers in almost every country (not quite there yet)

Large Root = Bad?, cont'd

- The growth of **.COM** certainly proves that large zones are technically feasible
 - on the other hand... last time I looked there were no **.COM** servers in Africa
- And should **.COM** “fail” in a remote corner
 - ...that’s not the end of the Internet as long as the root and the national ccTLD is available
- If the root zone “fails”, well that’s another matter...

Flattening the Name Space

- DNS is designed the way it is to satisfy a set of specific goals

- a massively large root would go against several of these

DNS Design Goals

- ~~Expand the name space~~
- ~~Localize updating responsibility~~
- ~~Minimize net traffic and latency~~
- A single mechanism to look up both name and address
- Extensible protocol for future needs

- All of these are consequences of flattening the name space

- umm, before DNS we **had** a flat name space. DNS was **designed** to save us from that badness

How To Limit Growth?

- There are basically only two methods
- Financial barriers
- Administrative barriers

Financial Barriers

- The initial TLD application fee is 185K USD
- “If needed, just increase the price”
 - for the moment we’ll ignore the problem of ICANN getting a lot of money as there are other problems with this strategy
 - there are complaints about the fee and ICANN has stated that the fee is a “function of internal processing costs”
 - ...which are expected to go down as volume goes up

“Digital Divide” Warning

- Quite likely most of the early applications will come from the industrialized world
 - but the initial [high] TLD application fee will go down as volume goes up
 - this will spur further growth
 - and the developing world will jump in as the cost goes down
 - then trying to slow down growth by raising the price (once the early birds have their TLDs) is likely to, umm, not be appreciated

Admin Barriers

- Admin barriers are good
 - actually, this is likely to be the only way to curb growth
 - and the present barriers seem to work
- The problem is that it will be much more difficult to add new admin barriers after the introduction of lots of new TLDs
 - in particular it will be difficult to add new barriers after having expanded IANA to deal with the higher volume

How to Treat an Addict

- Look at the world as the “TLD addict”
 - as everyone wants their own
- Old plan:

“You’re not getting any”

- New plan:

“We’ll distribute a large number of shots of the drug, but if it turns out that you like it too much we’ll turn off the supply”

- Could there be a problem with this strategy?

The Problem With a Global Resource

- Either it is **abundant**
 - then you just hand it out at a low price to anyone who asks (c.f. early IPv4 allocation policy)
- ...or it is **scarce**
 - then you must ensure that however it is handed out is generally found to be “fair” (c.f. late IPv4 allocation policy)
 - and when you run out you just stop...

Global Resource, cont'd

- So far TLDs have been very **scarce**
 - that has worked, more or less, in spite of everyone wanting their own
- Suddenly TLDs are instead **abundant**
 - so volume will go up and price go down
 - the end game of that is mostly obvious
- ...so, if needed, make it **scarce** again?
 - well, that will (of course) be considered unfair
 - turning of supply once the early birds got theirs
 - not to mention that we will not, ever, “run out”...

Global Resource, cont'd

- Ok, then, so to avoid having to **change** the policy, let's just decide from the outset that there will only be "N" TLDs allocated
 - for some large value of "N"
 - that's how you spell "**land rush**"
- And when then N+1 application is denied, there will be no technical ground for it
 - if N TLDs works, then N+1 TLDs also works
 - upholding the "N TLD" decision will be... **very** difficult... and decisions are sometimes revoked

Is Unbounded Growth Bad?

- It has been said that it is an “unproven assertion that unbounded growth of the root zone is bad”
 - that’s an interesting point of view, as the stability of the Internet may be at stake
- The question is wrong, however
 - a better question is:

“Is large scale growth of the root zone good?”

or even:

“Is large scale growth needed? Desirable?”

Burden of Proof

- It is clear that we can easily add a fair number of new TLDs without major technical issues
 - it is not clear that once we start doing this there is an easy way to stop
- Would this be safe? Stable? Robust?
- Where should the burden of proof lie?
 - on the opponents, i.e. the “skeptics”, (to prove that unbounded growth is bad)?
 - on the proponents (to prove that unbounded growth is good, or at least “ok”)?

“What if...?”

- “What if?” is sometimes referred to as the proverbial engineering question
- Let’s ask ourselves a few questions:
 - **what if...** there is no practical way of limiting growth once the gates are open?
 - **what if...** it later turns out that this doesn’t work too well?
 - **what if...** there is **no “Plan B”** to resort to then?
 - **what if...** we can **either** sign the root **or** do a large scale expansion of the root

Questions?

- Well, I'm not sure you should send them to me ;-)

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Some References

- Some comments from the community on the new gTLD program:

Microsoft:

<http://www.icann.org/correspondence/gupta-to-dengate-thrush-13apr09-en.pdf>

Lego:

<http://www.icann.org/correspondence/kjaer-to-twomey-06apr09-en.pdf>

Verizon:

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The Danish government:

<http://www.icann.org/correspondence/andersen-to-dengate-thrush-22jan09-en.pdf>

NTIA:

<http://www.icann.org/correspondence/baker-to-dengate-thrush-18dec08-en.pdf>

The Vatican:

<http://www.icann.org/correspondence/polvani-to-twomey-20feb09.pdf>

The GAC:

<http://www.icann.org/correspondence/karklins-to-dengate-thrush-10mar09-en.pdf>

More NTIA and also DOJ:

http://www.ntia.doc.gov/comments/2008/ICANN_081218.pdf

etc, etc.