If we are talking about the future of the DNS…

Then maybe we should first ask what is it that we are talking about!

What is "the DNS"?

Multiple Choice – tick all that apply:

☐ **A name space**: A collection of word-strings that are organised into a hierarchy of labels

☐ A distributed **name registration** framework that assigns a unique "license to use" to human-centric word-strings to entities (for money)

☐ A **distributed database** that maps human-centric word-strings into IP addresses

☐ A **protocol** used by DNS protocol speakers to "resolve" a word-string into a defined attribute (usually an IP address)

☐ A **signalling medium** that is universally supported across all of the Internet

Orchestration of the DNS

- If the DNS is a set of functions and a set of various actors in this space then how are their individual actions orchestrated to provide a cohesive outcome?

- How can client use the functions of "the DNS" if there is no one orchestrating all these elements of the name infrastructure?

- Why does all this work in a completely deregulated space?

- The answers lie in *Markets* and *Market Signalling*

What are DNS "Markets"?

The DNS is not a single market – it is a highly devolved framework and there are a number of discrete markets that are at best loosely coupled

Some of these markets are:

- The market for **new "top level" labels** (gTLDs) operated by ICANN. This market is open to ICANN-qualified registry operators. A registry has an exclusive license to operate a TLD.
- The market for "**registrars**", who act as retailers of DNS names and deal with clients (registrants) and register the client's DNS names into the appropriate registry
- The market for clients to **register a DNS name** with a registry
- The market for DNS **name certification**, which is a third party that attests that an entity has control of a domain name
- The market for DNS **name resolution** where users direct their queries to a resolver and the resolver provides DNS "answers"
- The market for **hosting authoritative name services**, where "bigger is better" has driven a highly aggregated market
- The market for **DNS query logs**

Current DNS Themes

There are many themes in the DNS, and here are just a few:

- DNS as a control element
- DNS and privacy
- DNS and trust
- DNS and name space fragmentation
- DNS as a rendezvous tool
- DNS as a collection of markets
- DNS and market aggregation
- DNS and abuse and cyber attacks
- DNS and scaling to silicon
- DNS and speed
- DNS as an economic failure
- DNS as the last remaining definition of a coherent Internet

Fragmenting the DNS

- Is appears more likely that **applications** who want to tailor their DNS use to adopt a more private profile will hive off to use DNS over HTTPS to an application-selected DNS service, while the platform itself will continue to use libraries that will default to DNS over UDP to the ISP-provided recursive DNS resolver

- That way the application ecosystem can fund its own DNS privacy infrastructure and avoid waiting for everyone else to make the necessary infrastructure and service investments before they can adopt DNS privacy themselves

- The prospect of **application-specific naming services** is a very real prospect in this scenario

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[handwritten overlay, red:] Those parts of the internet space with sufficient motivation and resources will simply stop waiting for everyone else to move. They will just do what they feel they need to do!

Why does this matter?

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- A common end-to-end protocol
- A common address space
- A common name and reference space

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Ooops! – the DNS is all that's left to bind the Internet as a coherent whole!