

# How domains fail and what they cost

Gavin Brown, CentralNic



[www.centralnic.com](http://www.centralnic.com)

## <info>

- CentralNic is a domain registry
- Been around since 1995
- Runs 27 domain extensions
  - .uk.com, .us.com et al
  - .la since 2007
  - New gTLDs in 2012

# How domains fail

1. Technical
2. Financial
3. Legal
4. Criminal
5. Political

# Insight

To ensure persistence of identifiers, we need solutions to these problems.

# Technical

- Nameservers go offline
- Zone files are lost
- Errors in parent

These are mostly transient issues

# Financial

- Domain isn't renewed
- Hosting isn't renewed

These are often permanent:  
providing services costs money  
(more on this later)

# Legal

- Domain names are property
- Domain names can be sold
- Domain names can infringe trademarks
- Governments seize domains
- Governments censor the Internet
  - -badly

# Criminal

- DDoS attacks are scary
- Domain hijacking
- DNS spoofing

These are usually temporary, but can become permanent (eg Blue Security)

# Political

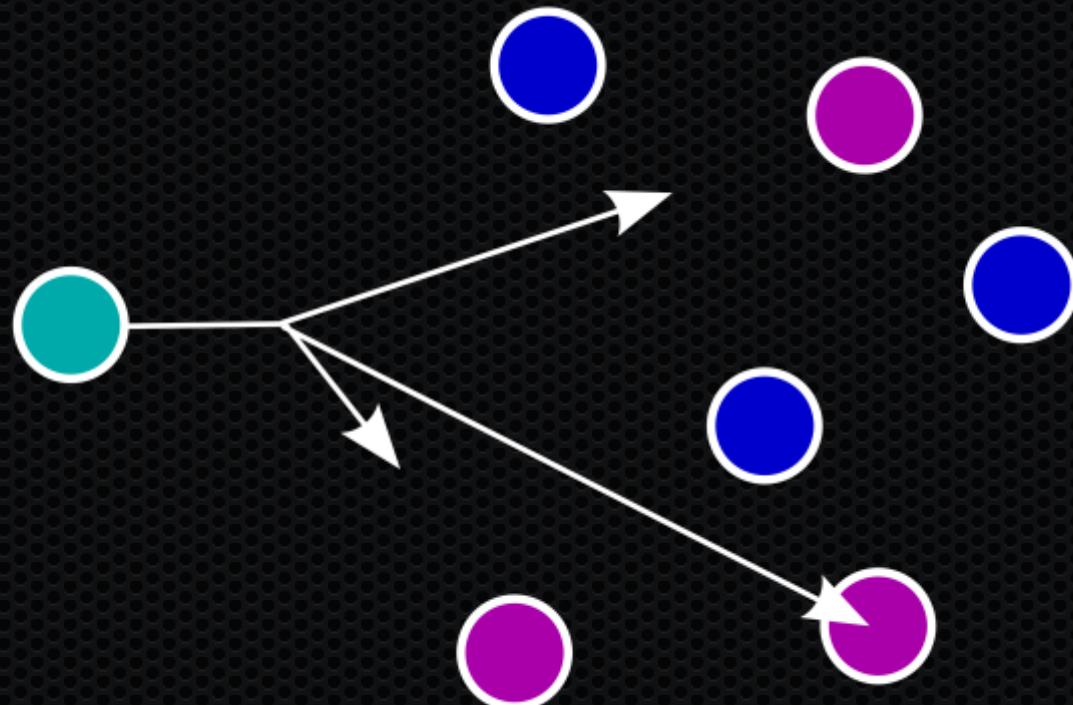
- TLDs don't last for ever
  - eg. .su, .yu
- The new gTLD program allows TLDs to fail

# Economics

- Estimated global DNS query volume is  $\sim 3 \times 10^9$  queries per day ( $\sim 3 \times 10^6$  qps)
- Total data volume is  $\sim 2.6$  TB per day
- gTLD registries have to maintain 100% availability
  - not one second downtime, ever!

# Anycast

Anycast is deployed to meet load, ensure resilience and isolate faults to geographic areas



# Anycast

- Lots of sites, lots of servers
- Lots of redundancy
- Registries operate at 5-10% utilisation due to DDoS threats

# Anycast

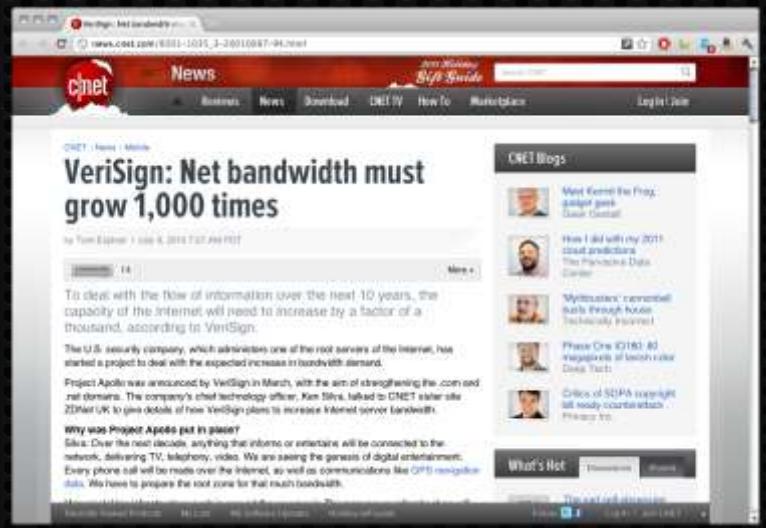
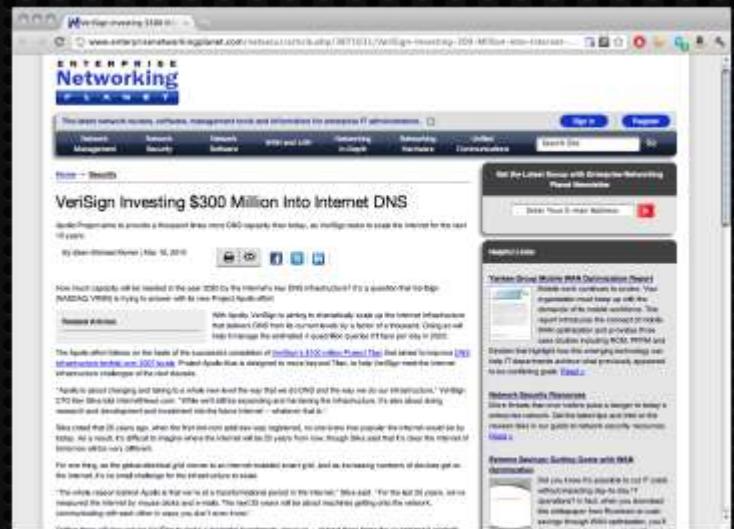


(source: [root-servers.org](http://root-servers.org))

# Economics

In 2010, VeriSign announced Project Apollo, a \$300 million project to expand capacity of the authoritative DNS system (ATLAS) for COM and NET

Builds on a previous investment of \$100m in 2003



# Economics

- To provide a reliable global DNS service, the costs of providing the service need to be met
- The business model that has been developed is based on rental of domain names
- Economies of scale don't always apply