

Why net neutrality is a bad idea

And always was

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At a glance

- Neutrality wasn't a goal
- Neutrality isn't evident
- Neutrality won't be a driver

Neutrality?



Neutrality?



1. Past

- Pre 92 – only “one” ISP&no real debate
- Post 88
 - TCP is “unfair” (1/rtt dependence)
 - Multicast allows free rider receivers
- Post 92
 - EGP/BGP + NSFNet divest
 - BGP rapid evolution of discriminatory routes

BGP Ancient History

- Pre NSFNet teardown:-
- Educational, Defense&Research
 - shared long haul
 - Policy was complex
- BGP developed to support
 - Customer, Provider, Transit, Blacker, Early Exit, Discrimators etc etc

TCP Ancient History

- Proportional Fairness (c.f. Kelly)
- $1/\text{RTT}$ dependence is *good*
 - Mitigates against far away service
 - Encourage use of proxy/cache/cdn
 - Cost of distance (cross ponds)
 - led to Oz & UK volume charges for long haul
 - Scandinavia nets downrating external use of their proxy caches.

2. Present

- Market Failure v. Technical Failure
- Vertical, Horizontal, Orthogonal
- Asymmetry

Failure to Thrive

- QoS
 - isn't visible (except as make worse)
- Multicast
 - Isn't deployed to the user
 - despite, e.g. BBC requests for it
- Mobility
 - Doesn't work right in IP
 - HTTP workaround on smart phones
- Multipath/home
 - Might get there in the end

Failure to stand still

- “Best Effort”
 - route even if dont forward.
- Failure to deploy IPv6 means
 - We don't even have the original service
- This is really quite a shocking failure
 - V6 would allow mobile, multicast, multihome and hip/accountable
 - What's not to like? :-)

Failure to Compete

- European Regulators observe
 - Access Net
 - DSL, 3G, Cable...
 - Core Net
 - Telco per Nation+New Entrant
 - Hence [BFD]T (oh, ok Telefonica:)
 - Slight hiccup
 - if access, core & cellular or not
- So maybe US problem here is structural...

Land Grabs

- Of course the internet is not flatland
 - CDNs formalize cache/proxy
 - Search “Provider” capture via portal
 - Content Service Provider (youtube etc)
 - App provider (fb etc)
- ISP could have build these but failed
 - Inability of GOP to adapt.

3. Future

- Rendezvous with Random
- CCN/NDN
- Data Center as IXP

Asymmetry v. Random

- IP was once symmetric
 - There's no host!=router in early code
 - Is now client only (couch potato NATed)
 - Server big guns
 - Router fw rules&policy engine
- Asymmetry for finding stuff is bad
 - User only gets what search/cdn thinks they want

Rendezvous

- feature of P2P, CCN, Multicast, i3 etc
 - Random walk scales well
 - On natural net topologies
 - And finds things in a content neutral way
- Returns us to a symmetric world
 - Could be green too (another talk...)

Data Centricity

- Is one line of innovation I like
 - But it needs to deploy
 - Many impl need Ipv6
 - hash URI into v6/crypto assigned addr
- Some nice novel software stack ideas
 - Psirp, ndn, hagggle
- Stifled at birth...

Data Center as IXP

- Get rid of routers
 - they enforce asymmetry
 - They are the ossification
- Internet is getting flatter
 - c.f. Nanog Arbornet report
 - CDN/Cloud multihomed
 - Why not get rid of intermediate routers!
- Run Metarouting on cloud

Summary and Conclusions

- A lot of the problem is down to
 - First Mover (dis-)Advantage
 - Regulatory toothlessness
- Search Neutrality
 - <http://googlemonitor.com/2011/ftc-google-antitrust-primer-top-ten-qa/>
 - 3 body problem – google have solved
 - 3 legged chair – very stable
 - Locks in higher level model
 - Need to break!
- Down with neutrality!!!

Questions...

