

Seeking Default/Control Plane

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Can we reach each other?

- Geoff Huston's talk on "Desperately Seeking Default¹"
 - Telephony based on any-to-any (peer-to-peer) connectivity
 - All telephones equally reachable; anyone could dial anyone else
 - This may have been an original concept in the Internet; perhaps no longer
 - Noticed ad-based measurement network with many incomplete connections
 - SYNs with no ACKs
 - From just below to just above 1% depending on IPv4 or IPv6
 - Measured routing tables from many vantage points
 - Route-Views and RIPE RIS (Routing Information Service)
 - Structurally persistent variances of double-digit percentages
 - Not just more-specifics or overlapping prefixes
 - No consensus on what the "full route table" is

¹ <https://www.nanog.org/meetings/abstract?id=2948>

What kind of system do we have?

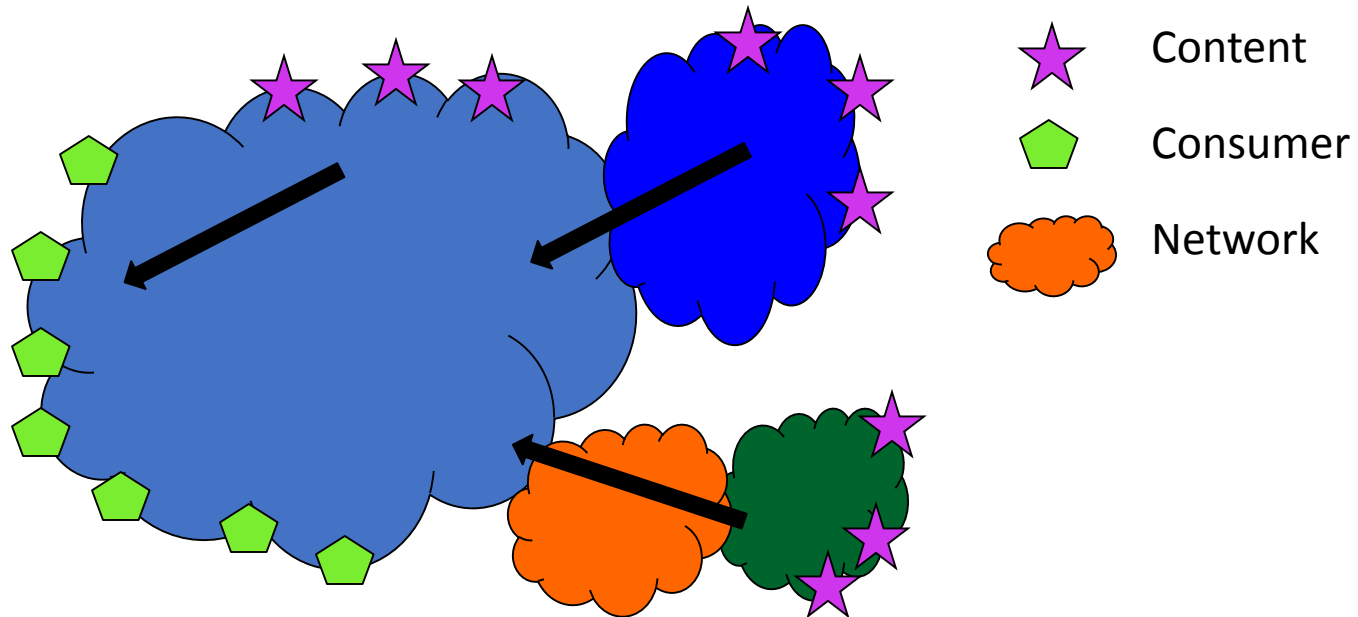
- Generally client/server
 - Not using “phone book” or other directory to reach users at other end-points
 - Communication through “servers”, often sitting in “clouds”
- NAT (Network Address Translation)
 - Began as a “hack”
 - Benefited/ossified client/server structure
 - End-users somewhat in control nonetheless (but maybe not in mobile)?
- Geoff Huston
 - We have a Tier1 CDN (Content Distribution Network) feeder system
 - As long as customers can reach their content they are happy
 - Contrast with historical Tier-1, Tier-2, Tier-3 and hosting providers

Reachable how?

- If we're not reaching addresses, but instead content, then how?
- Data living in "clouds" is often reached by DNS which is
 - Dynamic – mapping changes, often rapidly
 - Differential – mapping is not globally consistent, by design
- Going in the direction of Named Data Networking (NDN)?

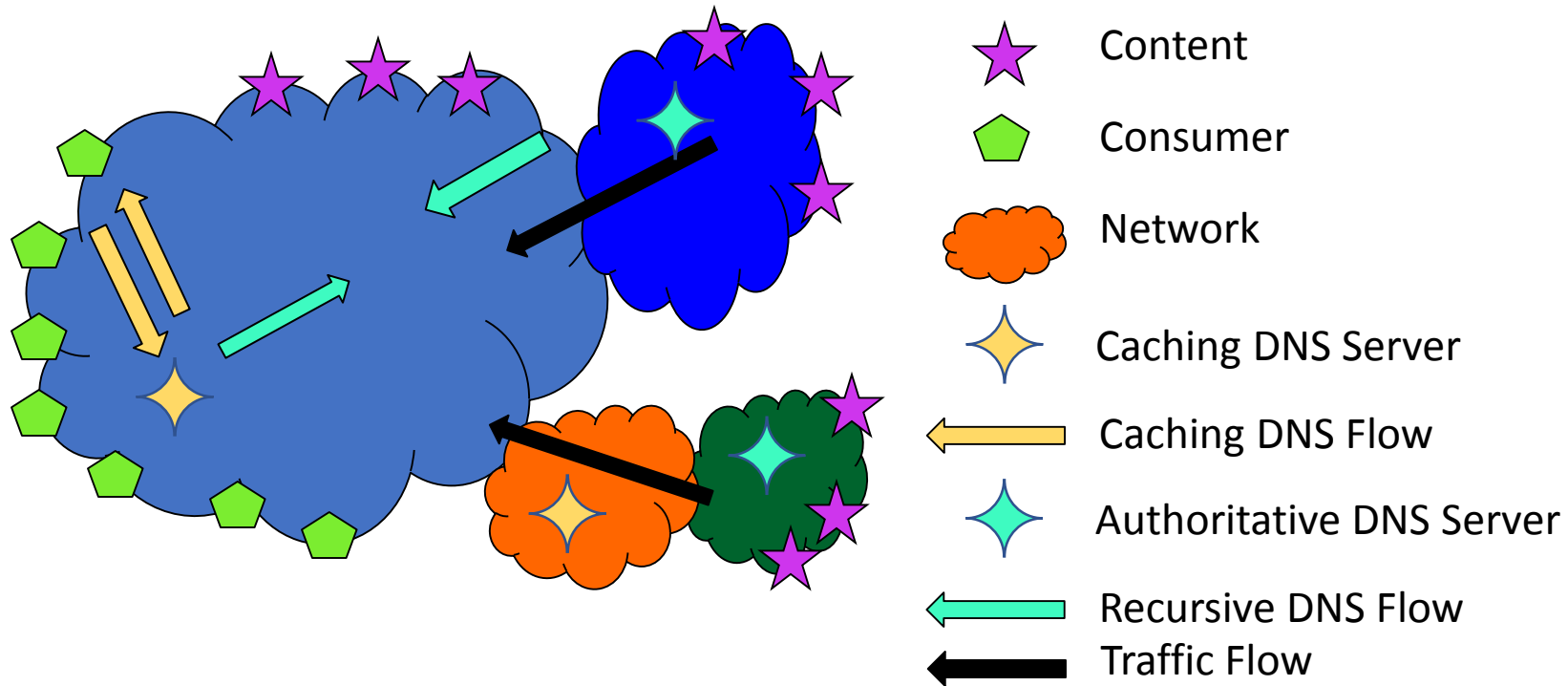
CDN/Transit/Access Topologies

- Content uses many paths to reach consumers



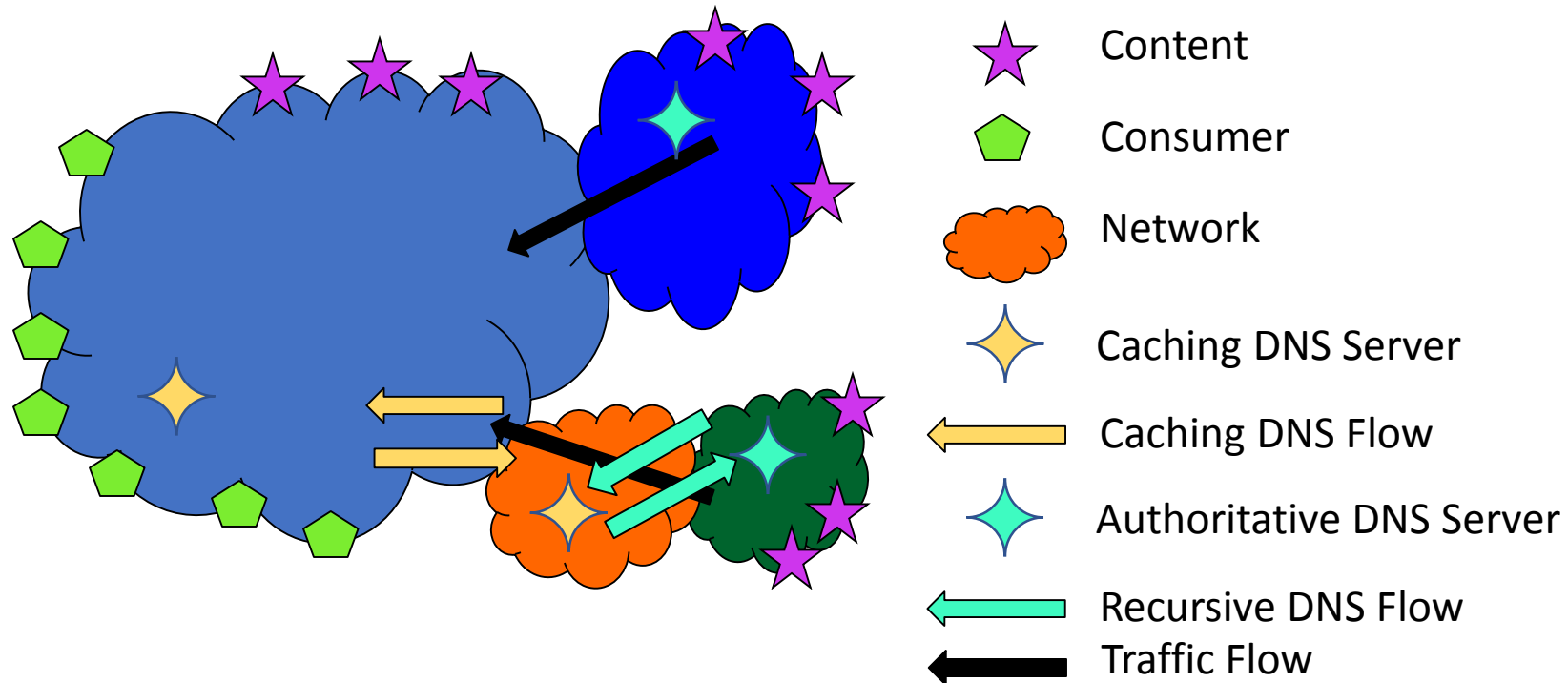
How to find content?

- Consumers use DNS to find content
- Content networks use DNS to steer traffic



DNS is not straightforward

- Consumers can use other DNS caching servers
- Different CDNs use a variety of DNS schemes



How do people find and reach each other?

- LinkedIn
- Facebook
- Skype
- Jabber
- Etc.

What are economic drivers?

- Consumers want Content
- Content wants Advertisers
- Advertisers want Consumers