facebook

DNS Infrastructure @ FB

Manu Bretelle

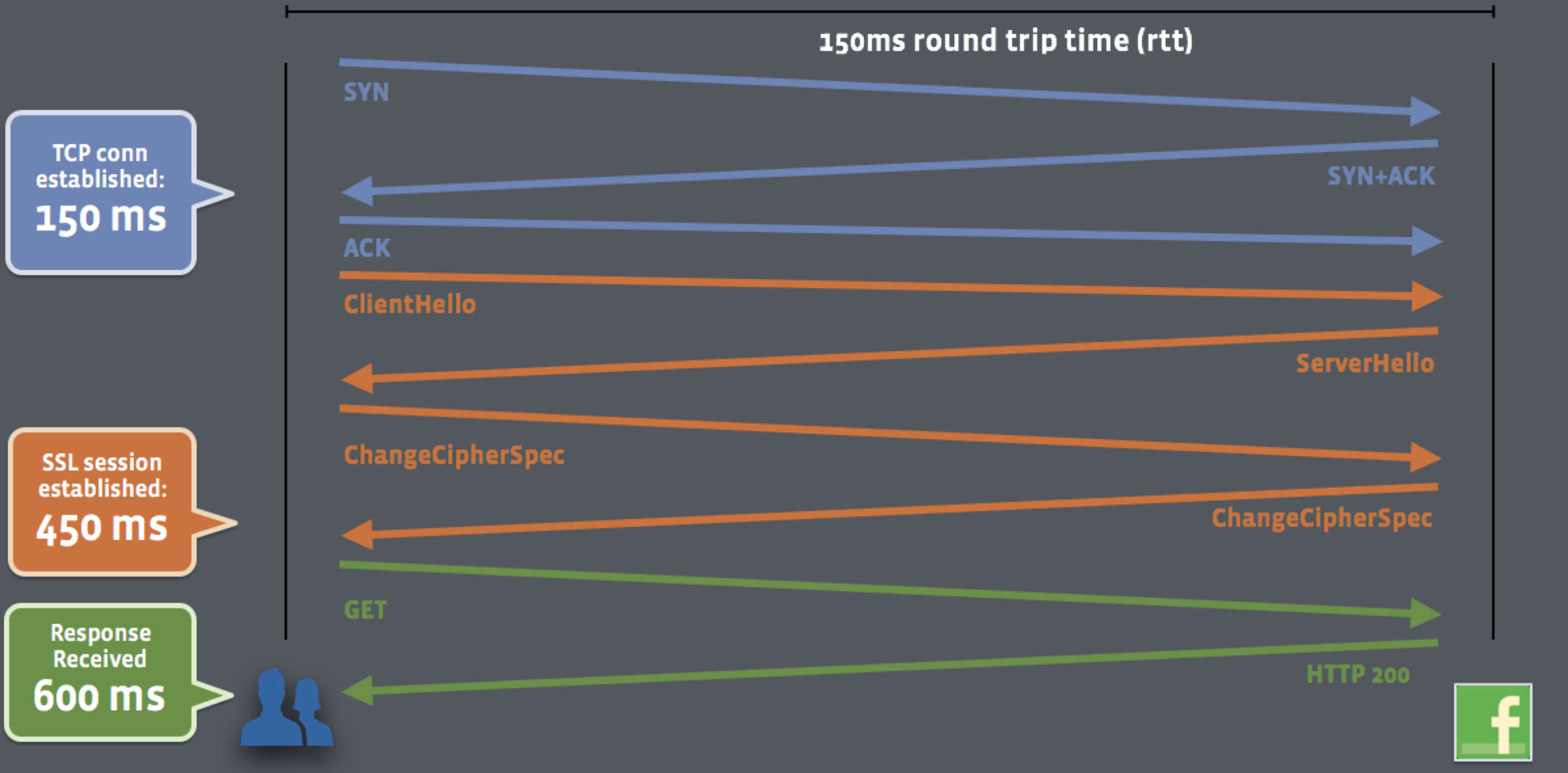
Production Engineer

Who am I

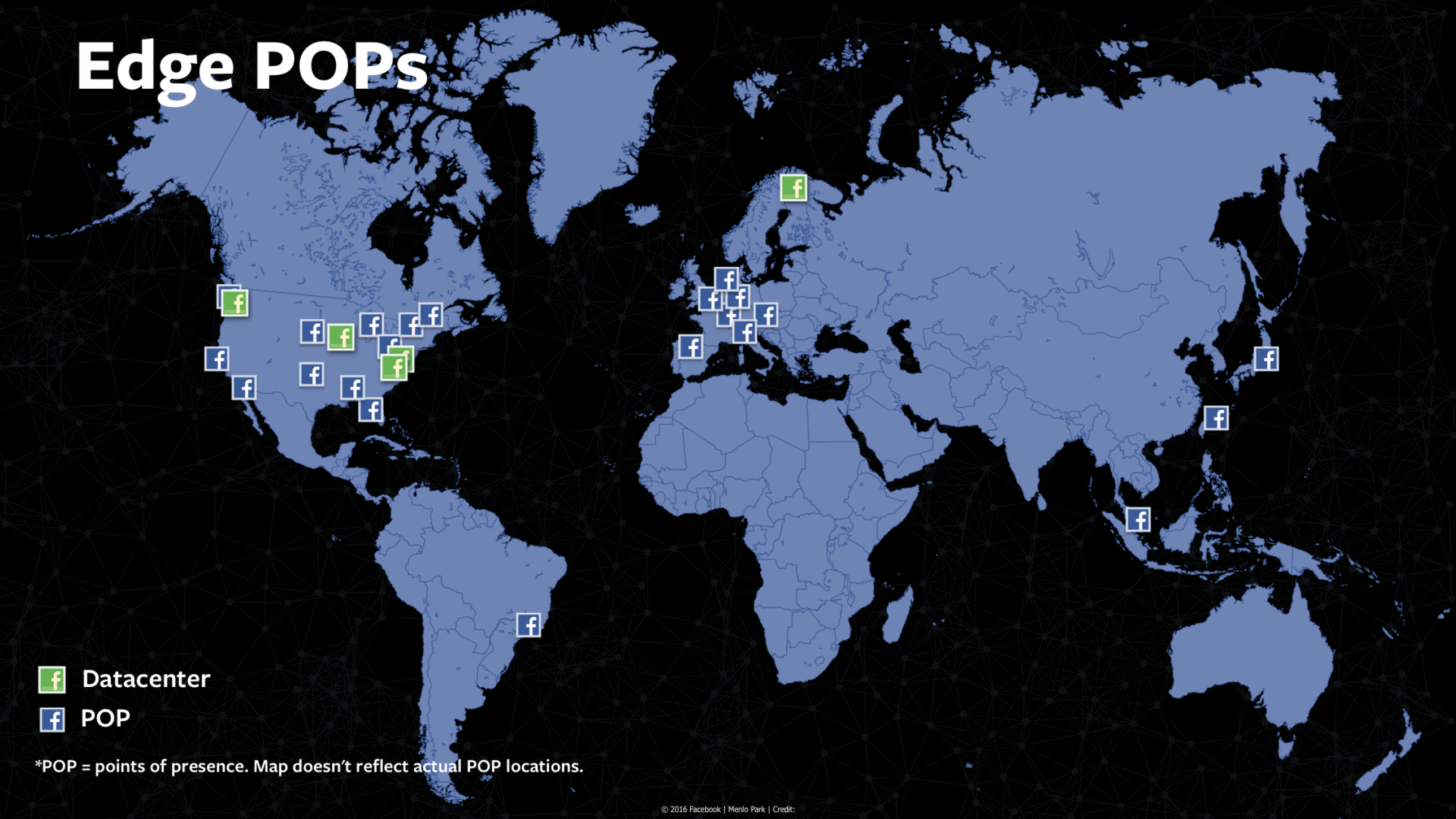
- Traffic Team
- At FB for 5.3808219178082 19 years

To give people the power to build community
and bring the world closer together.

HTTPS Seoul -> Oregon



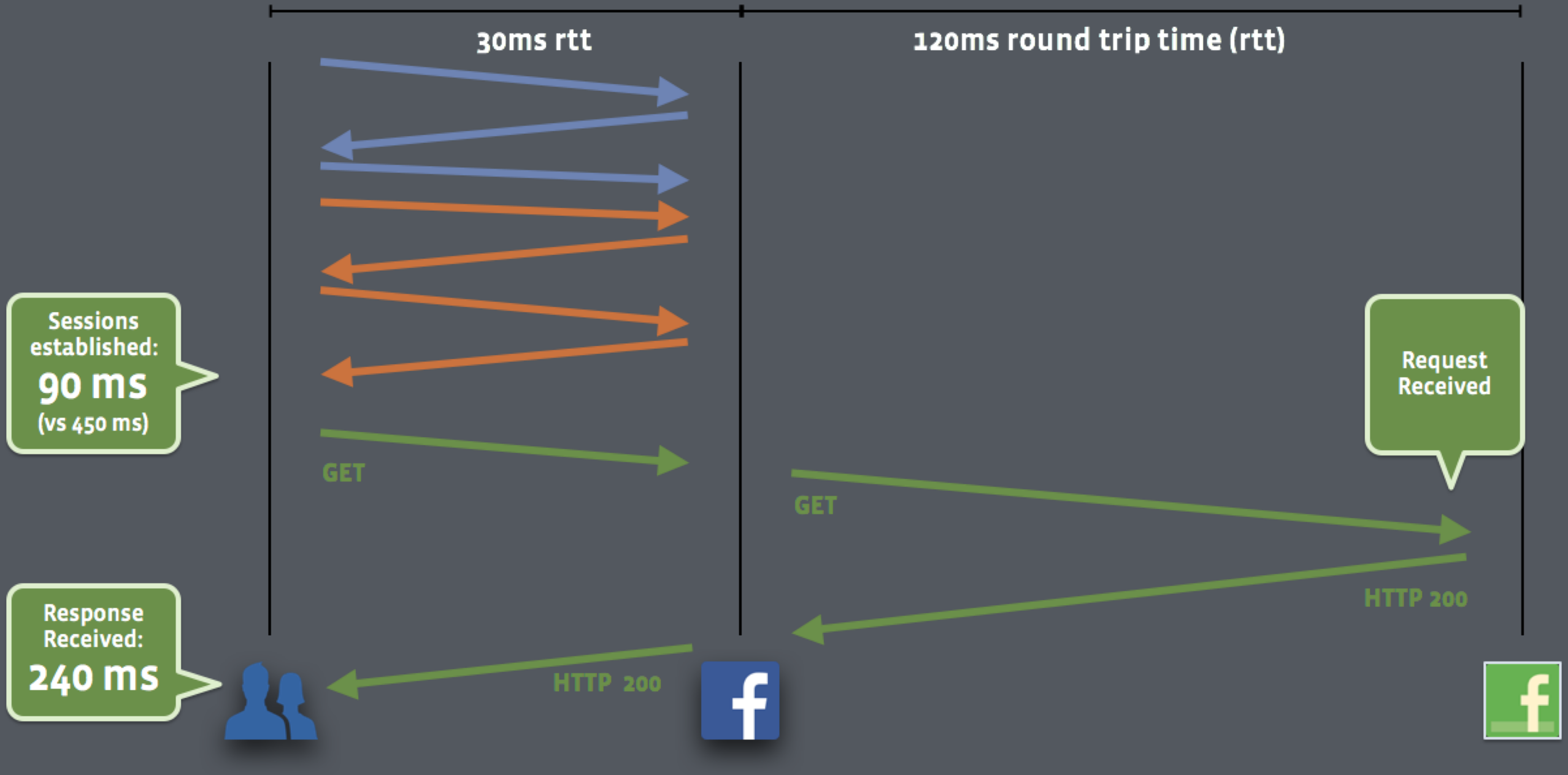
Edge POPs



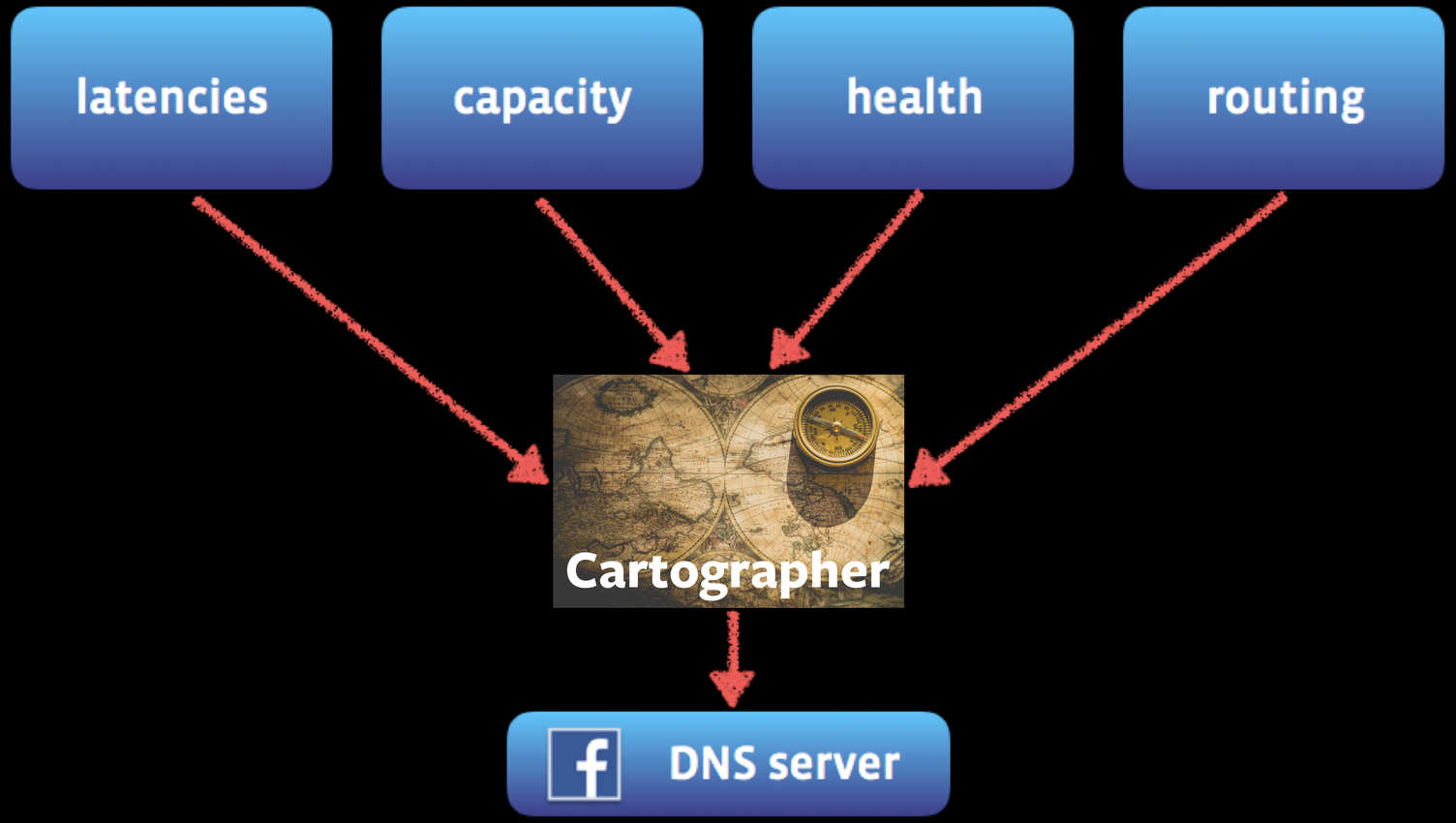
*POP = points of presence. Map doesn't reflect actual POP locations.

© 2016 Facebook | Menlo Park | Credit:

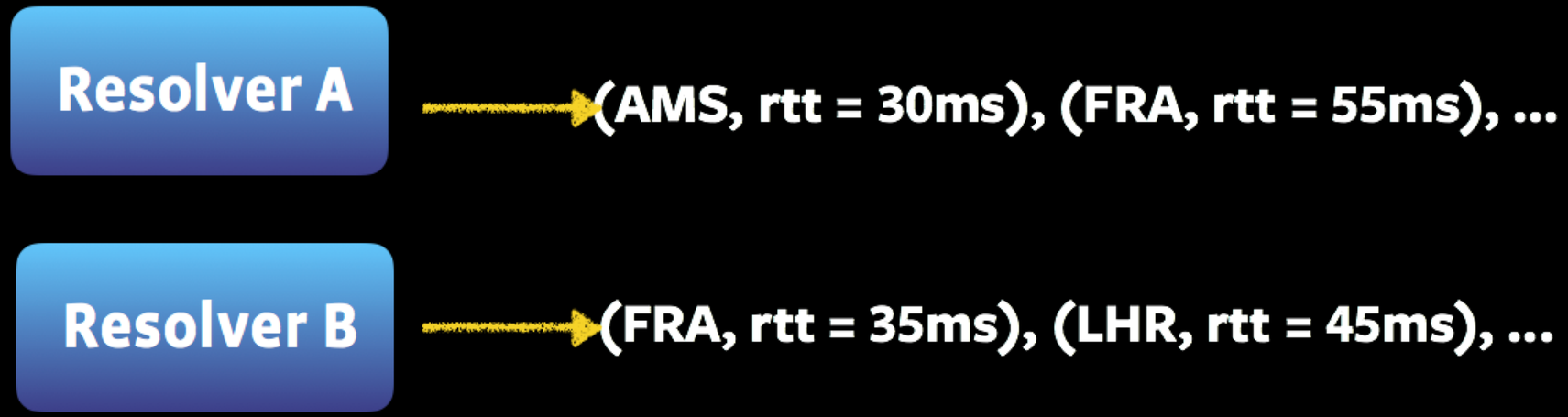
HTTPS Seoul->Tokyo->Oregon



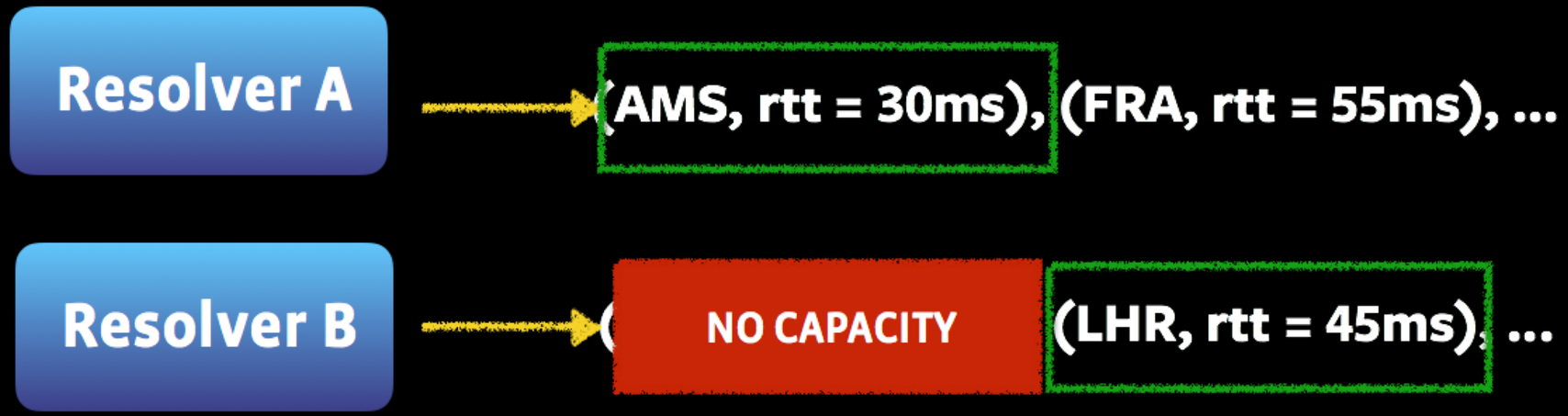
Global Load Balancing



Resolver Allocation

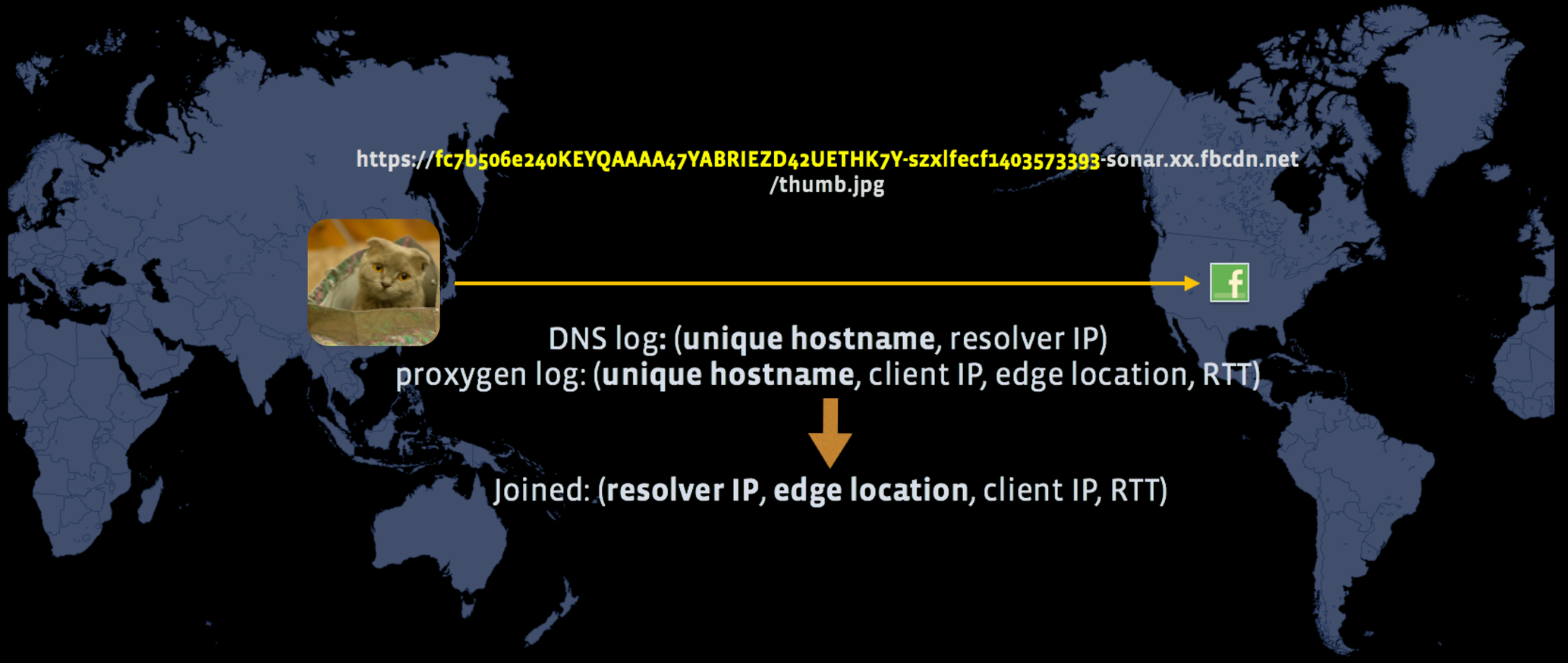


Resolver Allocation

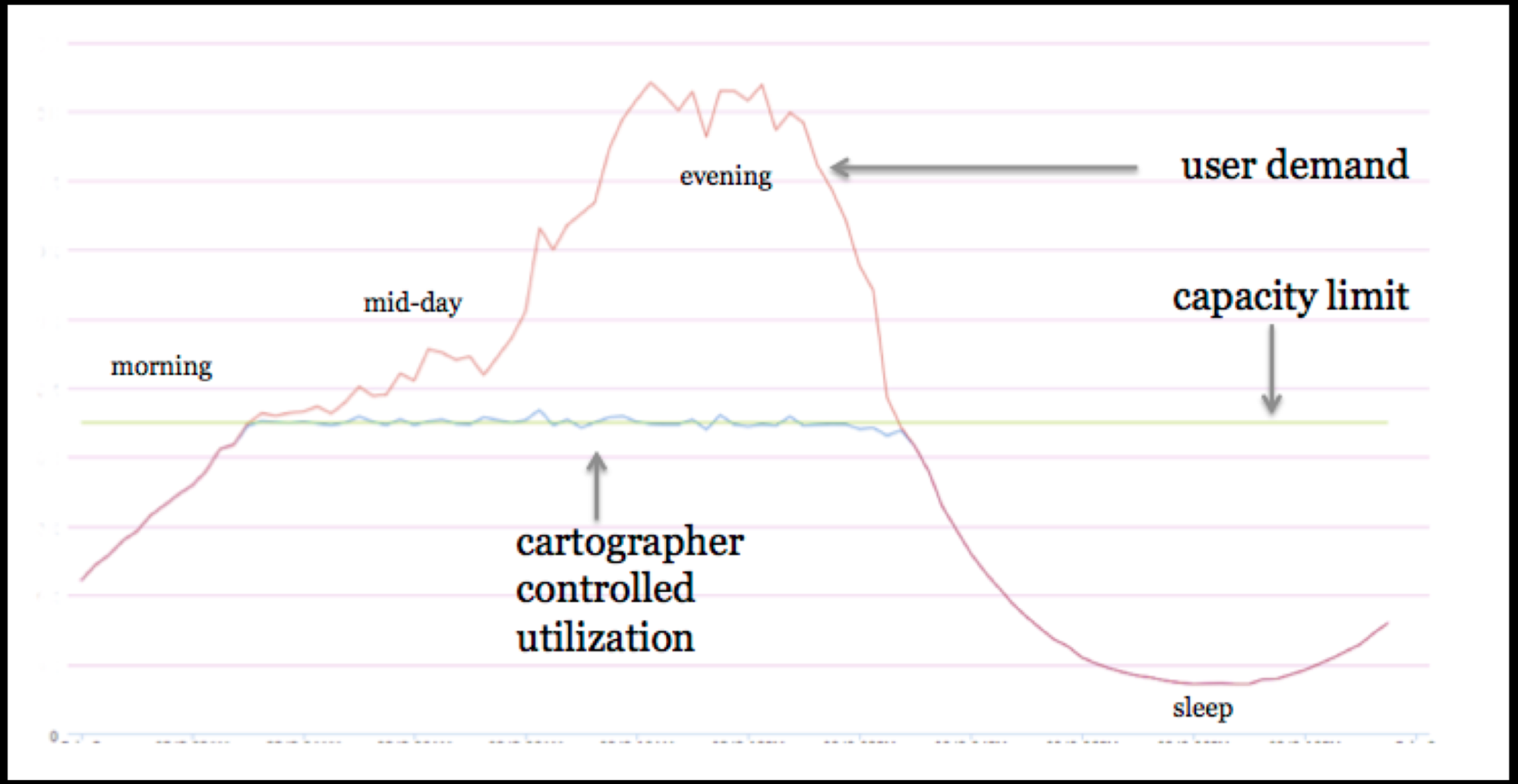


+ rules!

Sonar

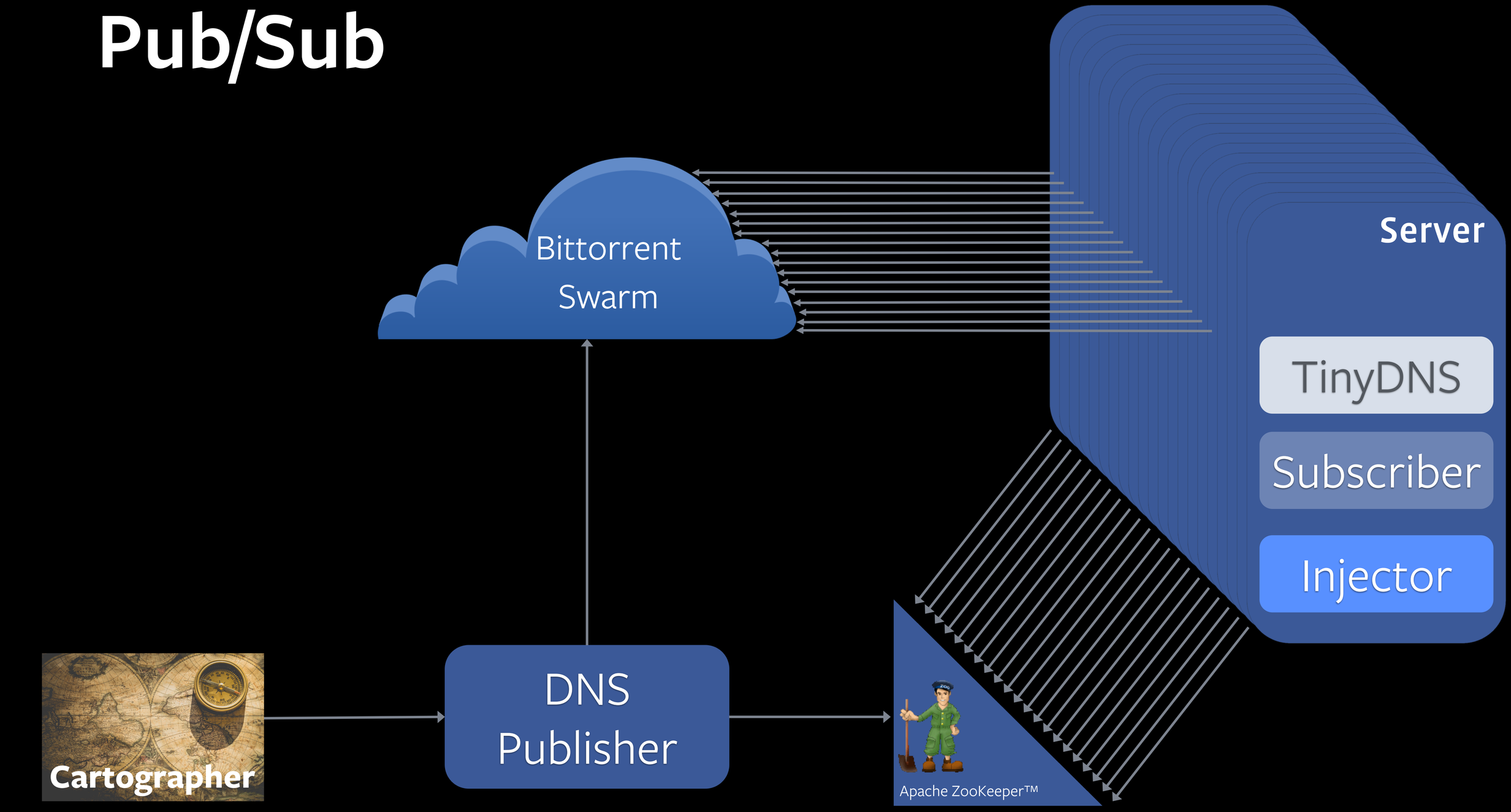

https://fc7b506e240KEYQAAAA47YABRIEZD42UETHK7Y-szxlfecf1403573393-sonar.xx.fbcdn.net
/thumb.jpg
DNS log: (**unique hostname**, resolver IP)
proxygen log: (**unique hostname**, client IP, edge location, RTT)
Joined: (**resolver IP**, **edge location**, client IP, RTT)

C10R managed load



Deploying DNS maps

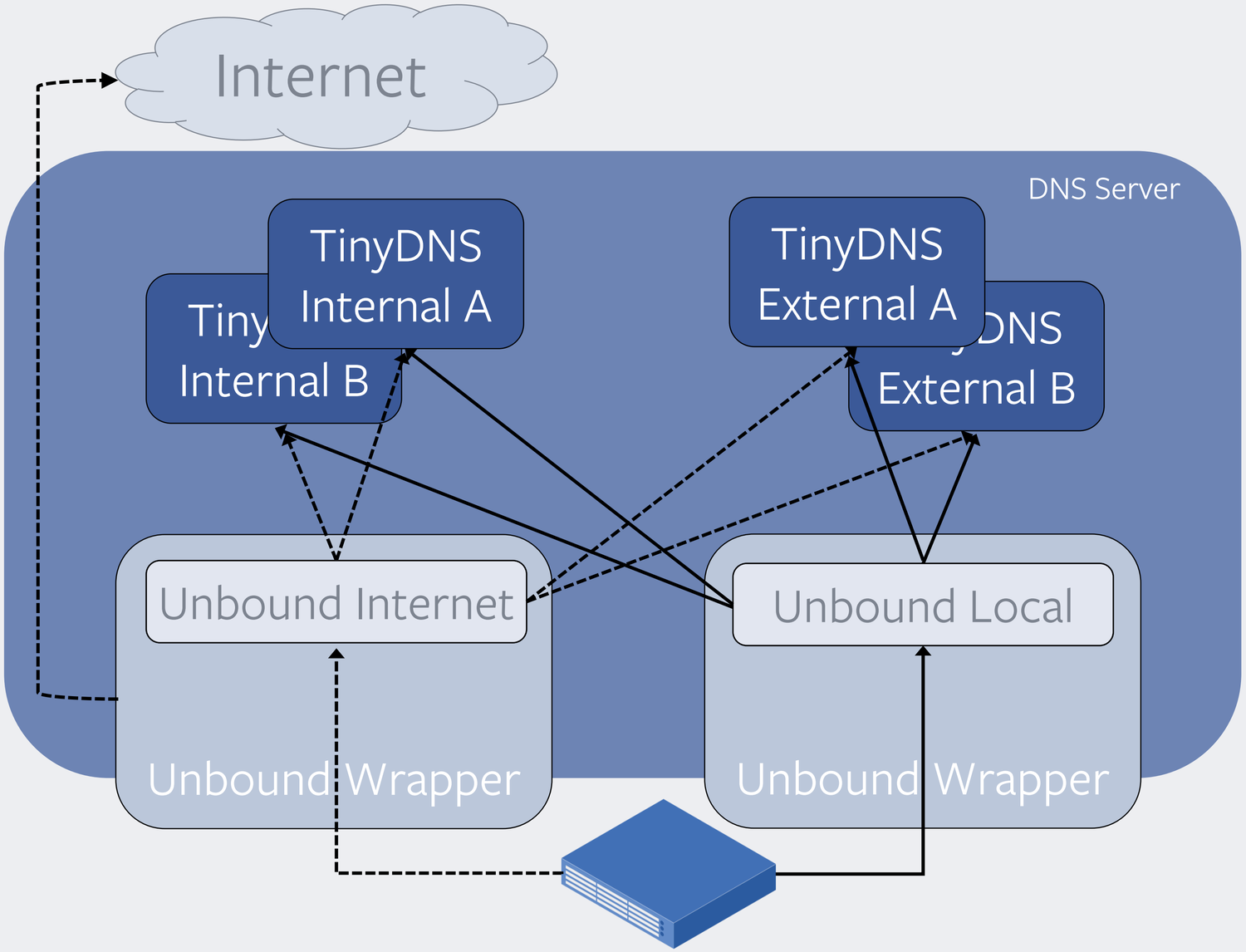
Pub/Sub


Bittorrent
Swarm
Server
TinyDNS
Subscriber
Injector
Cartographer
DNS
Publisher
Apache ZooKeeper™

Internal DNS Infra

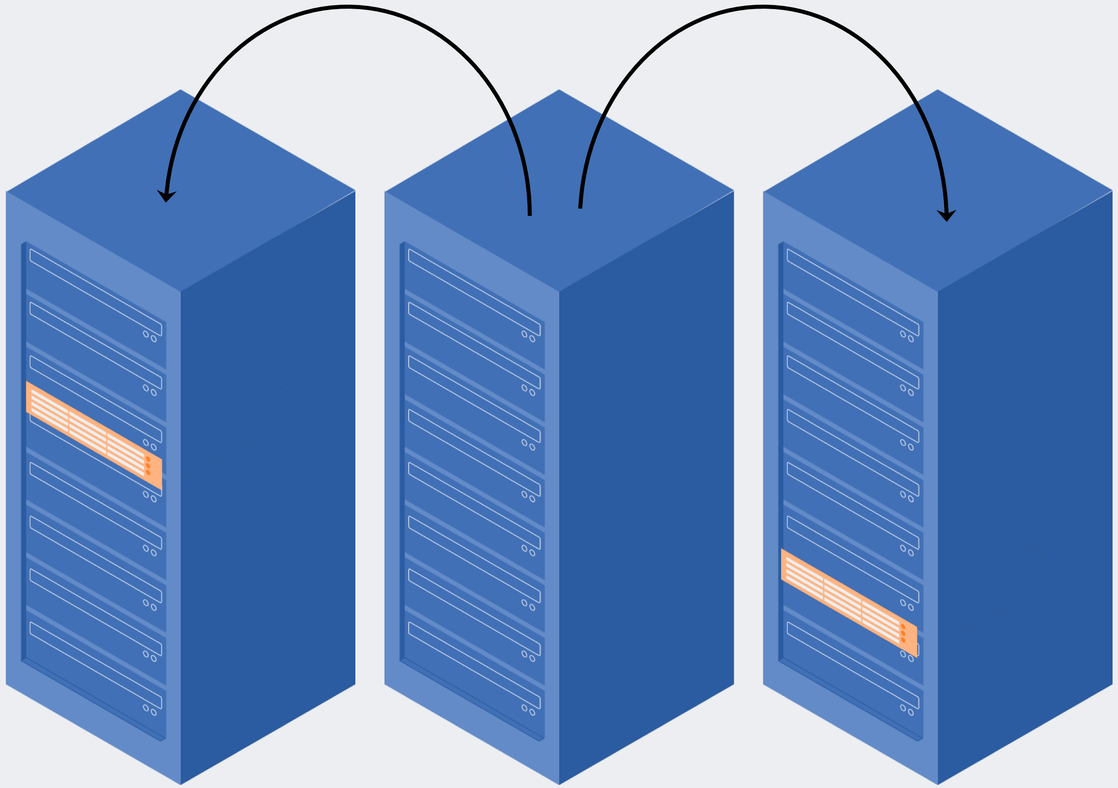
Recursive resolver

- Stub-zones
- Healthchecks
- Advertise VIP
- Monitor configs
- Rolled restart



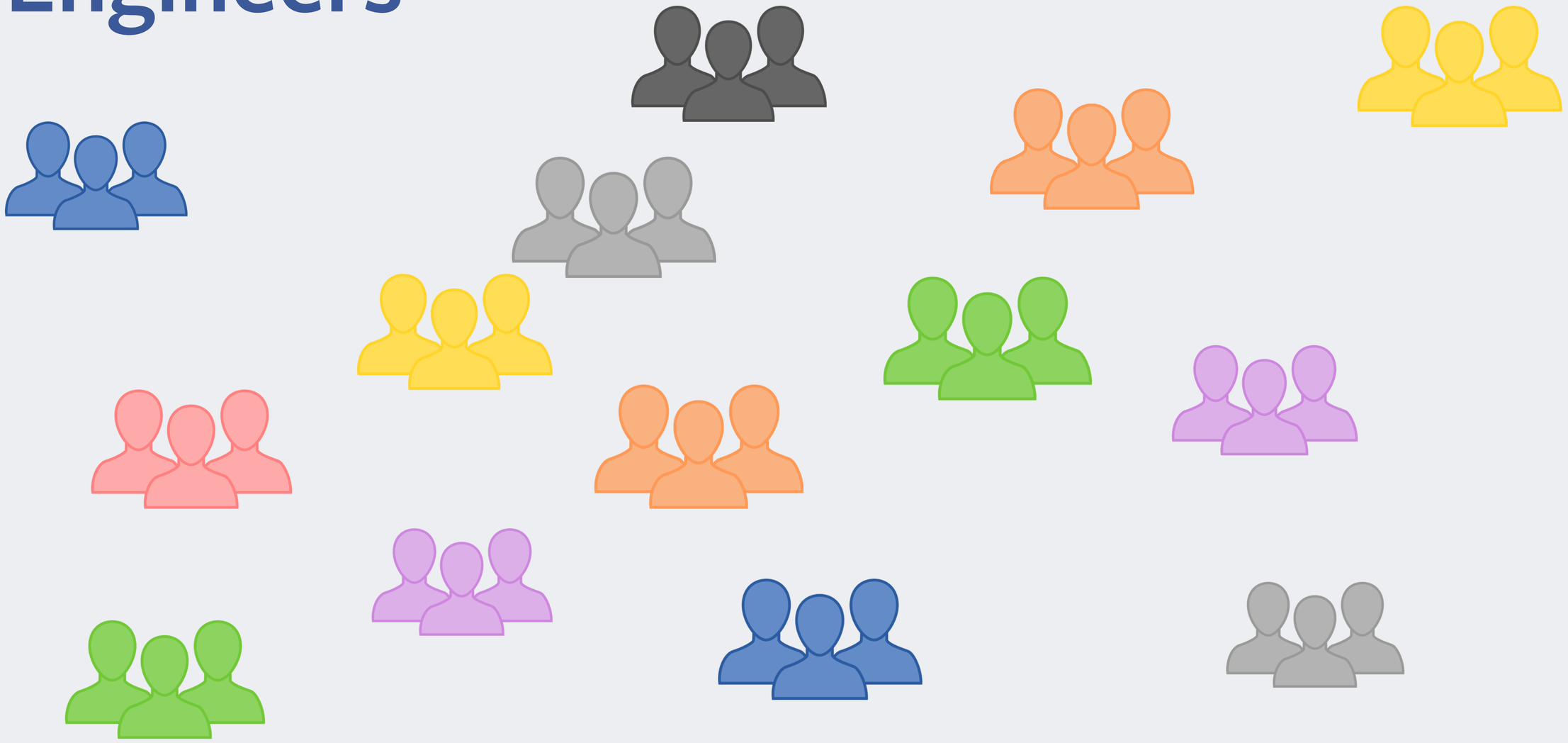
Anycast VIP Advertisement

- BGP
- ECMP
- ExaBGP between servers and TOR



Who makes changes

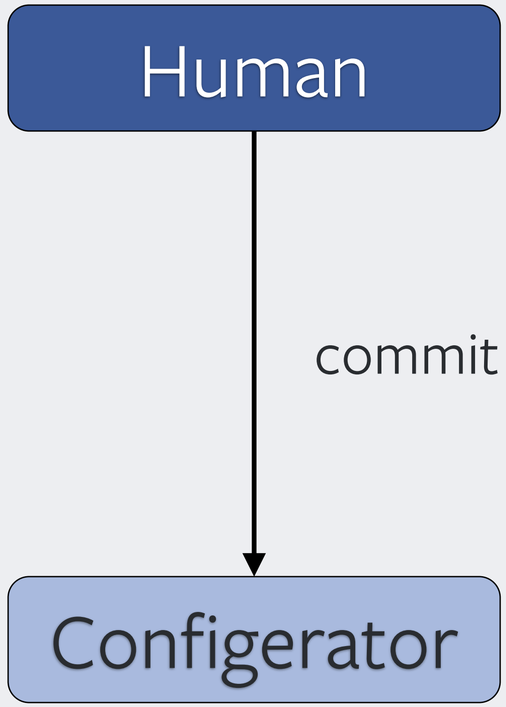
Engineers



Servers Themselves

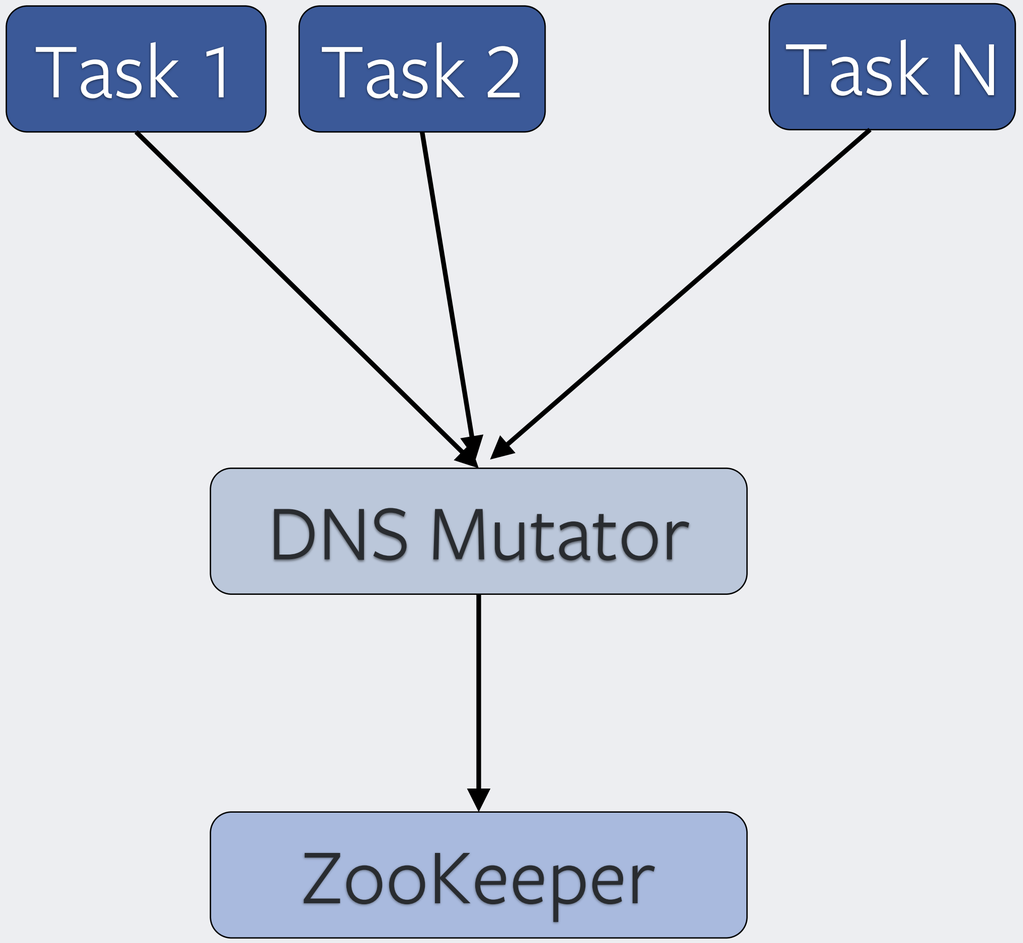
Human generated changes

- Version controlled/Code review
- Linter/CI to catch errors
  - Duplicates, cname cycles, unknown zone
  - Target IP, TinyDNS format
- Propagate to all hosts



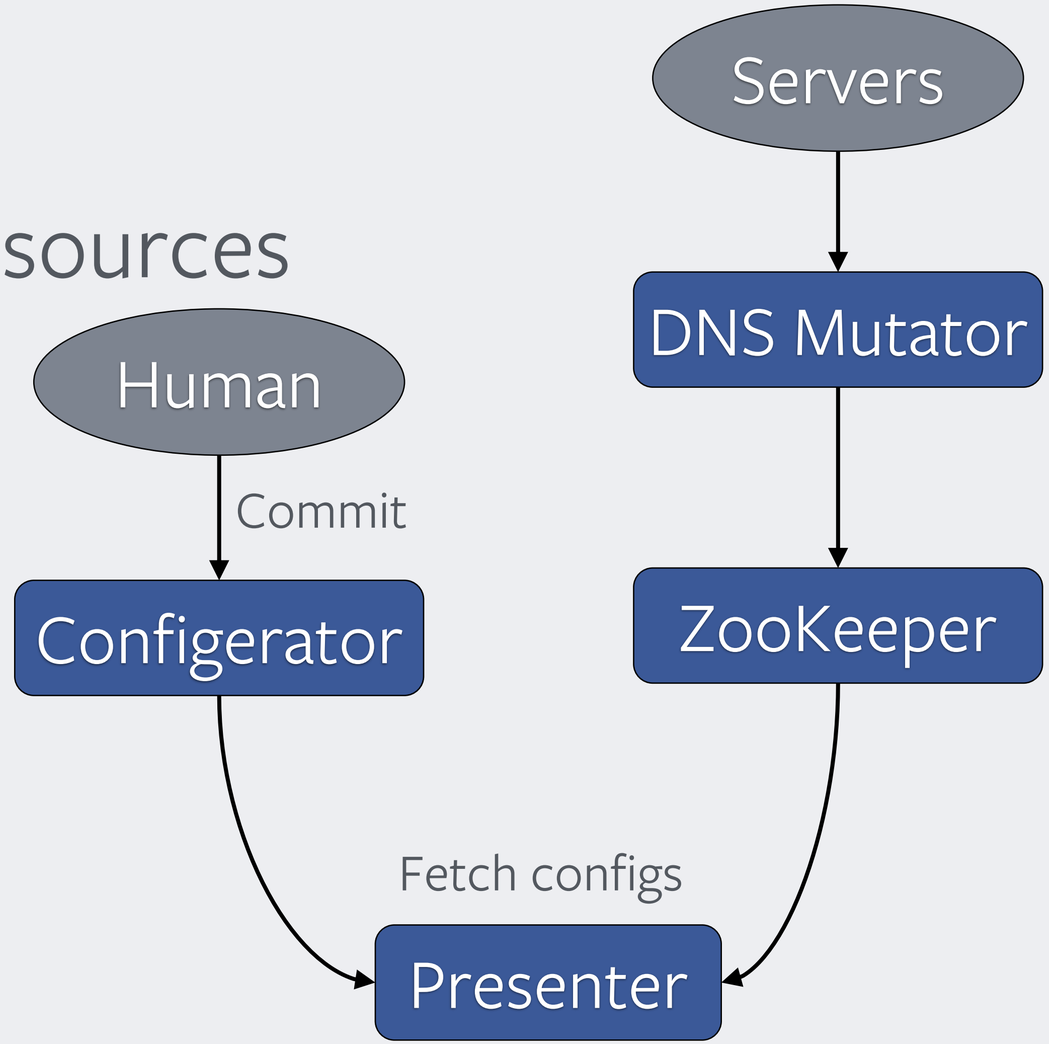
Automatically generated configs

- Python Framework
  - Only need to provide DNS data
  - abstract storage details, retrying...
- Periodically re-generate config
- Mutator checks generated data



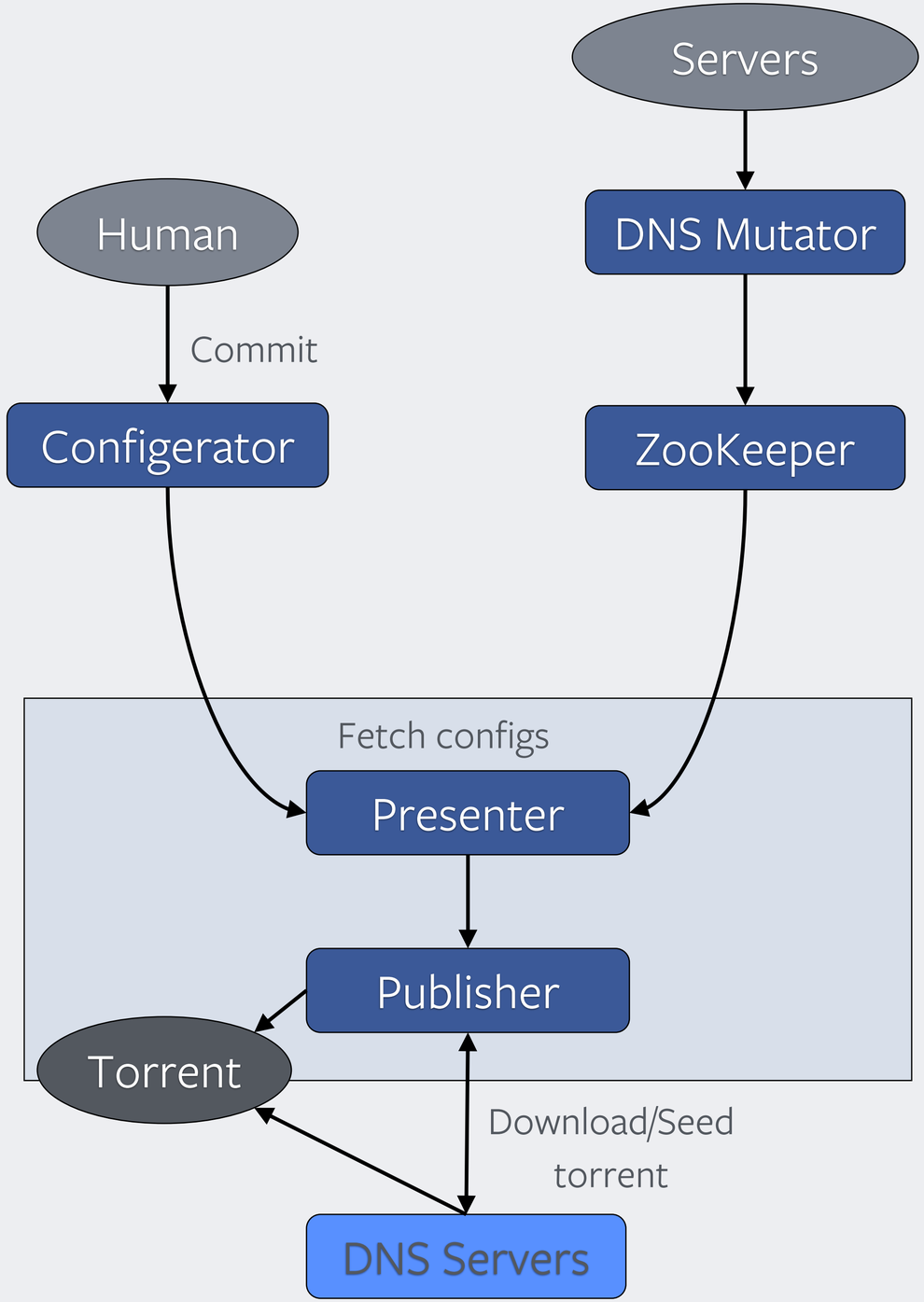
DNS Presenter

- Collect records from multiple data sources
- Record and Logical Validation
- Global view of DNS map
  - Perform final sanity checks
  - Collision/Resolution
  - Post processing



DNS Pipeline Overview

- Complexity broken into:
  - Small and simple services
  - Isolation
- Checks at every levels
  - Catch issues early
  - Easy to trace
  - Limit failure blast



Thank You

facebook