

On building VCCorp CDN

Vietnam Web Submit 2016

Phạm Tuấn Anh



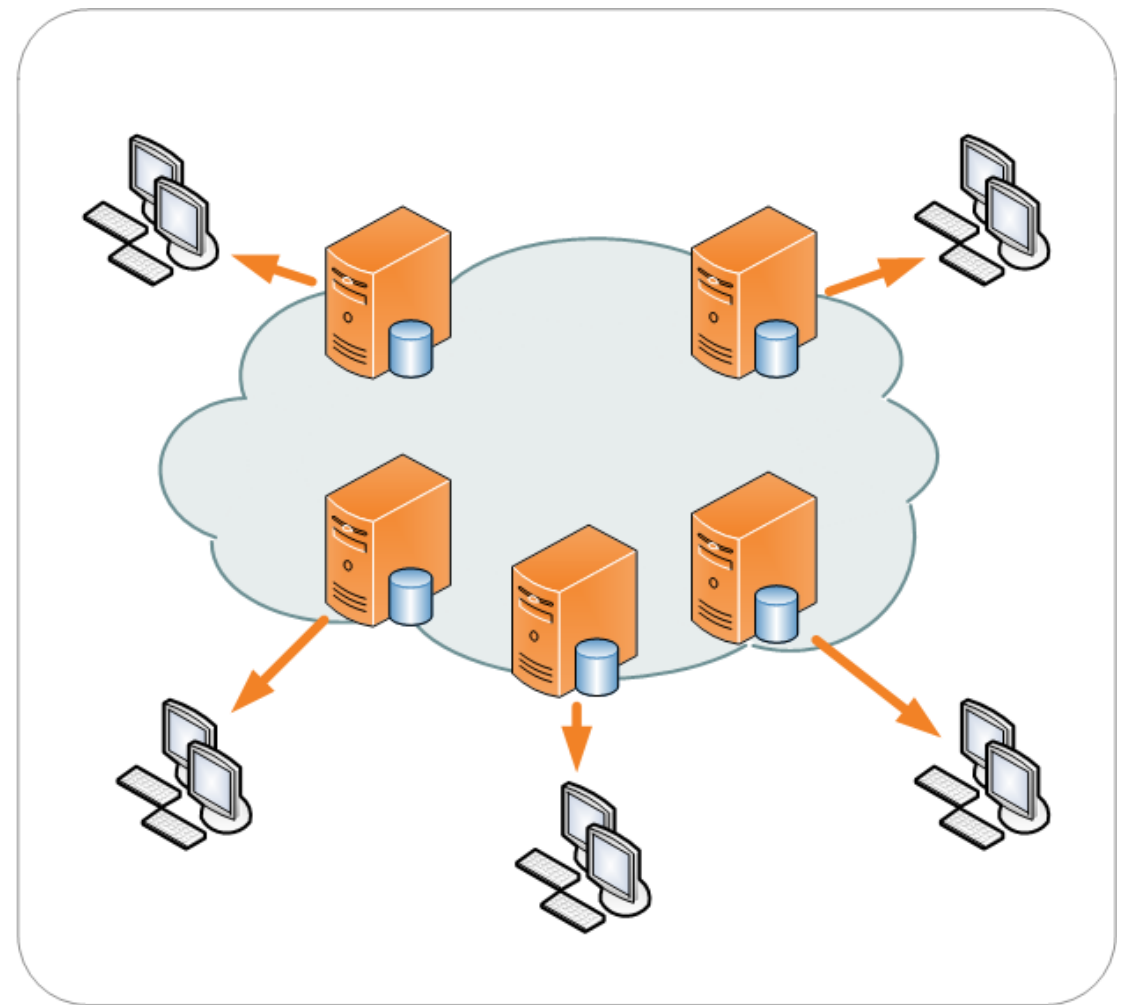
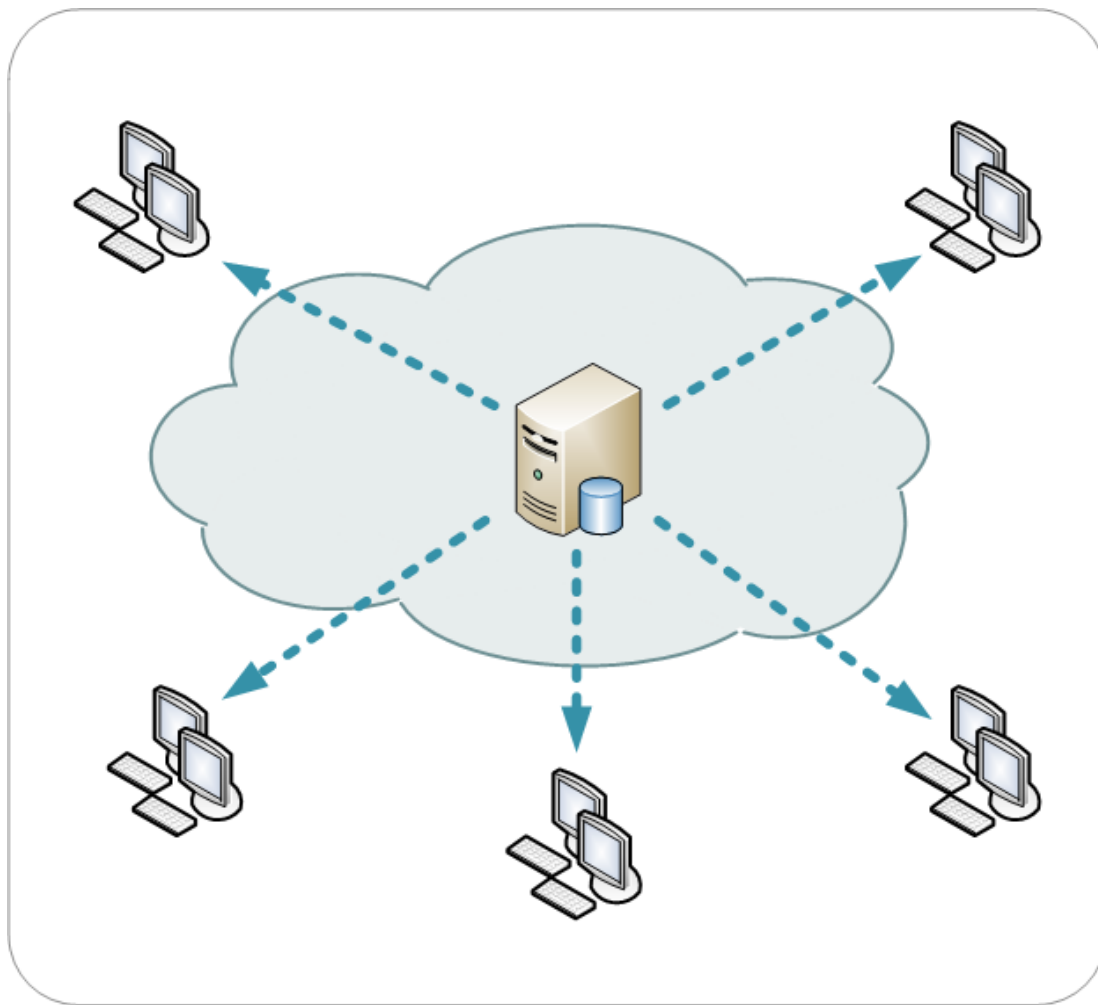
\$ whoami

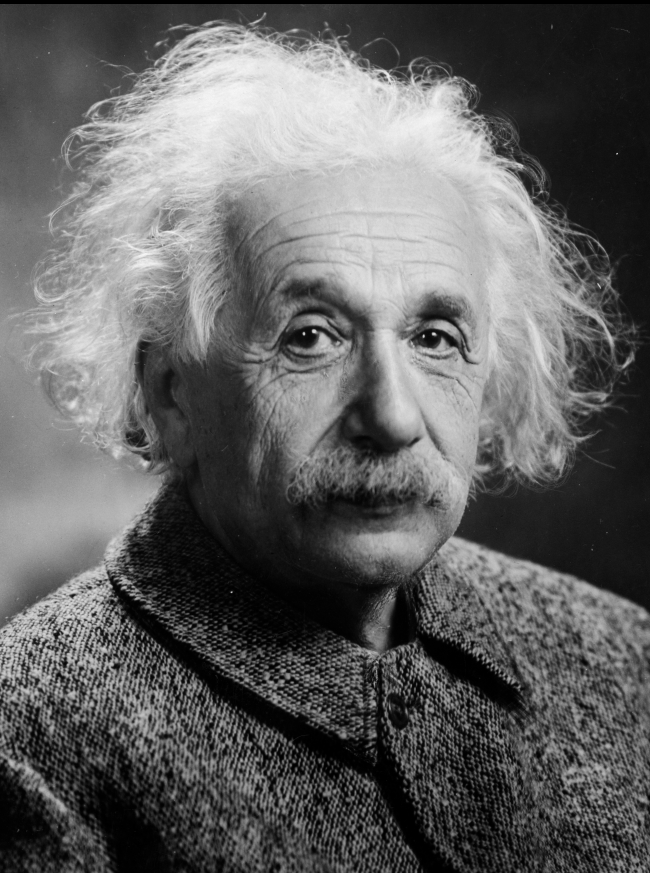
- Lead engineer at VCCloud Platform Services
- "Big" projects:
 - DDoS Shield (~ Cloudflare)
 - CDN (this talk)
 - Storage (~ Amazon S3)
 - PaaS (~ Google Container Engine)

About VCCorp

- Các báo: dantri, kenh14, soha, vtv...
- Quảng cáo
- Game
- TMĐT

Content Delivery Network





“The speed of light is the maximum speed at which all energy, matter, and information can travel.”

– Albert Einstein

Độ trễ giữa các location:

| Route | Distance | Time, light in vacuum | Time, light in fiber | Round-trip time (RTT) in fiber |
|--------------------|----------|--------------------------|-------------------------|-----------------------------------|
| HN → SG | 1,615km | 5.3ms | 8.8ms | 17.6ms |
| HN → Singapore | 2,212km | 7.4ms | 12.3ms | 24.6ms |
| HN → Tokyo | 3,665km | 12.2ms | 20.3ms | 40.6ms |
| HN → San Francisco | 11,752km | 39.2ms | 65.3ms | 130.6ms |

RTT thực tế giữa HN & SG là ở khoảng **25-30ms**.

Vấn đề nghẽn băng thông:

- Giữa các location
- Giữa các nhà mạng
- Mạng 2G/3G

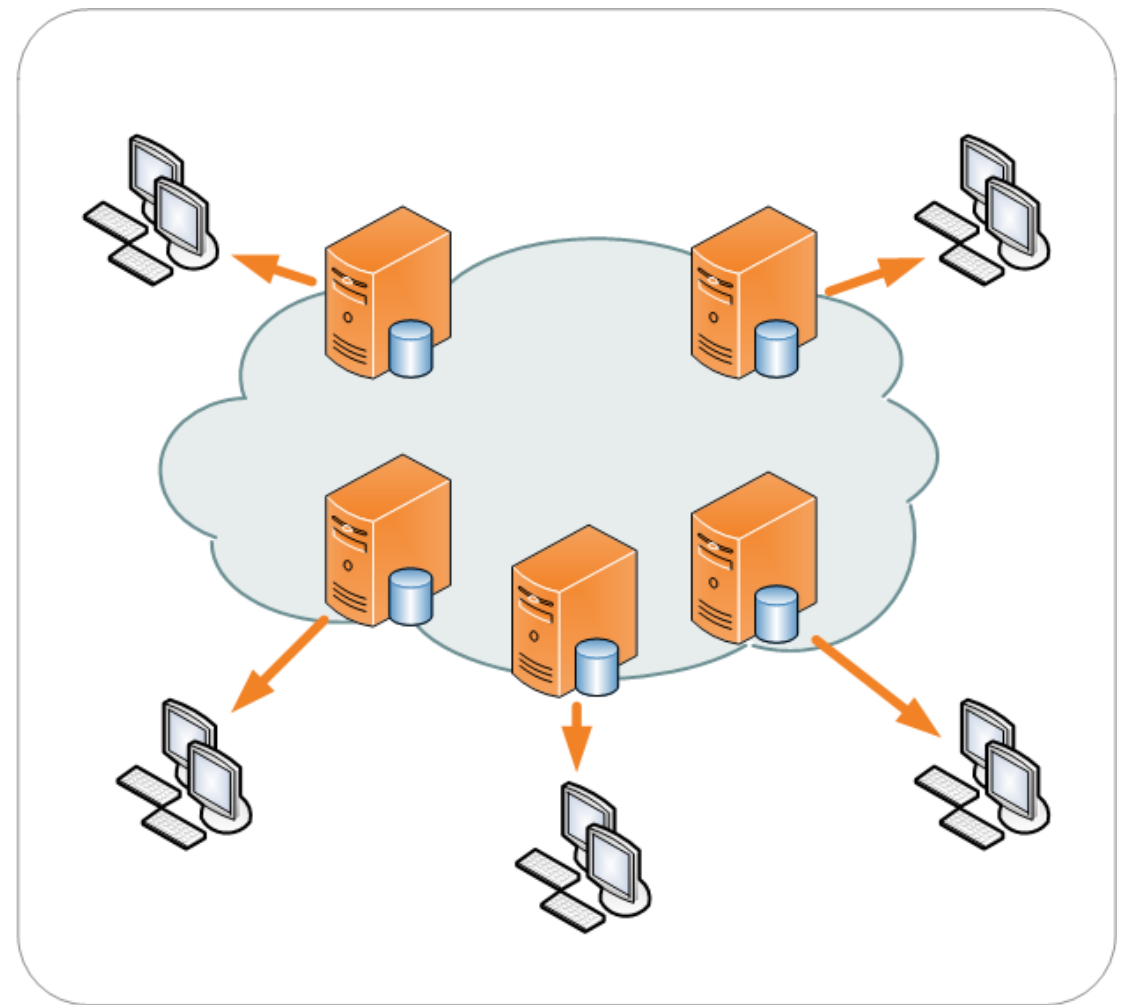
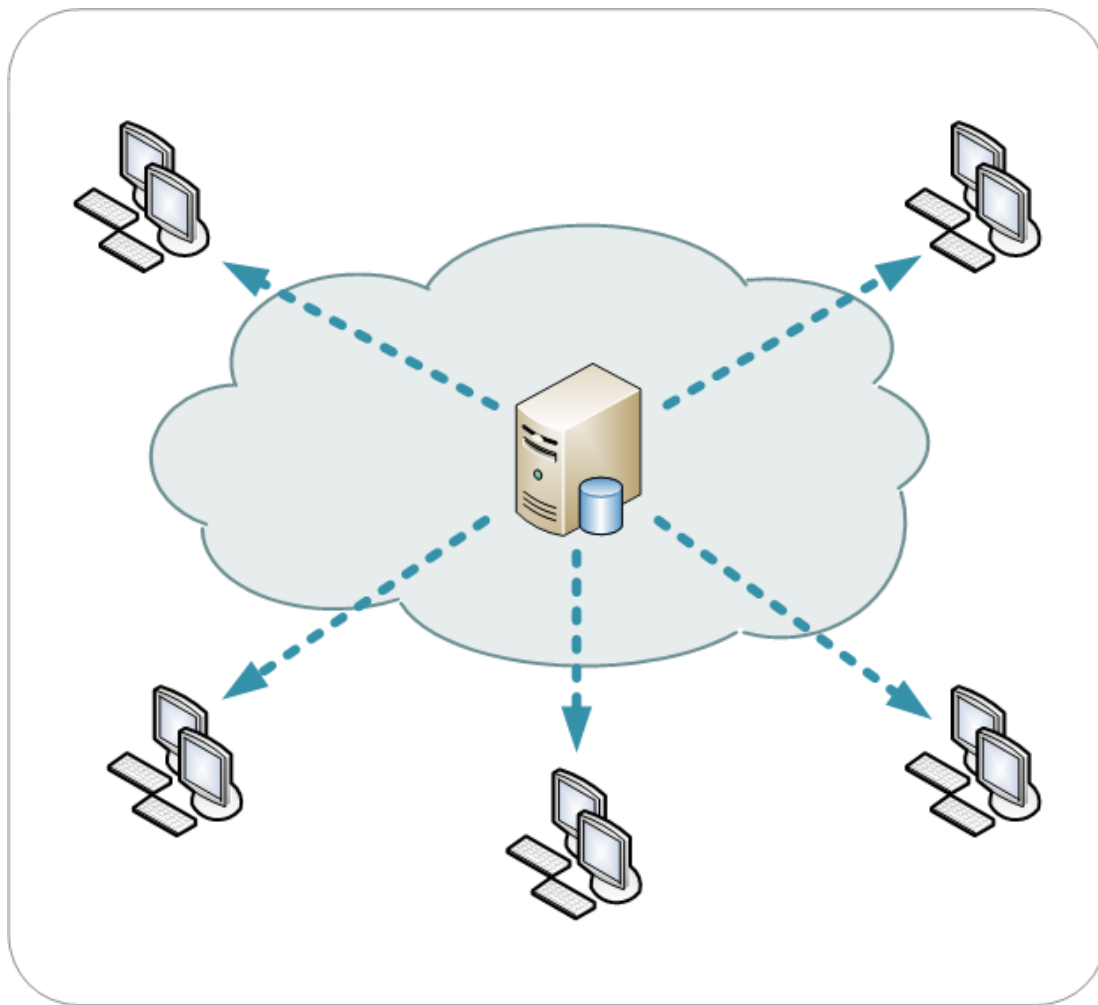
Lỗi mạng:

- Các bên cung cấp ADSL/FTTH
- Data center
- Đứt cáp quốc tế

HA & DDoS mitigation:

- Rủi ro khi đặt server ở 1 location
- Bị động trong việc xử lý sự cố
- Bị động trong việc điều phối băng thông

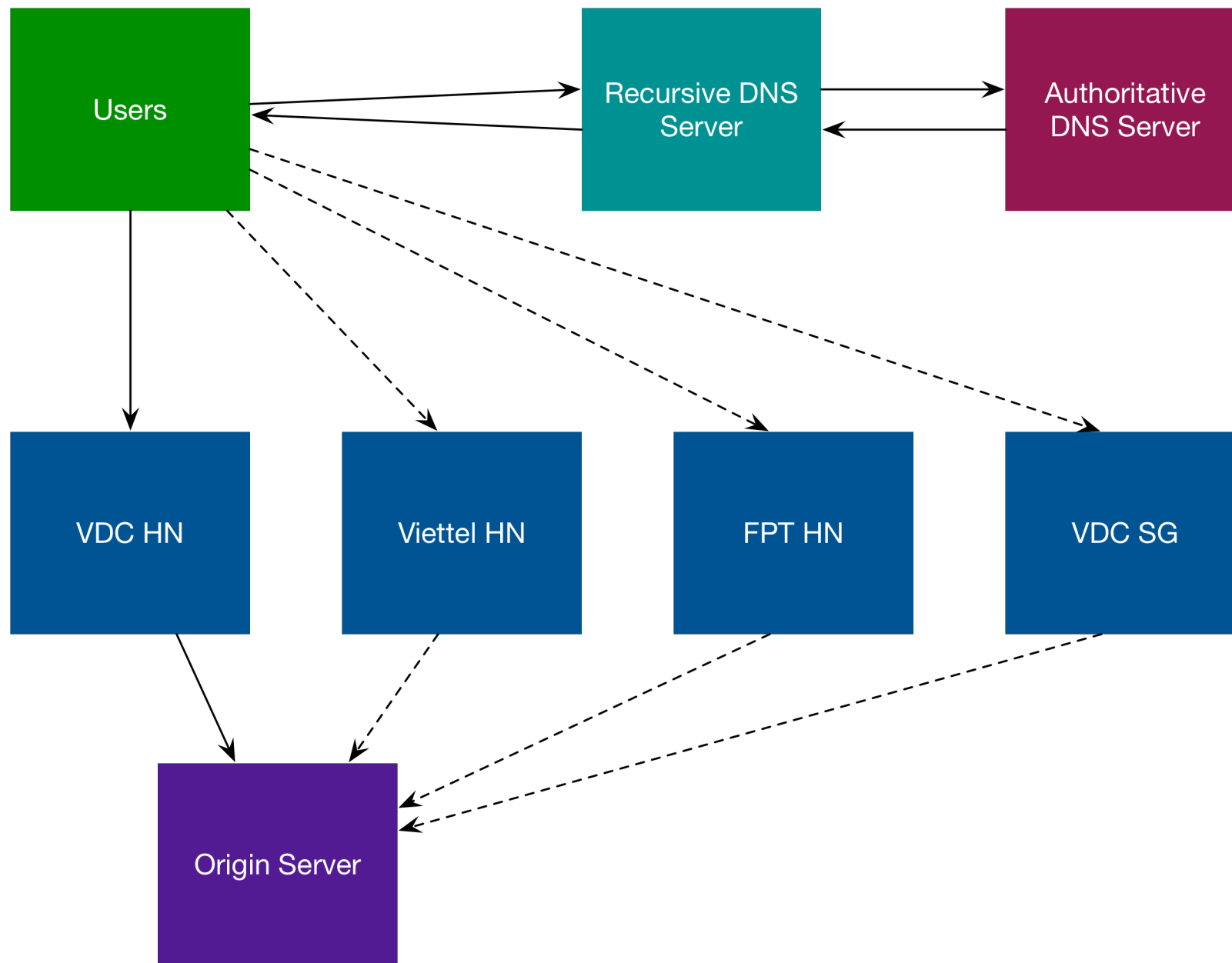
Content Delivery Network



Các giải pháp (nếu muốn dựng CDN)

- Domain based
- DNS based
- Anycast based

DNS-based CDN



Những vấn đề khi xây dựng CDN:

- Dữ liệu ip2location không chính xác
- Vị trí địa lý \neq vị trí network
- DNS server mặc định của các nhà mạng không hỗ trợ edns-clientsubnet
- Lượng băng thông sẵn có của các data center không đồng đều

Một số bài học (tính đến hiện tại):

- Đăng ký với OpenDNS & Google DNS để nhận clientsubnet
- "reverse ping"
- "metrics all the things"
- average sucks (apdex/heatmap/histogram are better)

<http://ip2dc.vcccloud.vn/>

ip2dc.vcccloud.vn

ip2dc.vcccloud.vn

IP2DC

IPv4 Address:

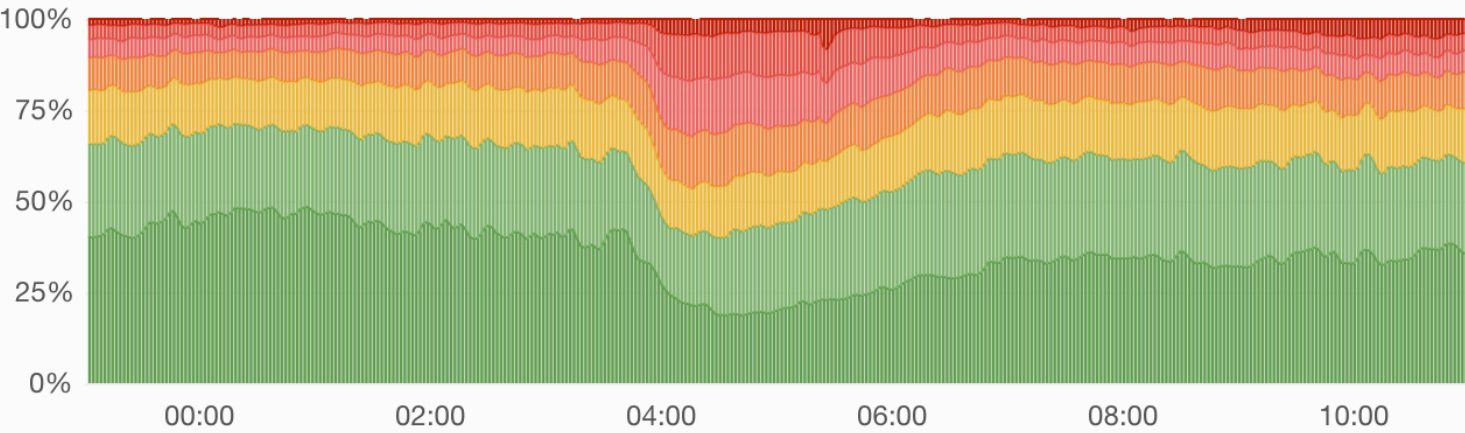
117.4.250.231

Check

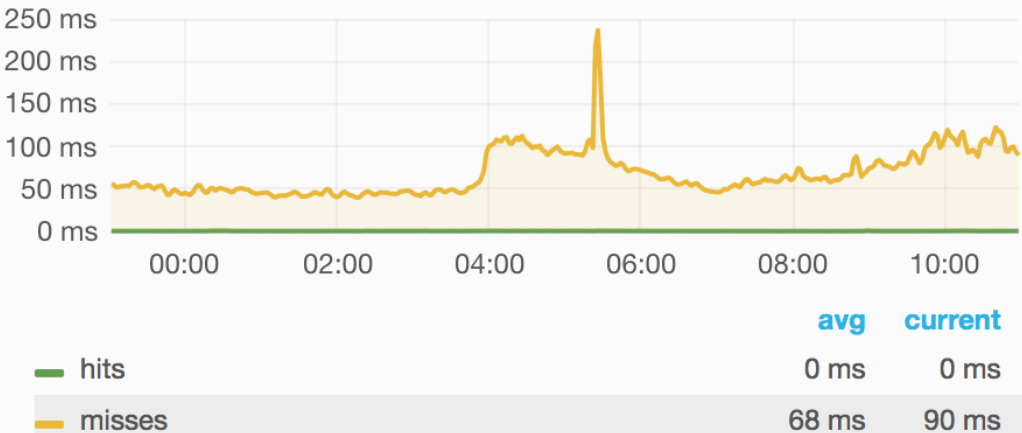
117.4.250.0/24

| DC Name | Num Pings | Avg. RTT |
|------------|-----------|----------|
| dc-hanoi | 24 | 3.6ms |
| dc-hcm | 25 | 26.4ms |
| dc-viettel | 25 | 4.0ms |

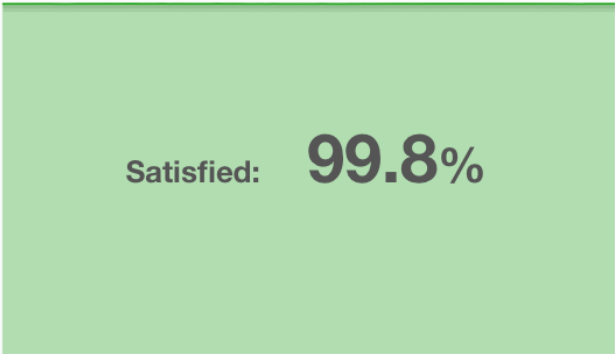
MISS Response Time Distribution



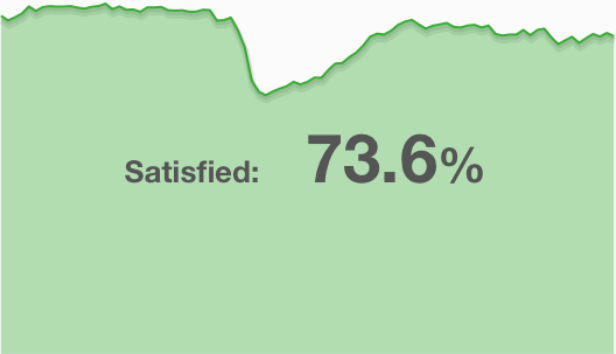
Response Time



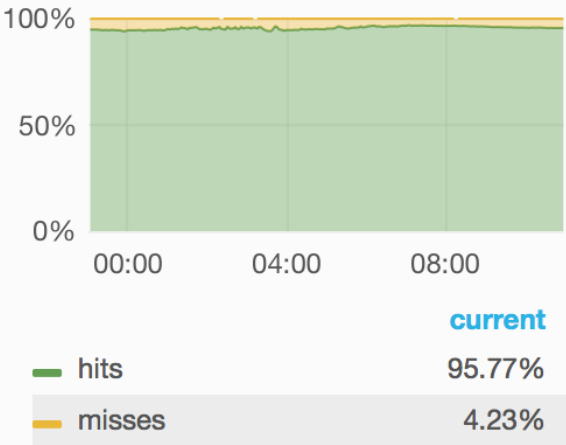
HIT (Apdex T=10ms)



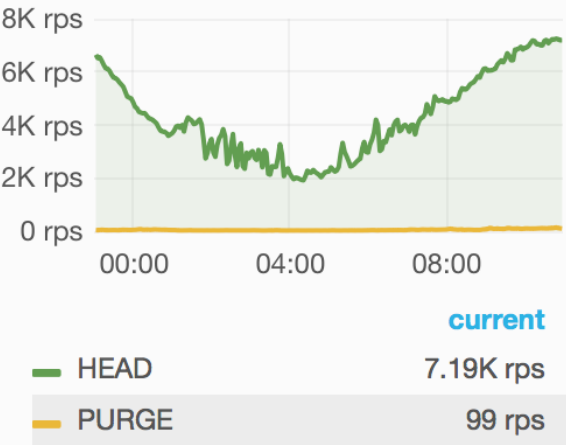
MISS (Apdex T=25ms)



Hit Ratio

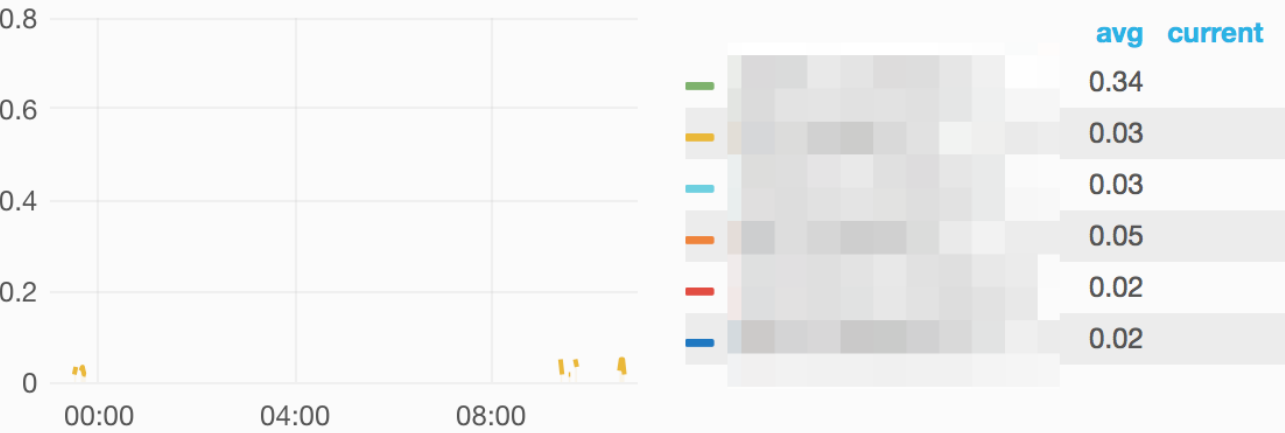


HEAD/PURGE

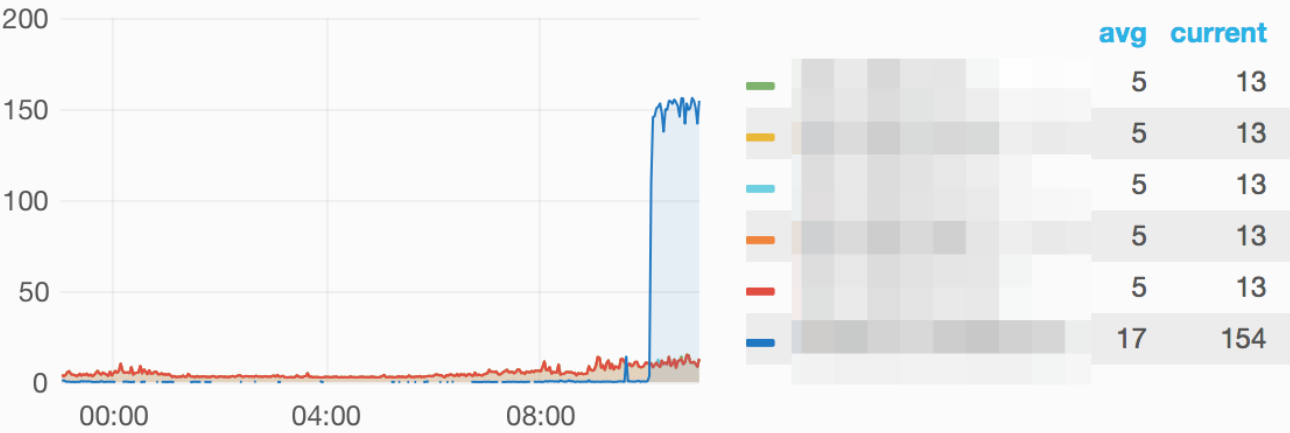


DOMAINS

Top 5xx Domains



Top 4xx Domains



Apdex



Future work

- Anycast
- Let's Encrypt integration
- BBR congestion control
- QUIC
- ECMP

Q&A