CloudFlare DNS Anycast Services

Ólafur Guðmundsson | olafur@cloudflare.com
Network

- Over 80 locations soon
- All services over Anycast

North America
- **Current**
  - Ashburn, Virginia
  - Atlanta, Georgia
  - Chicago, Illinois
  - Dallas, Texas
  - Los Angeles, California
  - Miami, Florida
  - Minneapolis, Minnesota
  - Montréal, Québec
  - New York, New Jersey
  - Phoenix, Arizona
  - San Jose, California
  - Seattle, Washington
  - Toronto, Ontario
  - Vancouver, British Columbia
- **Upcoming**
  - Denver, Colorado
  - Mexico City, Mexico

Europe
- **Current**
  - Amsterdam, Netherlands
  - Barcelona, Spain
  - Bucharest, Romania
  - Copenhagen, Denmark
  - Dublin, Ireland
  - Düsseldorf, Germany
  - Frankfurt, Germany
  - Hamburg, Germany
  - London, England
  - Madrid, Spain
  - Manchester, England
  - Marseille, France
  - Milan, Italy
  - Oslo, Norway
- **Upcoming**
  - Brussels, Belgium
  - Istanbul, Turkey
  - Moscow, Russia

Asia
- **Current**
  - Chengdu, Sichuan
  - Dongguan, Guangdong
  - Foshan, Guangdong
  - Fuzhou, Fujian
  - Guangzhou, Guangdong
  - Hangzhou, Zhejiang
  - Hengyang, Hunan
  - Guangzhou, Guangdong
  - Jiaying, Zhejiang
  - Langfang, Hebei
  - Nanning, Guangxi
  - Qingdao, Shandong
- **Upcoming**
  - Jinan, Shandong
  - Shenzhen, Guangdong
  - Wuhan, Hubei
  - Wuxi, Jiangsu

South America
- **Current**
  - Buenos Aires, Argentina
  - Lima, Peru
  - Medellín, Colombia
  - Valparaíso, Chile
  - São Paulo, Brazil
- **Upcoming**
  - Rio de Janeiro, Brazil
  - Quito, Ecuador

Africa
- **Current**
  - Cairo, Egypt
  - Johannesberg, South Africa
  - Mombasa, Kenya
- **Upcoming**
  - Lagos, Nigeria

Middle East
- **Current**
  - Doha, Qatar
  - Dubai, UAE
  - Kuwait City, Kuwait
  - Muscat, Oman

Oceania
- **Current**
  - Auckland, New Zealand
  - Melbourne, Victoria, Australia
  - Sydney, New South Wales, Australia
- **Upcoming**
  - Perth, Australia
CloudFlare DNS expertise

• Deliver DNS answers in fast and reliable manner worldwide

• Extensive experience in absorbing large DDoS attacks
  • Multilayer defense architecture
  • We answer less than 1% of DNS packets, and no-one complains
    • As most are attack packets

• Hard to use us as amplifiers
  • We block most attack traffic, and DNS packet size is kept under 512 bytes
DNS services: RRDNS

- Highly distributed authoritative server
- DNSSEC signing on the fly
- Data entered via API/UI replicated to edges in seconds
- FAST and reliable
- “ANY” suppressed

```
dig cloudflare.com ANY
```
```
cloudflare.com.  3788 IN HINFO "Please stop asking for ANY"
"See draft-ietf-dnsop-refuse-any"
```
DNS products: Virtual DNS

- A proxy authoritative server
- We will cache data requested and answer from edge
- Intelligent fetching of answers from origins.
- No need to update us if zones added/deleted
The cost of staying online?

• Providers need to capacity plan for attacks
  • We have mitigated 5xx Mp/s attacks

• Attacks evolve all the time
  • we see them all

19 DNS attack(s) / 44.11M pps  20 SYN attack(s) / 38.29M pps
The new norm of DNS

- Anycast delivery
- Defense in depth
- DNSSEC on the fly
- Smaller answers
  - No need for 5-13 NS records
  - RSA needs to be retired (Key sizes 5x bigger than ECDSA)
  - Suppress ANY