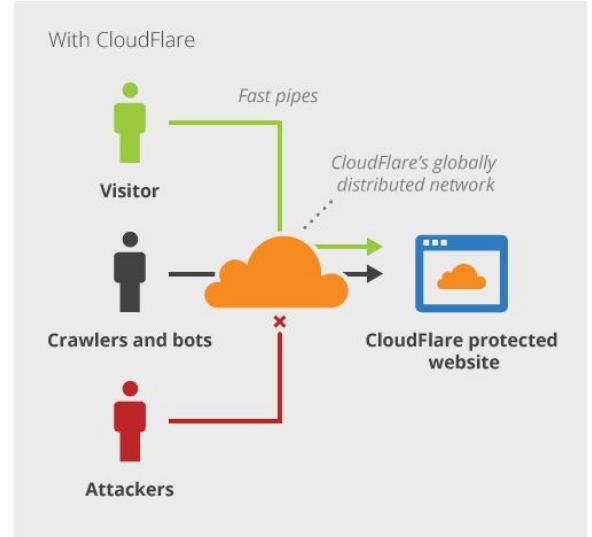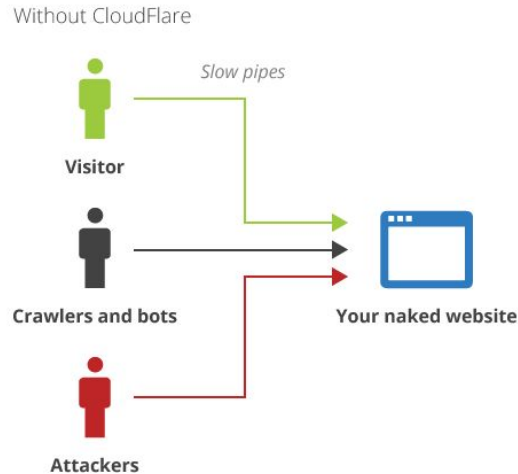# Life of Cloudflare's operation

Frankie Hui

What is Cloudflare?

Cloudflare makes websites faster and safer using our globally distributed network to deliver essential services to any website

- Performance
- Content
- Optimisation
- Security
- 3rd party services
- Analytics

CLOUDFLARE

Some numbers...

- 100+ PoPs
- 50+ countries
- 156 Internet exchanges
- 4 network hardware vendors
- 5 network device OS

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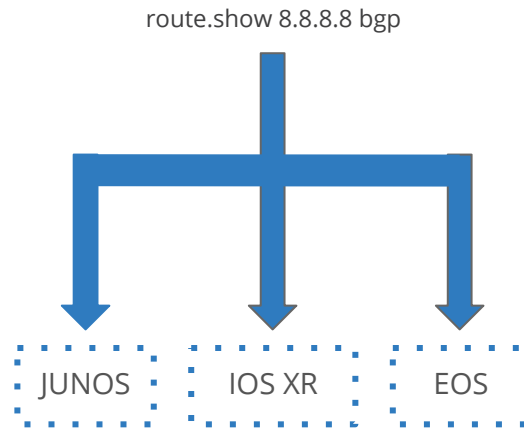# How to make our life easier?

SALT + NAPALM

How to make our life easier?

NAPALM is a network automation tool which support multi-vendors

SALT + NAPALM

Salt is a configuration management software and remote execution engine
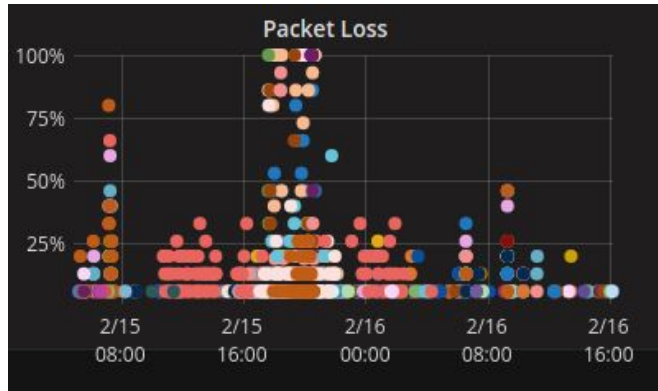
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Universal command

- Same command for different hardware vendors with different operating systems
- We can "search" thing like IP address/mac address/circuit ID very easily
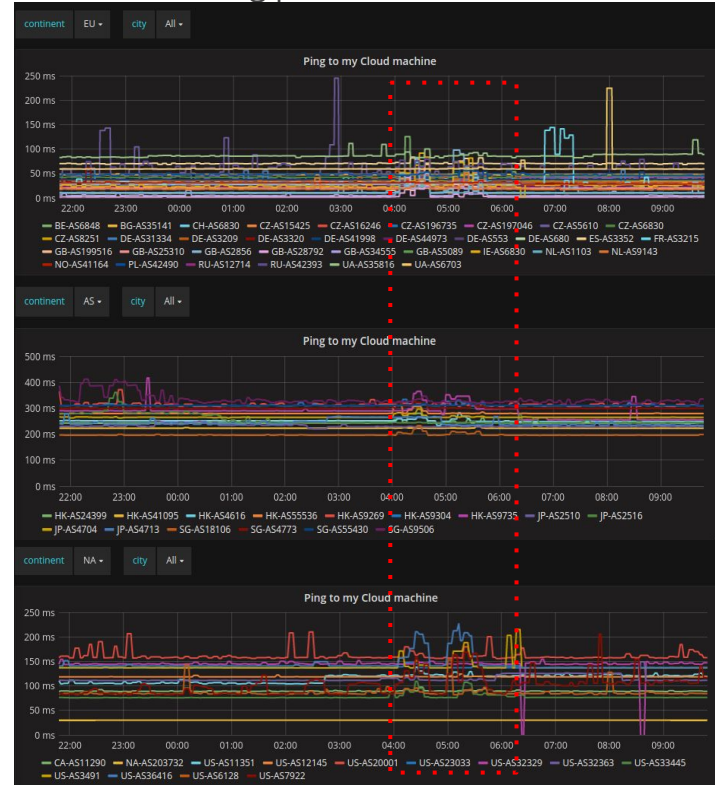- We can execute a command in a region

route.show 8.8.8.8 bgp

```
JUNOS       IOS XR       EOS
```

Improve SLA

- Internet is fragile

- Cloud hosting provider is not that stable

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Life of a request

Visitor

1. HTTP GET

4. HTTP 200

Cloudflare
Hong Kong

2. Cache fill

Transit

3. HTTP 200

Customer
web server
In US

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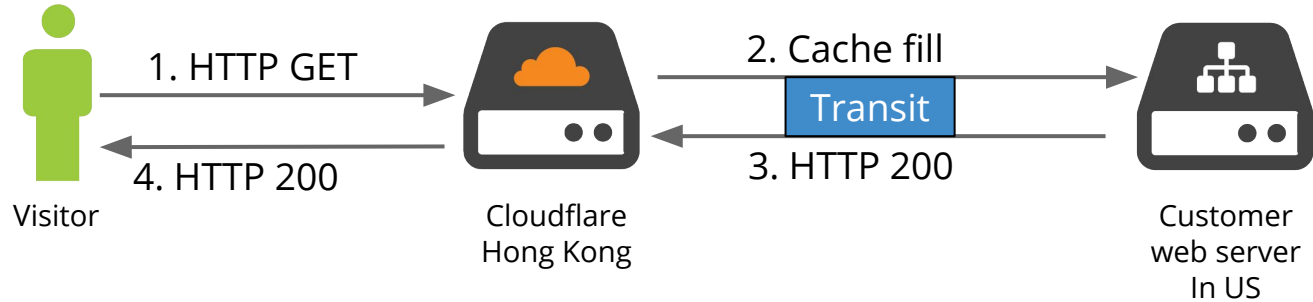
Life of a request during packet loss

Visitor

1. HTTP GET

4. 522 Timeout

Cloudflare
Hong Kong

2. Cache fill

Transit

3. HTTP Timeout

Customer
web server
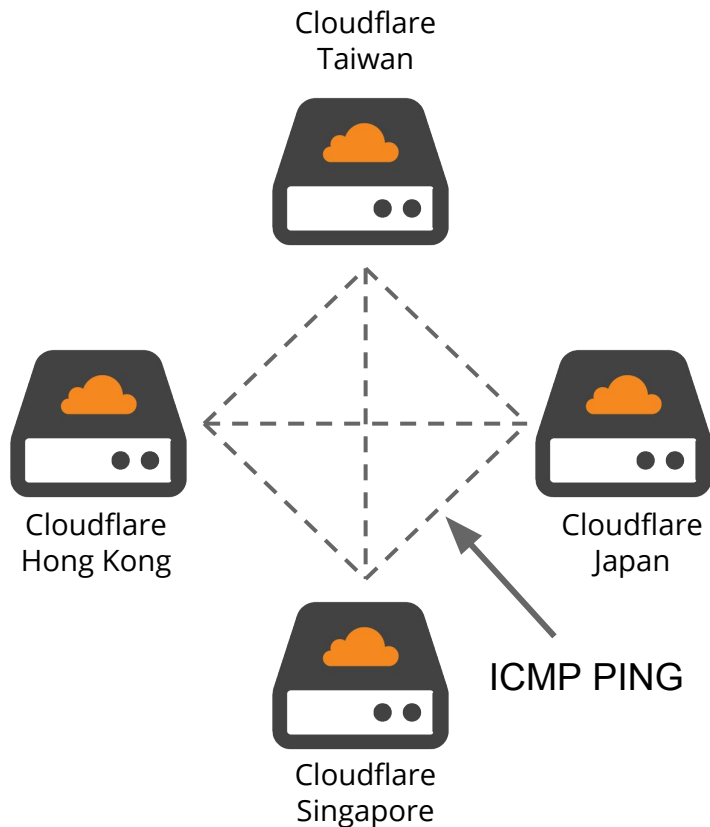In US

CLOUDFLARE®
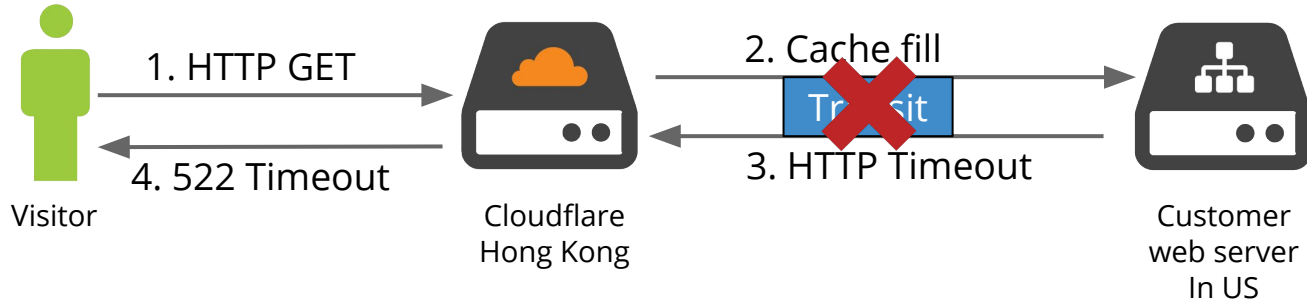
How we fix it?

- We use configured a mesh IPSLA ping test in all our routers via salt
- E.g. Transit A in HKG -> Transit A in SIN , Transit A in HKG -> Transit B in SIN
- If packet loss reach certain threshold, we will disable that Transit or PoP
- A reliable transit means more Happy customer :)

Cloudflare Taiwan

Cloudflare Hong Kong

Cloudflare Japan

ICMP PING

Cloudflare Singapore

CLOUDFLARE®

Peering DB

- >100 peering sessions in a router
- Traditional way to deal with peering
  - Copy IP/ASN from peering email
  - Login to a peering router
  - Paste configuration that you edit in "notepad"
- What are we doing?
  - Pull peering information from peeringdb and push!

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External Maintenance

- In Jan 2017, We received 60 maintenance notification emails from our service providers
- Traditional way to deal with maintenance
  - Add an event in calendar manually
  - Enable/Disable circuit manually
- What are we doing now?
  - Parse the mail with script
  - Add an event in calendar automatically
  - Enable/Disable circuit via salt
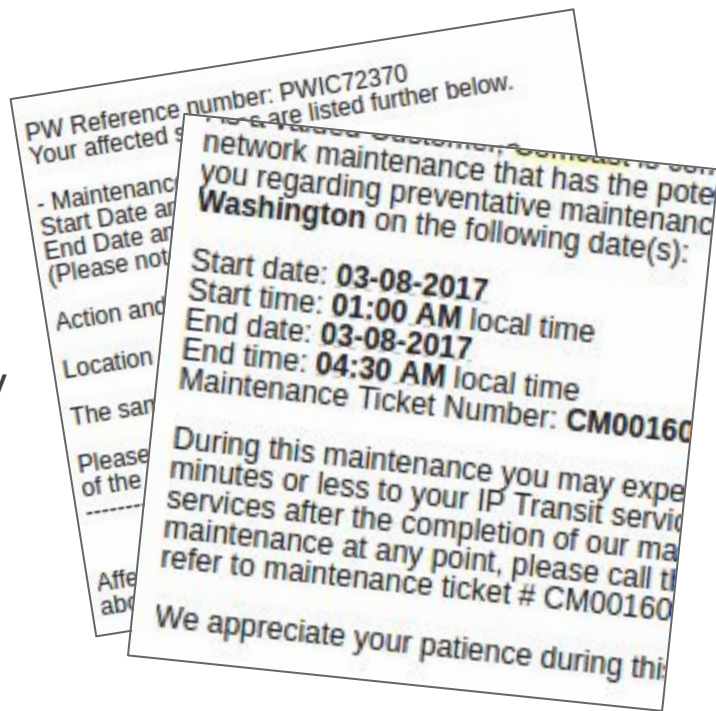
What 's next?

- Self-healing?
  - Poor light level
  - Port error
  - LACP timeout
- BGP sessions fix?
  - Maximum prefix limits

Questions?