Why does peering matter to an anycast network?

Marty Strong - CEE Peering Days 2018 - Berlin, Germany

Who am I?

Who am I?

Marty Strong

Network Engineer

Formula 1 Fan

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What do I do?

What do I do?

- Peering and interconnection
- Network expansion strategy
- Talking to you :)

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What is Cloudflare?

What is Cloudflare?

What is Cloudflare?

CDN
Moving content physically closer to visitors with our CDN.

Website Optimisation
Automatic optimisation of website content.

DNS
One of the fastest managed DNS providers in the world.

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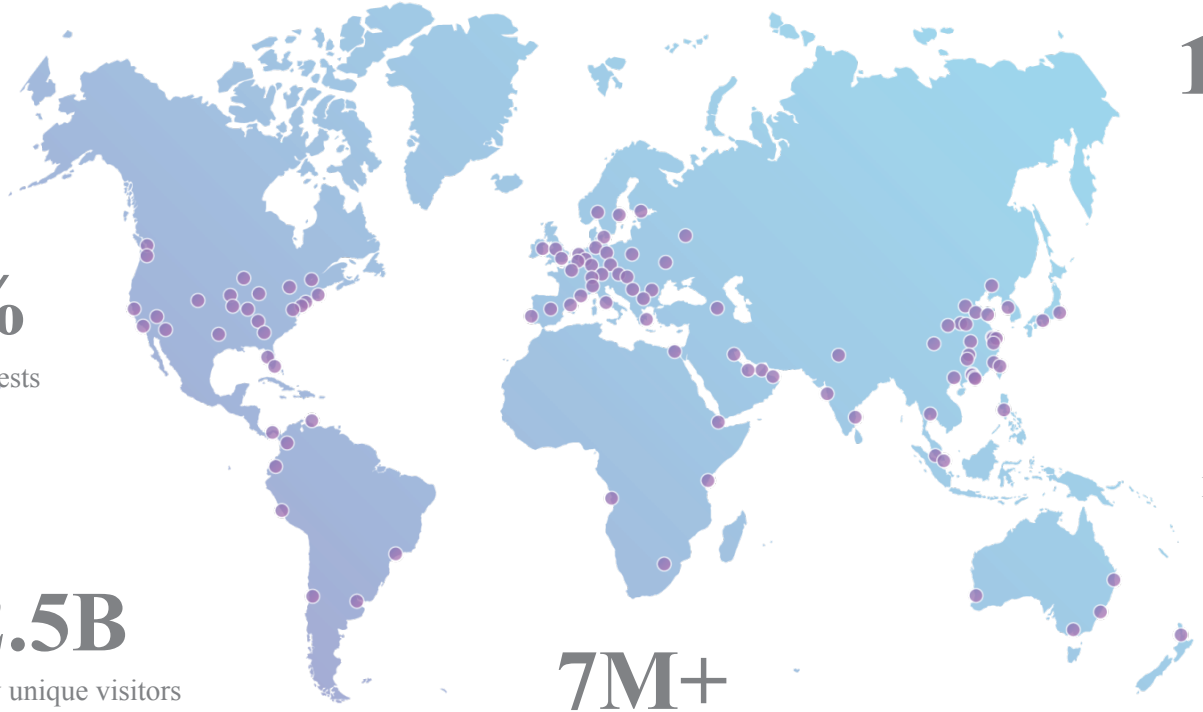
What is Cloudflare?



10MM

Requests/second

10%

Internet requests everyday

100+

Data centres globally

2.5B

Monthly unique visitors

7M+

websites, apps & APIs in 150 countries

Customers

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Transit vs. Peering

Transit

“The definition of Internet Transit is the service of allowing traffic from another network to cross or "transit" the provider’s network, usually used to connect a smaller Internet service provider (ISP) to the rest of the Internet. It’s also known as IP Transit. It can be thought of as a pipe in the wall that says "Internet this way”.

ISPs simply connect their network to their Transit Provider and pay the Transit Provider, which will do the rest.”

https://www.telstraglobal.com/insights/blogs/blog/peering-vs-transit

- Reach the whole internet
- Pay for usage
- Rely on a 3rd party to reach traffic destinations

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Peering

“the definition of peering is settlement-free, "bill-and-keep," or "sender keeps all," meaning that neither party pays the other for the exchange of traffic.”

https://www.telstraglobal.com/insights/blogs/blog/peering-vs-transit

- Reach only the peer’s customers
- Pay only operational costs
- Exchange traffic directly

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Why is peering so important?

Why is peering so important?

- Anycast is very sensitive
- Less prone to bottlenecks
- Easier to control routing
- Helps limit the effect of a route leak
- Helps CDNs to ingest large DDoS attacks close to the source
- Helps to foster a thriving ecosystem

Why is peering so important?

Anycast is very sensitive

- Anycast is the practice of originating and announcing the same address space in multiple locations
- The inbound path to the anycast network determines where the traffic is served from
- No local peering = No local content

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Why is peering so important?

- RIPE Atlas to the rescue!
- Very useful to check the path between two networks
- I have a few probes, come and ask me if you'd like one

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Why is peering so important?

https://marmot.ripe.net/openipmap/tracemap?msm_ids=11117205&show_suggestions=0

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Why is peering so important?

msm:11117205 prb:2066 ts:2018-02-02T11:04:53.000Z

remove

hop	IP	ASN	hostname	location		RTTs
1	130.149.152.129	680	129.128/26.152.149.130.in-addr.arpa		ok	7.5 1.2 1.2
2	130.149.235.241	680	e-n-inet.gate.tu-berlin.de	Berlin,Berlin,DE	ok	1.5 1.3 14.8
3	188.1.235.117	680	cr-tub2-te0-0-0-7-5.x-win.dfn.de	Berlin,Berlin,DE	ok	1.7 1.8 1.8
4	188.1.146.209	680	cr-erl2-be7.x-win.dfn.de	Erlangen,Bavaria,DE	ok	11.9 11.8 12.1
5	188.1.144.222	680	cr-fra2-be11.x-win.dfn.de	Frankfurt am Main,Hess	ok	14.7 15.1 14.8
6	213.248.97.40	1299	ffm-b12-link.telia.net	Frankfurt am Main,Hes	ok	15.2 15.1 15.1
7	62.115.141.226	1299	ffm-bb4-link.telia.net	Frankfurt am Main,Hess	ok	16.1 15.7 15.6
8	62.115.121.7	1299	ffm-b1-link.telia.net	Frankfurt am Main,Hess	ok	15.6 15.6 15.5
9	213.248.93.185	1299	dtag-ic-319285-ffm-b1.c.telia.net	Frankfurt am Main,Hess	ok	15.5 15.4 15.1
10	62.154.47.90	3320	b-ec5-i.B.DE.NET.DTAG.DE	Berlin,Berlin,DE	ok	20.4 18.9 19.8
11	62.154.47.90	3320	b-ec5-i.B.DE.NET.DTAG.DE	Berlin,Berlin,DE	ok	19.0 20.9 21.4
12	80.148.92.152	3320	0248976-1-1-gw.B.DE.NET.DTAG.DE	Berlin,Berlin,DE	ok	17.9 17.8 17.8
13	91.215.118.126	3320	atlas-probe-01.dasburo.com		ok	19.4 18.4 18.3

Berlin

Frankfurt

Berlin

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https://marmot.ripe.net/openipmap/tracemap?msm_ids=11117205&show_suggestions=0

It’s 2018, what’s still broken?

It’s 2018, what’s still broken?

- Large IP transit providers peer only in major hubs*
- Incumbent access networks have antiquated peering policies*
- IXPs spending more time and money on marketing than promoting domestic traffic exchange

*(Obviously there are some cases where this isn’t true)

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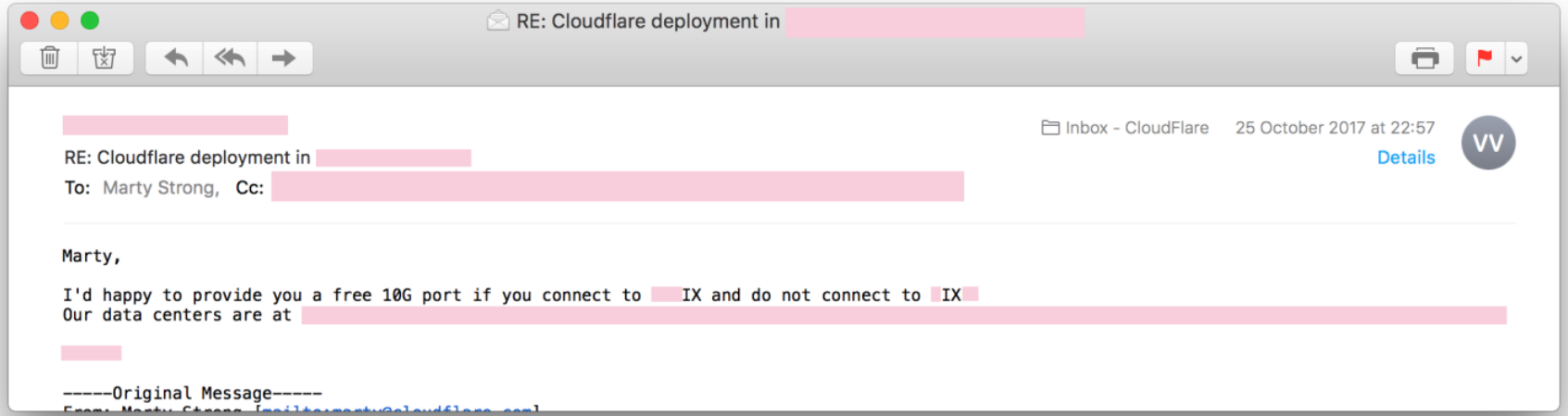
It’s 2018, what’s still broken?



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How do we fix it?

How do we fix it?

- Think about quality, not just cost
- Stop caring about traffic ratios
- Consider the content, not just the volume
- Peer regionally first, wherever it makes sense
- Shout at your transit providers when you see traffic hairpin

How do we fix it?

- IXPs should focus on being a valuable, efficient peering fabric
- Hot potato routing
- Build communities

Is it all doom and gloom?

Is it all doom and gloom?

- NO!
- Many operators, IXPs and policy makers have the right ideas
- Developing ecosystems are learning from all this
- Regional and cross-border peering initiatives are growing

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Case study: South Africa

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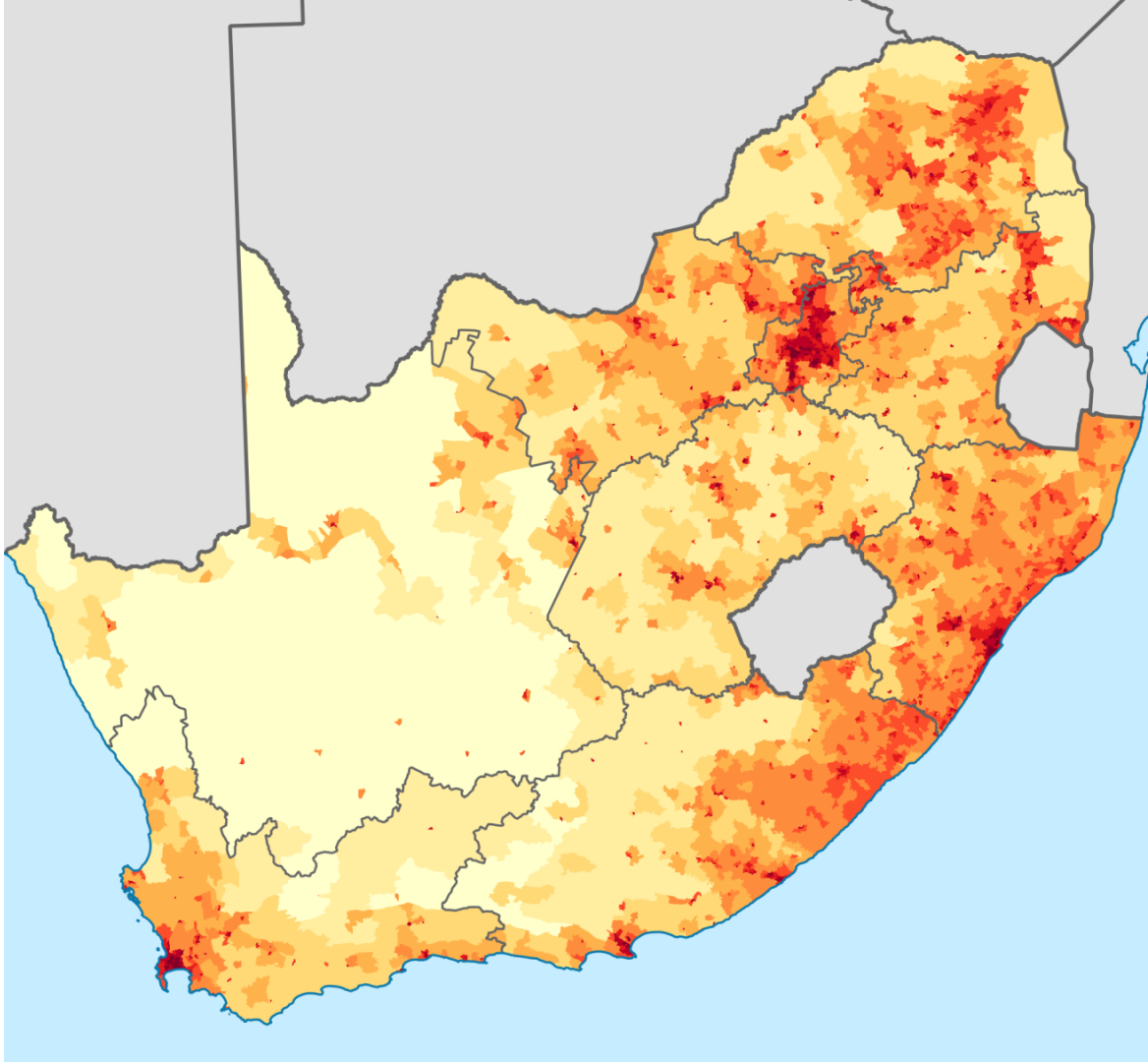
Population: 55 million+

Biggest cities:

- Cape Town
- Durban
- Johannesburg



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Case study: South Africa

- 3 interconnection hubs
- Hubs situated close to dense population centres
- Hubs on both sides of the country
- Between 12ms and 24ms between hub pairs

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http://bit.ly/2DUOjaA

Case study: South Africa

- Developing ecosystem
- 2 IXP operators with a deployment in each hub
- Good number of peers present at all 3 hubs (including the incumbent)

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Where do we peer?

Where do we peer?

- Over 180 IXPs
- Over 100 private facilities
- https://www.peeringdb.com/asn/13335
- OPEN policy
- peering@cloudflare.com

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Thank you! Questions?

Marty Strong <marty@cloudflare.com>