Preparing for a DDoS Attack

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The Cloud…

What is a DDoS?

Where’s your Umbrella?

1 - Be Prepared

Have a Plan

- Know what your options are
- Find out what upstreams can do to help and know how to use it
- Consider AUPs - yours and your upstreams

Be nimble

- Low DNS TTLs on likely targets
- Put likely targets on independently routable prefixes
- Be able to quickly adapt your routing

2 - Be aware

Monitor everything

- Bit rate and packet rate via SNMP
- Netflow, Sflow, etc
- Peering portal stats
- Span ports / Taps

Know what's going on on your network

- Otherwise you're in the dark

Know what's going on downstream

- Your customer might *want* to see 43Gbps of NTP
- Or they might only want 80/tcp.

3 - Have a Robust DNS Infrastructure

If you (or your customer's) DNS is broken, so are you.

Don't make it an easy target:

```
;; ANSWER SECTION:
example.com.        14400    IN   NS   ns1.example.com.
example.com.        14400    IN   NS   ns2.example.com.

;; ADDITIONAL SECTION:
ns1.example.com.    14400    IN   A    a.b.c.10
ns2.example.com.    14400    IN   A    a.b.c.140
```

```
;; ANSWER SECTION:
akamai.com.         300  IN   NS   a20-66.akam.net.
akamai.com.         300  IN   NS   a2-66.akam.net.
akamai.com.         300  IN   NS   a3-66.akam.net.
akamai.com.         300  IN   NS   a9-66.akam.net.
akamai.com.         300  IN   NS   a8-66.akam.net.
akamai.com.         300  IN   NS   a5-66.akam.net.
akamai.com.         300  IN   NS   a11-66.akam.net.
akamai.com.         300  IN   NS   a13-66.akam.net.
akamai.com.         300  IN   NS   a1-66.akam.net.
akamai.com.         300  IN   NS   a16-66.akam.net.
akamai.com.         300  IN   NS   a28-66.akam.net.
akamai.com.         300  IN   NS   a12-66.akam.net.
akamai.com.         300  IN   NS   a7-66.akam.net.

;; ADDITIONAL SECTION:
a1-66.akam.net.          90000    IN   A    193.108.91.66
a1-66.akam.net.          90000    IN   AAAA 2600:1401:2::42
a2-66.akam.net.          90000    IN   A    95.100.174.66
a3-66.akam.net.          90000    IN   A    96.7.49.66
a5-66.akam.net.          90000    IN   A    95.100.168.66
a7-66.akam.net.          90000    IN   A    23.61.199.66
a8-66.akam.net.          90000    IN   A    2.16.40.66
a8-66.akam.net.          90000    IN   AAAA 2600:1403:a::42
a9-66.akam.net.          90000    IN   A    184.85.248.66
a11-66.akam.net.         90000    IN   A    84.53.139.66
a12-66.akam.net.         90000    IN   A    184.26.160.66
```

4 - A Firewall Will Not Save You

State Kills

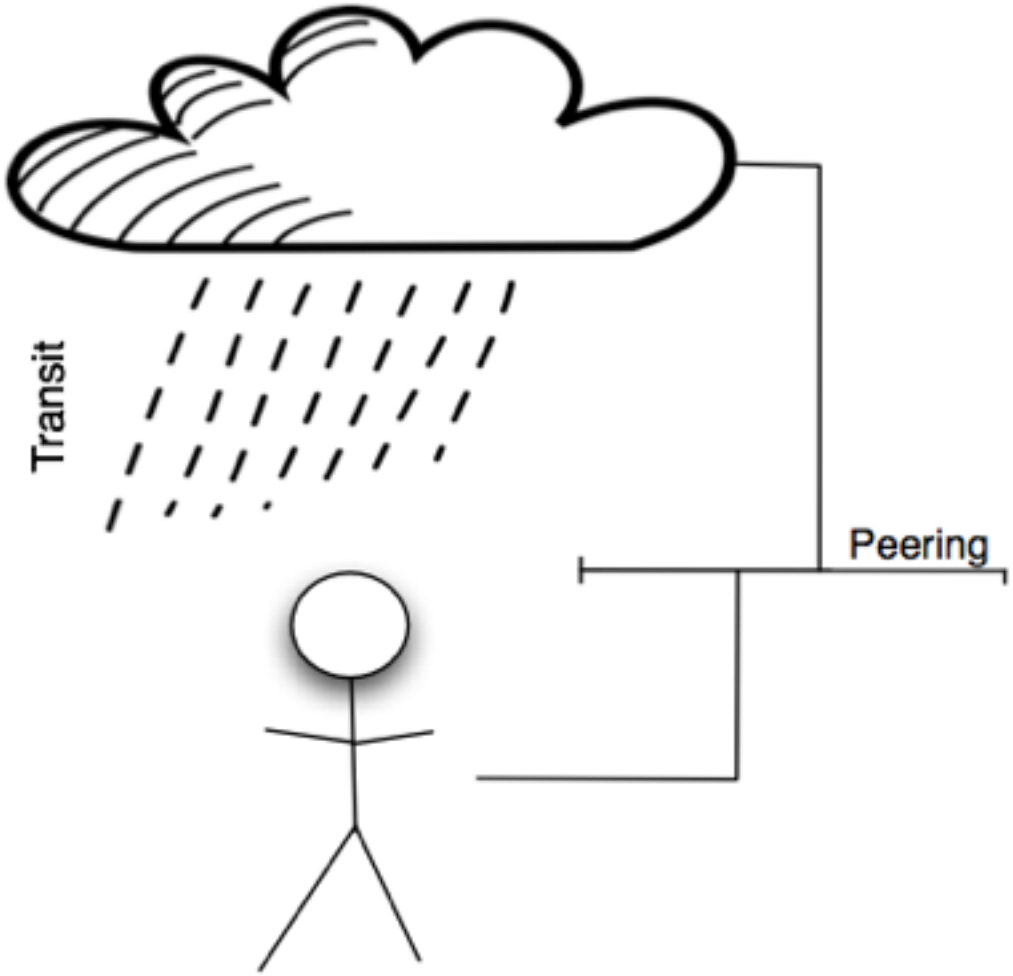
The vast number of flows involved in a DDoS attack can easily overwhelm a stateful firewall

5 - Spread the pain

Have multiple paths over which traffic can arrive

A broader ‘attack surface’ gives you more options

You can apply different measures on different paths



6 - Null Routing

The ISP View

The Customer View

7 - Mitigation Appliances

Many vendors offer on-premises appliances

- Typically fixed N Gbps of capacity
- Some come with ‘cloud’ capabilities to use resources upstream

They will help defeat some attacks, but:

- They can be expensive
- You still need big pipes to ingest the traffic
- Not every attack vector will suit every device
- You need a human element to drive effective mitigation
- and…

8 - Know your Limits

The N+1th Gbps is a killer

Some day you're going to need a bigger boat

9 - Use Somebody Else's

There are options to mitigate attacks before they reach your network

Upstream providers may offer a mitigation service, or…

10 - Pass the Buck (or Euro)

There are third-party alternatives:

Content Distribution Networks

- Push content out to a vast server footprint
- Primarily an end-user-experience / performance service
- But can also absorb DDoS attacks
- They do not suit all types of (legitimate) traffic

DDoS Protection Services

- Have connectivity and mitigation capacity to absorb large attacks
- They pass ‘clean’ or ‘post mitigation’ traffic back to you
- via proxy or a direct link (real or tunnelled)

Summary

- Be Prepared
- Be Nimble
- Be Aware
- Have Solid DNS
- Don’t rely on state
- Know your limits