NAT in the cloud

FRNOG 21
September 20th, 2013

Richard Gass and Damien Saucez
Disclaimer

Please don’t laugh, this happens at every single research conference!
The context

The 8th Conference on emerging Networking EXperiments and Technologies was organized in Nice last year:

- good papers
- lovely conference venue and nice weather

Everything was fine, except the Net. Despite a leased line...
The organizers leased a “pro” DSL setup for the week, including the wireless coverage for attendees

- 4Mbps symmetric was the best for the budget

In theory, this setup should work very well for 200 attendees

In practice, the network blew out at the end of the first day morning sessions
Oops: Internet is broken, as usual in research conferences on networking

No DNS resolution
  - but ISP’s DNS is running perfectly
  ➡ AP’s DNS resolver is overloaded

Clients do not always manage to connect to the network
  - but wireless signal is good enough
  ➡ AP’s DHCP is overloaded

Web pages still do not render correctly
  - but loss rate “acceptable” with ping (~15%)
  ➡ AP’s NAT is overloaded
Oops: Internet is broken, as usual in research conferences on networking

No DNS resolution

- but ISP’s DNS is running perfectly

➡ AP’s DNS resolver is overloaded

Call the operator!

Web pages still do not render correctly

- but loss rate “acceptable” with ping (~15%)

➡ AP’s NAT is overloaded
Oops: Internet is broken, as usual in research conferences on networking

No DNS resolution
- but ISP’s DNS is running perfectly
- ➡ AP’s DNS resolver is overloaded

AP’s is a DSL box for home networks, designed to support 15-20 clients

Web pages still do not render correctly
- but loss rate “acceptable” with ping (~15%)
- ➡ AP’s NAT is overloaded
Where are we?

AP’s barely configurable (even DHCP cannot be configured) and not physically accessible

One old laptop (Dell Latitude E5400)

One old Cisco Access point

One old 100 Mbps switch

A few old (?) cables
Where are we?

AP’s barely configurable (even DHCP cannot be configured) and not physically accessible

Get rid of the AP as much as possible

One old 100 Mbps switch

A few old (?) cables
Outsource the network to the cloud

Conference Wireless Network

DSL Modem

Internet

VPN Tunnel

NAT’ed traffic to Internet

Client Server
- DHCP Server
- Default gateway
- Tunnel entry point

Cloud Virtual Machine
- Tunnel end point
- NAT

Accept only UDP, TCP, ICMP
Outsource the network to the cloud

Accept only UDP, TCP, ICMP

And voila!
no problem anymore until the end of the week*

- DHCP Server
- Default gateway
- Tunnel entry point
- NAT

NAT’ed traffic to Internet
Conference front-end does not need to be powerful

CPU was not overloaded
- but we deactivated OpenVPN crypto support

Memory consumption was negligible
Take away notes

Access points are usually under provisioned in conference venues (NAT will break eventually)

Move your traffic to the cloud via tunnels so to not overload access point state

* In your cloud instance, beware of
  - SMTP traffic
  - not being considered as a bot (e.g., by Google scholar)
NAT in the cloud

FRNOG 21
September 20th, 2013

Richard Gass and Damien Saucez