One Network to rule them all

Netnod 2018, 14-15 Mar
Christian Adell
Networking nowadays
Challenges

- Scalability
- Containerisation
- Distributed Systems
- Multi-platform, Cloud
- High Performance applications
- Efficiency

*Traditional* network architectures/operations are not good enough
Are we **ready**?

- Multi-vendor with *legacy* devices not well-suited for automation
- There is a lot of *new things to learn*
- Vendor *trainings* aren’t (weren’t) focused on this
- Automation *amplifies* everything (including mistakes)
- Usually, *not close to developers*, to the business

And most of the times, *we don’t know where to start from*…
How can we approach it?

- APIs everywhere, your network devices should support them
- Use Data Models, they will help you translate your will
- Take advantage of the information your network is providing
- Don't fear dynamic infrastructure
- Some coding skills will be needed
- Validate, validate and validate again

Start by solving simple problems... keeping applications on your focus
A brief story of a network service
Typical IT ecosystem
How the network looks like
Downsides

- By default, inter/intra platform communications use Internet which is not (always) the most performant, secure and cheapest communication channel
- Manual network provisioning doesn’t work in terms of speed and reliability
- Prone to errors and lack of consistency
- Some communications still need network layer security (no TLS)
We tried to solve all in one
... and we failed
(non-technical) Lessons learned

● Think as your users will do
● Get feedback as soon as possible, iterate!
● The solution should flexible enough to accommodate several underlying solutions
● Evaluate current needs case-per-case (capability, performance, cost, etc.)
● Apply Pareto Rule, focus on solving most urgent needs first
Then, we created a network service
Requirements

- Easy onboarding / self serve
- Users should be autonomous to handle connections
- Abstract all network details from users and pick the best option in every case
- Support several providers/platforms
- Offer a secure service
- Continuous monitoring of connection status
Continuous Integration & Deployment

- Unit test
- Integration tests

- Comments
  - bla bla bla
  - 2 developer approval

- AMI & Docker bakes

- Acceptance tests

- Unit test
  - Integration tests

- Pull Request

- Merge

- Travis

- GitHub repo

- Spinnaker Pro

- Spinnaker Pre

- Spinnaker Dev

- JFrog Artifactory

A some_feature

develop

B

0

1

2

3

0 pull request

1

2

3

0 pull request
Scenario

Network A1

Service/Provider X

Platform AWS

Service/Provider Y

Network A2
EC2 Dashboard

Resources

You are using the following Amazon EC2 resources in the US West (N. California) region:

- 0 Running Instances
- 0 Dedicated Hosts
- 0 Volumes
- 0 Key Pairs
- 0 Placement Groups
- 0 Elastic IPs
- 0 Snapshots
- 0 Load Balancers
- 1 Security Groups

EC2 Spot. Save up to 90% off On-Demand Prices. Turbo Boost your Workloads. Get started with Amazon EC2 Spot Instances.

Create Instance

To start using Amazon EC2 you will want to launch a virtual server, known as an Amazon EC2 instance.

Launch Instance

Note: Your instances will launch in the US West (N. California) region

Service Health

Service Status:
US West (N. California):

Scheduled Events

EC2 Launch Wizard. Or try these popular AMIs:

Barracuda NextGen Firewall F...
Why our developers use it?

- They don't care about underlying network details
- They always use the best possible network solution
- They have one API to handle everything
- They are notified about connections' health
- They need an out-of-the-box multiple platform connectivity
- They get visibility about network dependencies
Takeaways

- Don’t be afraid of going out of your comfort zone
- Learning coding will give you superpowers
- At some point, you will need to join pieces
- Adopting a DevOps approach will speed up your business (and career)
- Networking is a key skill in IT, bring it close to the business
Thanks for your attention
Related material

Some learning stuff: https://github.com/chadell/learning