

How to build, maintain & market IPv6-only datacenter



IPv6 only HOSTING

Nico Schottelius

Data Center Light (www.datacenterlight.ch)

- Reuse of old factory halls
 - Don't build new, don't tear down
- Passively cooled
 - Low density
 - Supported by thick walls
- Powered by hydropower
 - From the **on site power plant**
 - 100% renewable energy
- 100% Open Source
- IPv6 first



Building a data center on IPv4 is like building a diesel car. It works, it sells, but it really is not sexy.





Stage 1: the nice & naïve approach

- IPv6 only
- Add IPv4 via NAT64 on border routers
- Use DNS64 in both directions
 - outgoing: mapping to our prefix
 - incoming: mapping to servers/VMs



Stage 1: challenges

- Services binding only to 0.0.0.0 failed
 - Most can be changed
- Some services had hard coded (!!!) IPv4 addresses
 - DNS64 was never used
 - Broke network design assumptions
- Minor (outdated) software problems





Stage 2: Make life easy for customers

- Most customers liked our stage 1 approach
- However: some customers did NOT understand it at all
- Changing VMs: <u>all dual stack</u>
- Only hardware with IPv4: routers
- Switches, servers, storage: IPv6 only

Stage 2: challenges

- Dualstack VMs: IPv4 scarcity bites us
 - Strong tension between sales & infrastructure operators
- Also added IPv4 netboot
 - Hardware did not support DHCPv6
- How to continue?



Stage 3: IPv6 injection

- Launched <u>https://ipv6onlyhosting.com</u>
 - No incoming NAT64
 - Only reachable by IPv6
- Introducing: Smart NAT64
 - IPv4 via proxy
 - http + https + imaps + ... proxy
 - 1:n mappings



Stage 3: IPv6 VPN

- Allow accessing IPv6 only VMs
- Allow accessing the whole IPv6 Internet
- Works on all UDP ports
- Based on wireguard



IPv6 only marketing?

- For fun
- To be different
- For sustainability
- To decentralise
- For profit



SO, WE WANT TO BUILD OUR OWN DATACENTER...LET'S SEE... EVERYTHING'S OVER THERE.







Everyone can have IPv6. At home, at work, in the data center and on the phone. IPv6 is virtually everywhere.



Connectivity: solved.

- ISPs offer native IPv6
 - \circ $\;$ Those who don't: you don't have time to wait anymore
- Hardware / network equipment supports IPv6
- No native IPv6?
 - Use a tunnel (Wireguard, OpenVPN, ...)
 - Use teredo/miredo (deprecated, but works)
- Running IPv6 VPNs in Spain, France, China, Turkey, Slovakia, South Korea, Venezuela, Croatia, Netherlands, ...



Everyone can publish content on IPv6 (only) systems.





Content providers: solved.

- CDNs support IPv6
- Cloud providers support IPv6



Create IPv6 only services & products

- Get IPv6 connectivity
 - Native (your ISP)
 - Free tunnel (HE.net)
 - Paid tunnel (ipv6vpn.ch)
- Solve a problem







IPv6 enthusiasts

- Testing/Development
- Usually non critical services
- Target groups
 - Geeks/Hackers
 - "Networking people"
 - Early adaptors





Ultra Low Cost Hosting

- Price is main driver
- Tiny hardware/VMs
- Low bandwidth
- Target groups
 - Private users
 - IoT
 - Anyone you meet at a bazaar



SME / IT companies

- Expose work-in-progress results via IPv6
- Connect offices to each other
- Allow remote access
 - Access to the office
 - Accessing services from remote workers
- Become more independent of big providers



Large Scale Enterprises

- A lot of opportunities
- Longer lead times
- Always looking for skilled people
- Afraid of loosing edge





Large Scale Enterprises

- Upgrade networks running out of RFC1918 space
- Upgrade infrastructure: Frontends, proxies, mail servers, etc.
- Upgrade VPN: No collision with customer VPNs
- Tricky to maintain dual stack networks: Reduce complexity with IPv6 only
- Provide IPv6 migration plans



How can you profit from IPv6?

Solve problem with IPv6 and profit from the growth.



More of this?

- https://hack4glarus.ch in Switzerland (29th November 2019)
- https://IPv6.chat
- https://IPv6.blog
- https://IPv6.work
- Stage 4: in preparation

