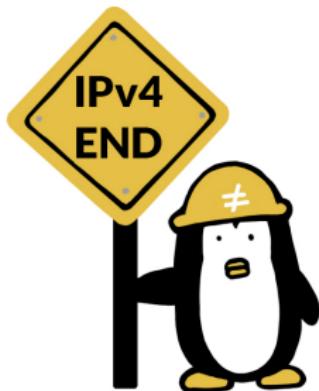


# RIPE83: Building IPv4 islands for fun and profit

✚ ungleich



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## Background / Motivation

- ▶ More and more networks are shifting to IPv6 only
- ▶ Motivations are known
  - ▶ Simplification
  - ▶ Unification
- ▶ Some devices are IPv6 incompatible
- ▶ Work started in 2020

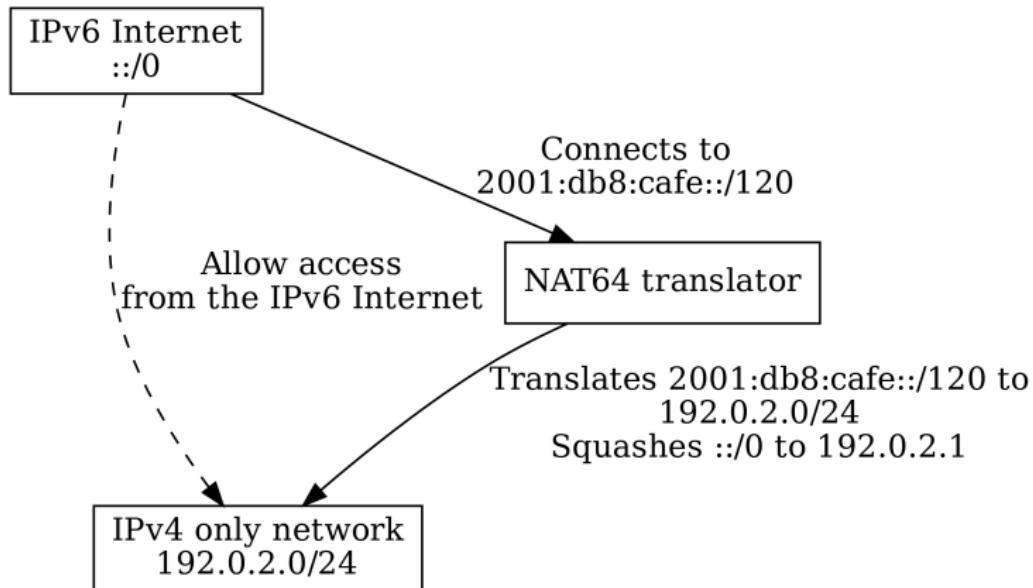
## Examples of incompatible devices

- ▶ X-Ray scanners
- ▶ Ultrasound scanners
- ▶ LoraWAN Gateways
- ▶ Printers
- ▶ Power plants (...)

# Strategies

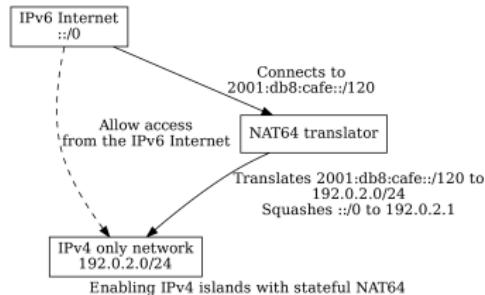
- ▶ Replacement of devices
  - ▶ Sometimes possible
  - ▶ Sometimes extremely expensive
- ▶ Isolation translation via external device
  - ▶ Devices believe they are still in IPv4 only world
  - ▶ Rest of the network stays IPv6 only

# IPv4 islands Concept



# IPv4 islands in practice

- ▶ Often low bandwidth ("the old devices")
- ▶ OpenWrt routers
- ▶ Stateful NAT64
  - ▶ Jool NAT64
  - ▶ Squashing the IPv6 Internet to 192.0.2.1



# Creating your own IPv4 islands

```
# OpenWrt vs. Kernel IPv6 configuration - jool needs accept_ra=2
sysctl -w net.ipv6.conf.all.accept_ra=2
# Load the kernel module
modprobe jool
# Configure stateful NAT64
nat64_prefix=2a0a:e5c0:10:b00::/96
jool instance add default --netfilter -6 ${nat64_prefix}
```

<https://code.ungleich.ch/ungleich-public/ungleich-tools/>

The screenshot shows a GitHub repository page for 'ungleich-public/ungleich-tools'. The URL in the address bar is https://code.ungleich.ch/ungleich-public/ungleich-tools/. The page header includes navigation links for Issues, Pull Requests, Milestones, and Explore. The repository name 'ungleich-public / ungleich-tools' is displayed with a fork icon. Below the repository name, there are tabs for Code, Issues, Pull Requests, Projects, and Releases. The 'Code' tab is selected. The repository description is 'No Description' and there is a link to 'Manage Topics'. At the bottom, it shows 465 Commits and 3 Branches.

https://code.ungleich.ch/ungleich-public/ungleich-tools

Issues Pull Requests Milestones Explore

ungleich-public / ungleich-tools

Code Issues Pull Requests Projects Releases

No Description

Manage Topics

465 Commits 3 Branches

## Ready-to-go device

- ▶ Any 2+ port OpenWrt devices easily works
- ▶ VIWIB (rebranded, reflashed, pre-configured) GL-Inet MT300N
  - ▶ 100 Mbit/s + WiFi 802.11b/g/n



- ▶ <https://ungleich.ch/u/products/viwib-wifi-ipv6-box/>

## Conclusion / Follow up

- ▶ Even if networks need to maintain legacy devices, you can switch to IPv6 only today
- ▶ <https://www.youtube.com/watch?v=Gfe35IFdx-Q>
  - ▶ full technical details on Youtube
- ▶ <https://IPv6.chat> (Matrix chat: #ipv6:ungleich.ch)
- ▶ For questions / suggestions: [ipv6@ungleich.ch](mailto:ipv6@ungleich.ch)