RIPE NCC
RIPE NETWORK COORDINATION CENTRE

“Lost Stars”
Why Operators Switch Off IPv6

Emile Aben | February 2016 | NANOG 66

Credits

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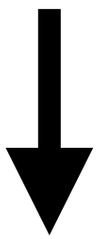
IPv6

All going well?

Enabling IPv6 (Simplified)

- Get IPv6 Address Space

- Get It Routed

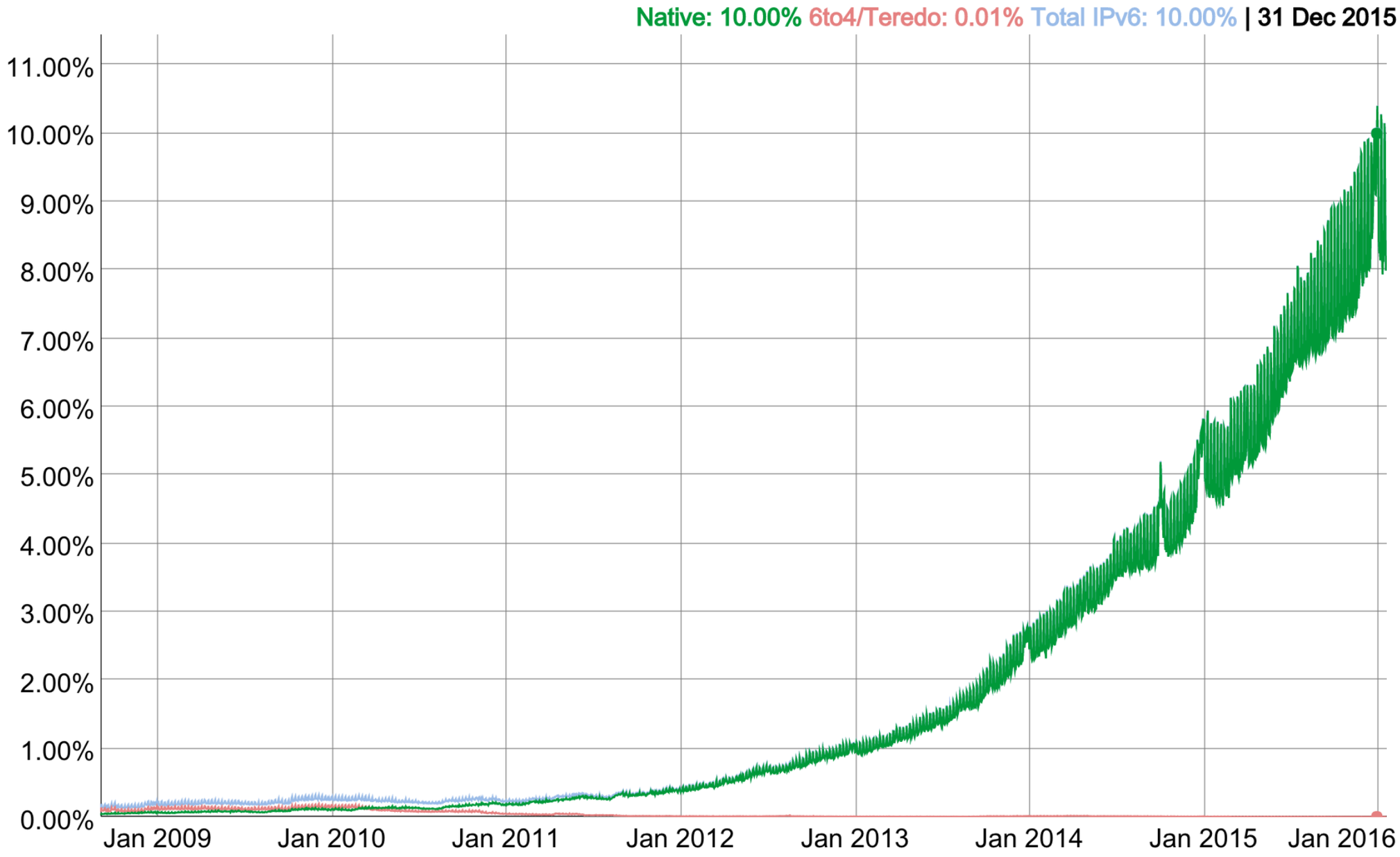


- Get It Used

Google IPv6 Statistics

IPv6 Adoption

We are continuously measuring the availability of IPv6 connectivity among Google users. The graph shows the percentage of users that access Google over IPv6.

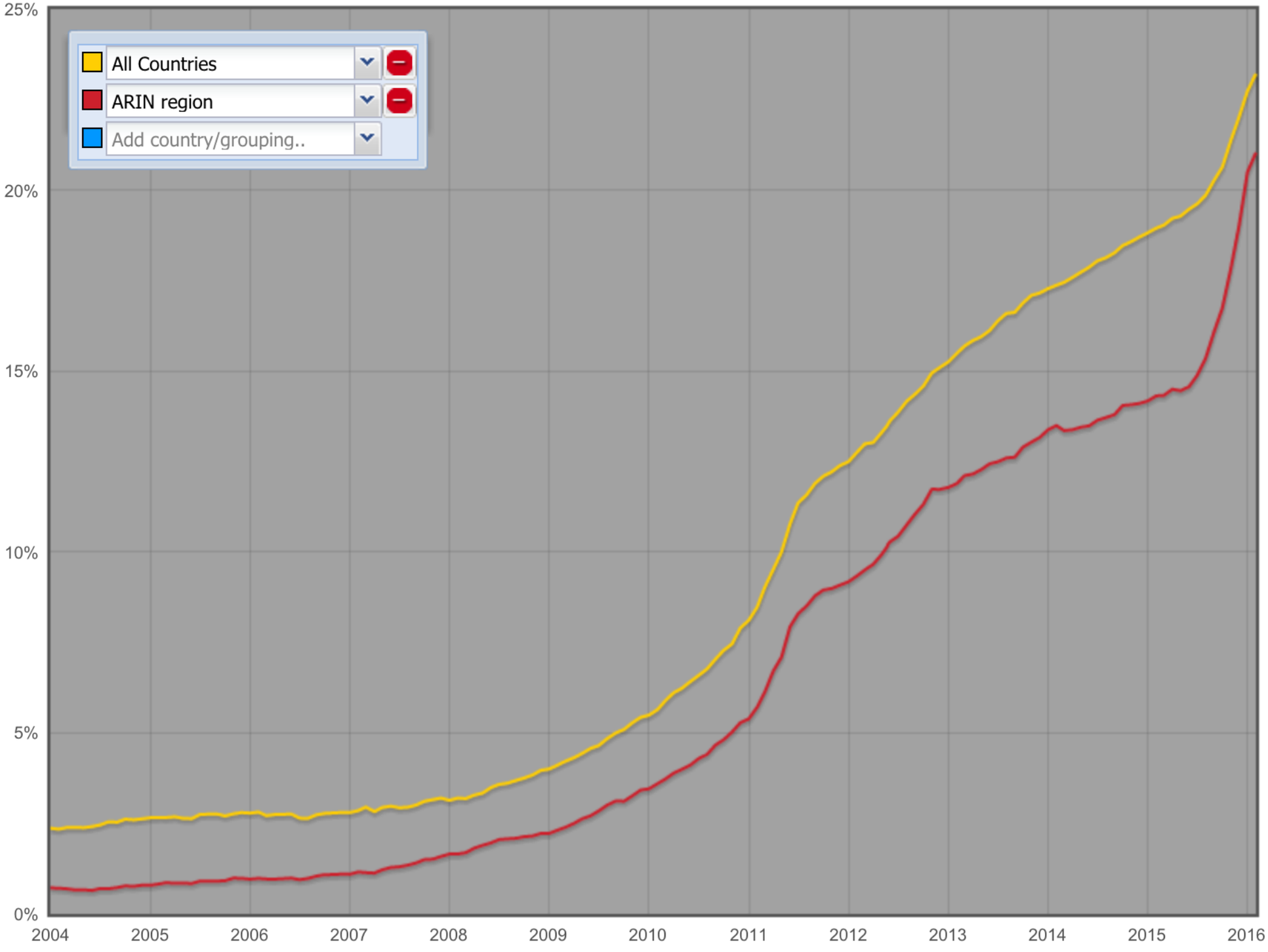


https://www.google.com/intl/en/ipv6/statistics.html

IPv6 Enabled Networks

permalink: **http://v6asns.ripe.net/v/6?s=_ALL;s=_RIR_ARIN**

This graph shows the percentage of networks (ASes) that announce an IPv6 prefix for a specified list of countries or groups of countries



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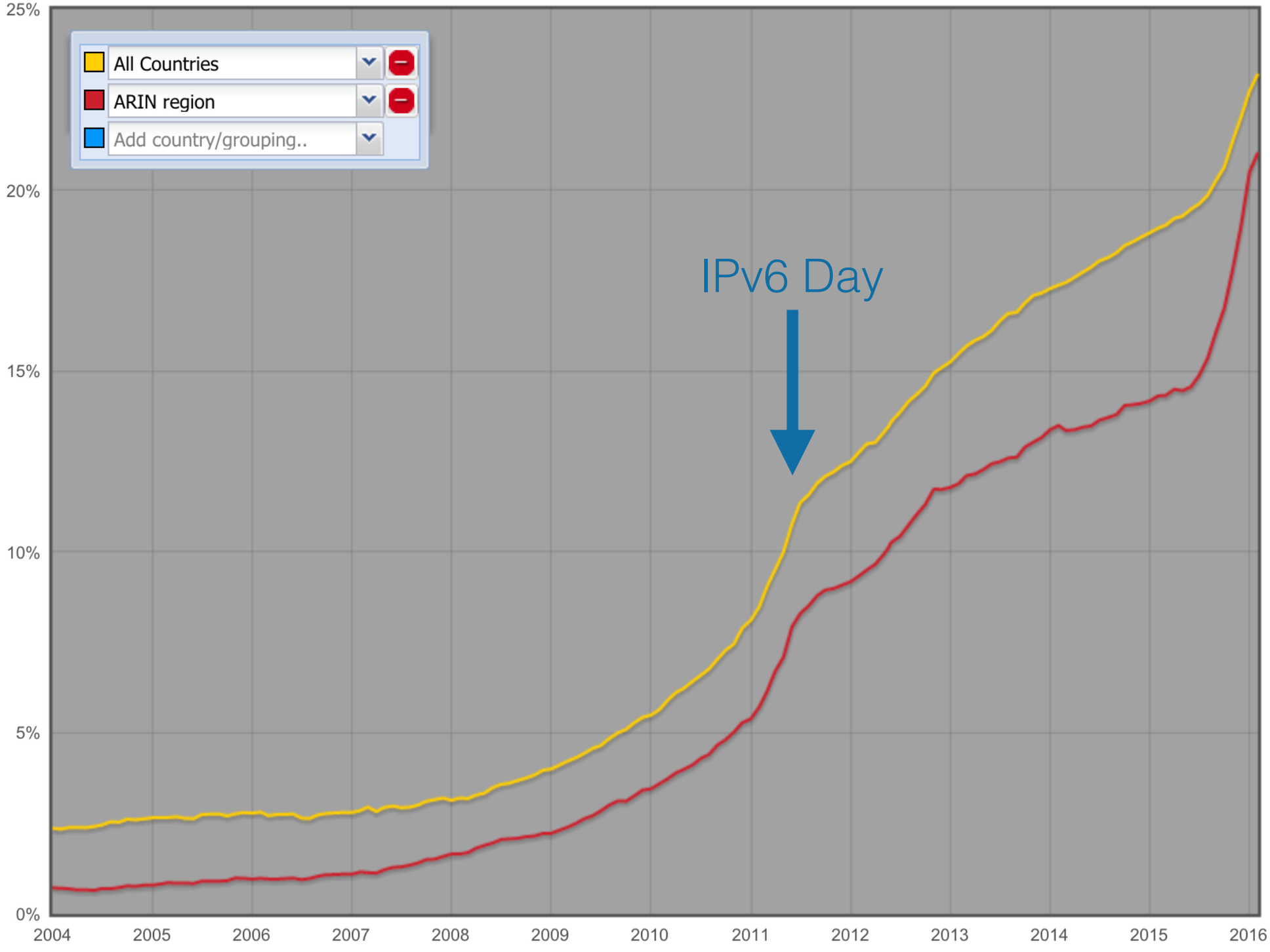

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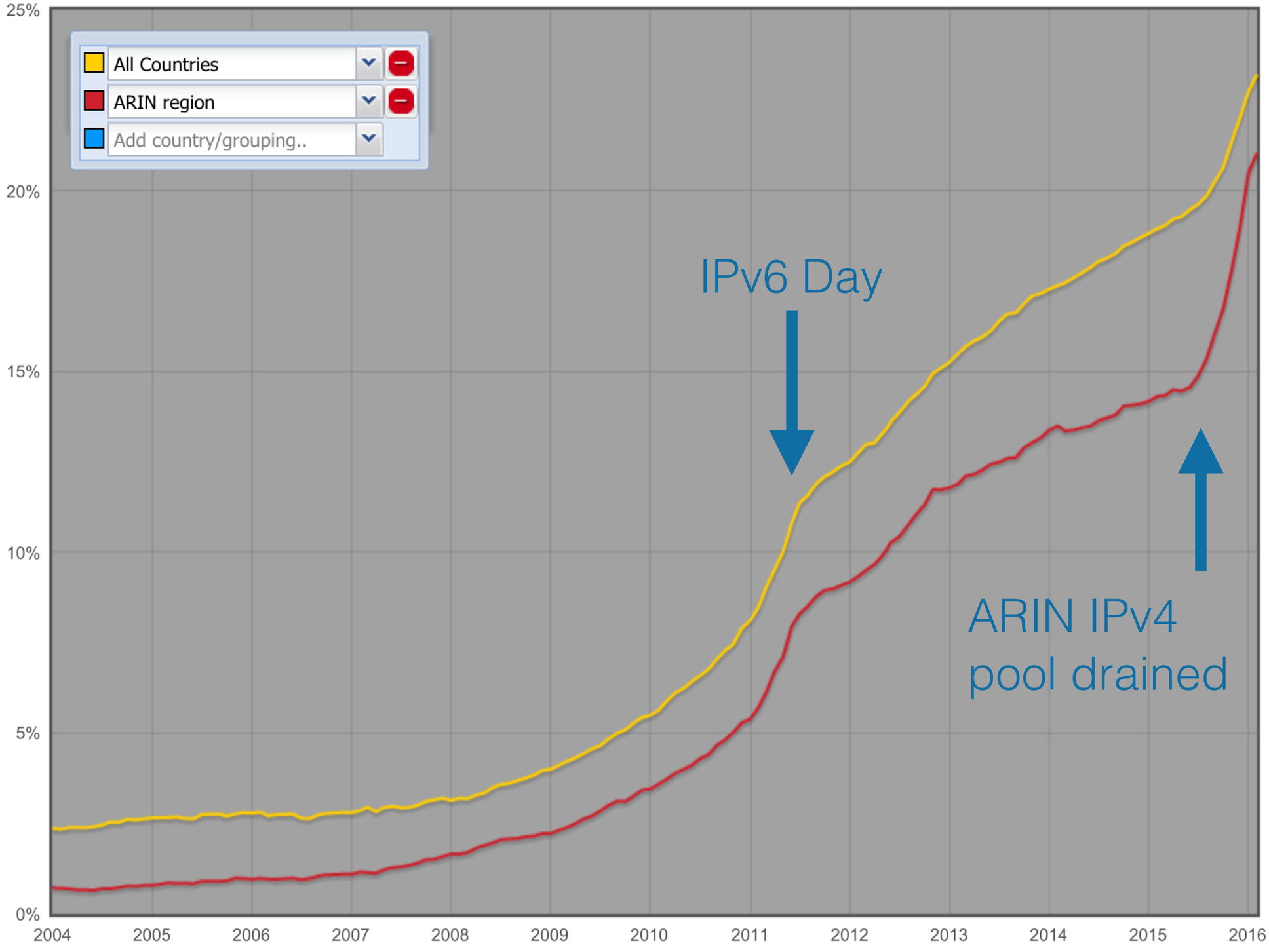
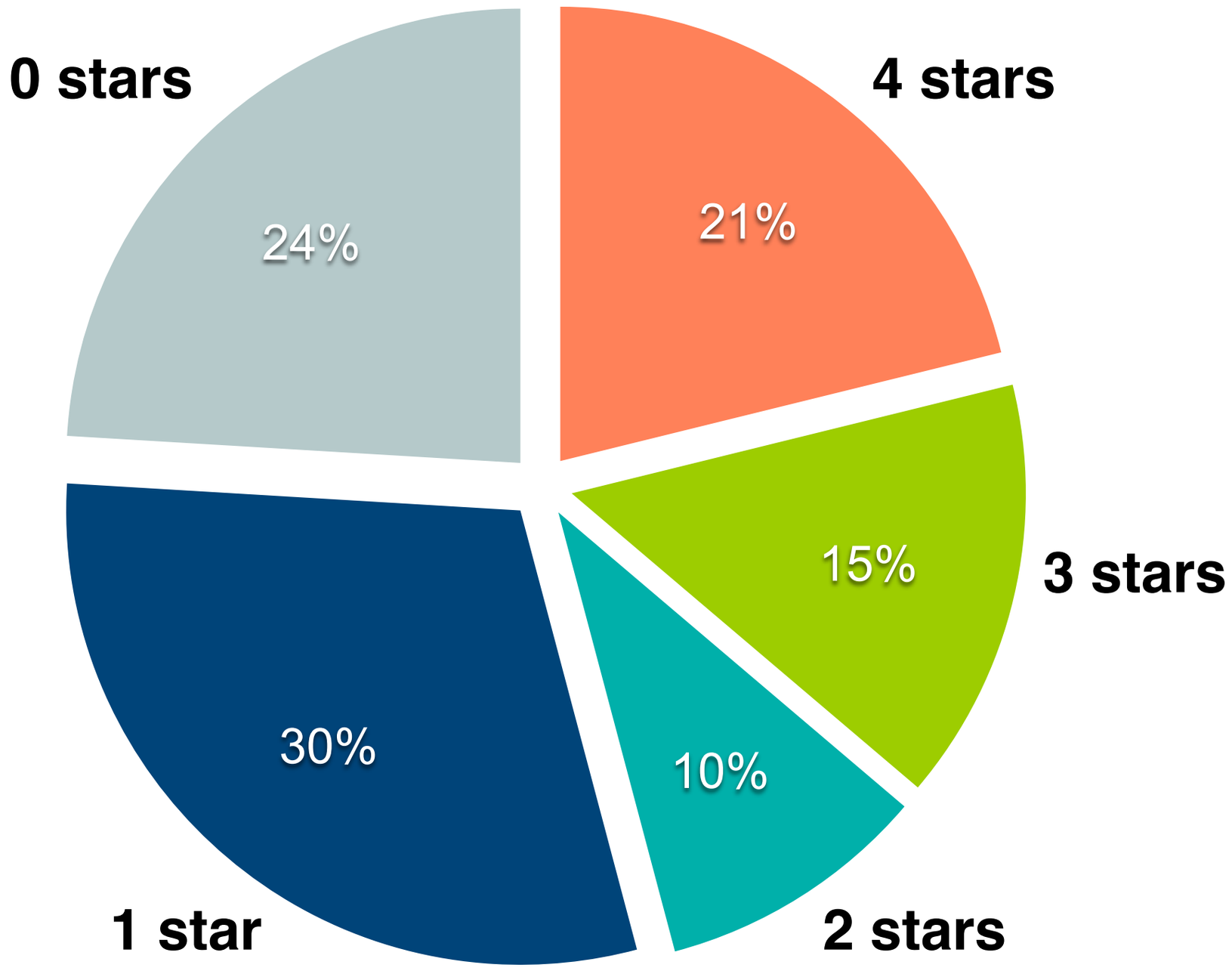


IPv6 RIPEness

- Rating system to measure early signs of IPv6 deployment
- 1 star if LIRs has an IPv6 allocation
- 3 more stars possible if
  - Prefix is announced (visible in RIS)
  - Prefix is registered in routing registry (route6 object)
  - Reverse DNS is set up

http://ipv6ripeness.ripe.net/

IPv6 RIPEness total (12,981 LIRs)



IPv6 RIPEness “5th star”

- **Measuring actual IPv6 deployment**
  - Content networks: Percentage of IPv6 enabled Alexa1M listed sites in that network, weighed by Alexa ranking
  - Access networks: Percentage of IPv6-enabled users from APNIC ads-measurements
  - Threshold for “5th star” has been doubled every year

Threshold	5th star LIRs
4%	7,8%
8%	6,8%
16%	5,6%
50%	3,2%

Current status at various thresholds

IPv6

Things not going so well

Enabling IPv6

- Get IPv6 Address Space

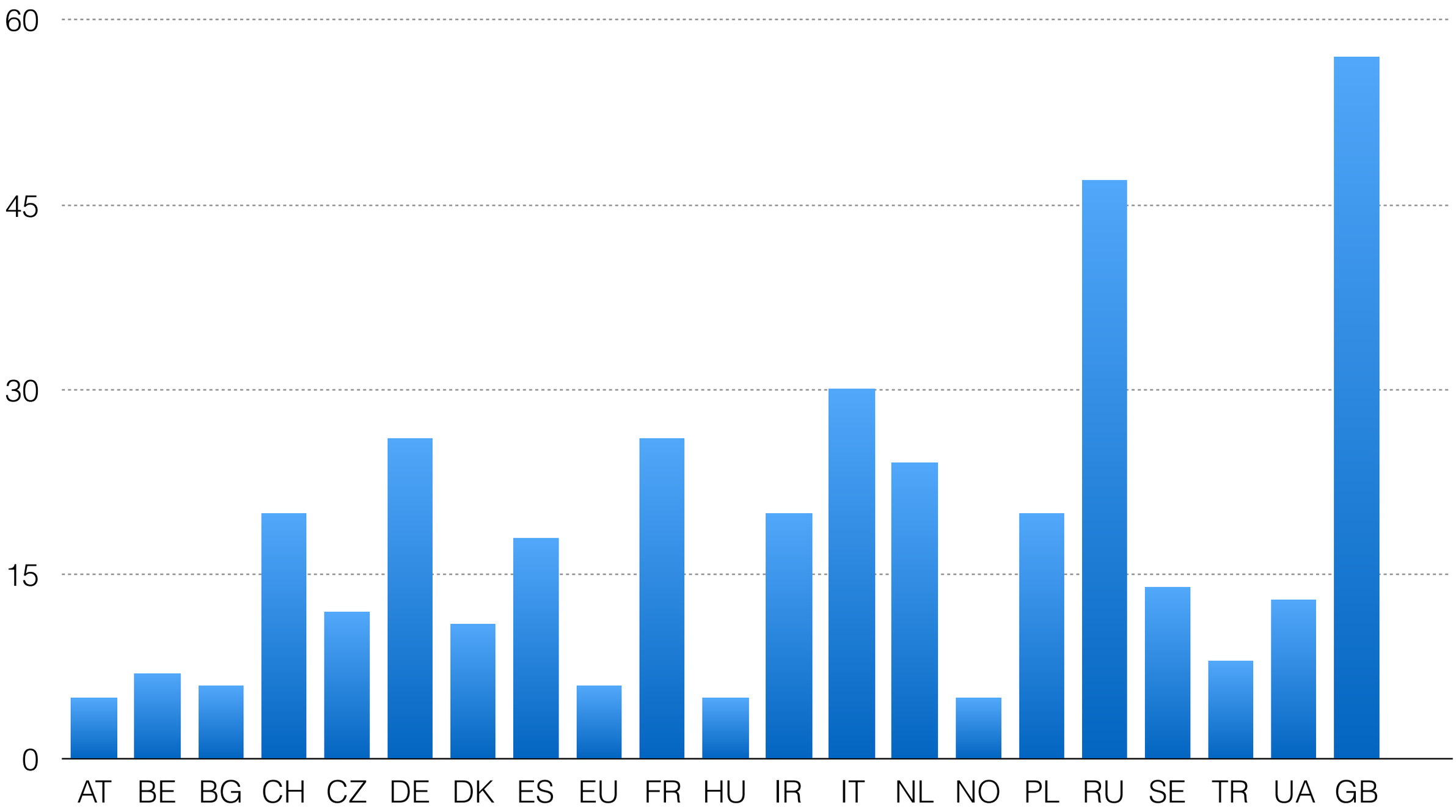
- Get It Routed

- Get It Used

False Starts?

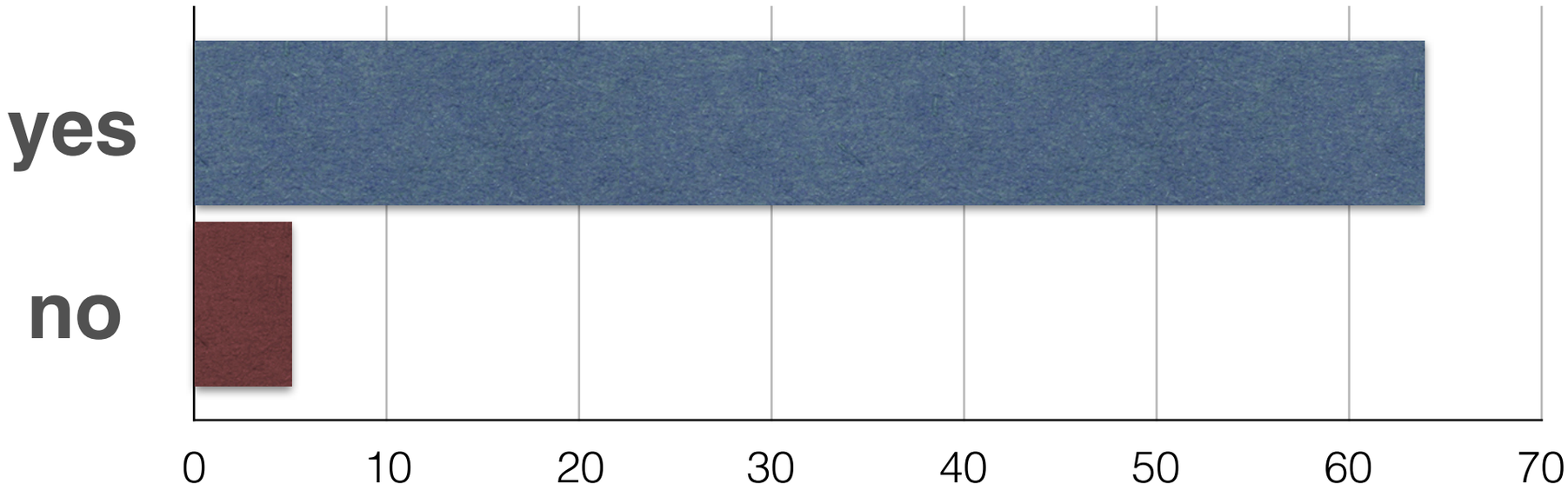
- We found that 462 Local Internet Registries (LIRs) stopped announcing IPv6
- We contacted them all to find out why
- Within 2 weeks we received 69 survey responses
  - And a lot of e-mails directly sent to us

Where are these LIRs?



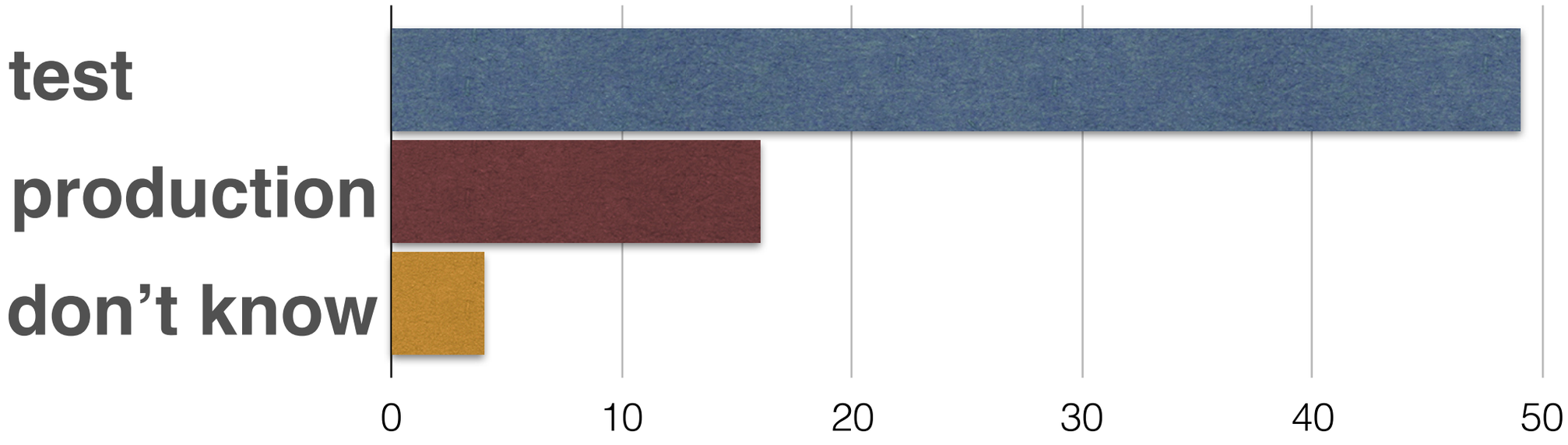
Awareness

- Are you aware you previously announced your IPv6 allocation to the global routing table?



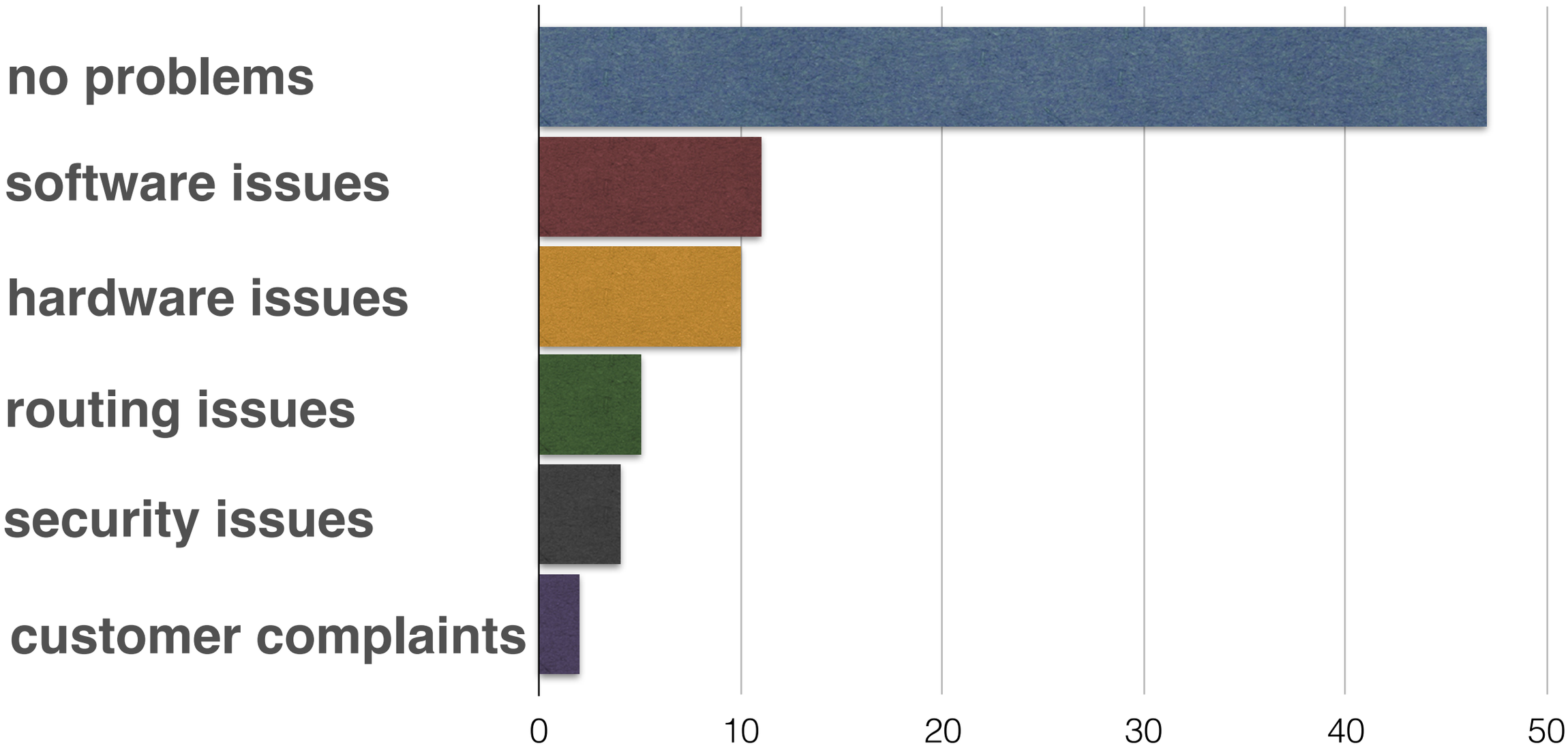
Purpose

- What was the purpose of the announcement?



Experiences

- What were your experiences during the announcement?



Experiences - Details (1)

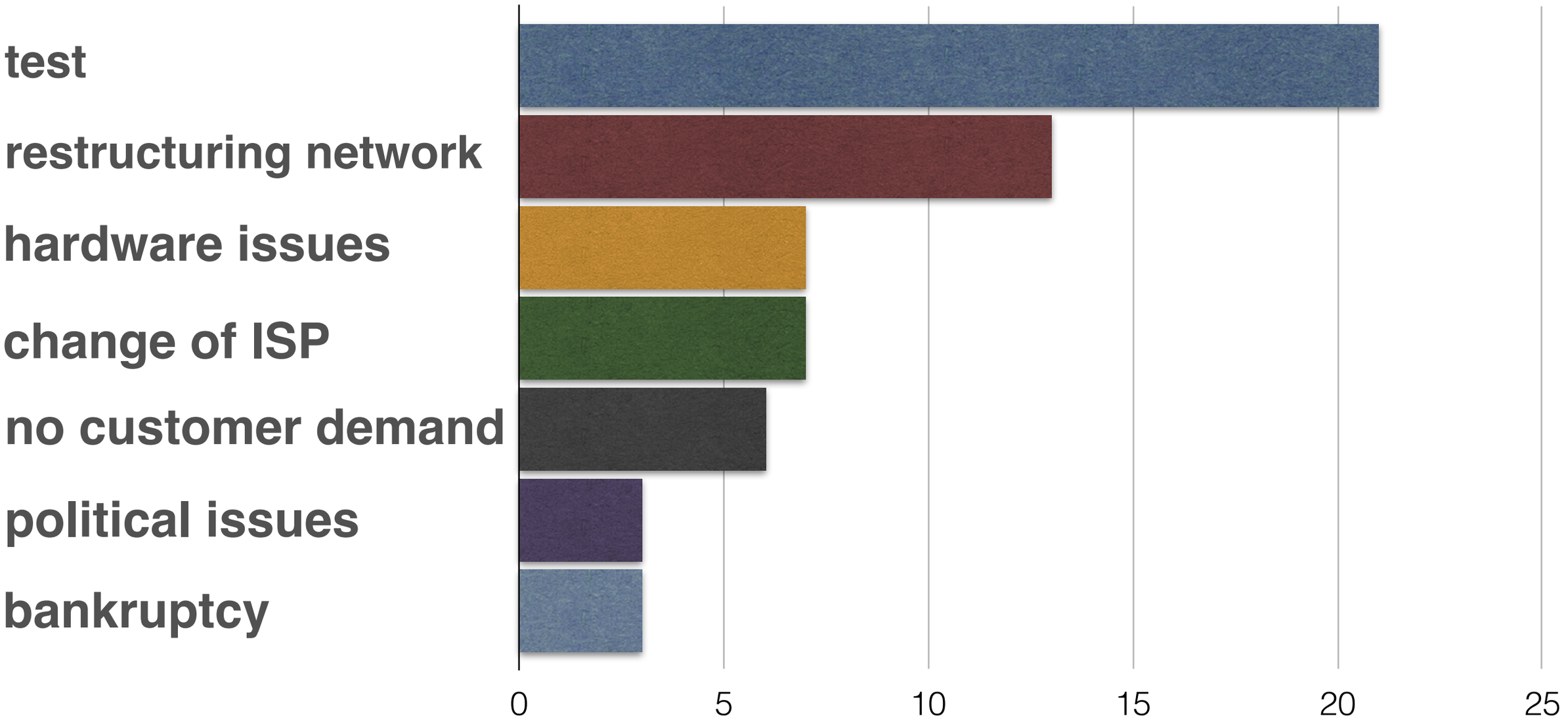
- **It was only a test**
  - Announced IPv6 just for testing
  - “test customer hasn't setup his test scenario“
- **Hardware or software issues**
  - New router and new set-up needed
  - Documentation tools needed to keep records clean

Experiences - Details (2)

- Lack of acceptance by other aspects of the business
- IPv6 not supported in my country
- Main engineer left
  - Are a lot of IPv6 deployments driven by a single person?

Reasons

- Why did you disable your IPv6 announcement?



Reasons - Details (1)

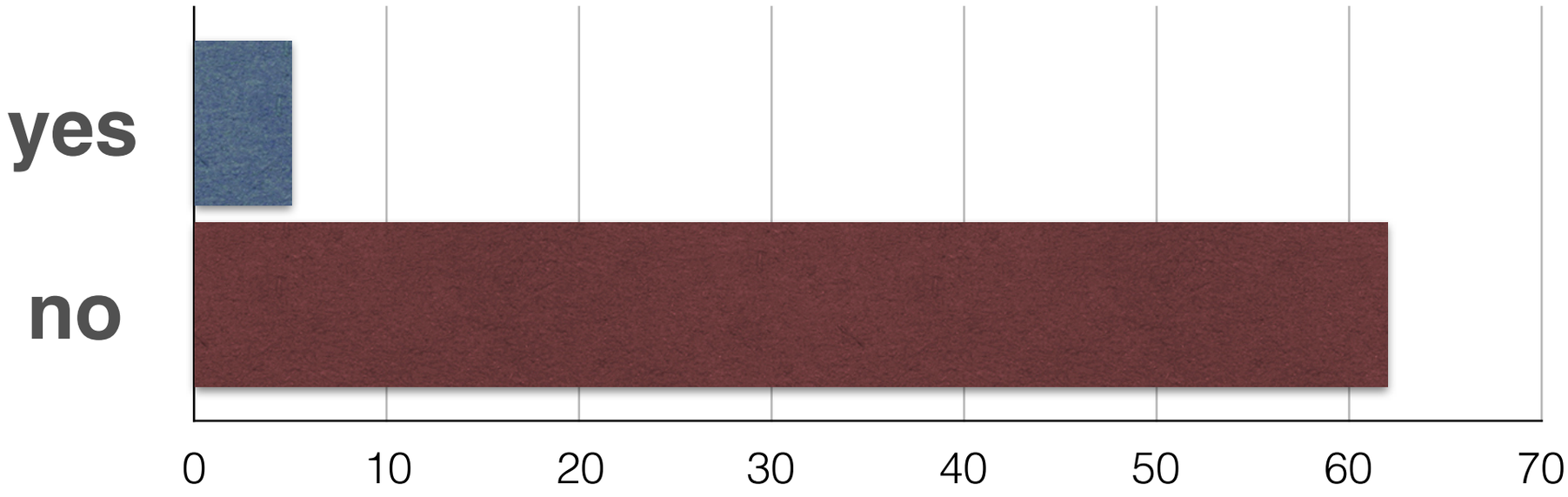
- **No interest from customers**
- **Just testing**
  - Wanted to get ready
  - Switched it off until needed
- **Network infrastructure changed**
  - We changed something, didn’t re-enable IPv6 again (core routers, data centre, …)
  - Traffic moved to different IPv6 range

Reasons - Details (2)

- **Hardware or security issues**
  - “Compatibility issues with old Cisco and new Juniper equipment related to deployment of 6PE MPLS”
  - “We were under a huge DDOS attacks all the time"
  - Routers didn’t survive stress testing (IPv6 done in software)
- **Service provider issues or issues with tunnel broker**
- **Didn’t realise that announcement stopped**
  - Need for better monitoring tools?

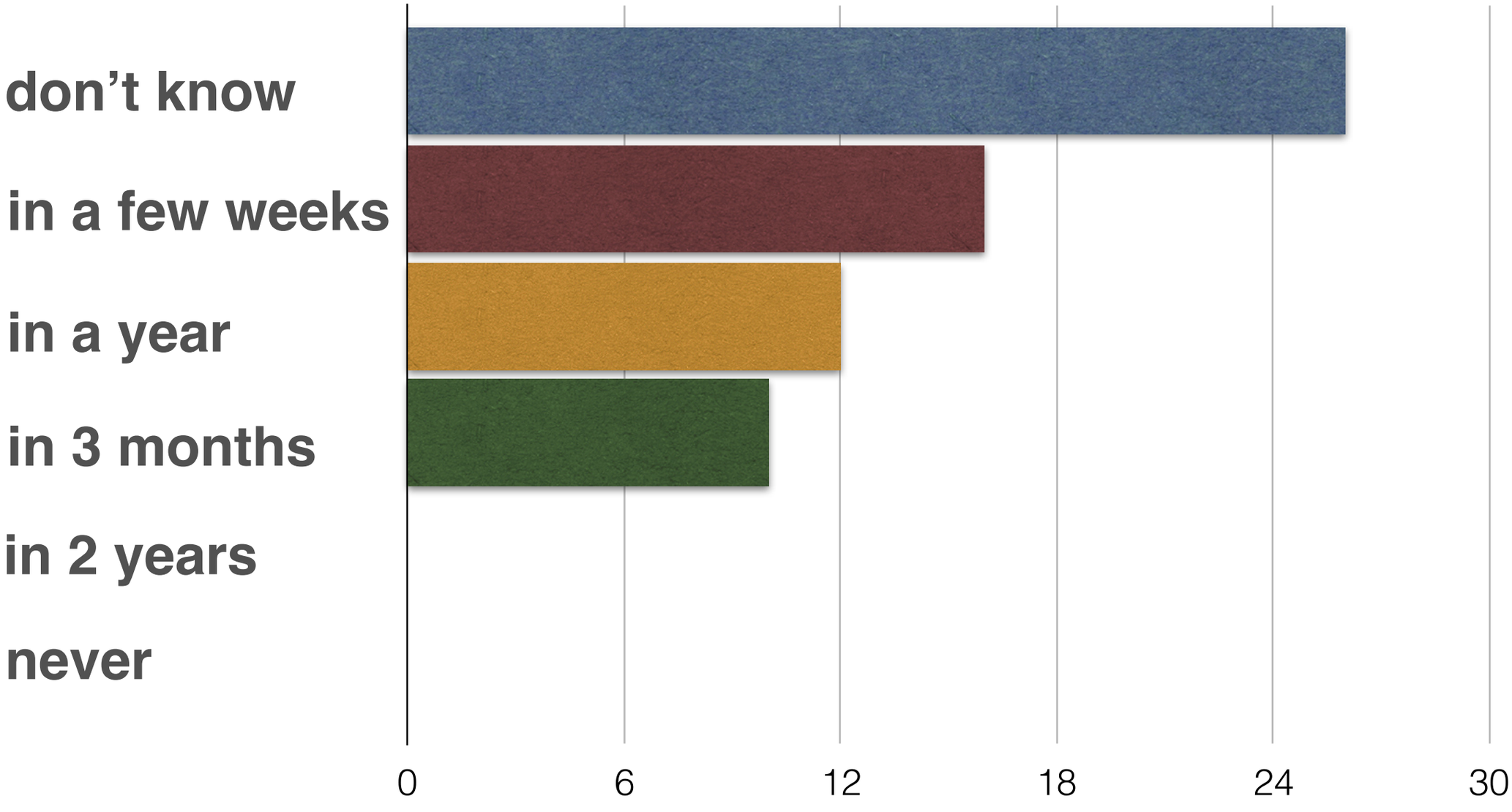
IPv4?

- Did you also stop your IPv4 announcements?



Plans

- When will you announce your IPv6 prefix again?



Plans - Details

- Sorry - Fixed!
- Will return resources
- When customers want it
- Depends on upstream provider

How Can the RIPE NCC Help?

- Provide more training
- Tips for addressing plans
- Pointers for best practices
- Discuss IPv6 with governments

https://ipv6actnow.org/

Summary

- **People appreciated us asking**
- **Still various issues**
  - Hardware, software, upstream
- **Lack of customer demand**
  - Will customer demand for IPv6 ever exist?
- **Monitoring missing**
- **Are issues similar for North American operators?**

Questions

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