Blackholing at IXPs

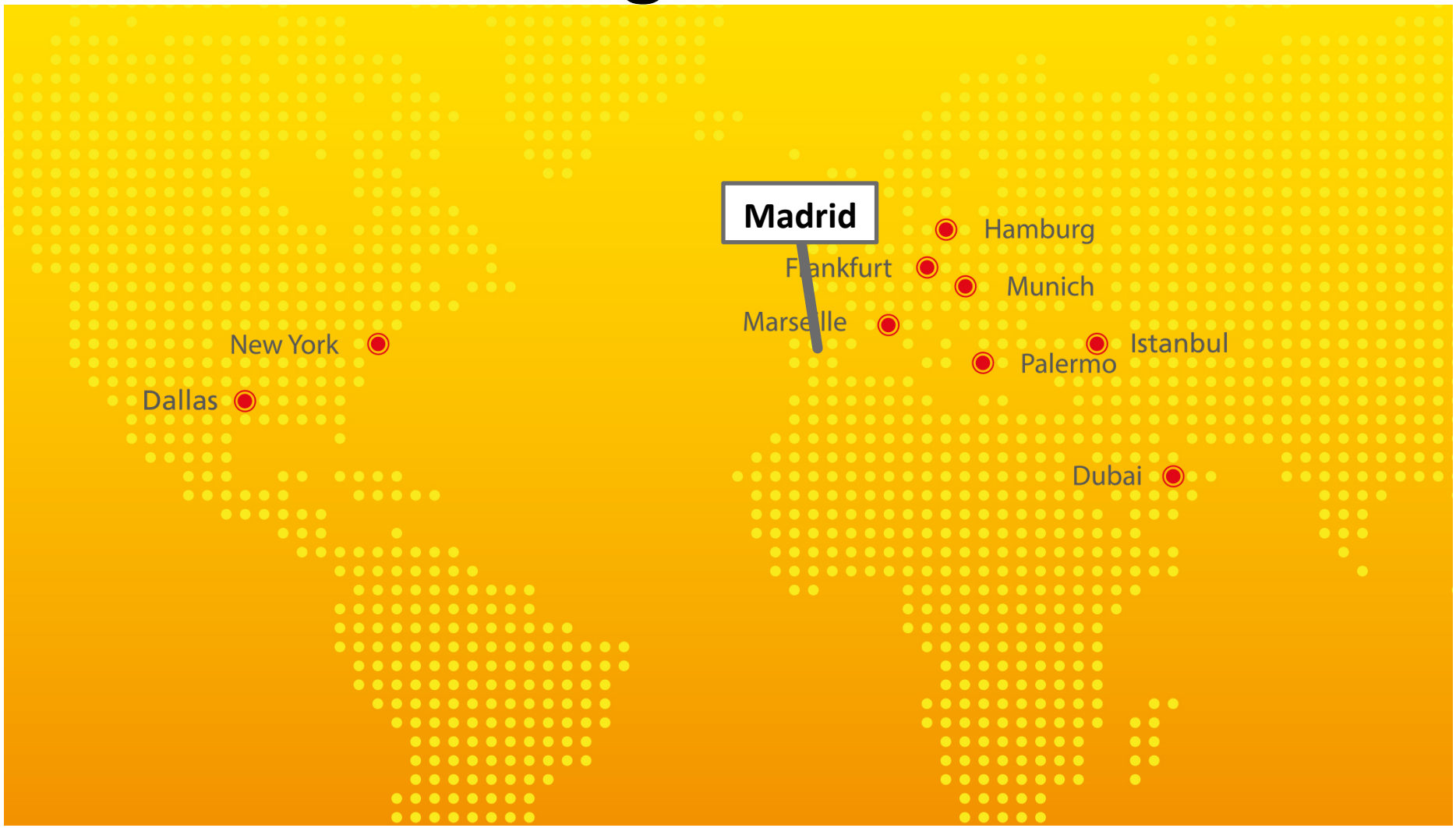
On the Effectiveness of DDoS Mitigation in the Wild

ESNOG

Thomas King

CIO, DE-CIX

DE-CIX goes Madrid



Madrid

- Back to the roots: keep local traffic local
- Push peering opportunities
- Establish multiple IXPs at promising locations around the globe

- Operational end of May
- 1 GE port is free of charge
- 2 data center:
  - Interxion, Calle Albasanz 71, 28037 Madrid
  - Interoute, Lezama, 4, 28034, Madrid

DDoS Attacks Remain a Serious Threat

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DDoS Attacks Skyrocket in 2015

BY DAVID MURPHY MARCH 11, 2016 03:41PM EST 1 COMMENT

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DDoS attackers seem to prefer to launch assaults at the weekend, but it turns out they aren't actually making that much money from selling their services.

By Liam Tung | March 4, 2016 -- 11:45 GMT (11:45 GMT) | Topic: Security

'Booter' services run by cybercriminals let anyone with a gripe point a network of infected computers at a target.

Image: Timur Arbaev/iStock

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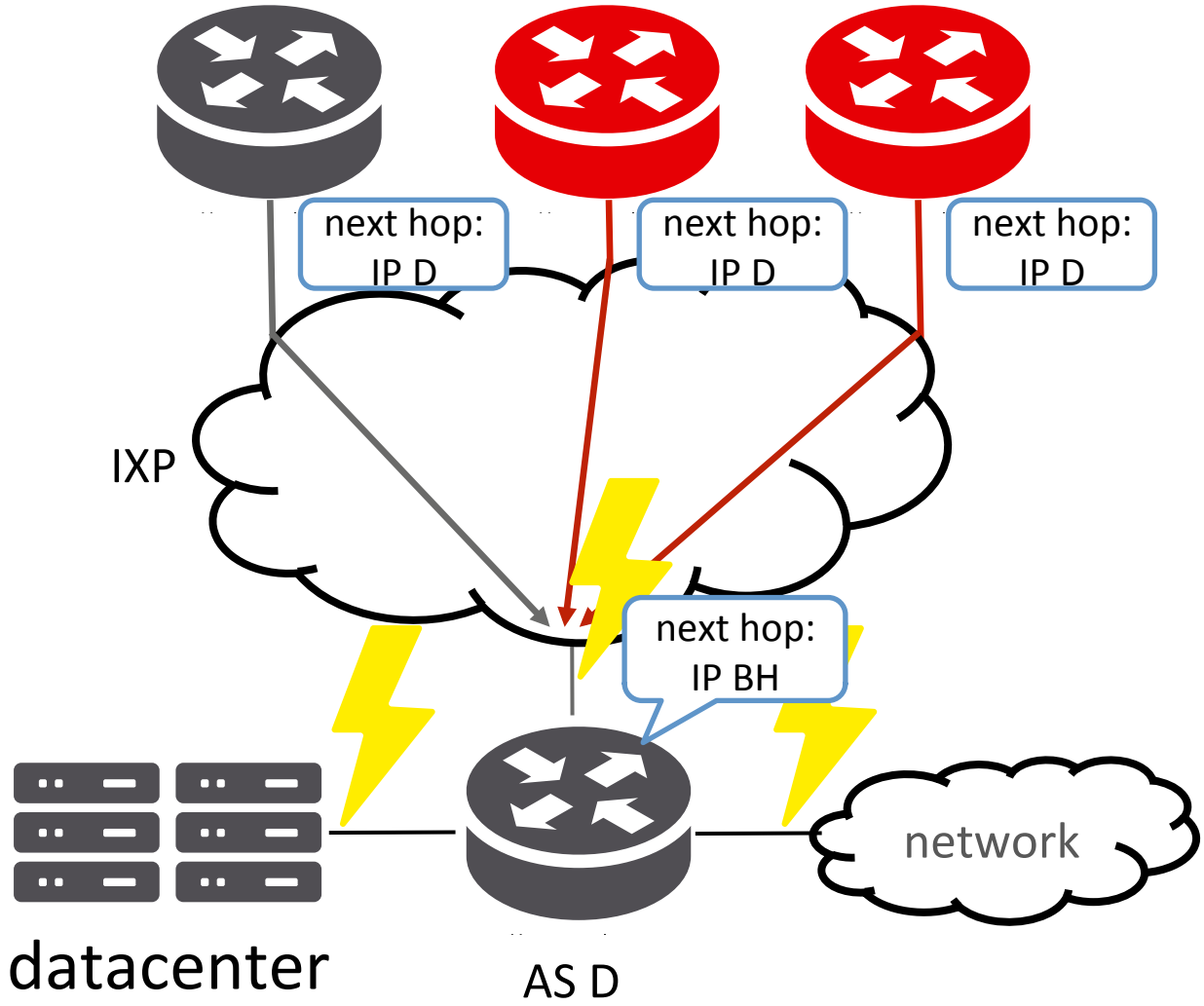
Recap - Blackholing



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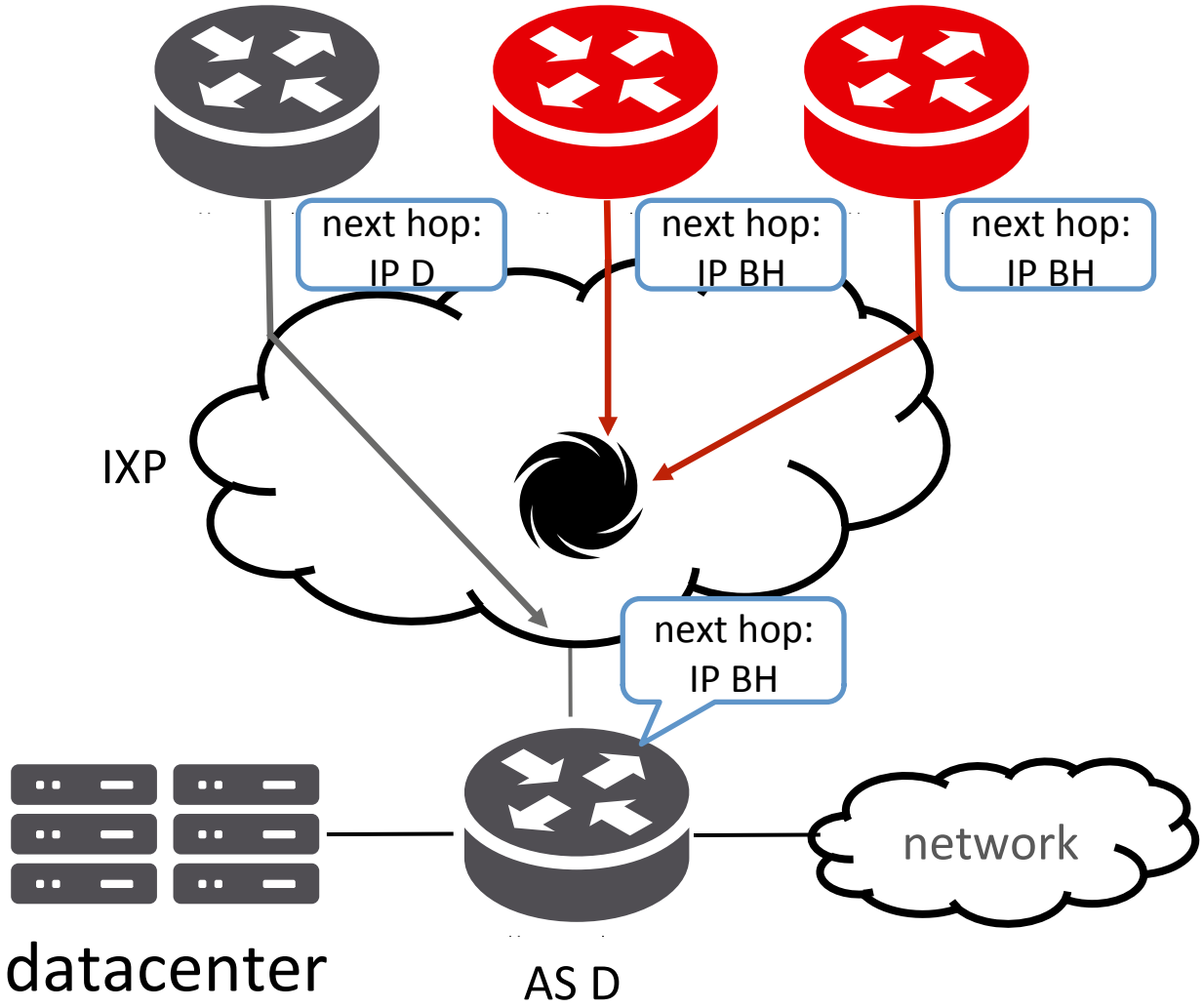
Recap - Blackholing



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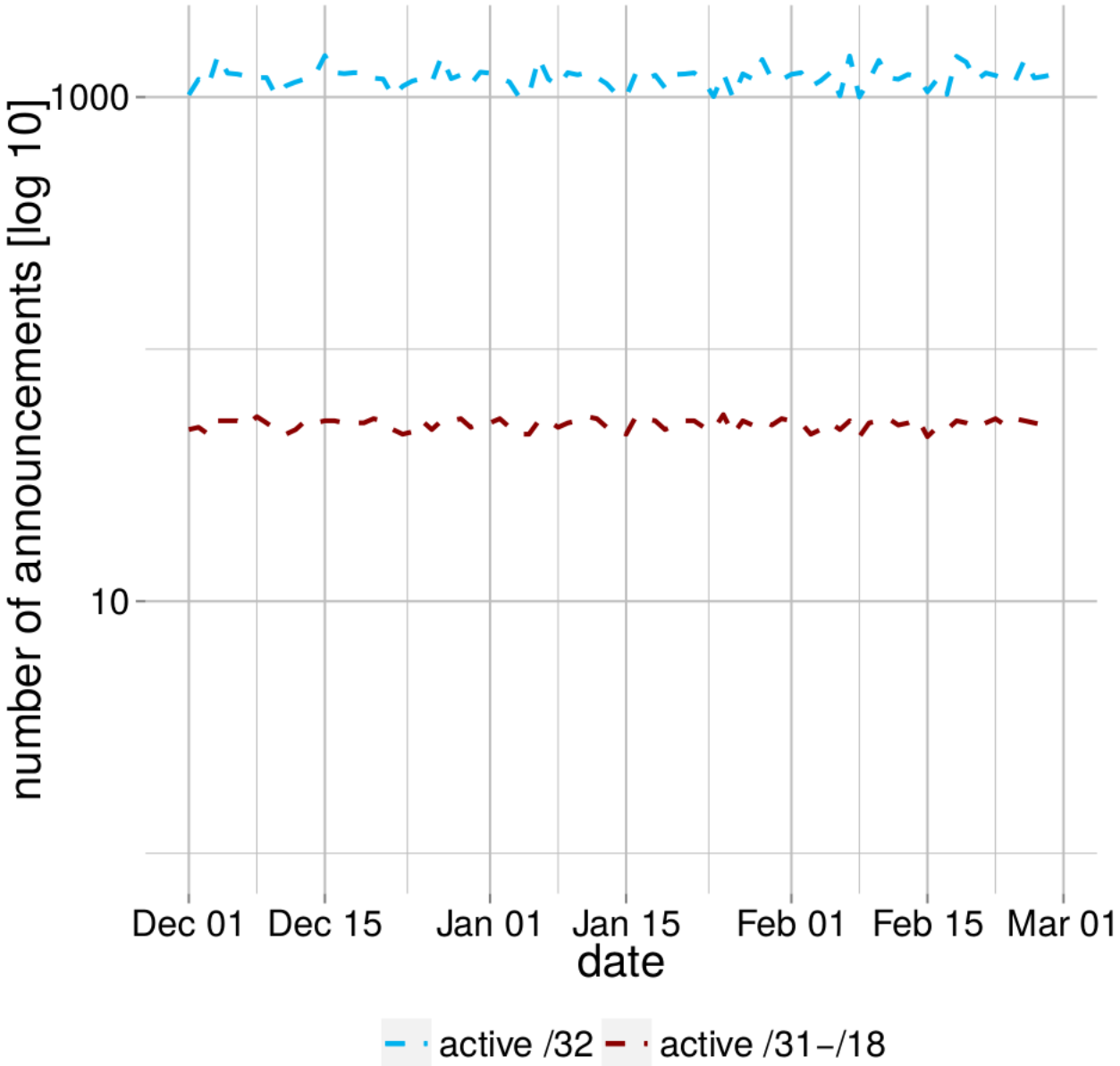
Is it frequently used and how is it used?

What is the impact on traffic?

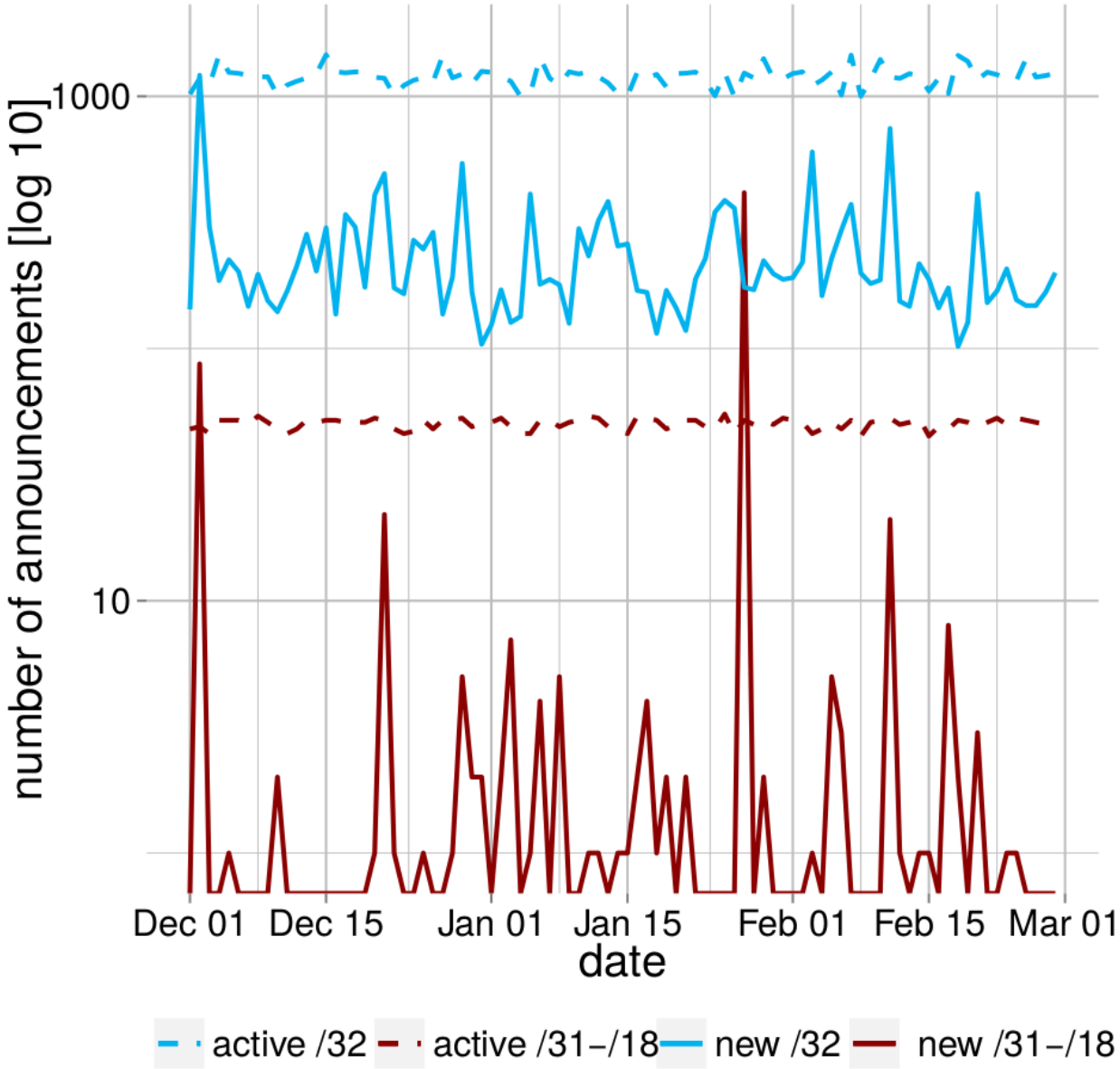
How can we improve blackholing?

Blackholing Usage Analysis – Active Announcements



- About 23,000 announcements
- Stable number of active / 32 blackholes (~1200)
- Also stable number of less specifics /31 - /18 (~50)
- **What about new announcements?**

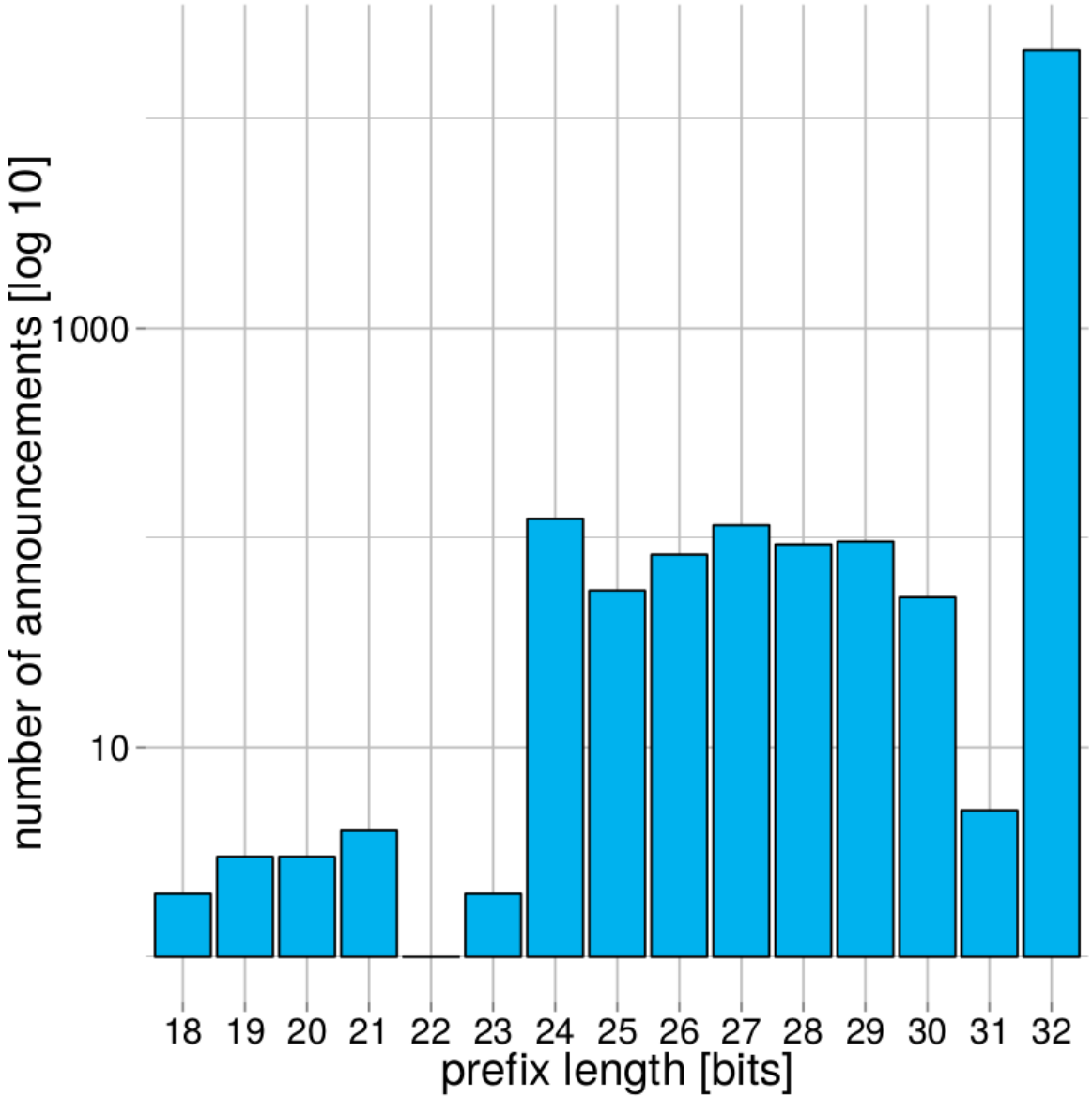
Blackholing Usage Analysis – New Announcements



- High variance in new announcements
- Spikey less specifics (/31 - /18)
- Blackholing is indeed widely used!
- **But which prefix sizes?**

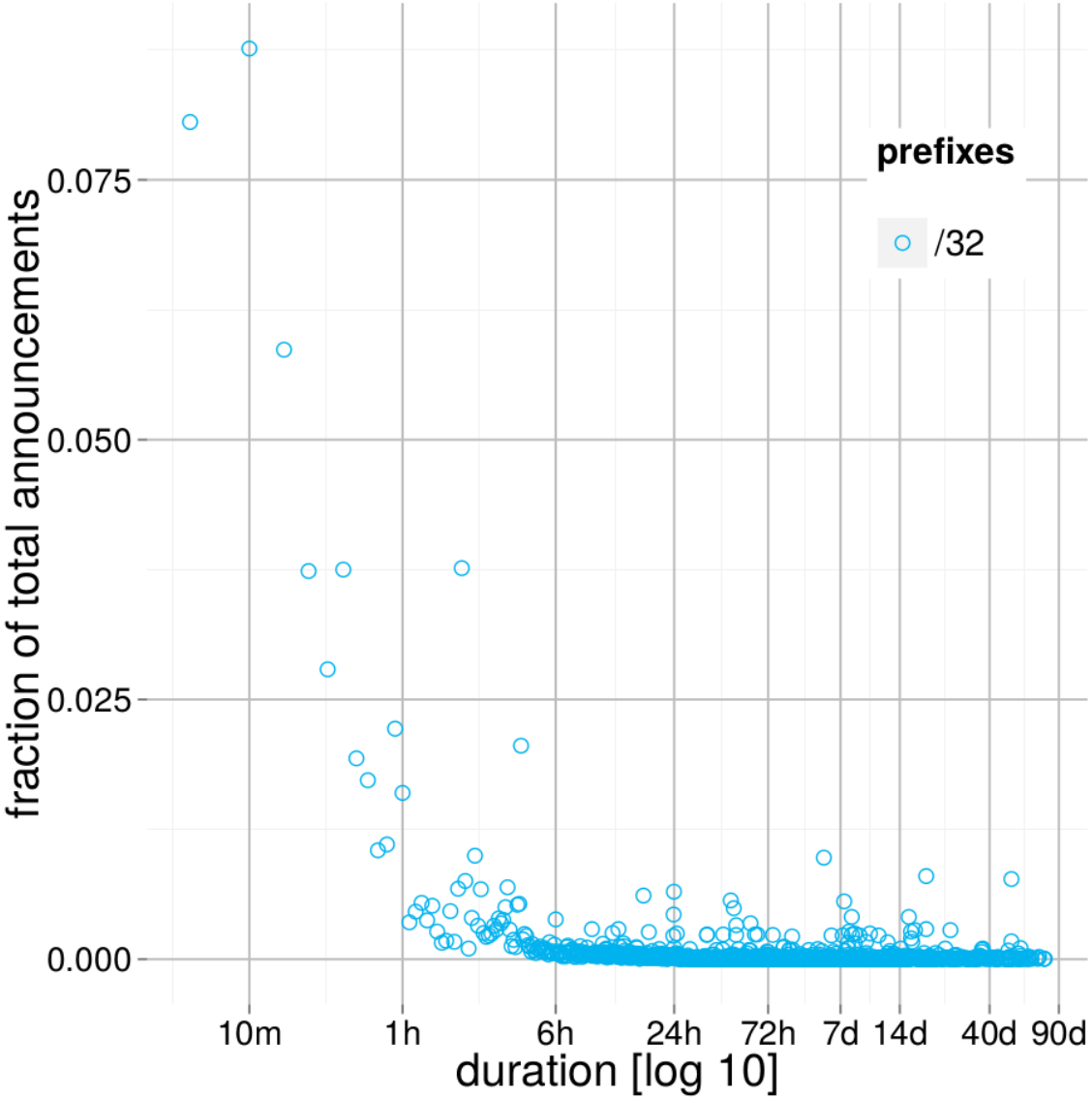
Blackholing Usage Analysis – Prefix Length

- Mainly /32 announcements (97%)
- /24 - /31 account for 2.5%
- 9 announcements for < /24
- More specific acceptance needed
- **Announced for how long?**



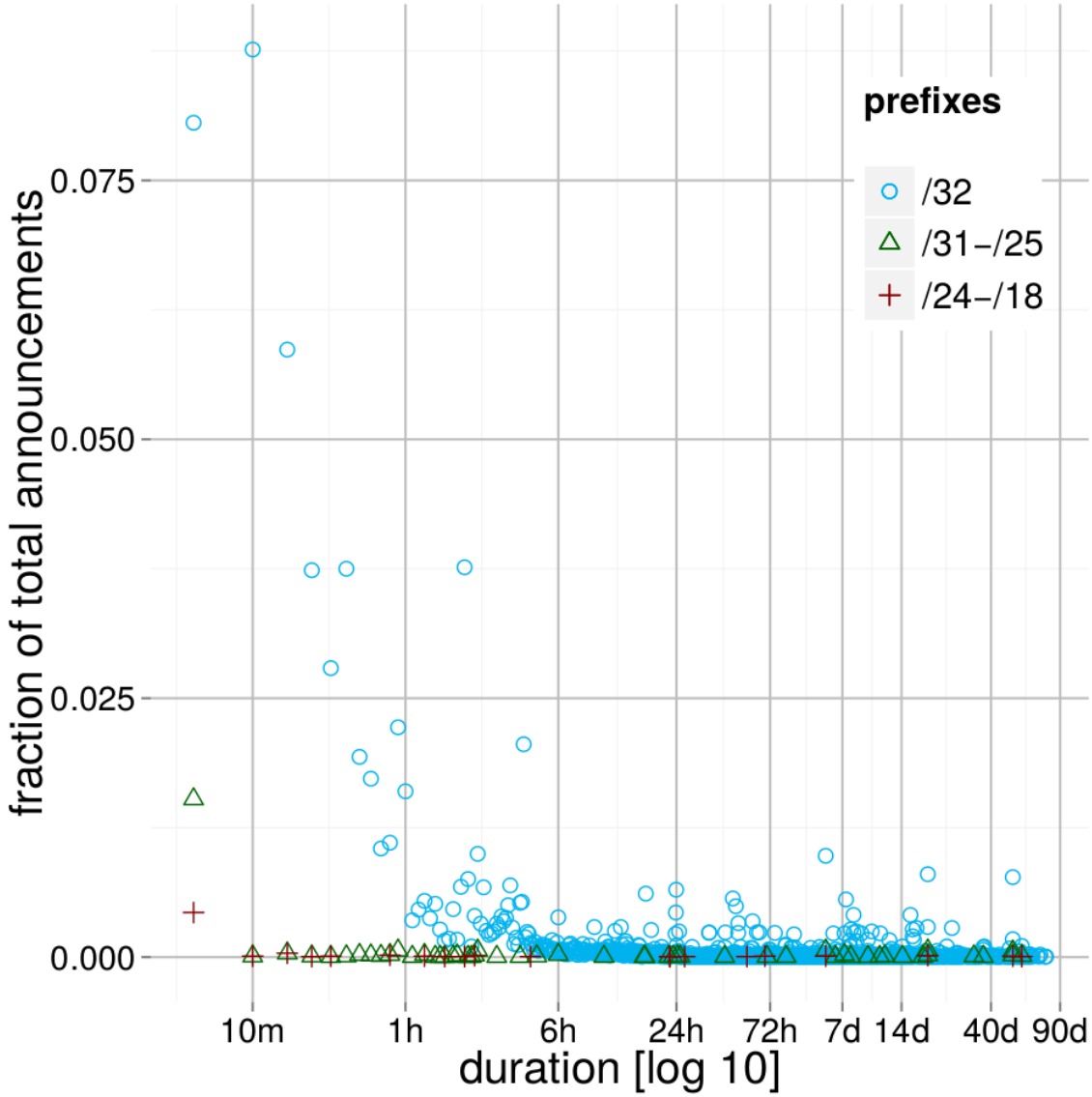
Blackholing Usage Analysis – Active Duration

- Active duration per prefix (/32)
- Majority is short-lived (~50% <= 3 hours)
- Longest observed announcement 76.31 days



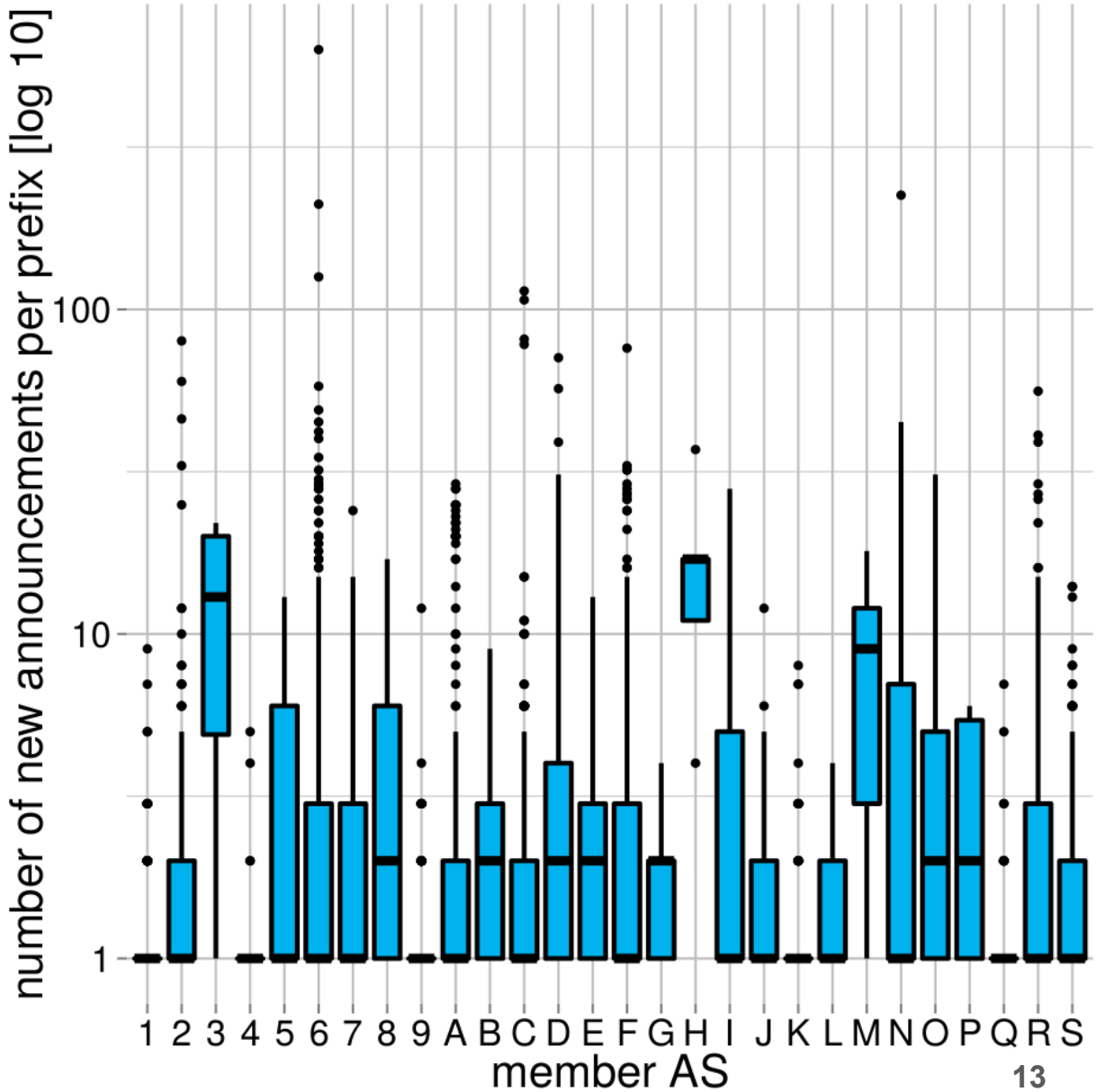
Blackholing Usage Analysis – Active Duration

- Majority is short-lived
- Also very long living announcements
- **Could be the same prefix?!**

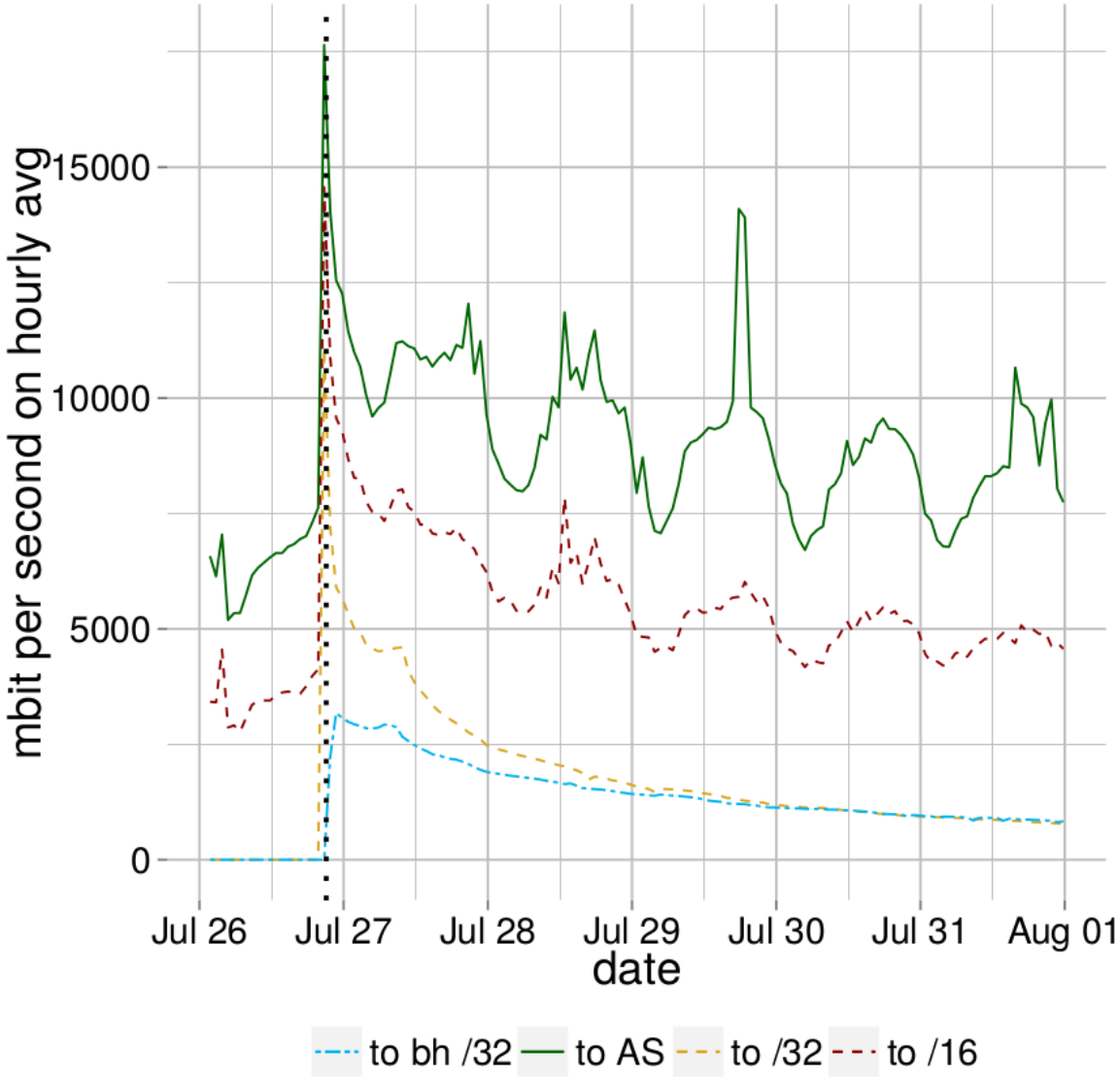


Blackholing Usage Analysis – Re-Announcements per Prefix

- 7,864 unique prefixes
- Most prefixes announced once (10%), or between two and three times (15%)
- Outliers spread from 10 to 100, max 623



Case Study - Impact on Traffic



- Traffic for one /32
- Traffic rises up to 17.6 Gbit/s
- Traffic is reduced by one third

Summary

- 23,000 announced blackholes (over a three month period)
- Stable number of 1200 active blackholes
- Observed least specific was a /18
- Very diverse announcement patterns (frequency, duration, …)
- Succeeds in mitigating large DDoS attacks
- Full paper at http://www.net.t-labs.tu-berlin.de/papers/DFK-BIXPO-16.pdf

IETF: Standardized Triggering of Blackholing

- Well-defined community for triggering blackholing for IXPs and ISPs
  - Get rid of IXP depending next-hop blackholing IP address
  - Get rid of ISP depending communities

- Internet Draft available: https://tools.ietf.org/html/draft-ietf-grow-blackholing-00

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Thanks for listening!

Questions and comments?