KIRIN:
attacking BGP with IPv6

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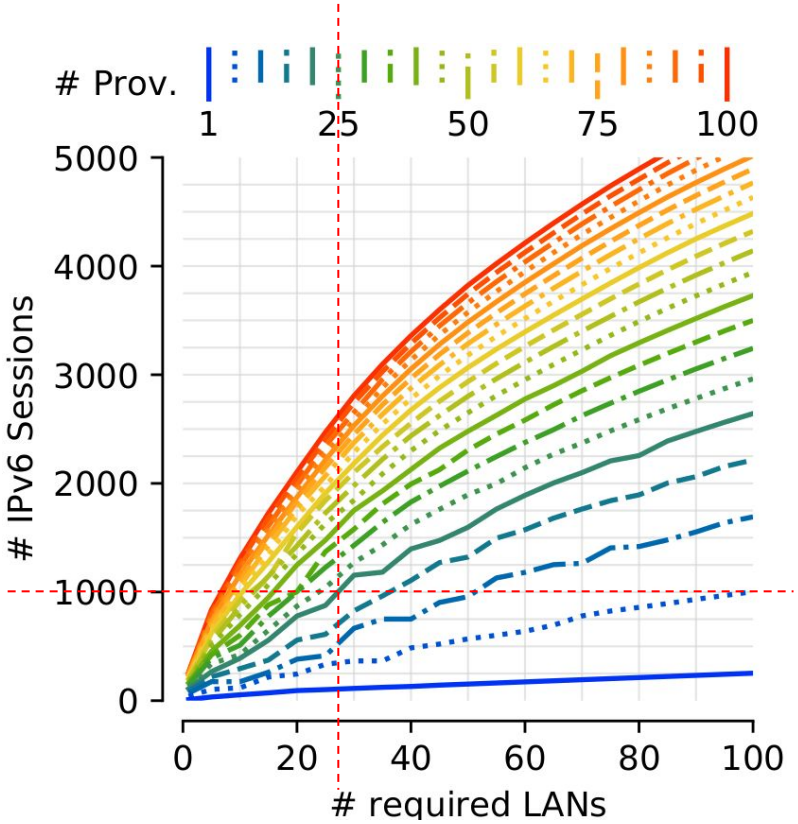
1. KIRIN: Killing Internet Routers in IPv6 Networks

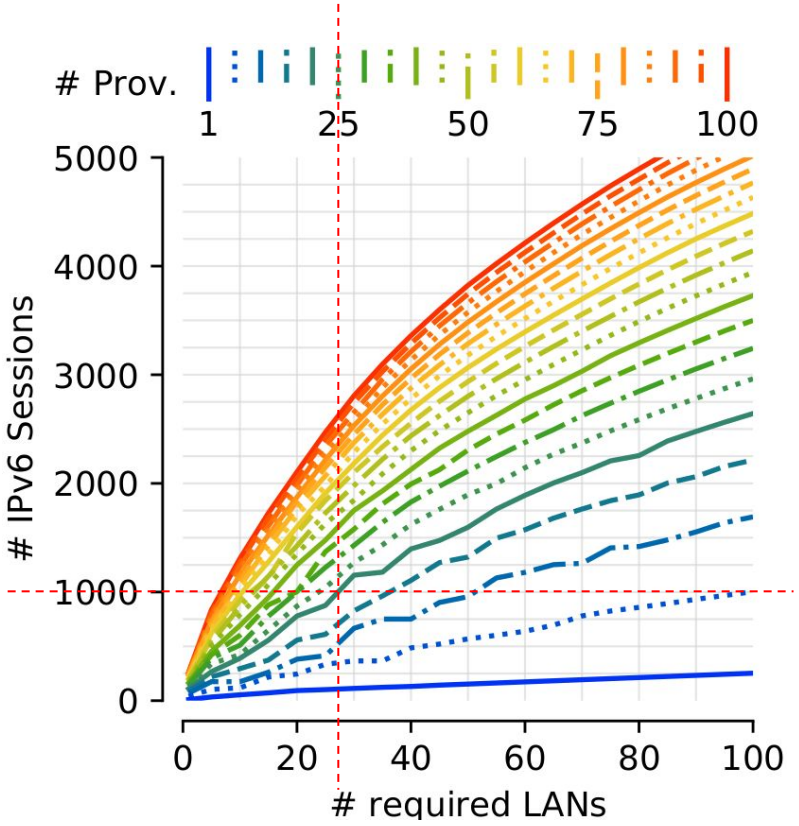
- Internet routers' FIB/RIB tables have *limited capacity* [1]
  - **What if we announce *too many* prefixes, and overflow them?**
- Let's re-visit *prefix de-aggregation attacks*, but also consider:
  - **IPv6**
    - Easy /29 allocation = 1 million possible sub-prefixes good for BGP
  - **Instant and "cheap" remote BGP sessions**
    - No need for physical presence: remote peering, network-as-a-service, VPSes, … (eg. [2])
  - **BGP max-prefix limits and prefix aggregation**
    - Establish many BGP sessions + unique, non-aggregatable announcements for each
  - **…and RPKI can sometimes "help"**
    - Parent ROA with a maxLength = route filter accept for each sub-prefix (eg. [3])

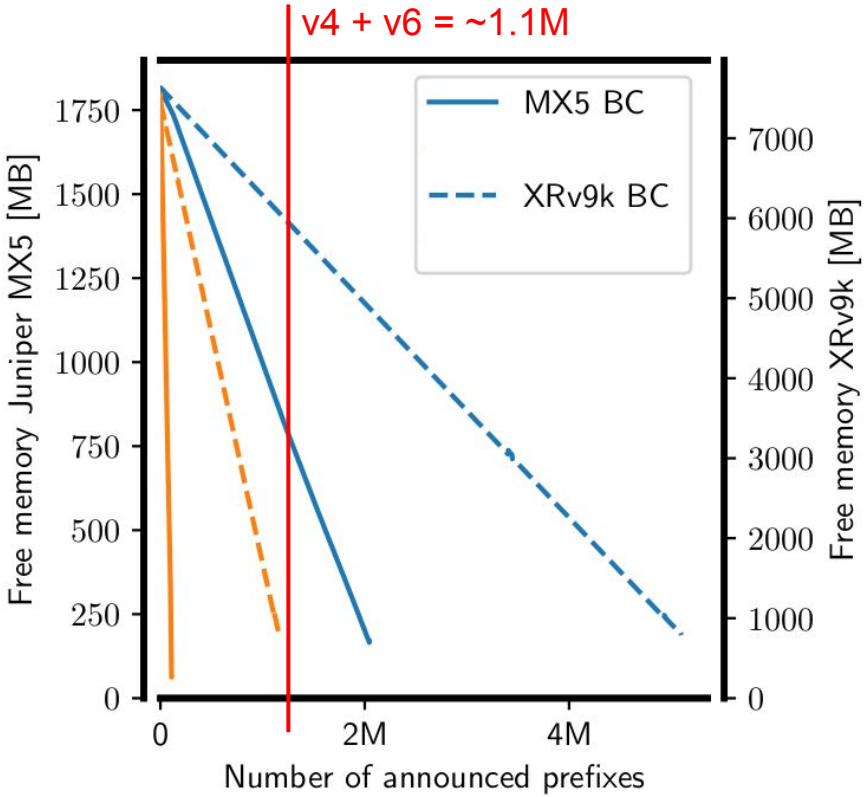
1. https://blog.apnic.net/2021/03/03/what-will-happen-when-the-routing-table-hits-1024k/
2. https://www.ixreach.com/services/remote-peering/ | https://www.megaport.com/ | https://www.vultr.com/ | https://bgp.services/
3. https://routing.he.net/algorithm.html

2. Is it possible to launch KIRIN *today*?



2. Is it possible to launch KIRIN *today*? Yes!





3. What should I do?

- KIRIN is easily detectable
  - **Needs monitoring**
- Recommendations for operators
  - **More tight yet dynamic max-prefix limits**
    - 1.5x growth per day - peers and customers sessions
    - a few thousand new prefixes per day - transit sessions
  - **Introduce limits on**
    - …routes per origin (max now: AS9808 = ~4k IPv6 prefixes)
    - …more-specifics per each assigned block (max now: 2409:8000::/20 = ~10k more-specifics)
  - **Don’t blindly rely on PeeringDB max-prefix limits (add sanity checks)**
- …read much more in our paper!

kirin-attack.github.io

Thank you!

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Backup slides


ONE DOES NOT SIMPLY
ANNOUNCE A MILLION NEW ROUTES
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