I2 Routing INTEGRITY

"Each of us protecting all of us"

**Ensuring packets arrive at their destinations with
no detours, no delays, and no outages**

# The challenges of RPKI-ROA Diffusion within US R&E

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What is Internet2?

- Not a full transit provider
- Interconnects state research and education networks
- Customer cone includes ~1,200 ASNs, 2,400 direct customer allocations
- We aim to reduce the friction of using advanced networking-related technologies (e.g., cloud, federated authentication, faster than the speed-of-light data transfers, etc.)

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Percent of Routes
Protected by RPKI-ROAs

*Slope 0.018
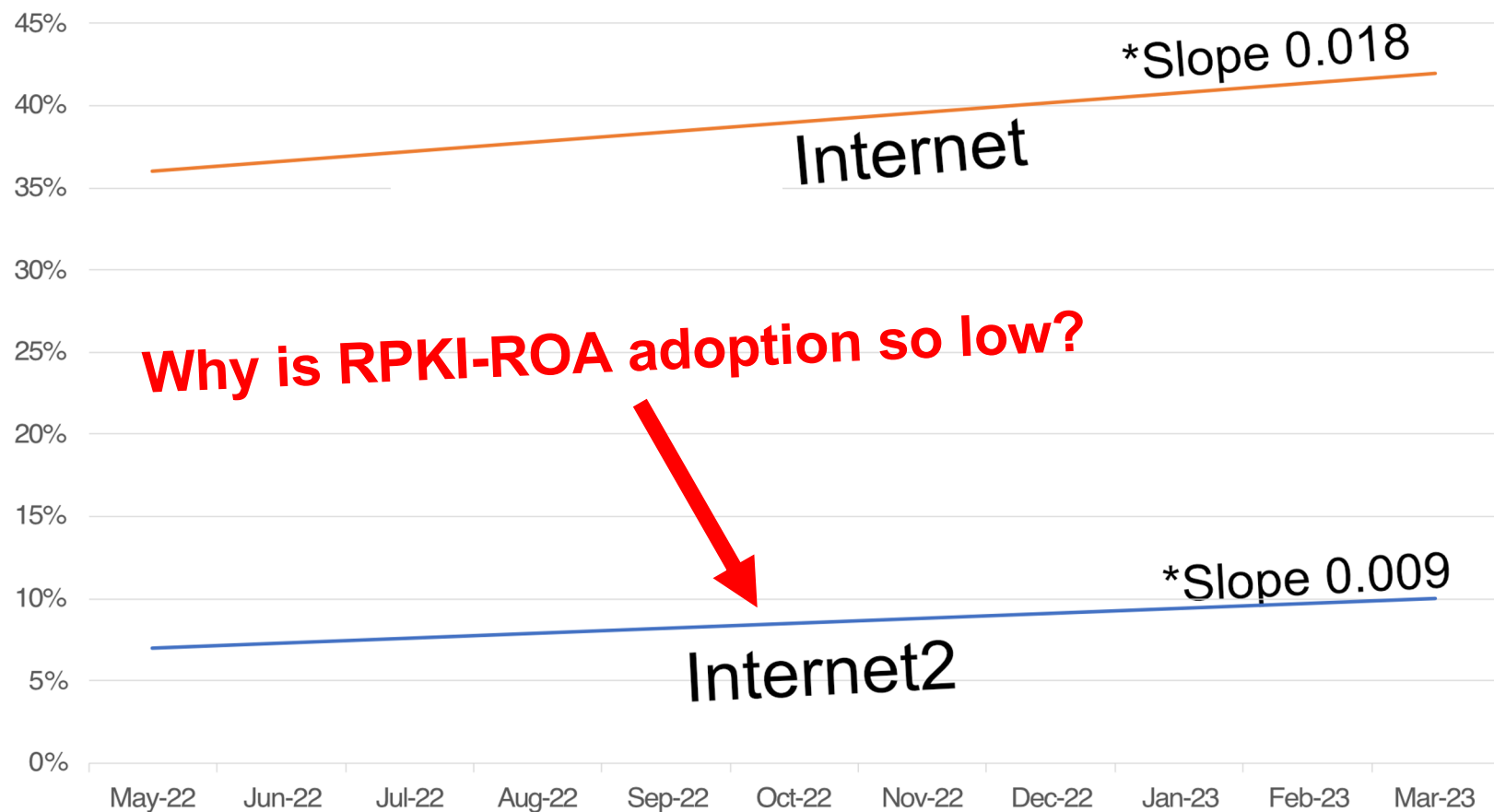
Internet

Why is RPKI-ROA adoption so low?

*Slope 0.009

Internet2

* dimensional slope (% over days)

RPKI-ROV transfers some of the technical burden of routing security from the internet service provider towards the IP address holder.

This works for well-resourced IP address holders (e.g., cloud providers, ISPs, etc.)

Not so much for K12 school districts, community colleges, and some universities.

Barriers to RPKI-ROA Adoption

- **The Internet2 Community Adopted IP Early**
  - 45% of IP allocations are legacy without an ARIN agreement.
  - While ARIN has vastly improved their agreement, it's still legal friction.
  - Many of our members are state institutions, governed by state laws… and those can be rather restrictive.

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Barriers to RPKI-ROA Adoption

- **Routing security may not have a natural champion**
    - Typically not the CISO.
    - It says "security", but security teams often see this as the network team's responsibility.
    - Our ISP/regional network/Internet2/DDoS scrubber protects our networks, so they're already secure, right?

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Barriers to RPKI-ROA Adoption

- **There's nothing urgent**
  - No current outage, never experienced a route leak (*that we know of*) before, etc.
  - ARIN's pricing changes for legacy resources may create some urgency for small institutions.
- **Our leadership isn't hearing this elsewhere**
  - **Internet2 is working on this one…**

What is Internet2 doing to improve RPKI-ROA adoption?

- Messaging - to leaders and decision makers in our community.
- Education - everything from answering "what is ARIN" to how to create a ROA.
- Support - ROAthons, webinars, individual support sessions, reporting, etc.

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Parting Thought

We don't see the equivalent effort for other sectors. This effort is critical. Internet2 clearly has this role for US R&E, but what about the other sectors?

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