IETF -125, Shenzen, China

Are you RPKI ready?

The Road Left to Full ROA Adoption

Deepak Gouda, Romain Fontugne, Cecilia Testart

March 17, 2025

Resource Public Key Infrastructure (RPKI)

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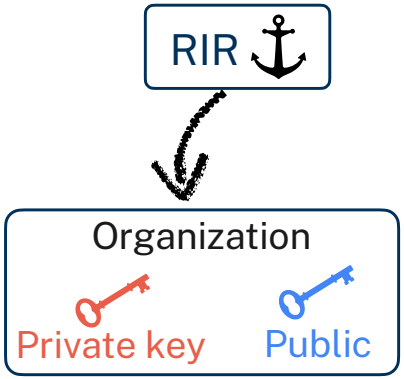

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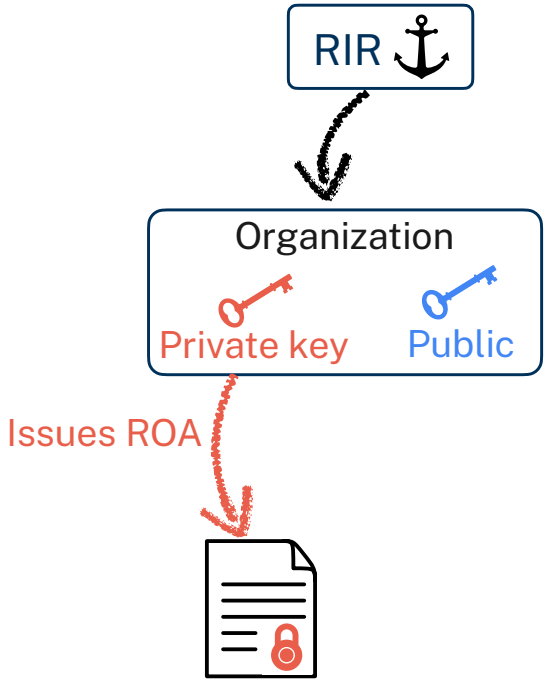

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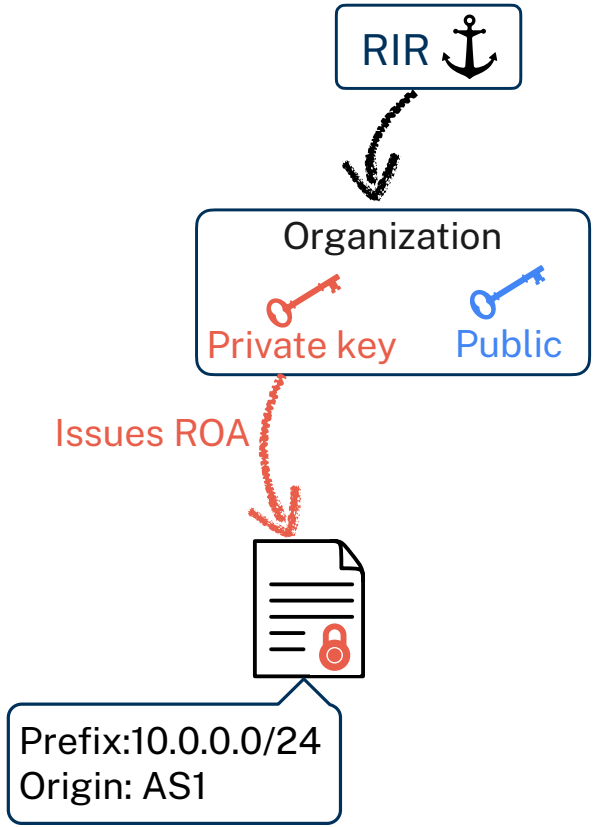

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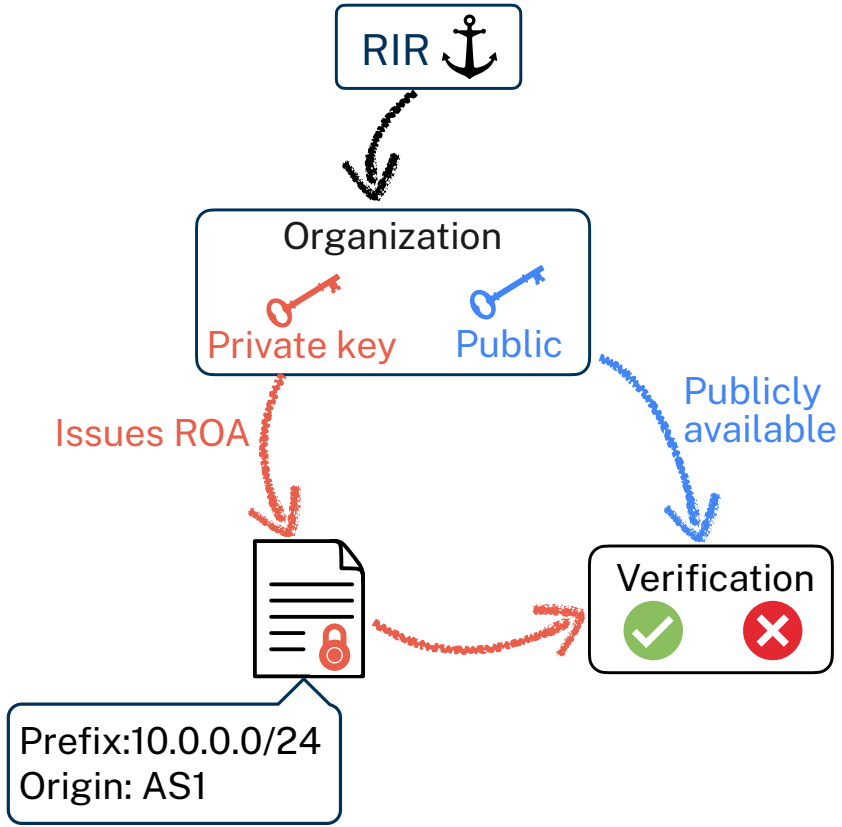

We have a consensus on the benefits of RPKI

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IMC 2019

RPKI is Coming of Age

A Longitudinal Study of RPKI Deployment and Invalid Route Origins

Taejoong Chung
Rochester Institute of Technology

Emile Aben
RIPE NCC

Tim Bruijnzeels
NLNetLabs

Balakrishnan Chandrasekaran
Max Planck Institute for Informatics

David Choffnes
Northeastern University

Dave Levin
University of Maryland

Bruce M. Maggs
Duke University and
Akamai Technologies

Alan Mislove
Northeastern University

Roland van Rijswijk-Deij
University of Twente and
NLNetLabs

John Rula
Akamai Technologies

Nick Sullivan
Cloudflare

IMC 2022

Stop, DROP, and ROA: Effectiveness of Defenses through the lens of DROP

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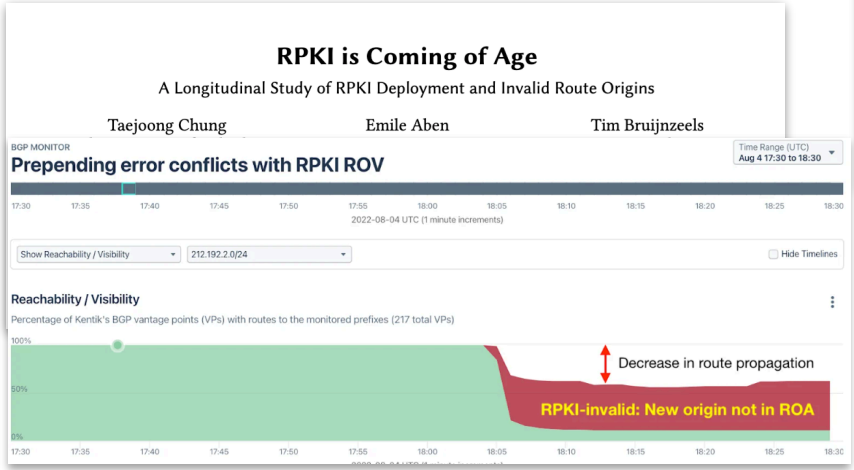
IMC 2019



[1] Kentik

IMC 2022

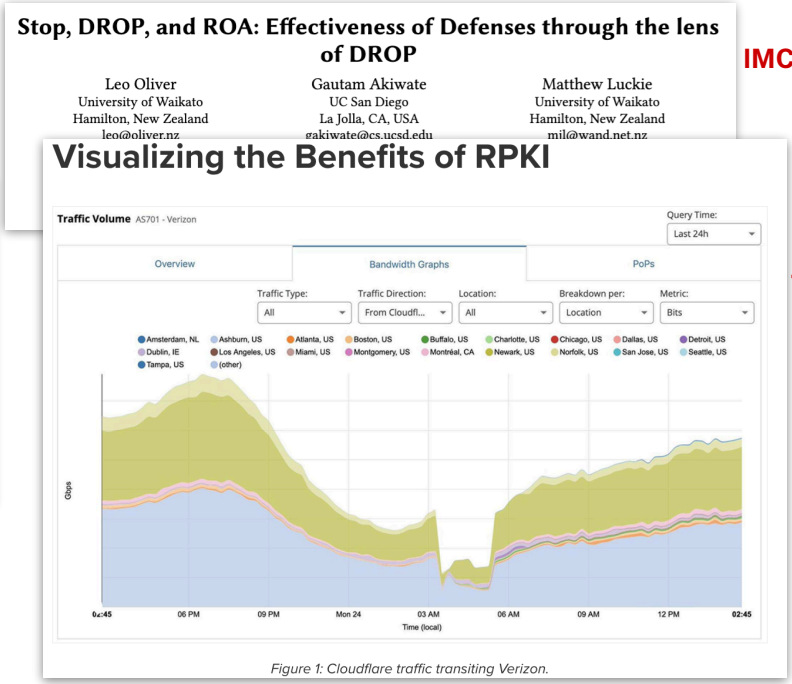
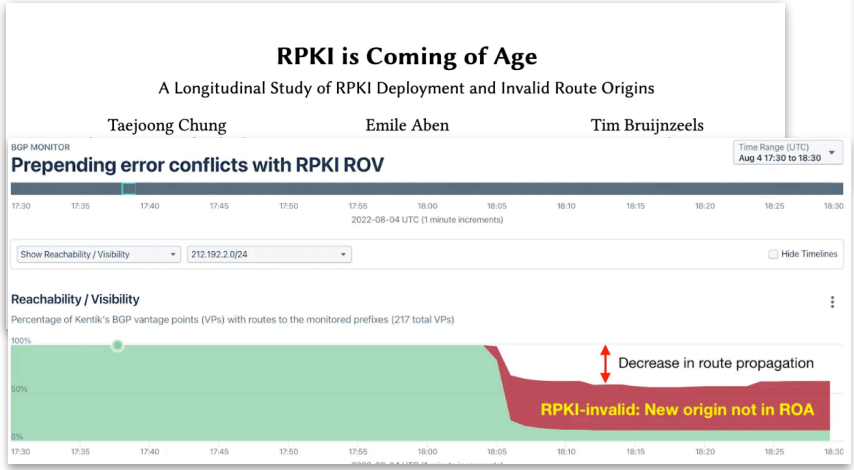


Figure 1: Cloudflare traffic transiting Verizon.

[2] Cisco Thousandeyes

We have a consensus on the benefits of RPKI

IMC 2019



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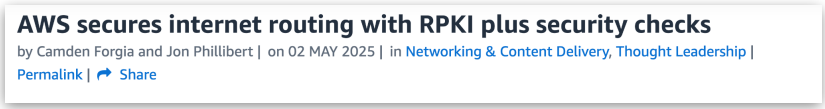

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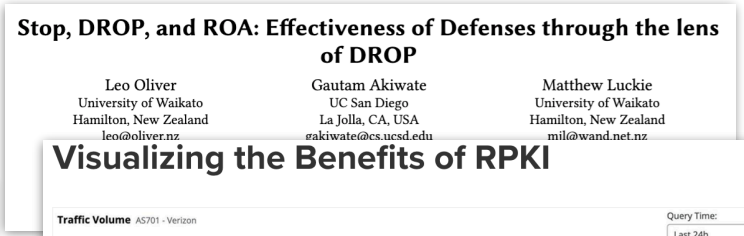
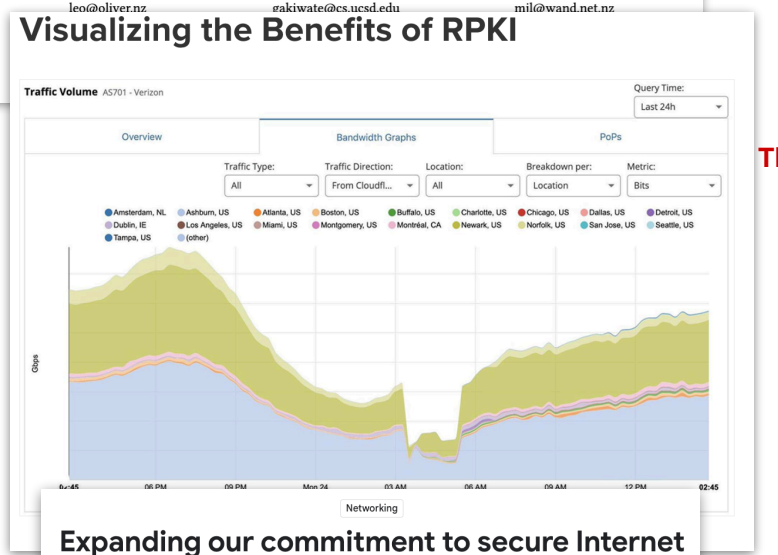
IMC 2022





[2] Cisco Thousandeyes

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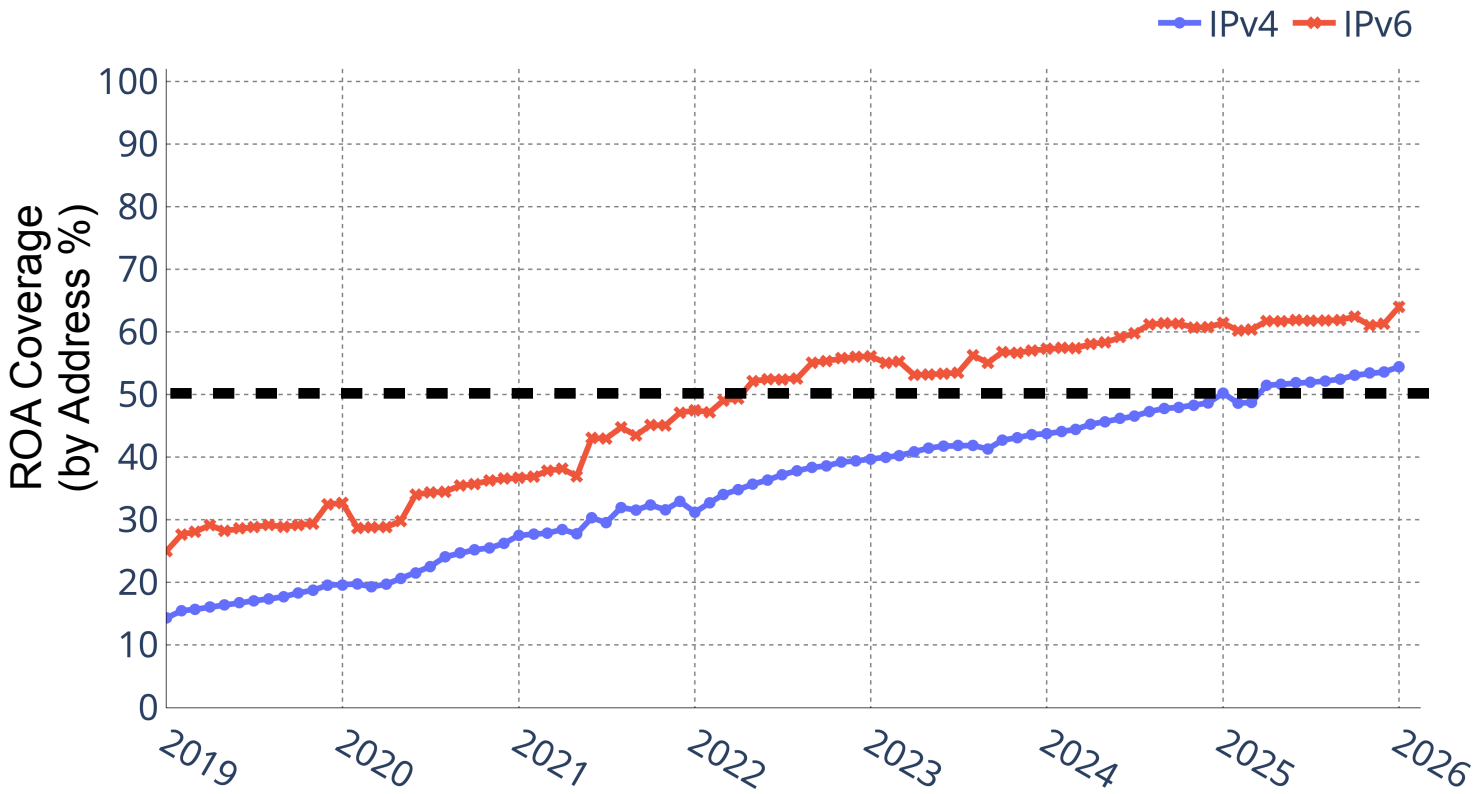
[1] https://www.kentik.com/blog/how-much-does-rpki-rov-reduce-the-propagation-of-invalid-routes/
[2] https://www.thousandeyes.com/blog/visualizing-the-benefits-of-rpki
[3] https://aws.amazon.com/blogs/networking-and-content-delivery/aws-secures-internet-routing-with-rpki-plus-security-checks/
[4] https://cloud.google.com/blog/products/networking/how-google-is-working-to-improve-internet-routing-security

Global ROA Adoption is over 50%!



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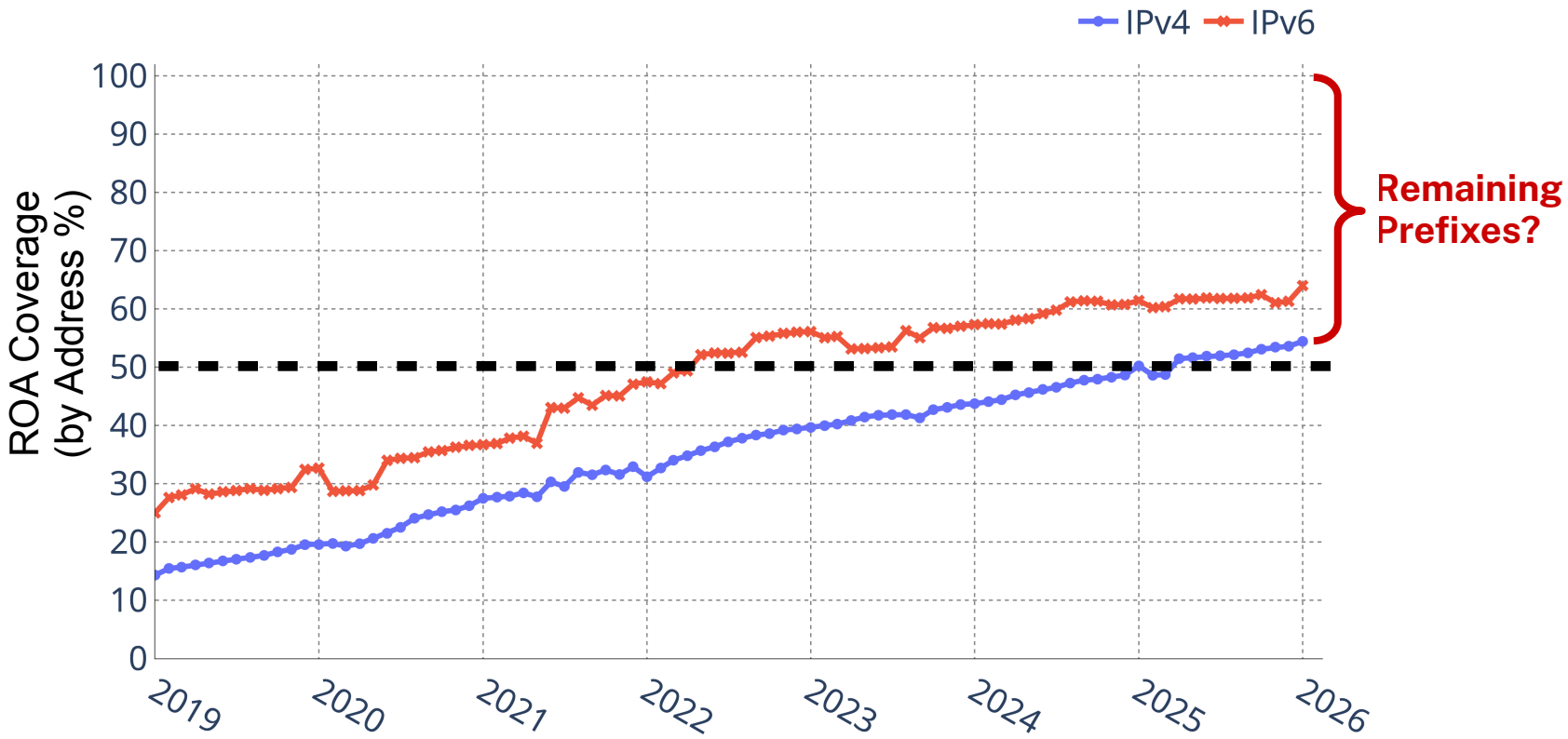
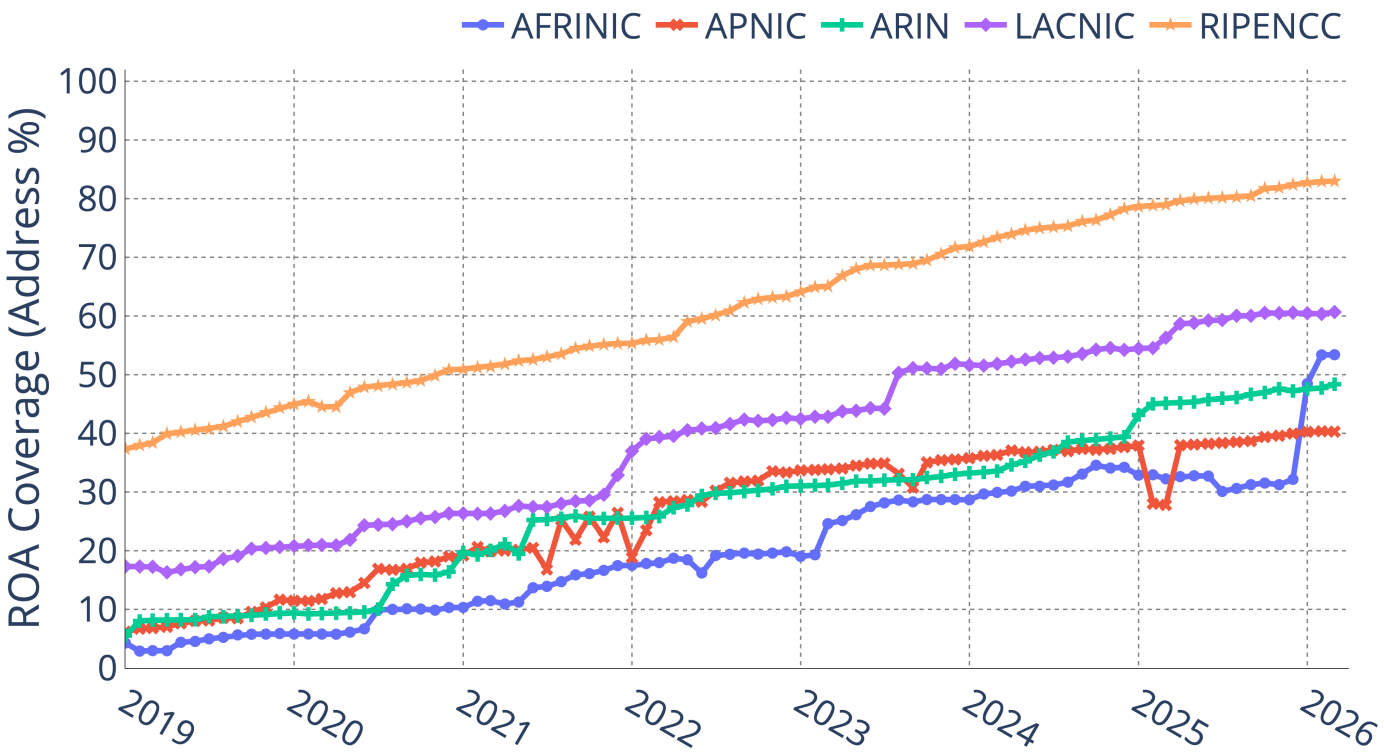
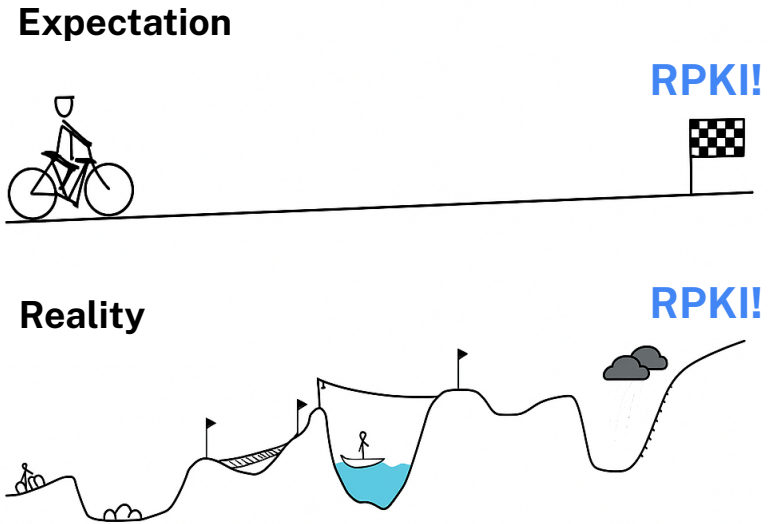


How can we support RPKI adoption to cover the remaining 50% of prefixes?

ROA adoption in not uniform across RIRs



How complex is the planning of a ROA?



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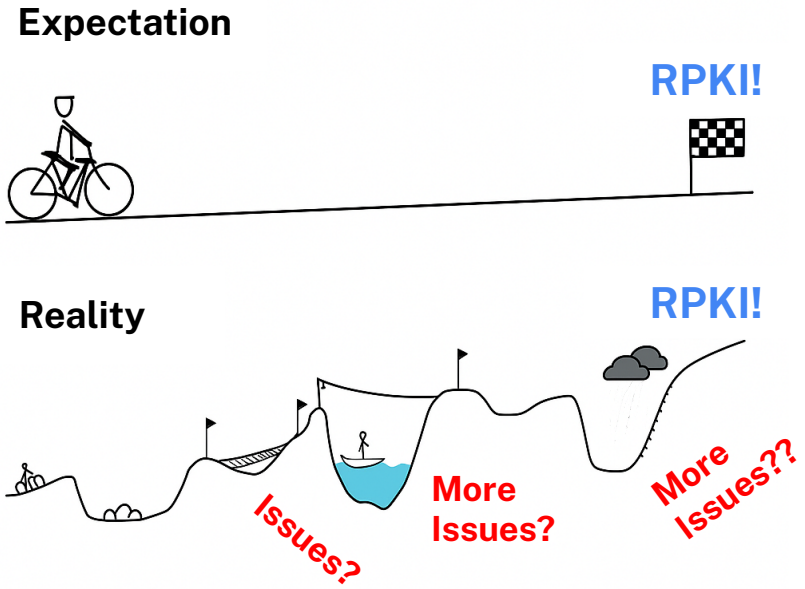

ROA Planning: Example

Prefix		Origin ASN
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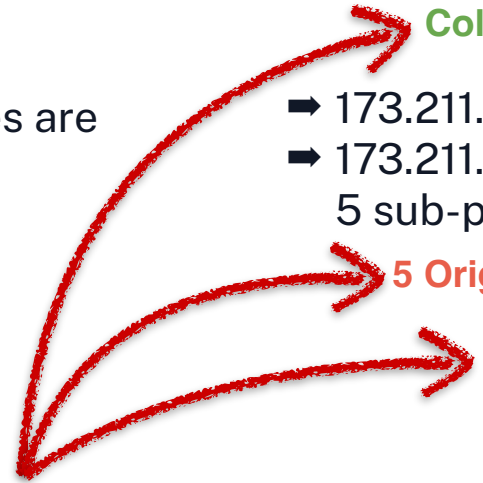
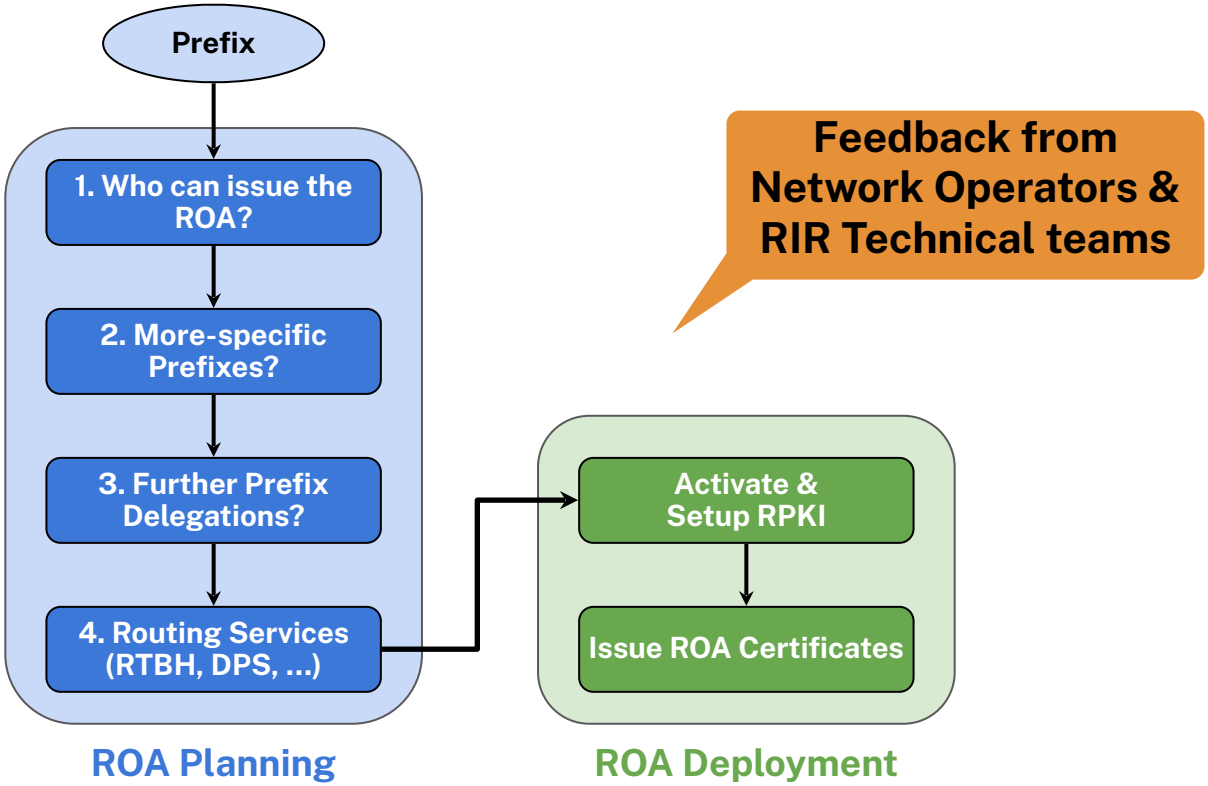
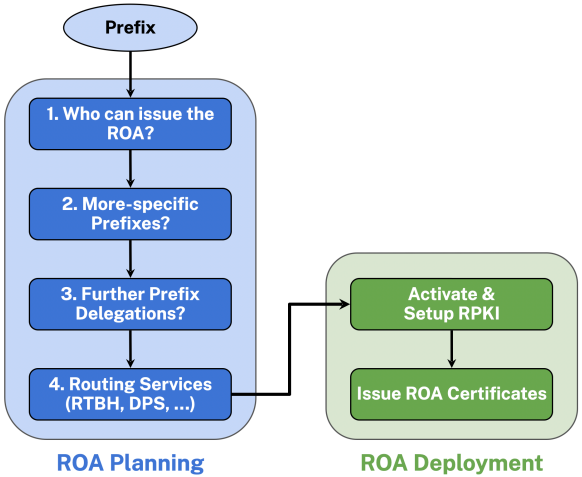


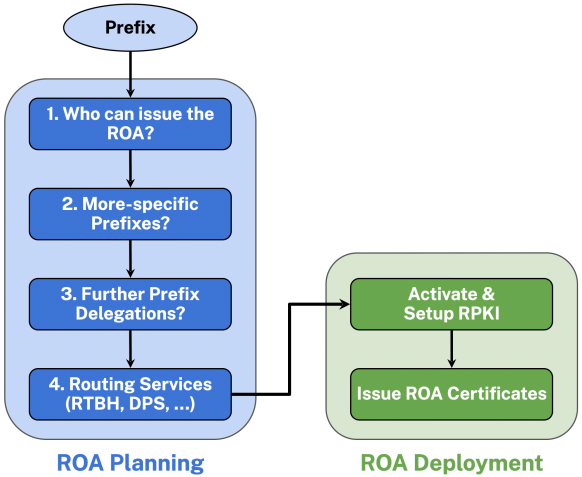
ROA planning can be complex due to multiple factors!

A framework for issuing ROA





Our Framework



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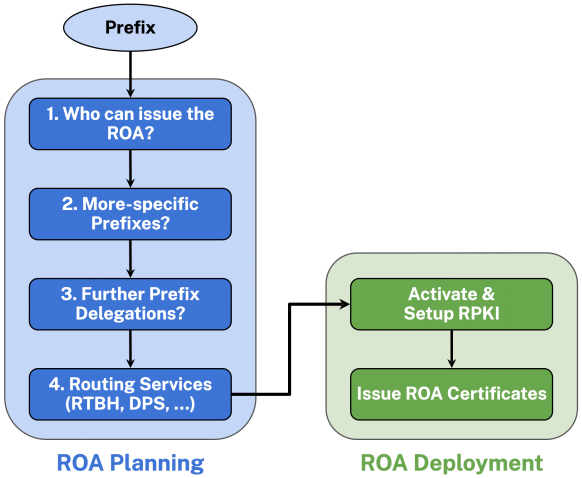

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=

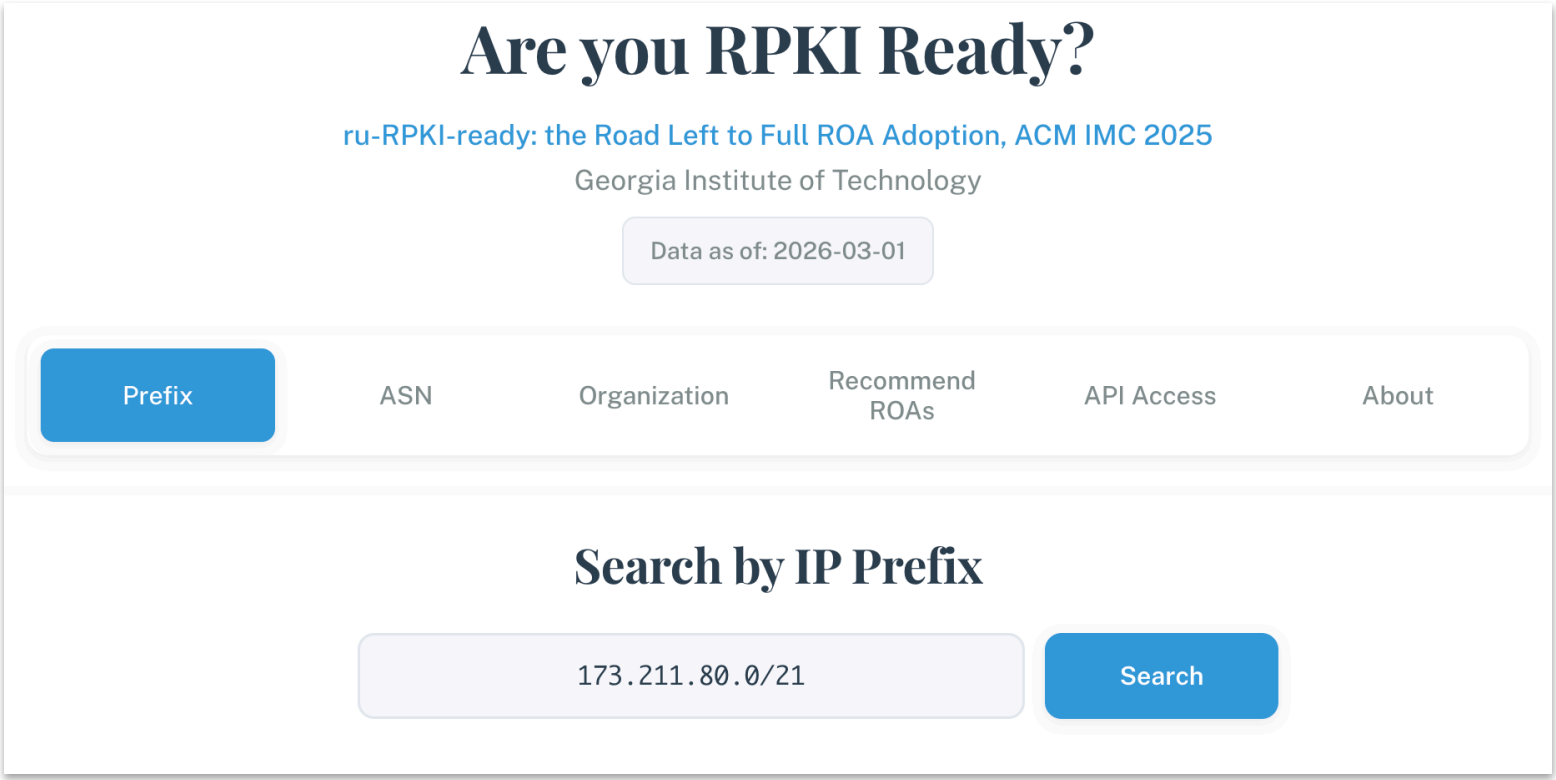
Are you RPKI Ready?

ru-RPKI-ready: the Road Left to Full ROA Adoption, ACM IMC 2025

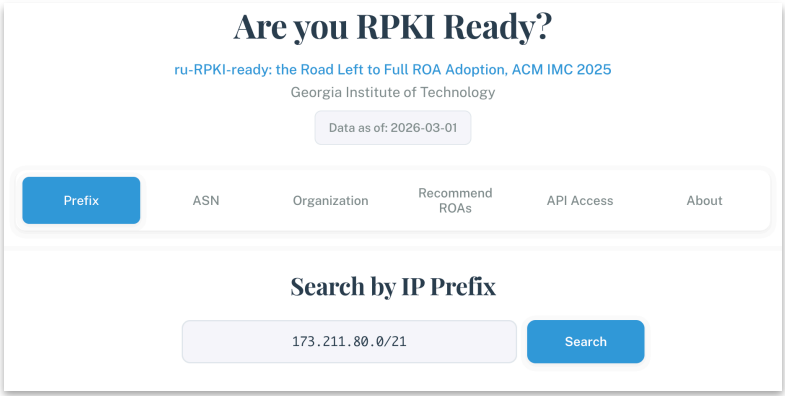
Georgia Institute of Technology

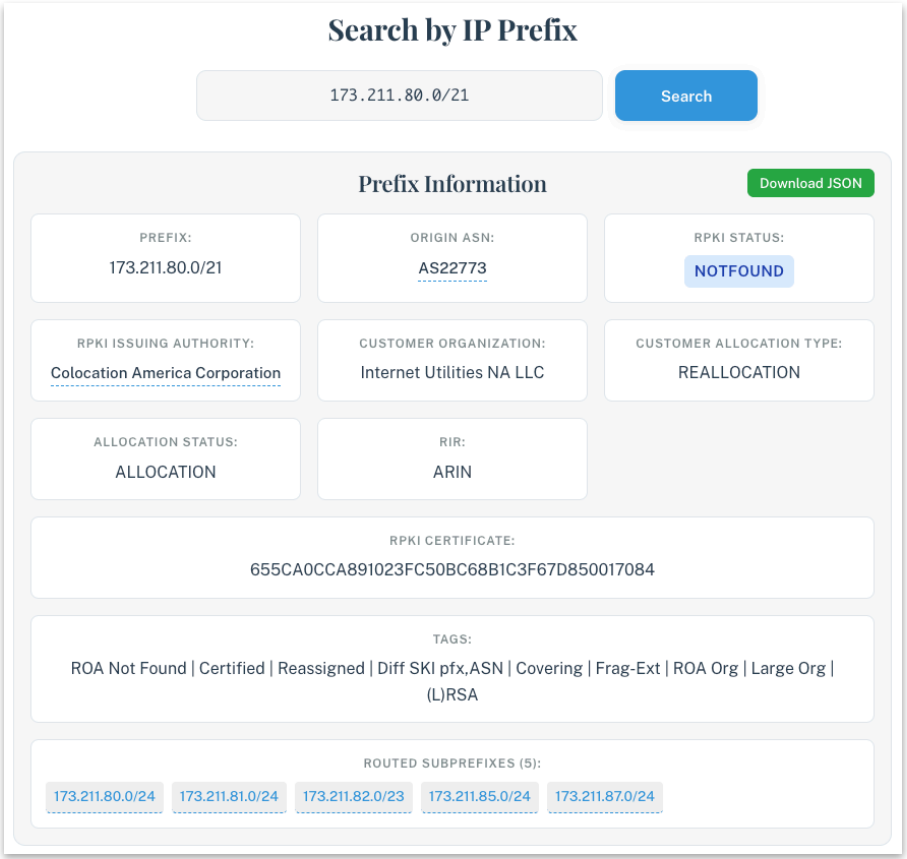
Our Framework | Public Data | Our Platform

Dashboard: Homepage



Dashboard: Prefix information





https://ru-rpki-ready.iss.cc.gatech.edu/

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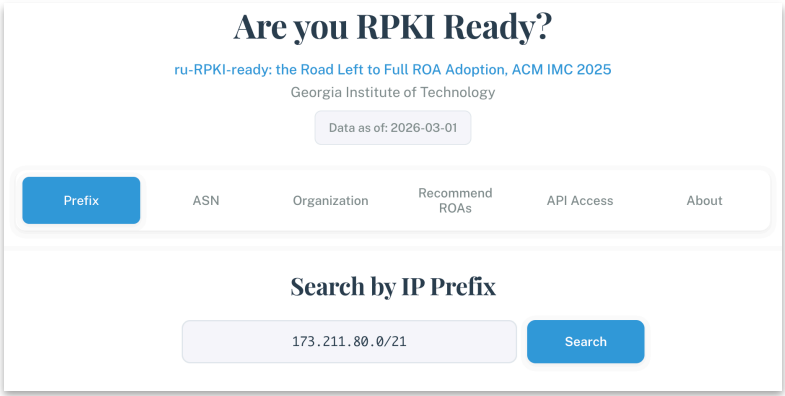

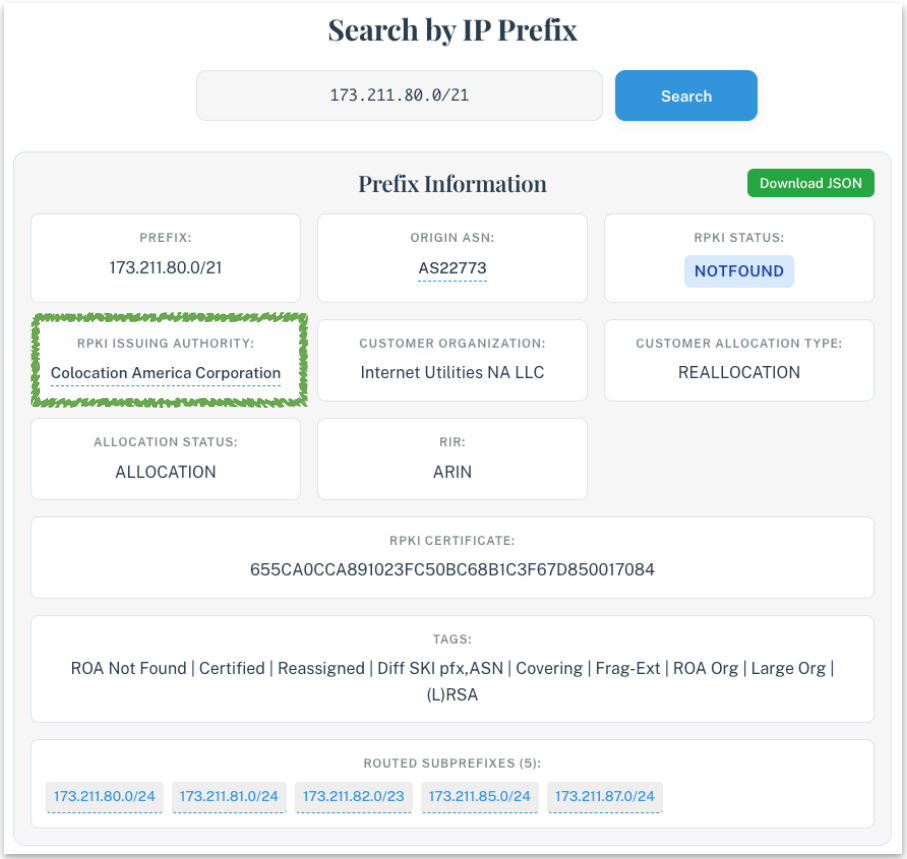

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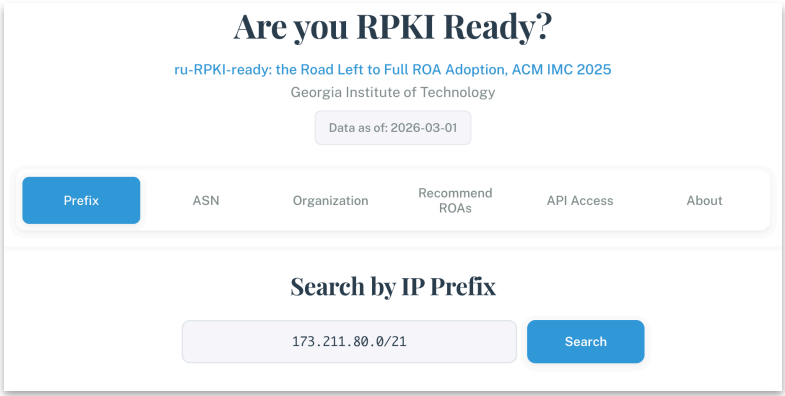

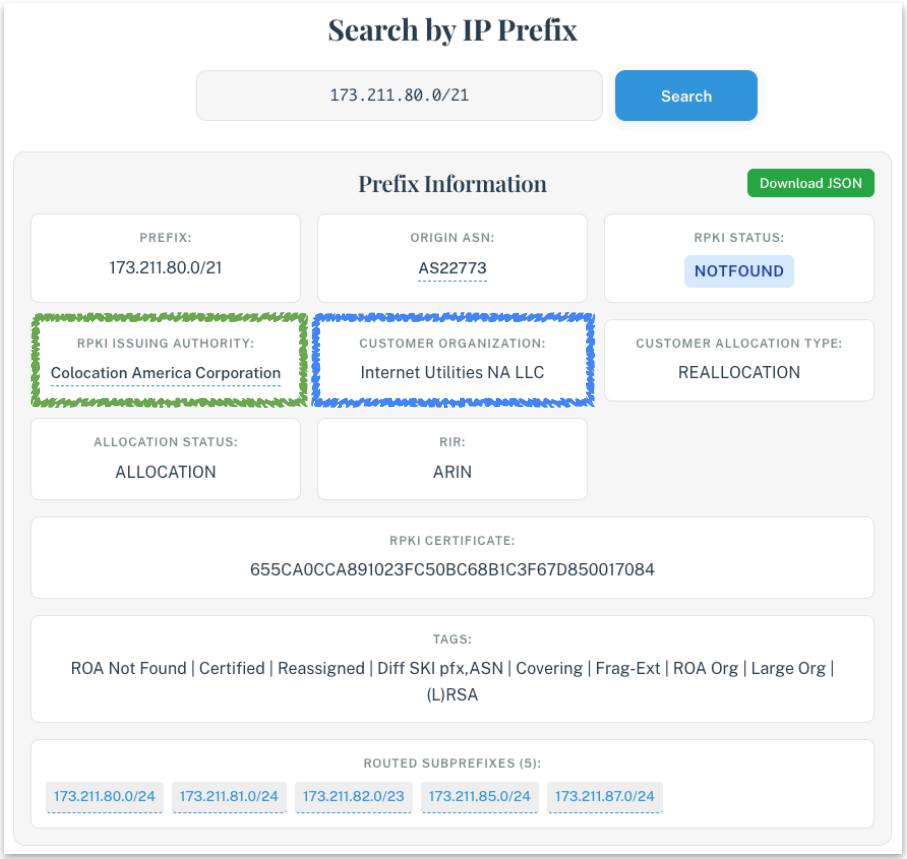

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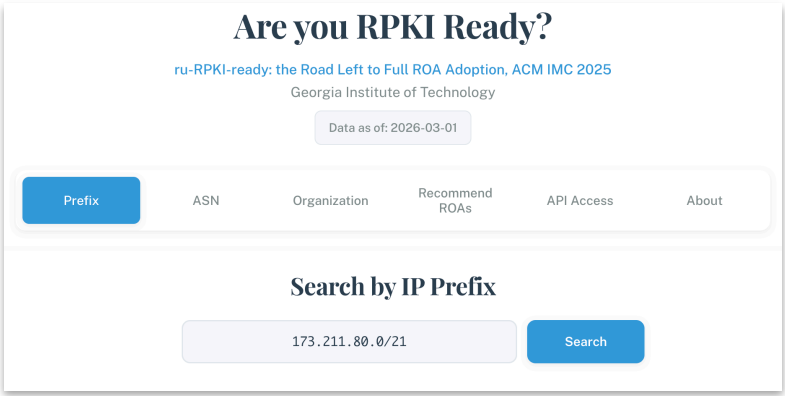

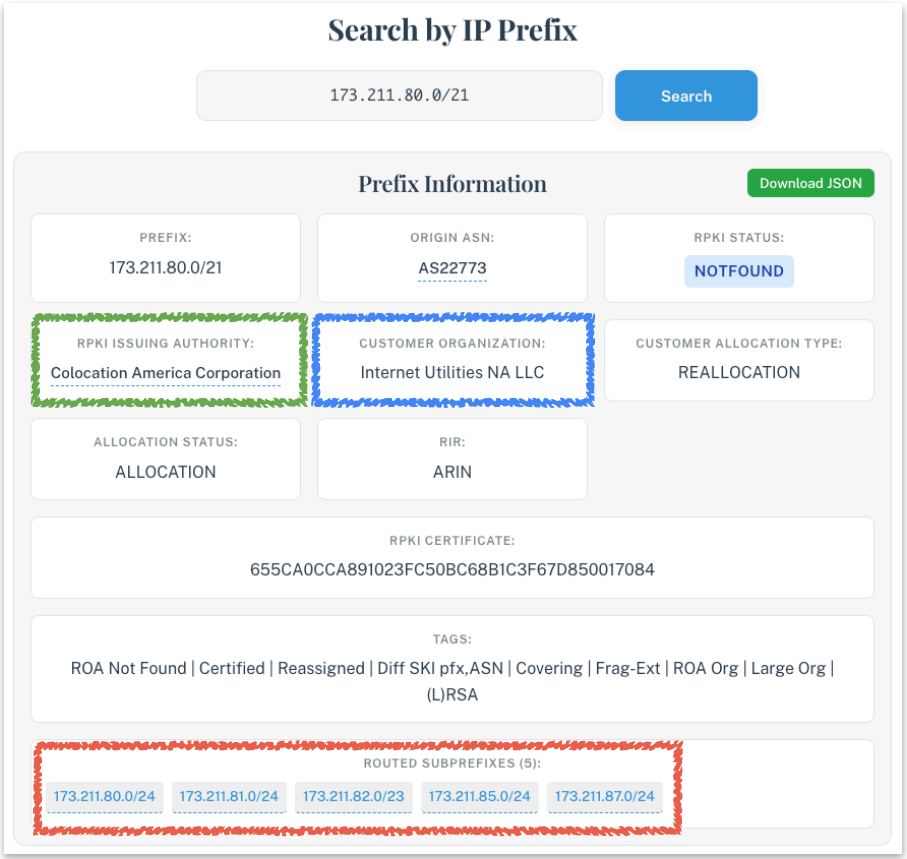

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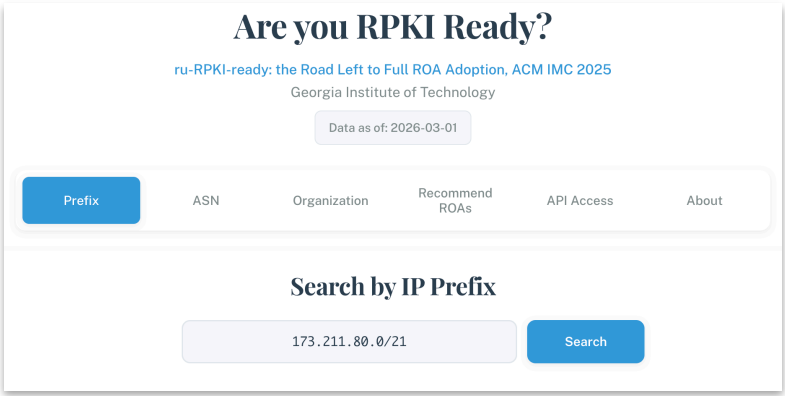
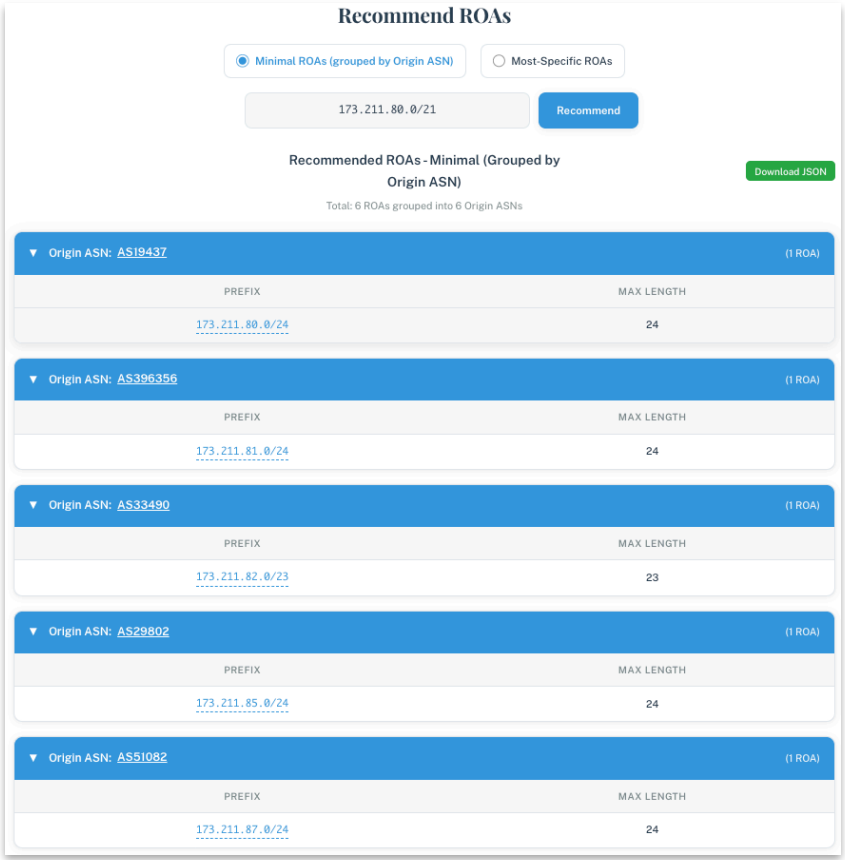
Dashboard: Recommended ROAs for a prefix





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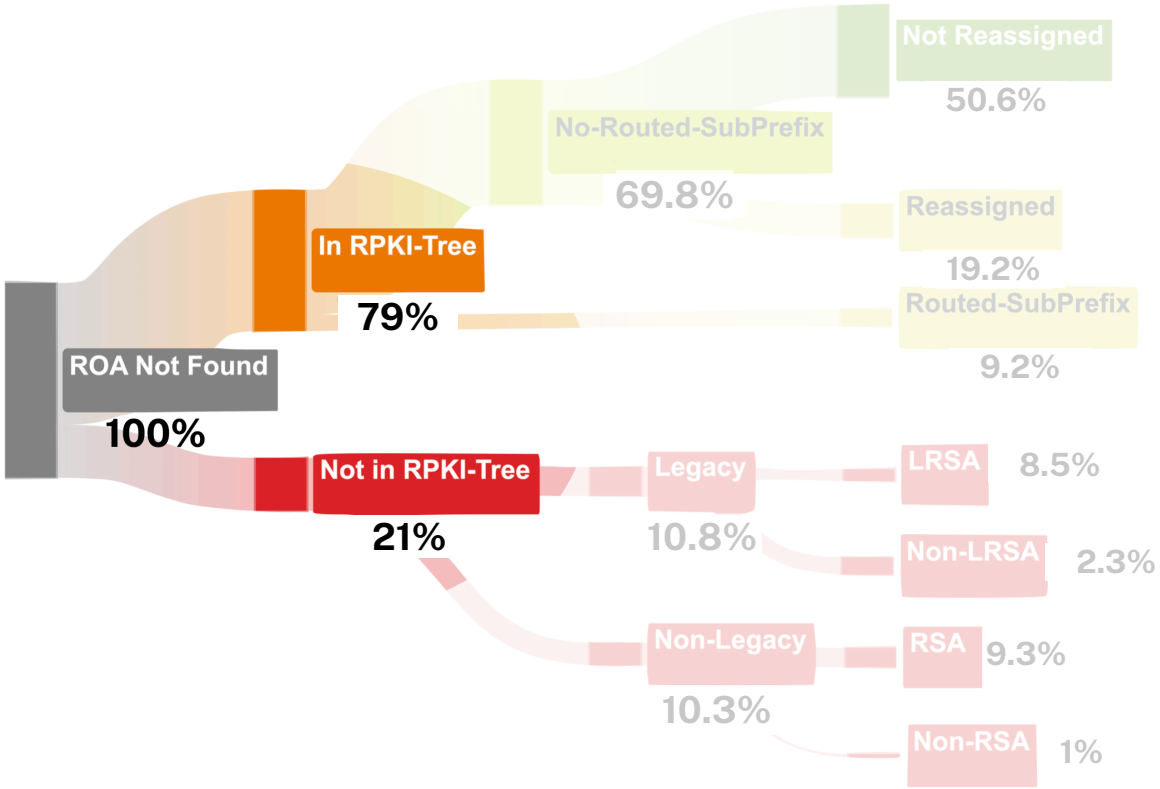
Characterization of Prefixes without ROAs

Breakdown of IPv4 Prefixes without ROAs



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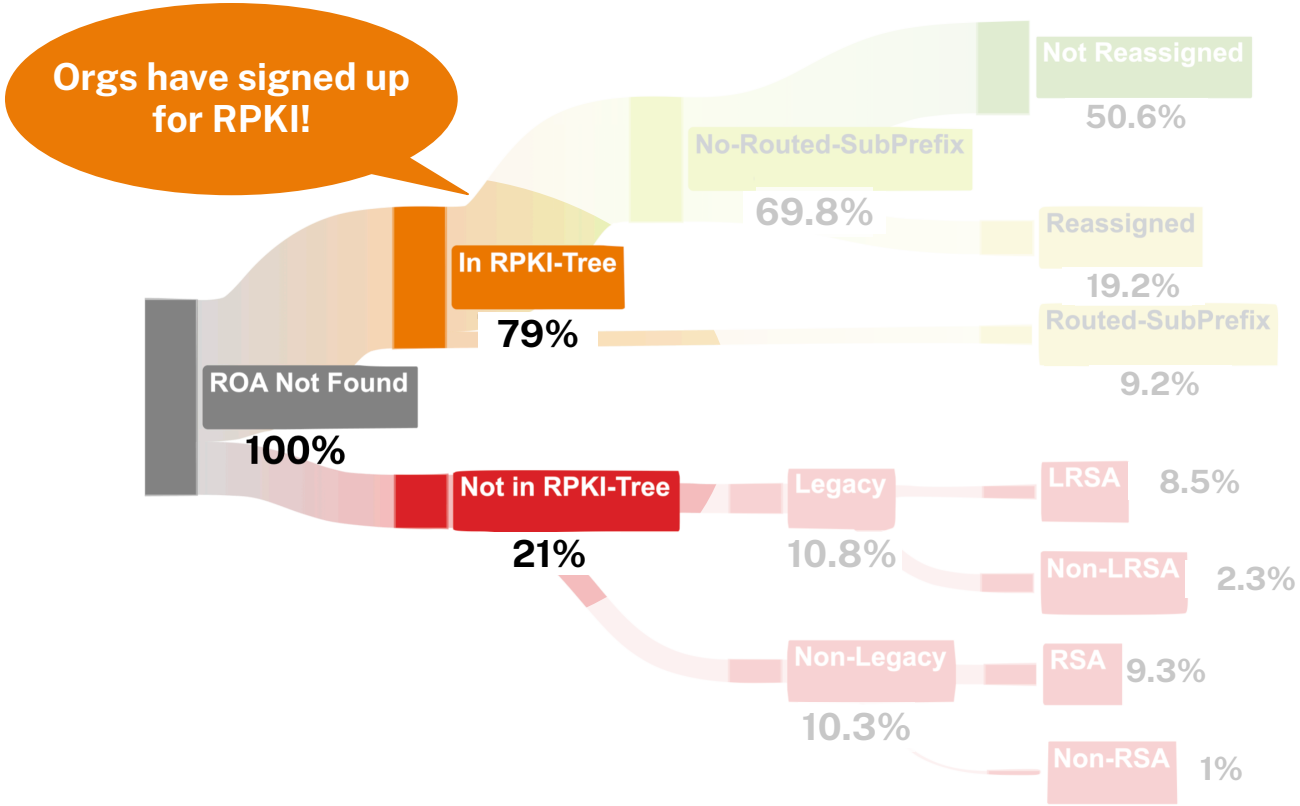

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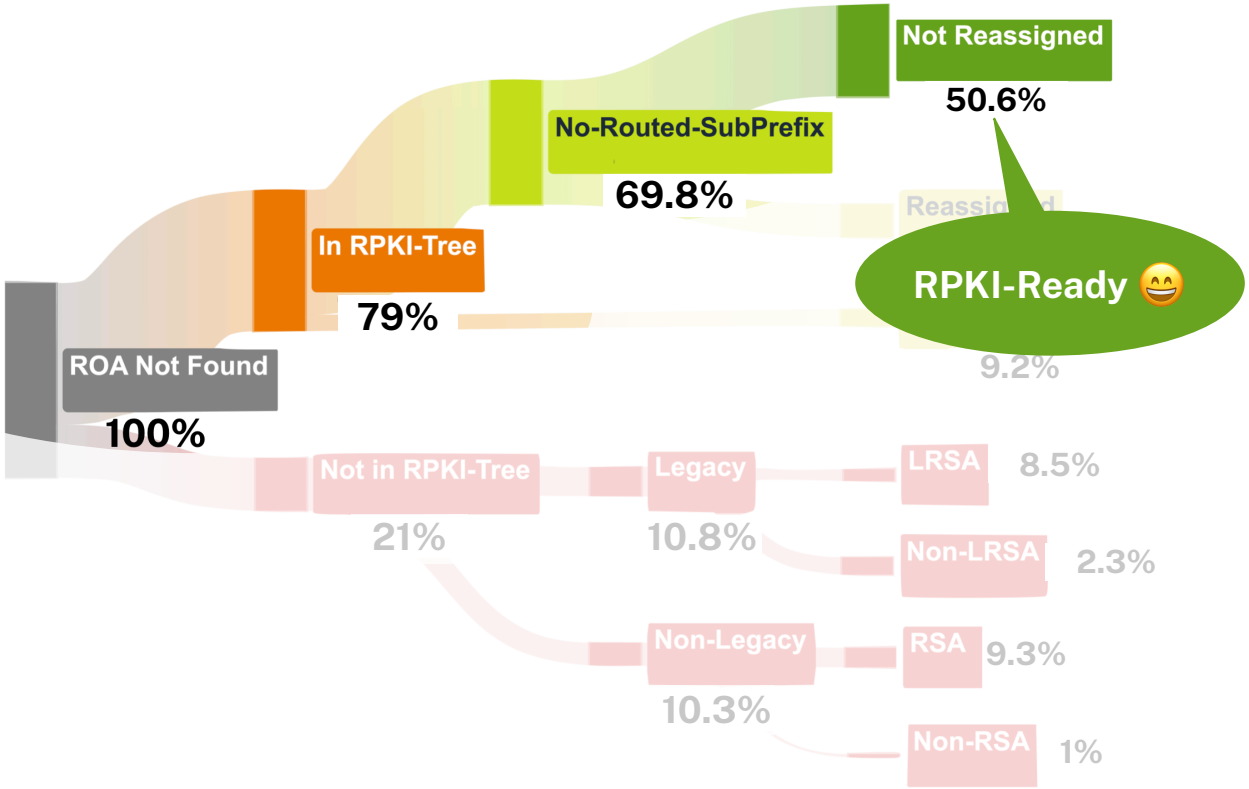

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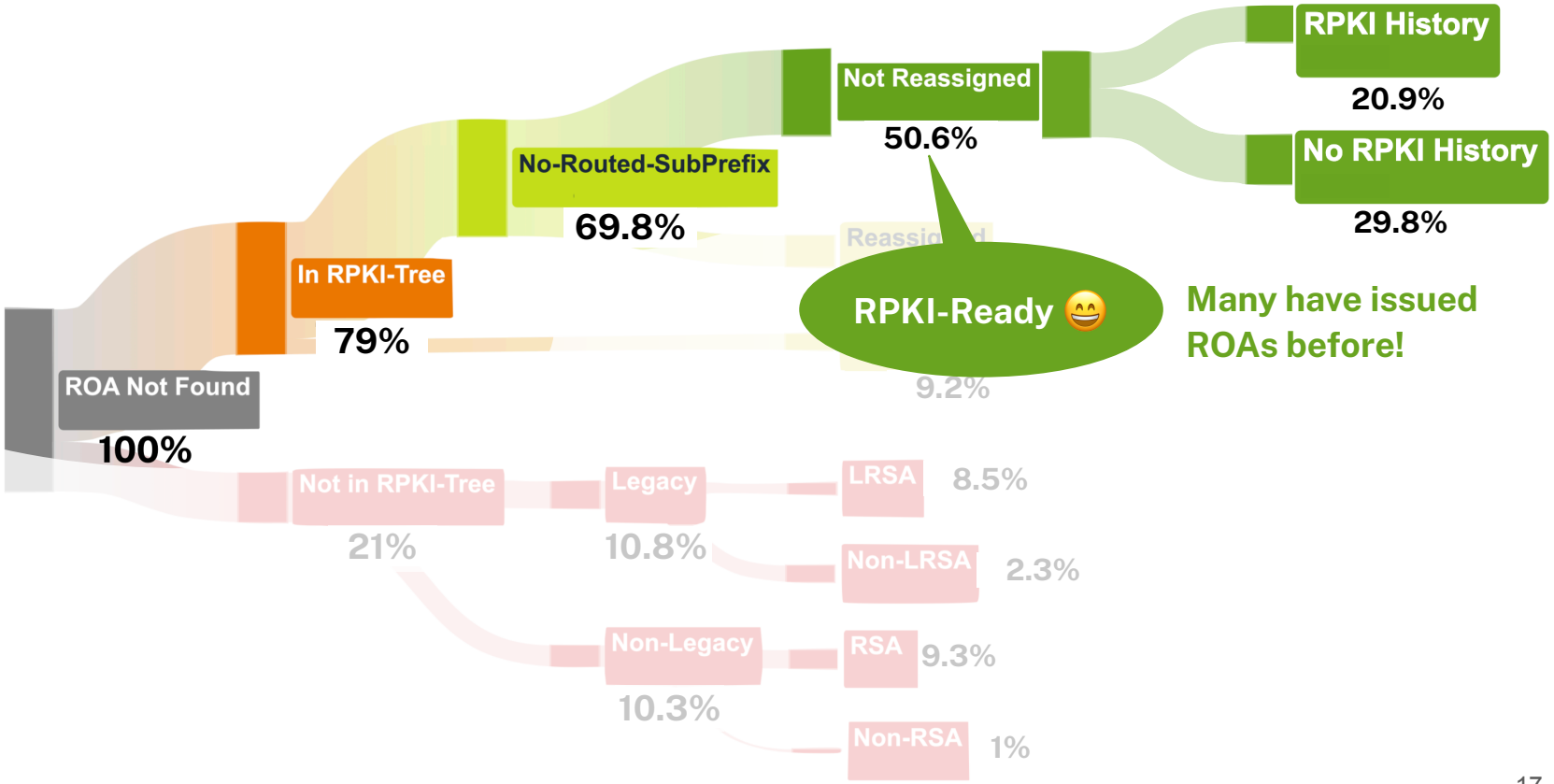

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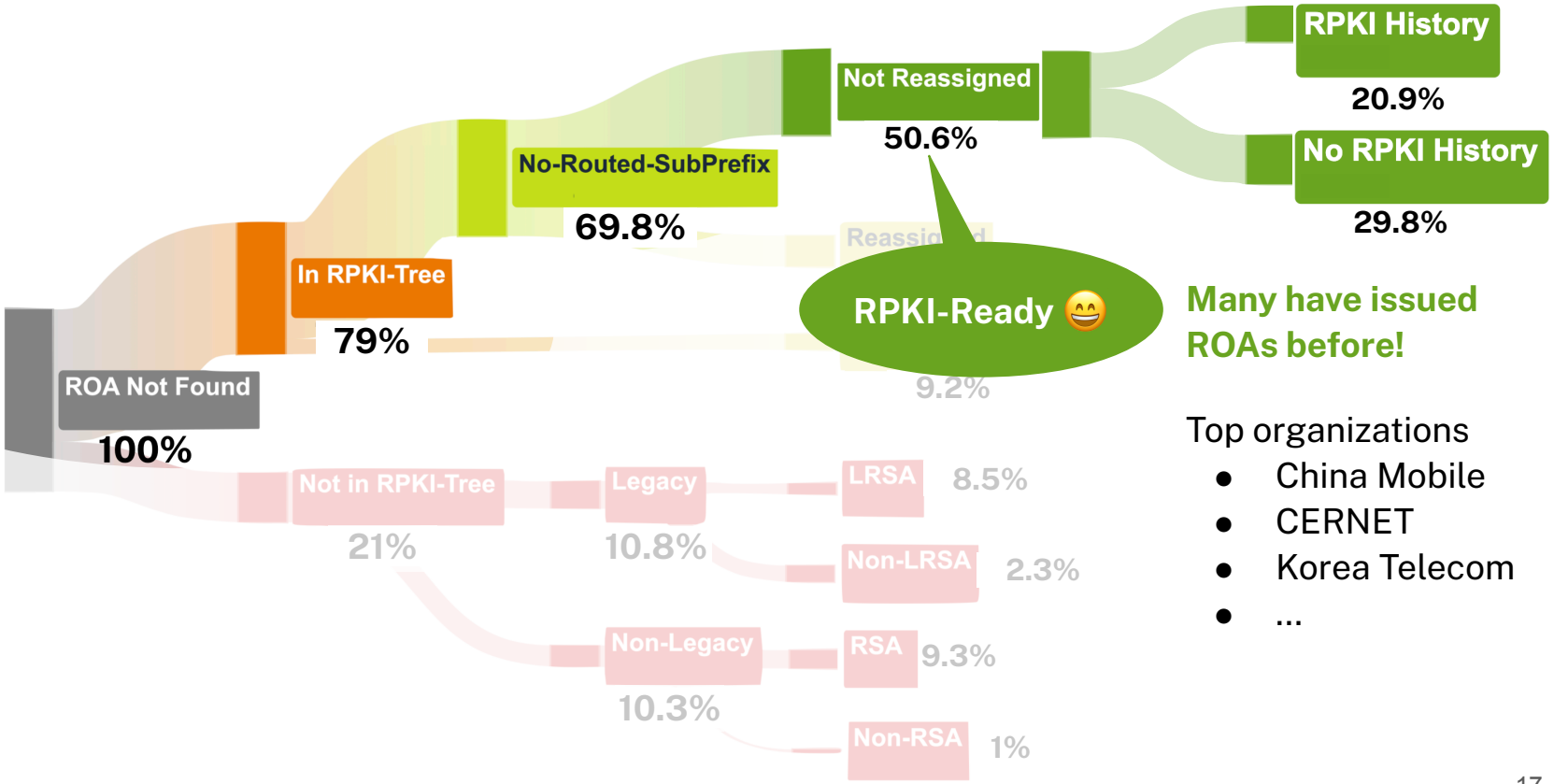

Many have issued ROAs before!

Top organizations

- China Mobile
- CERNET
- Korea Telecom
- ...

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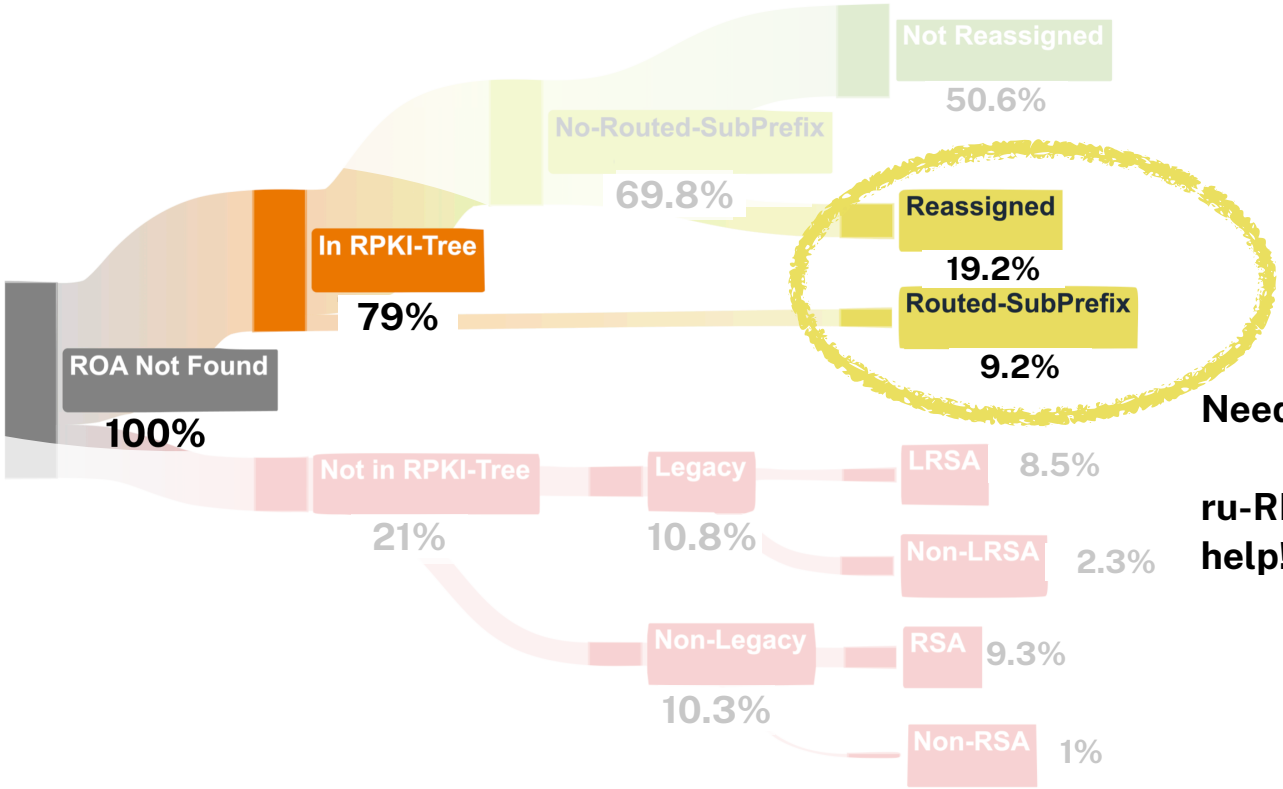

Needs careful planning

ru-RPKI-ready can help!

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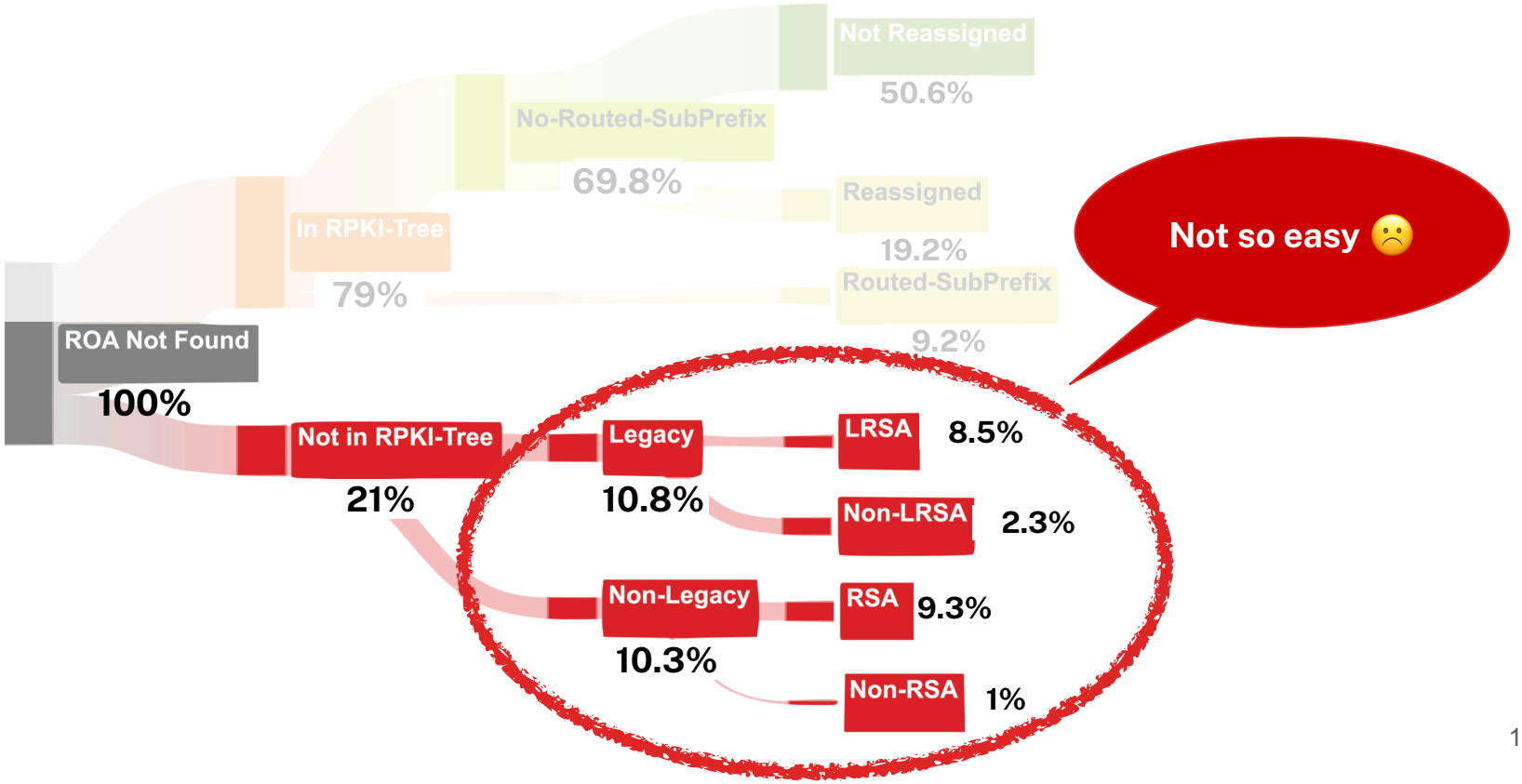

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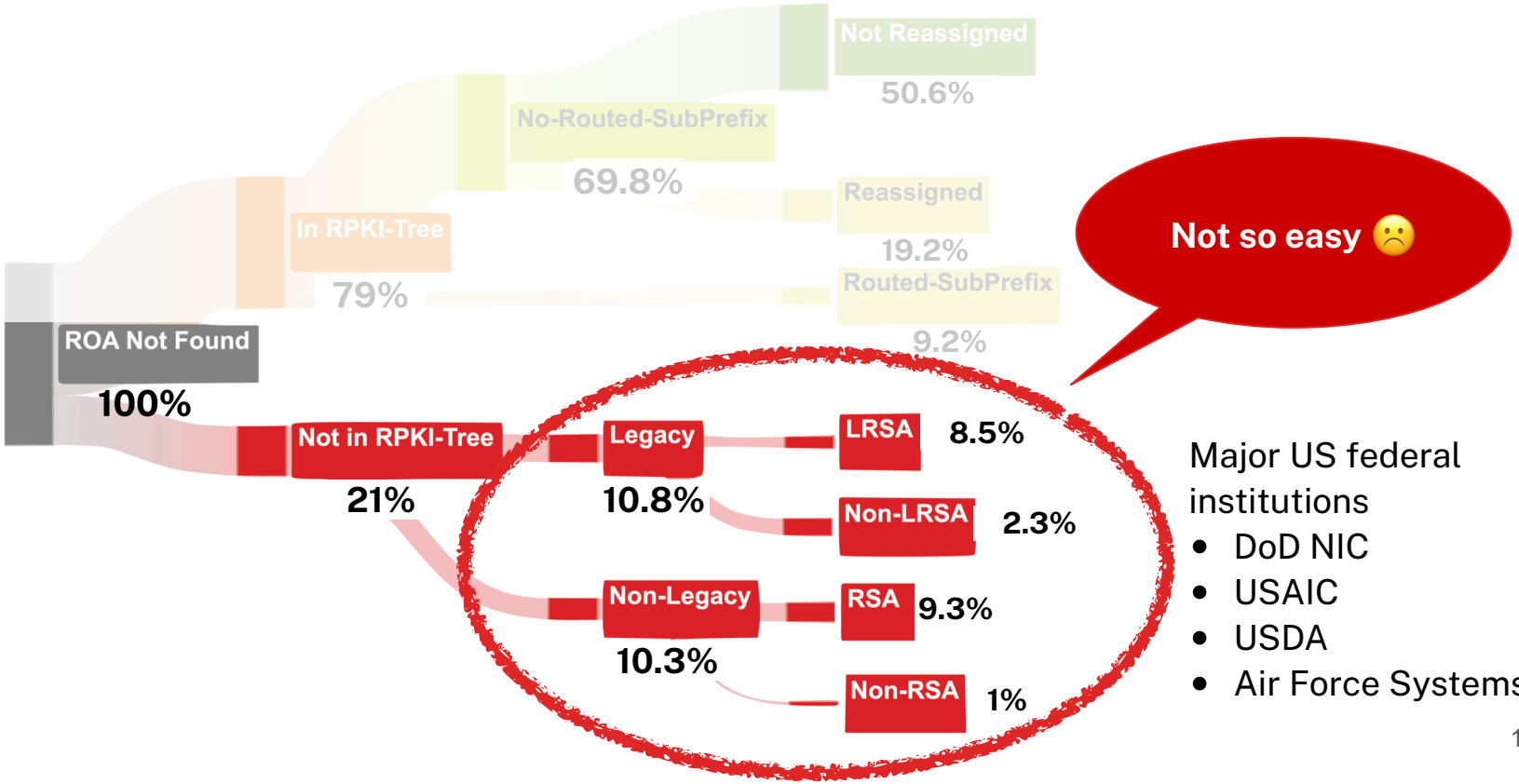

Major US federal institutions

- DoD NIC
- USAIC
- USDA
- Air Force Systems

Key Takeaways

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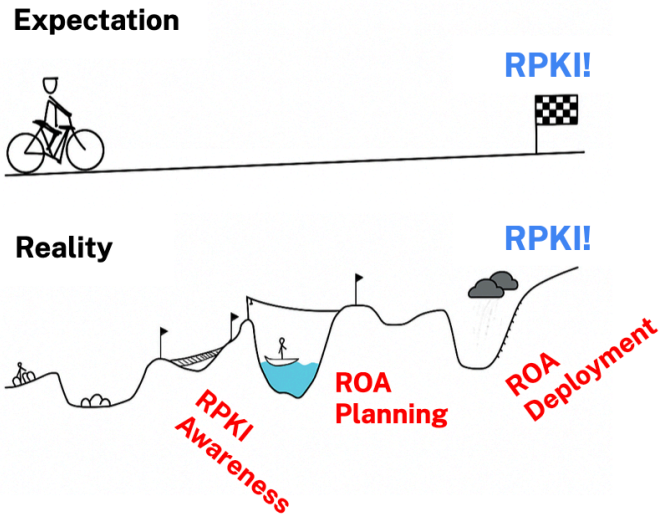

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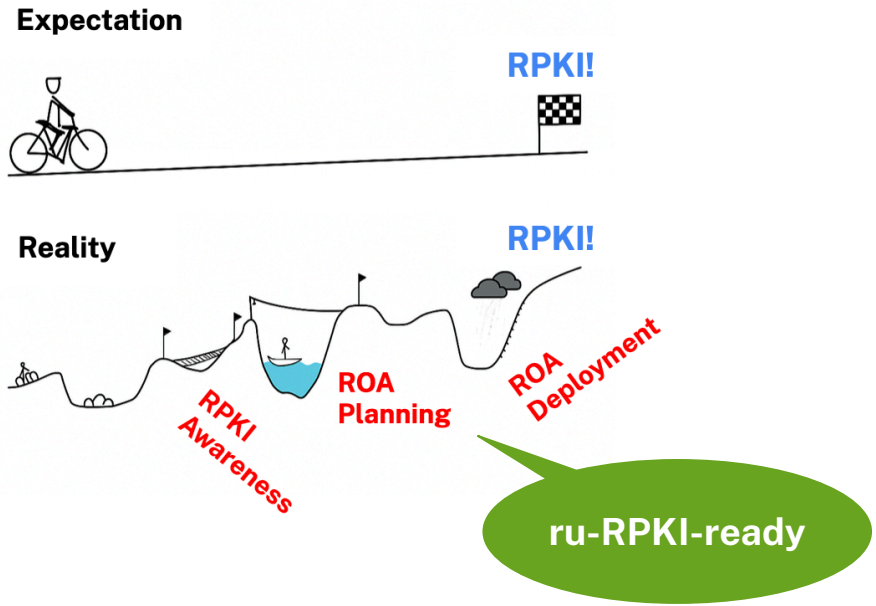

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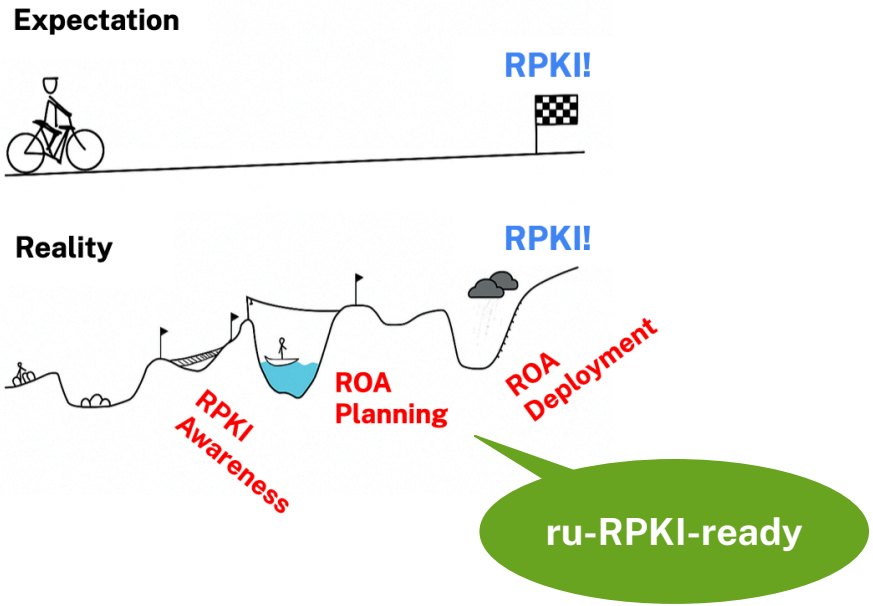

IMC ’25 Paper

Dashboard

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Questions!

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