



Routing Security and COVID-19: How Staying at Home Made Networks Safer

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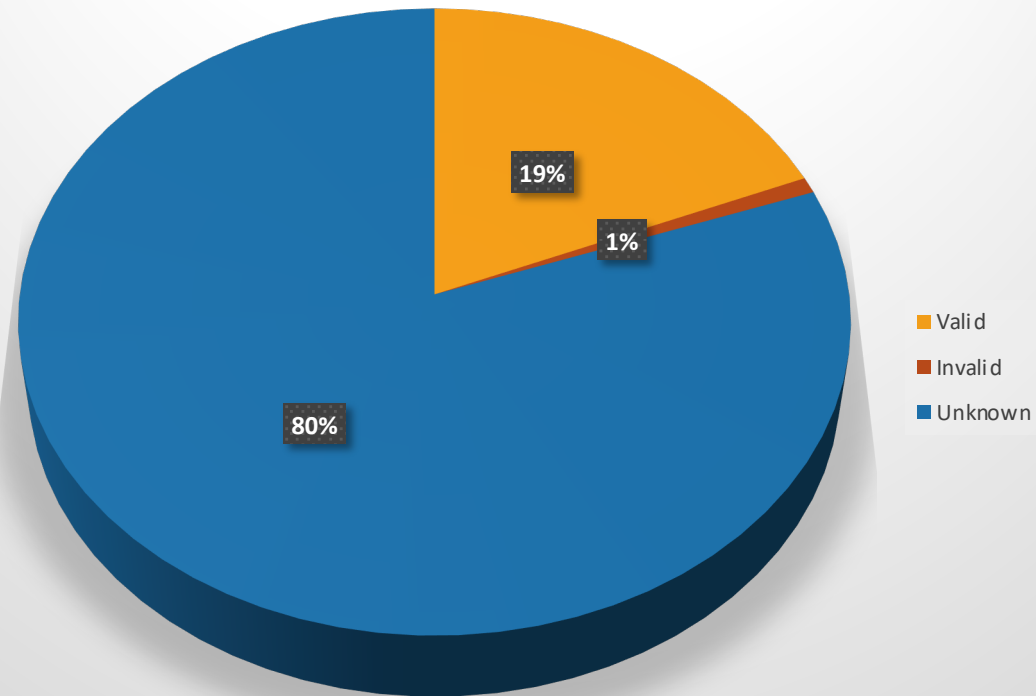
In 2020,
countries are
not all that we
need to lock
down.

For the networking industry, COVID-19 has meant increased focus routing security.

- RPKI ROA creation has gotten some attention.
- More networks implemented RPKI route origin validation.
- IRR record validation is increasingly required for prefix acceptance.

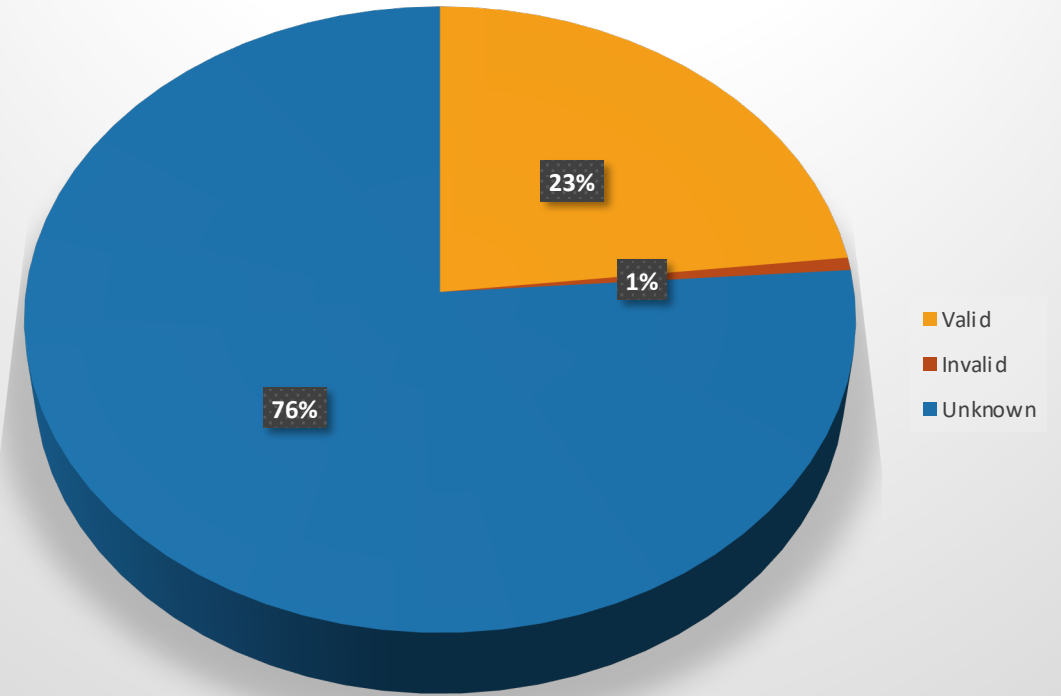
RPKI ROA Creation

Global Prefixes With ROAs March 2020



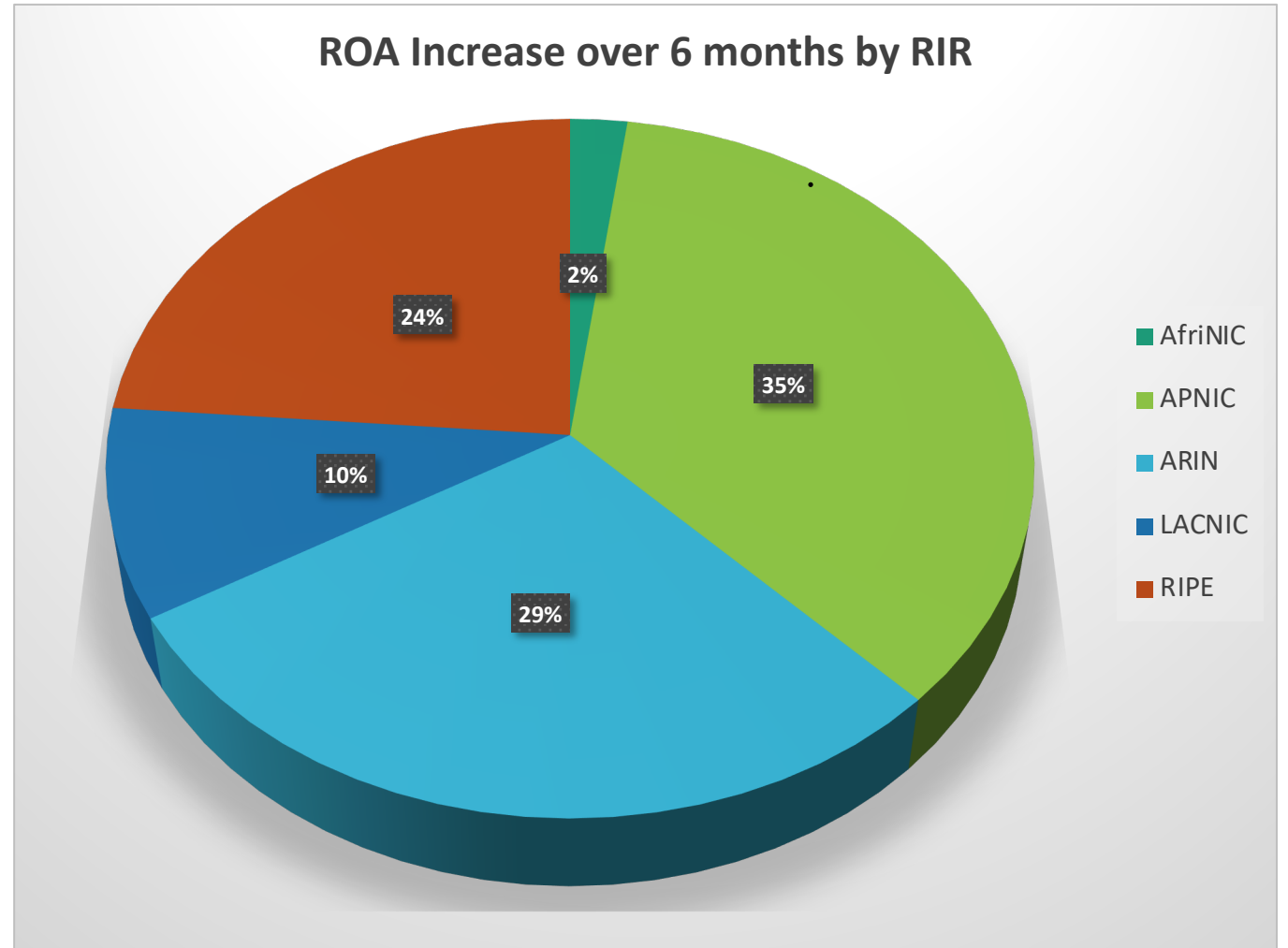
862,756

Global IPv4 Prefixes in RPKI October 2020

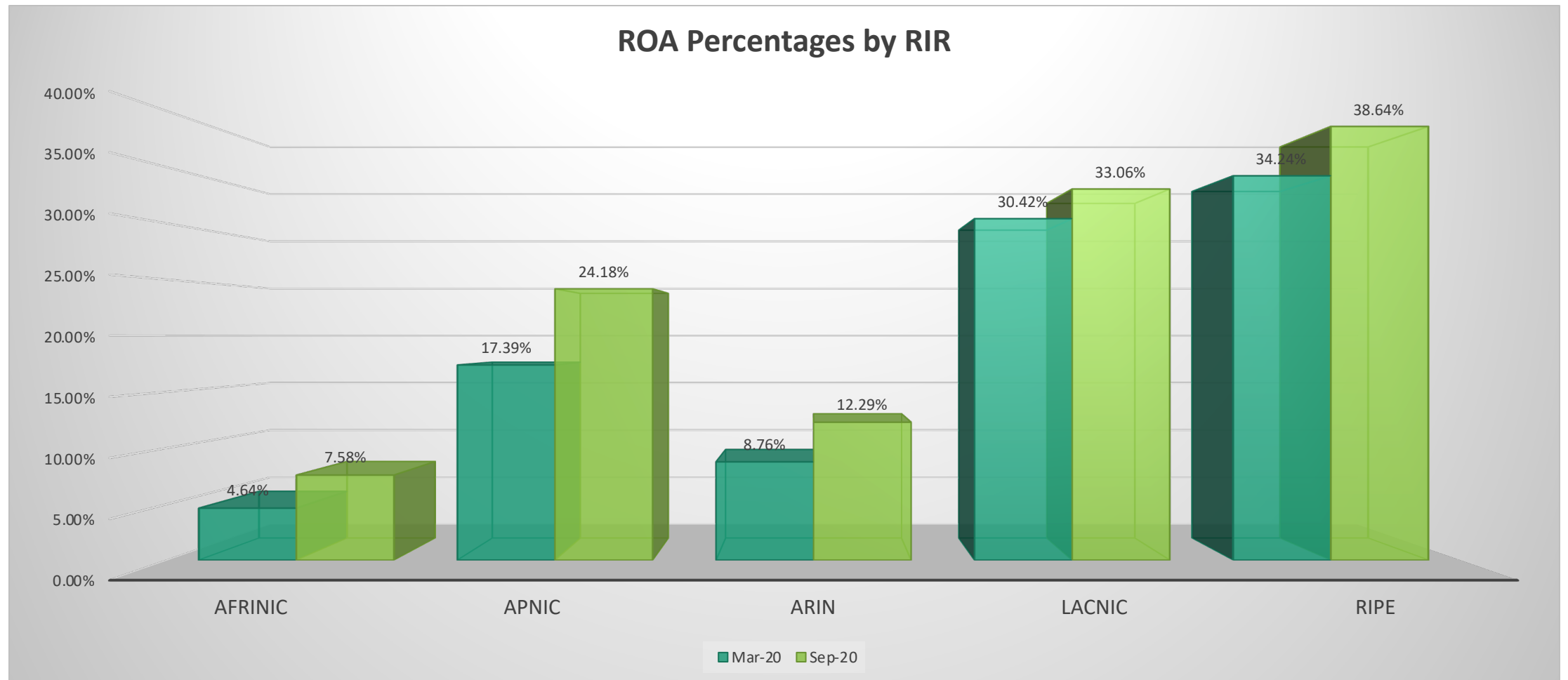


883,476

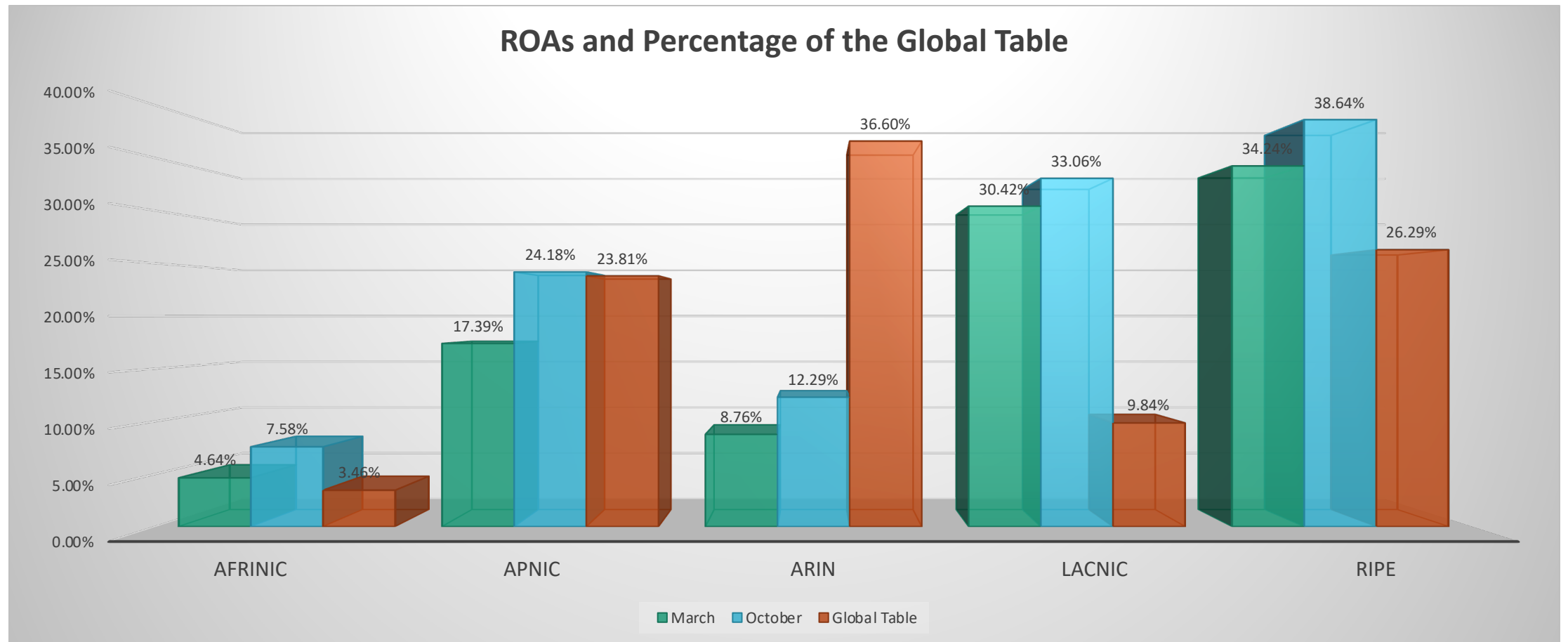
RPKI ROA Creation



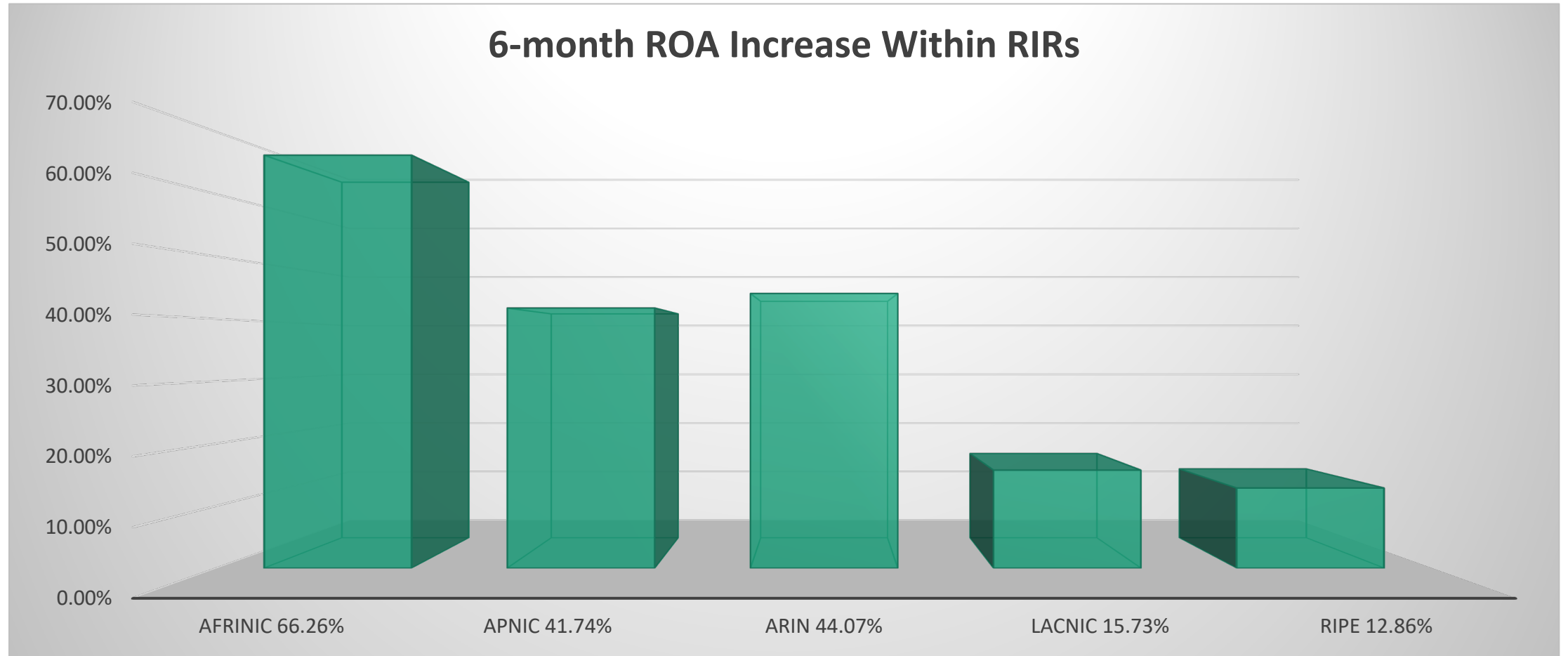
RPKI ROA Creation



RPKI ROA Creation



RPKI ROA Creation

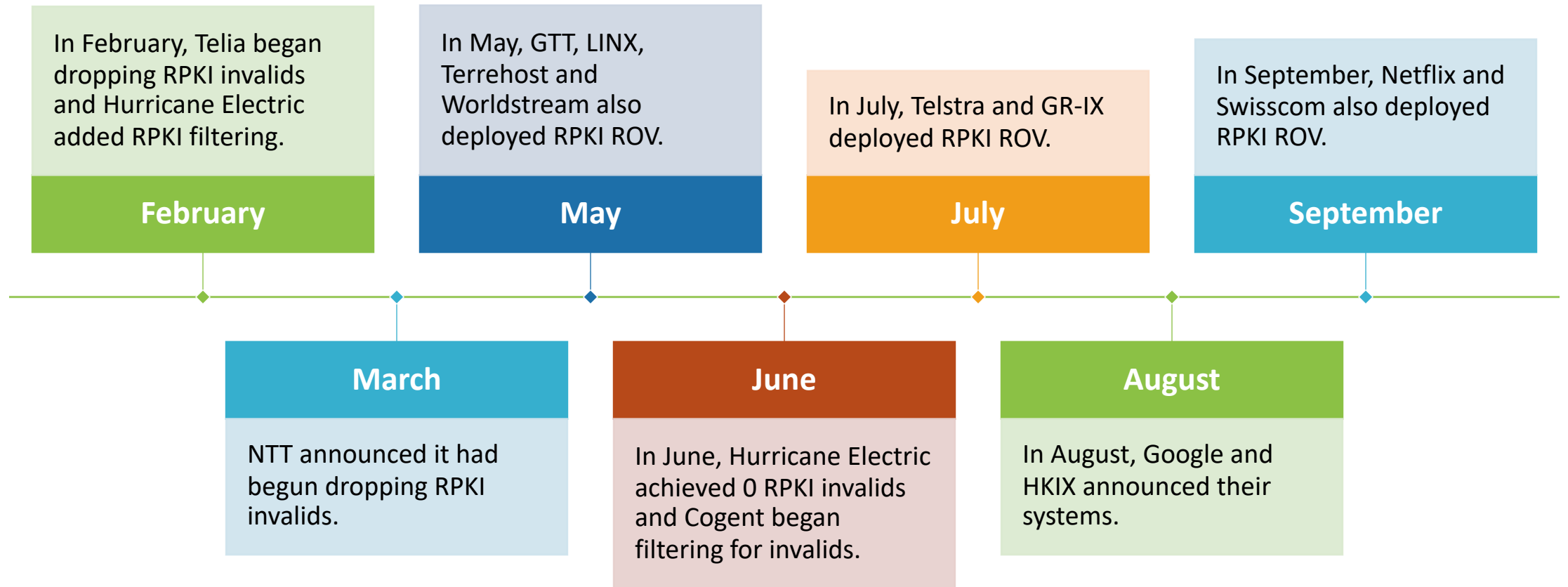


RPKI Route Origin Validation Takes Hold

RPKI Route Origin Validation found a place in the sun this year.

- RPKI ROAs only count when they are seen.
- More networks and Internet exchanges onboarded RPKI ROV.

RPKI Route Origin Validation Adoption



RPKI Route Origin Validation Adoption

Why this matters:

- The number of ISPs participating has created a much wider net.
- Internet exchanges have begun to participate.
- ROA creation is more compelling.

IRR Records: Still the last defense

Just a few years ago, it was not hard to ignore IRR records.

- Some ISPs required it.
- In November 2018, Telia and NTT began requiring valid IRR origin and path records from their peers.
- Some were too big to fail.

IRR Records: Still the last defense

IRR records are still the only way to validate AS paths.

If you are not already doing this, you should:

- Maintain your IRR records as accurately as you possibly can.
- Filter for bogons.
- Use AS Path filters or Peer Lock.
- Announce all your IP space.
- Set prefix limits.

IRR Records: Still the last defense

Here's what happens when you don't do that:

12 November 2018 Google Route Leak

- Affected Google and a number of other services for 74 minutes.
- The source was a small, unfiltered ISP that re-advertised about 500 Google prefixes learned from an IX route server.

What could have prevented this?

- RPKI ROAs?
- AS Path filters (peer lock)?
- IRR Path filters?
- Maximum prefix limits?

IRR Records: Still the last defense

Verizon's June 24, 2019 outage.

This was a route leak from a small company with a route optimizer., making this downstream the preferred path of a large quantity of Internet routes transiting Verizon (AS701).

- RPKI ROAs?
- AS Path filters (peer lock)?
- IRR Path filters?
- Maximum prefix limits?

Routing Security and COVID-19

Quarantines and remote work weren't all bad. While 2020 has not been great on some levels, it has been pretty good for routing security.

Routing security, like an end to the pandemic, is not here yet. So while you are waiting for a return to normal:

Sign all your IP space.

Clean up your IRR records.

Secure your peering sessions.

Questions?

Thank you for
your kind
attention.