RIPE NCC
RIPE NETWORK COORDINATION CENTRE

Resource Public Key Infrastructure

Routing Security

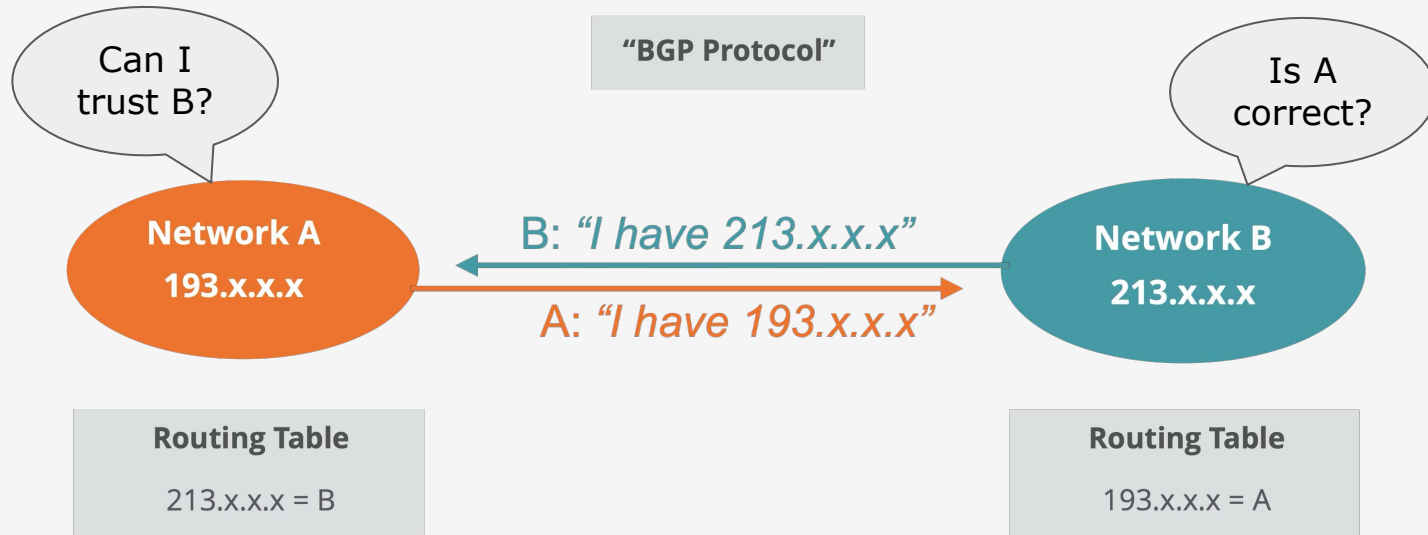**Jad El Cham | RIPE NCC |** 5 September 2025

Hello!

I'm Jad El Cham

Senior Public Policy Technical Advisor
RIPE NCC

✉ jelcham@ripe.net

Routing on the Internet

Why should you care?

- Networks run on BGP, an old **insecure** protocol by default

- Security Incidents by the **thousands** each year!

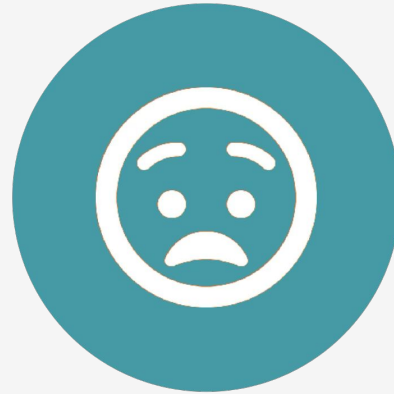- Loss of Business / Reputation Damage / Downtime

UNIQUE ROUTE LEAKER ASes	Q2, 2025	UNIQUE BGP HIJACKER ASes
2,030	April	9,004
2,064	May	9,744
1,961	June	8,820

Source: QRATOR

Malicious

Accidental

RPKI Fixes Things

- RPKI is a security framework to secure routing on the Internet

- RPKI prevents hijacking, route leaks, misoriginations

- RPKI relies on the five RIRs as Trust Anchors

- RPKI is based on an X.509 certificate profile defined in RFC3779

- Free*, Fast to deploy and Globally used

How Does RPKI Work?


I have prefix **Y**!

Resource holder creates statement for its prefix

1

ASN 300 is authorised to announce my prefix **Y**

Sign

2

ASN 300 is authorised to announce my prefix **Y**

3

Publish

BGP announcement

Prefix Y

Prefix Y, AS300

AS300

AS200

Authorised statement

AS300
Prefix Y

RPKI Repository

4 Others use those statements to make better routing decisions

Elements of RPKI

SIGNING

Create ROAs for your prefixes in the RPKI system

+

VALIDATION

Verify the information provided by others
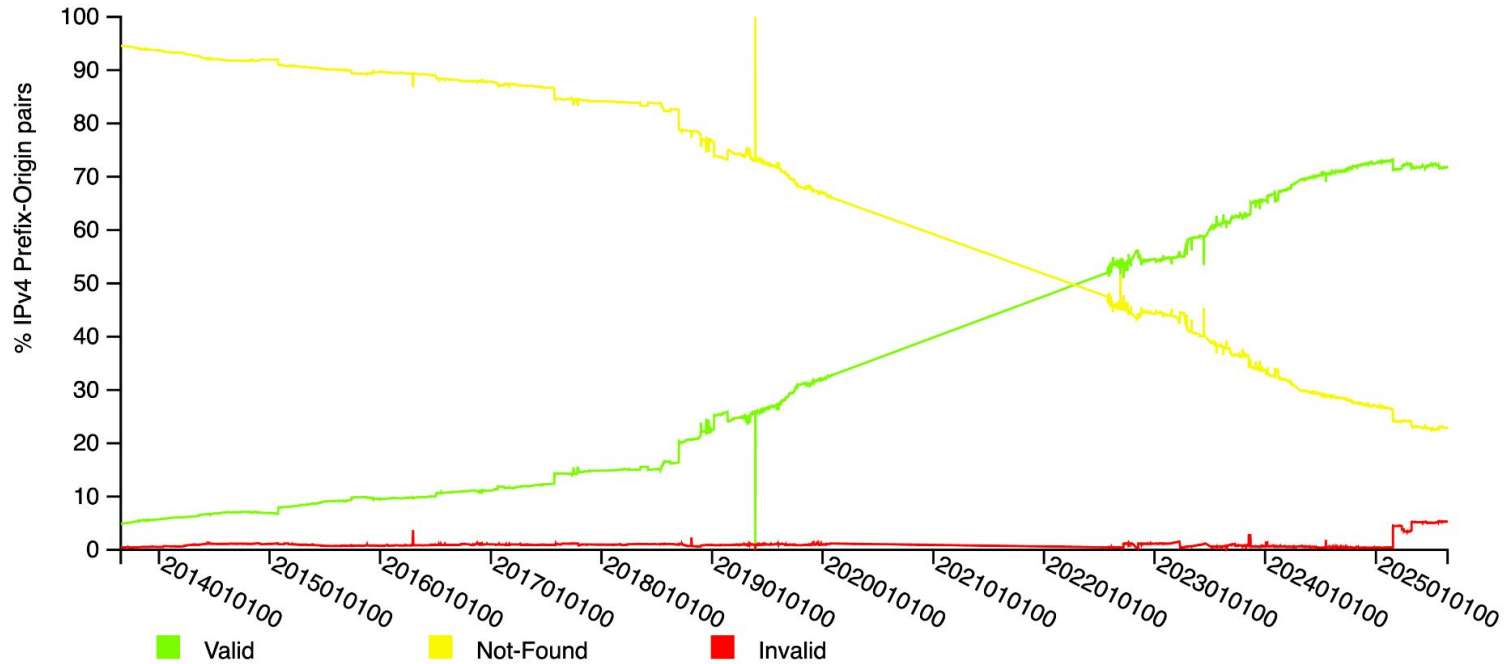
Is everyone creating ROAs globally?
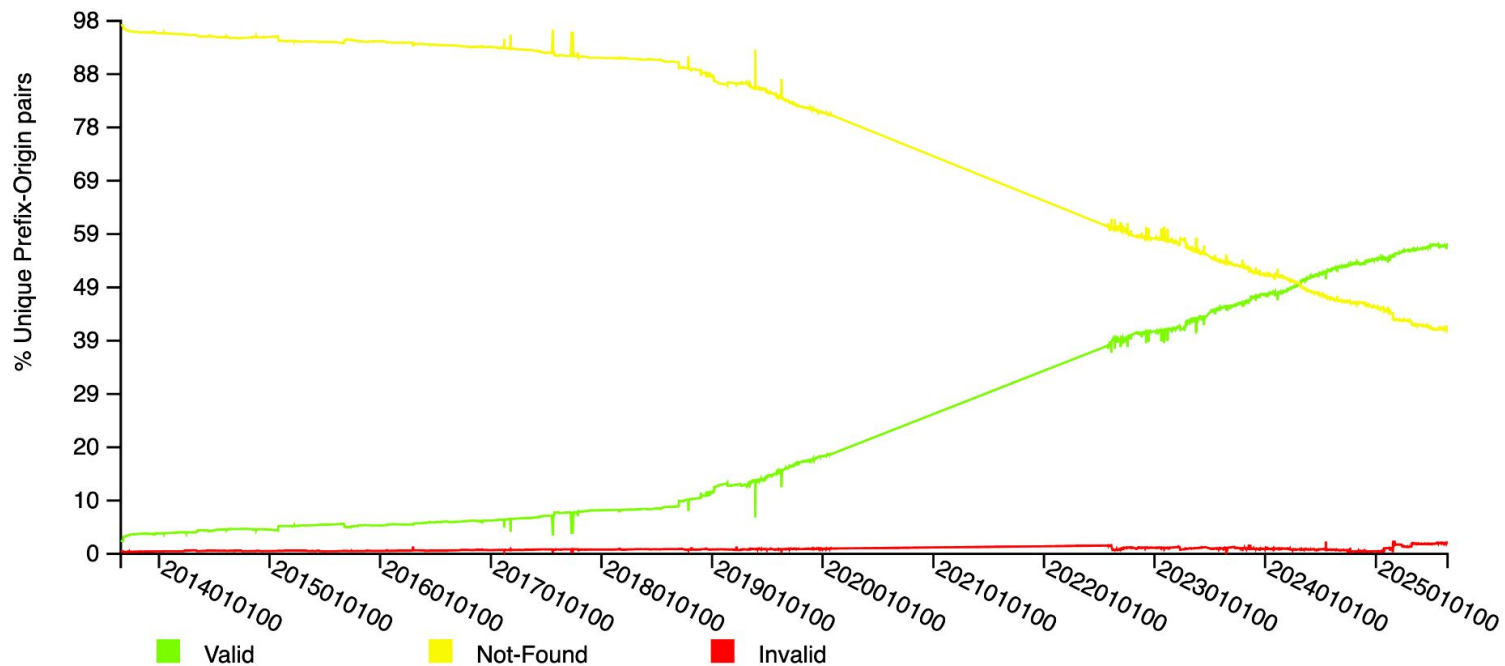
NIST RPKI Monitor: RPKI-ROV Analysis   Protocol: IPv4   RIR: All   URL: https://rpki-monitor.antd.nist.gov/ROV#div2

What about the RIPE Region specifically?

% IPv4 Prefix-Origin pairs plotted over time (2014–2025)

Legend: ■ Valid ■ Not-Found ■ Invalid

NIST RPKI Monitor: RPKI-ROV Analysis   **Protocol:** IPv4   **RIR:** RIPE   **URL:** https://rpki-monitor.antd.nist.gov/ROV/R/4#div2

Together, we can make a measurable Impact

December 2022
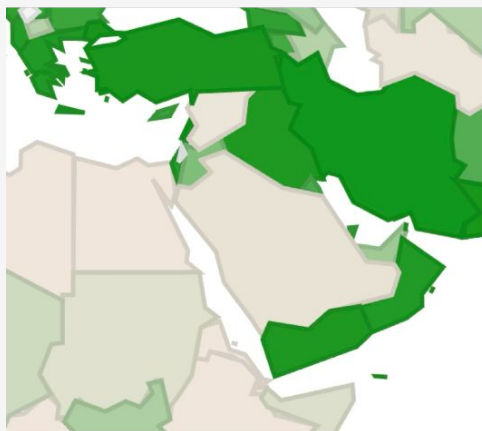
Source: RIPE NCC

Country	% IPv4 covered
Lebanon	97.28
Yemen	95.66
Iraq	94.86
Oman	94.02
Qatar	83.82
Kuwait	73.9
Bahrain	71.78
Jordan	50.17
Palestine	50.08
UAE	35
KSA	3.13
Syria	0.87

February 2024
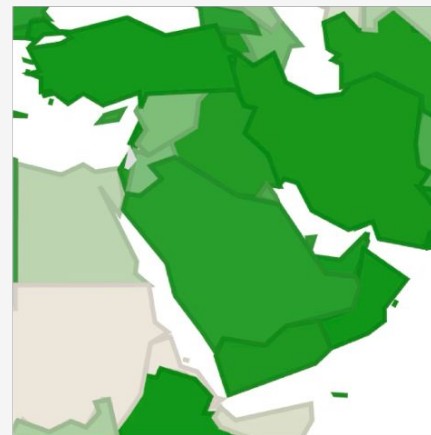
Source: RIPE NCC

Country	% IPv4 covered
Oman	98.71
Lebanon	97.9
KSA	97.82
Yemen	96.57
Iraq	96.56
UAE	94.58
Palestine	89.61
Qatar	83.89
Bahrain	76.08
Kuwait	73.62
Jordan	51.03
Syria	50.67

The reason: RIPE NCC Workshops with Regulators

Current and Future Efforts by the RIPE NCC
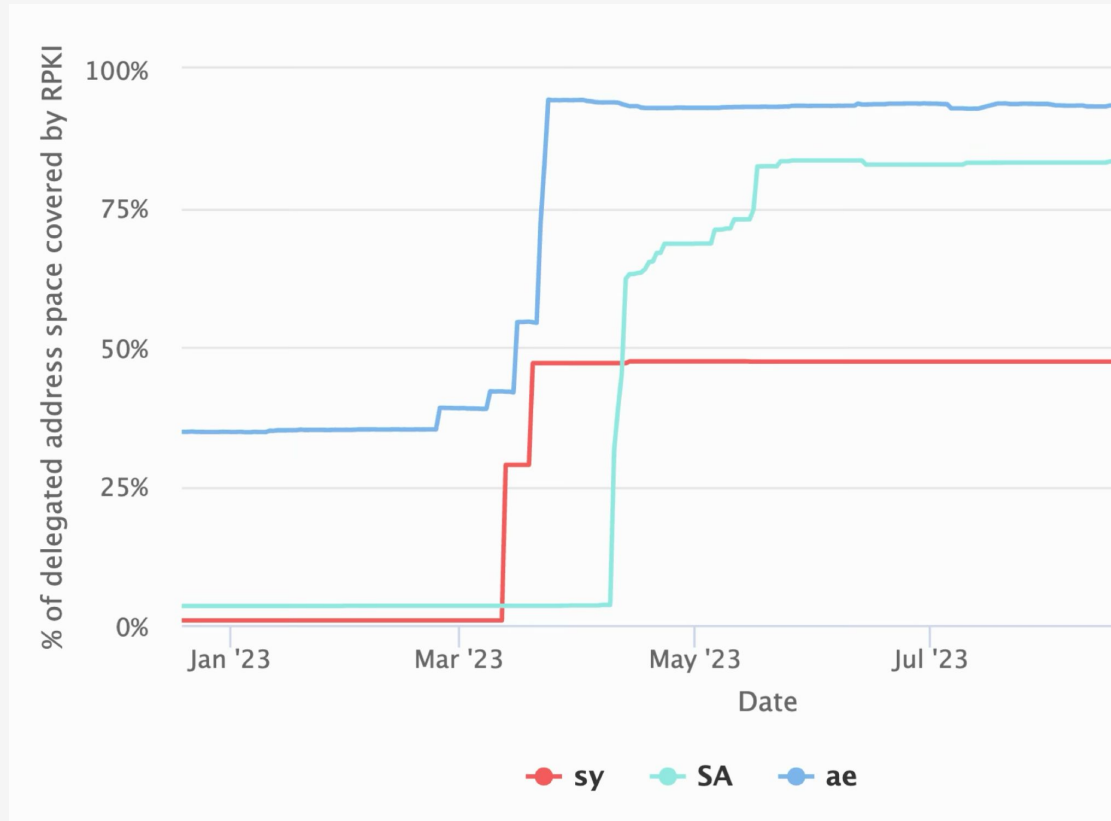
ROA Signing

- Increase % of covered space in IPv4 in some countries

- Increase % of covered space in IPv6

Routing Security

- Push for RPKI Validation & Proper BGP Filtering

- Advocate for best practices and assist where needed

Stakeholders

- Regulators

- Telcos

- Private Sector / Industry / LIRs

Questions & Comments ?

✉ jelcham@ripe.net