RIPE NCC

RIPE NETWORK COORDINATION CENTRE

RPKI: Enhancing Security with Robust Deployment

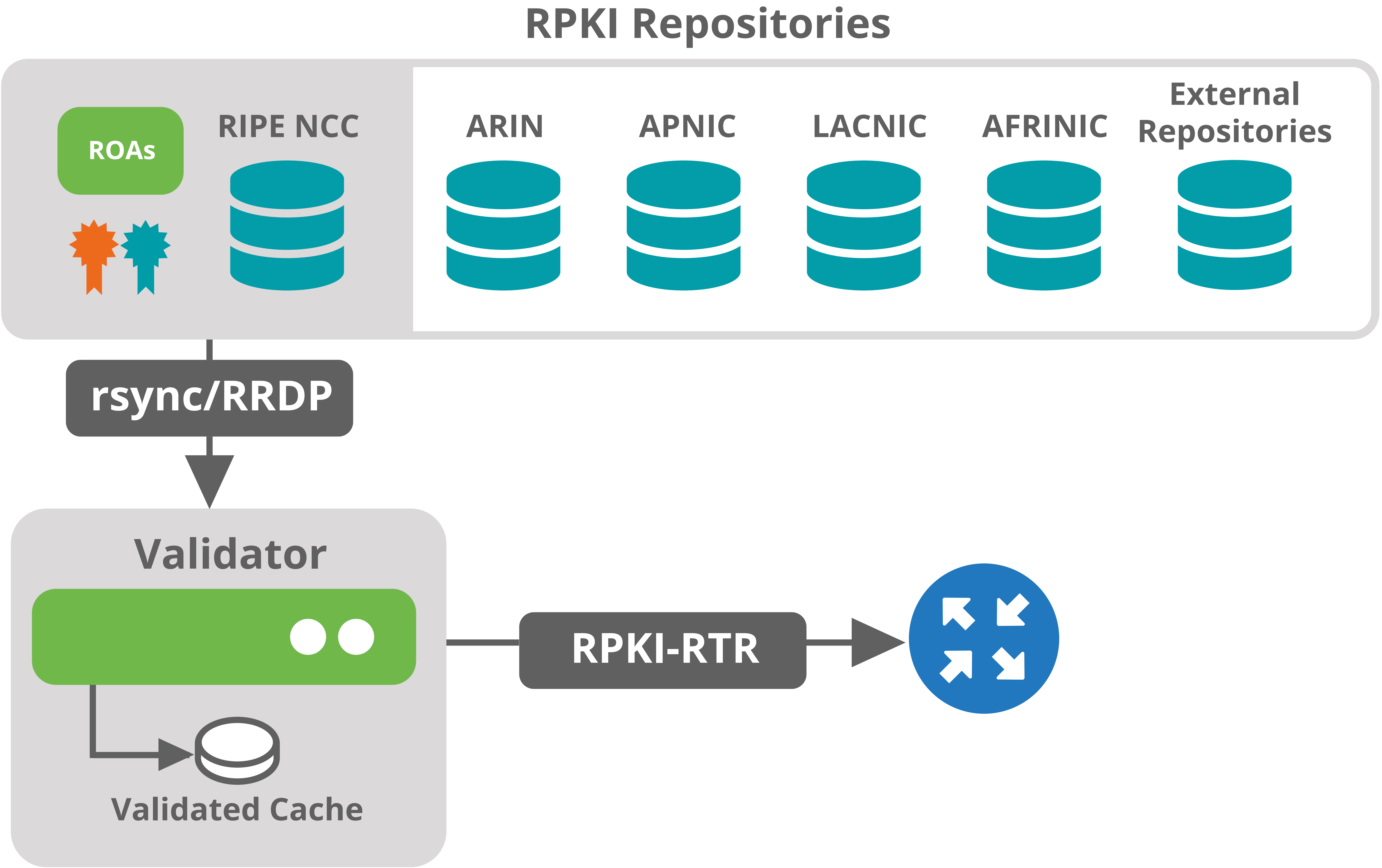
Presentation

Gerardo Viviers | 7-8 March 2024 | DKNOG 14

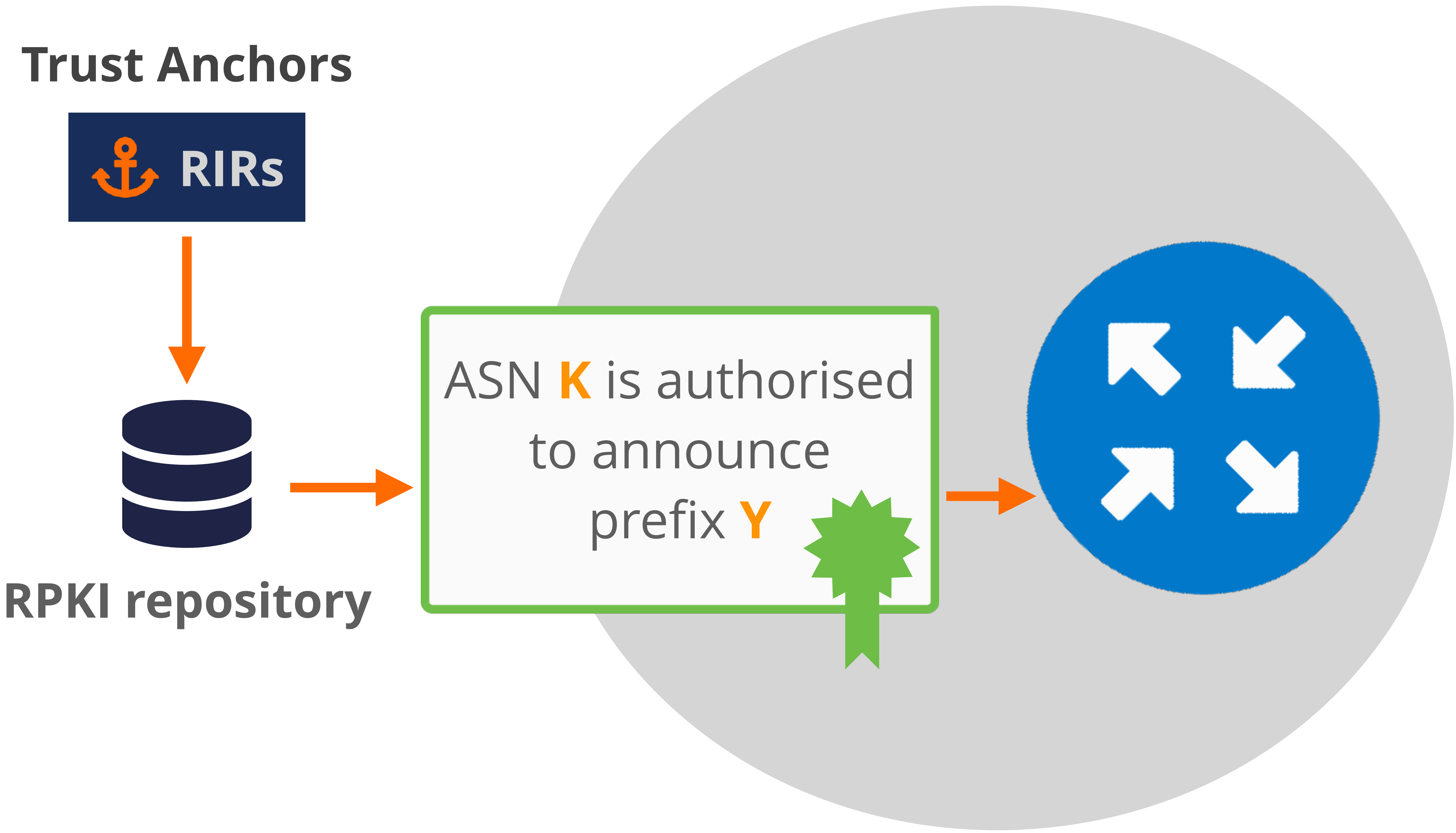
Introduction

- **RPKI**: a framework for Internet routing security
- Helps to validate and verify routing information
- Prevents route hijacking and malicious activities

RPKI System


RPKI Repositories
ROAs
RIPE NCC
ARIN
APNIC
LACNIC
AFRINIC
External Repositories
rsync/RRDP
Validator
Validated Cache
RPKI-RTR

Routing Security using RPKI



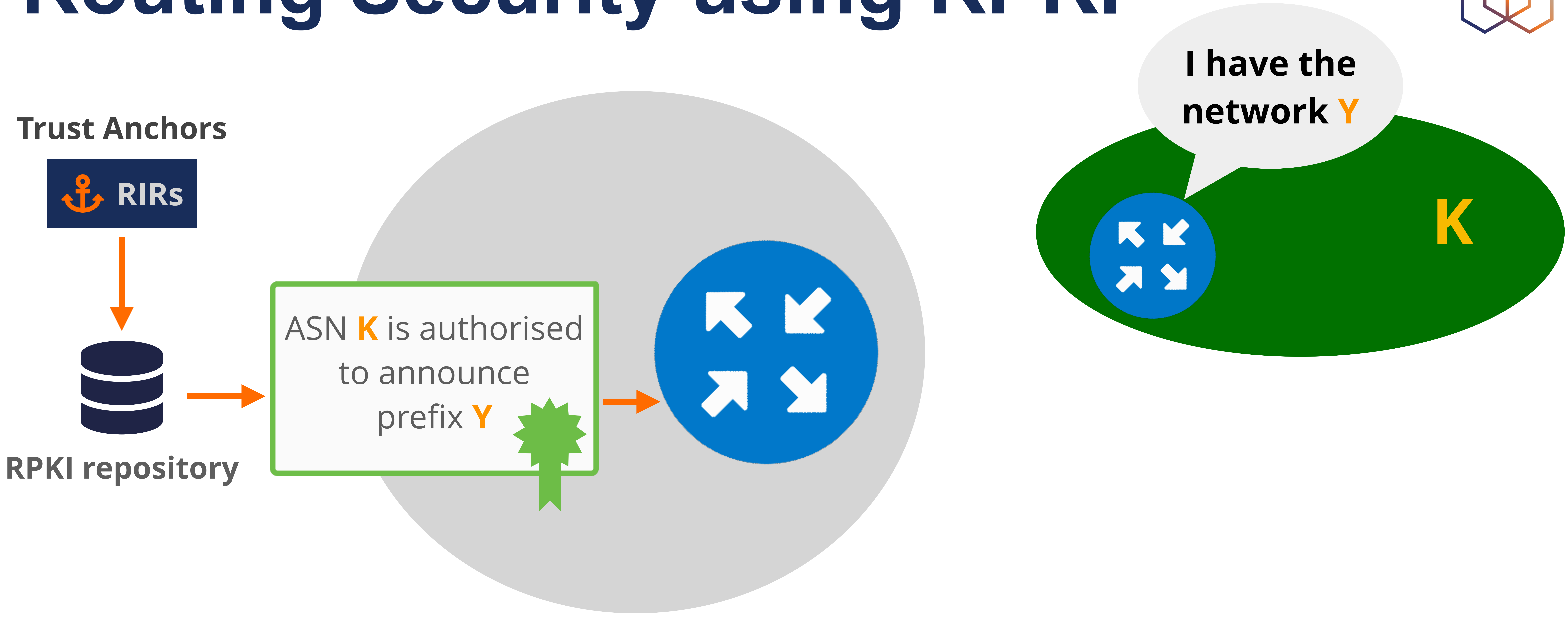
Trust Anchors

RIRs

RPKI repository

ASN K is authorised to announce prefix Y

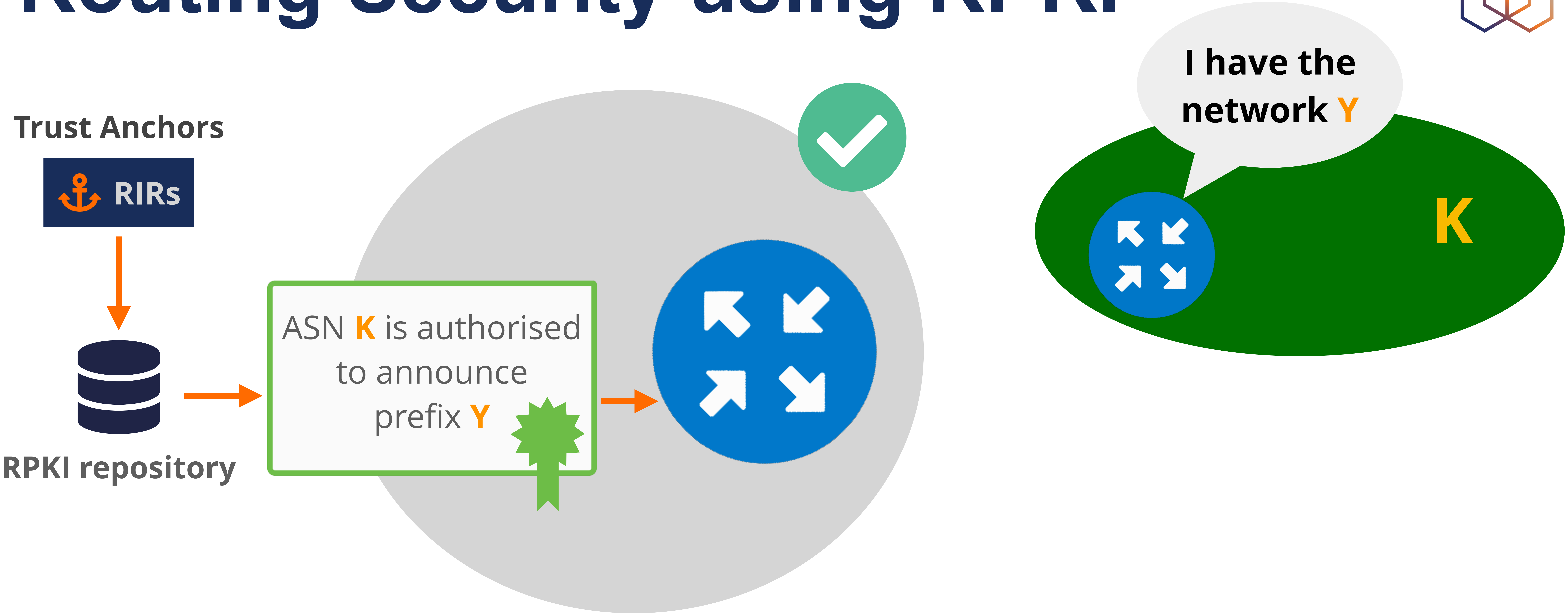
Routing Security using RPKI



ASN K is authorised to announce prefix Y

I have the network Y

Routing Security using RPKI



Trust Anchors

⚓ RIRs

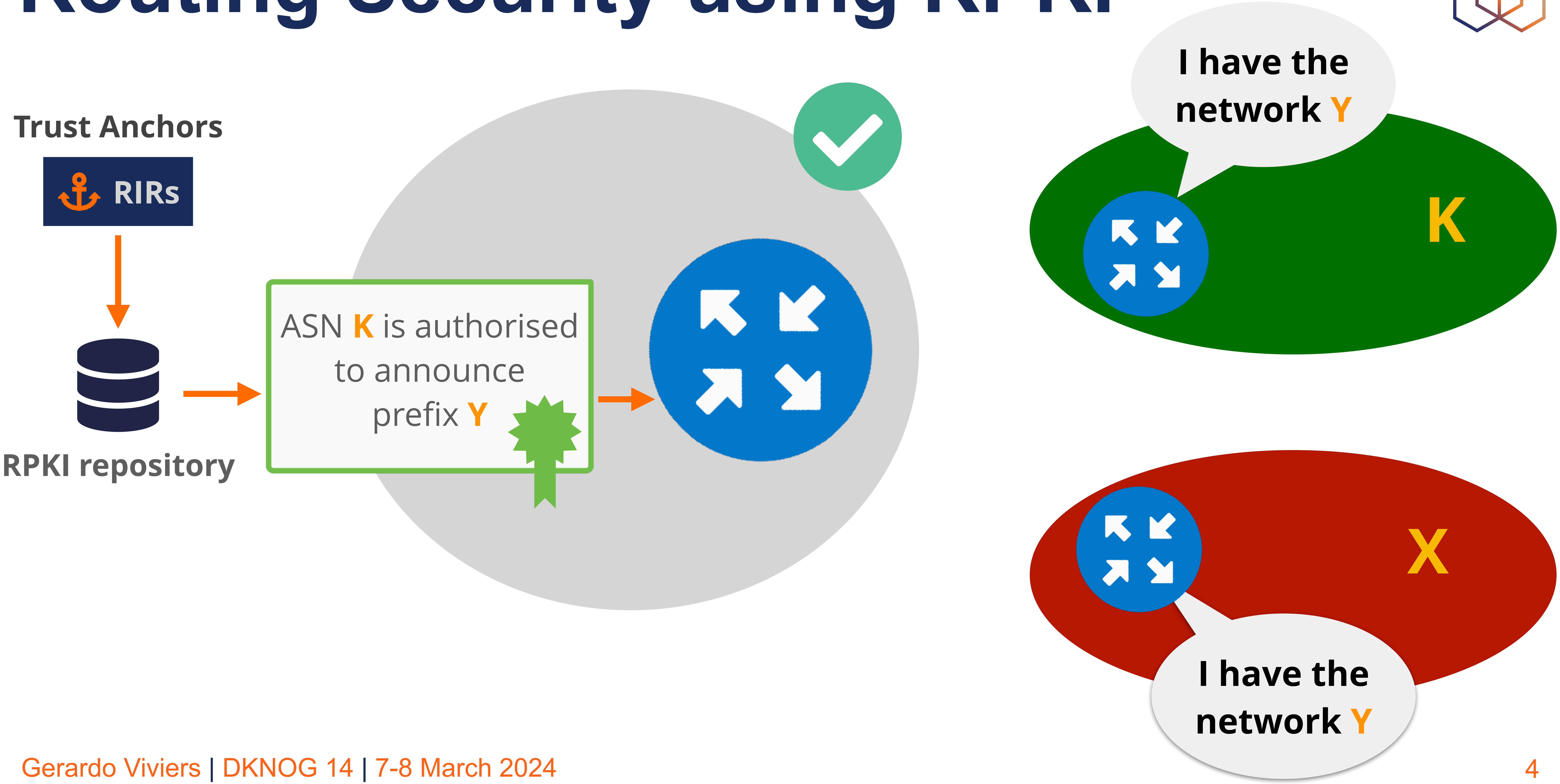
RPKI repository

ASN K is authorised to announce prefix Y

I have the network Y

K

Routing Security using RPKI



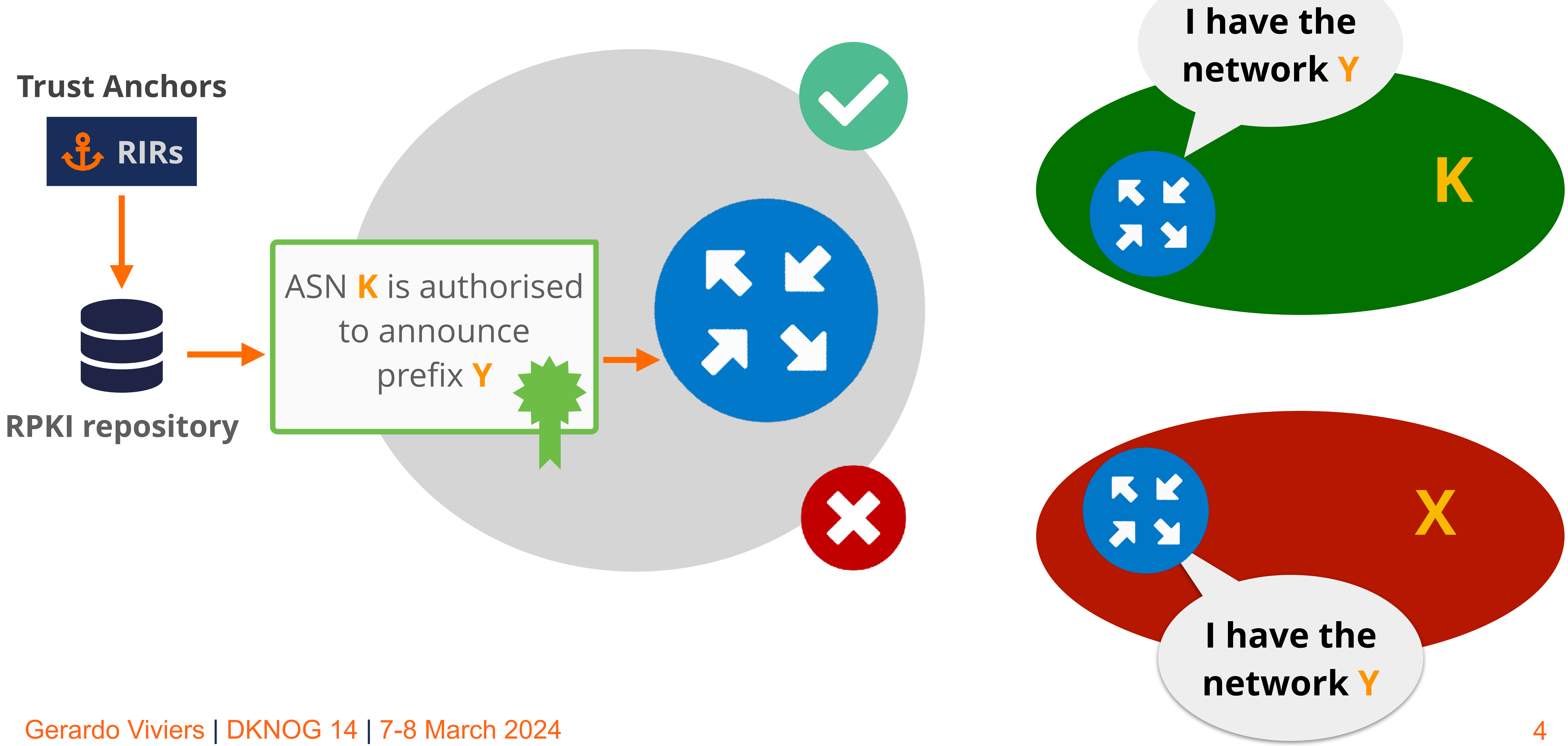
Trust Anchors

RIRs

RPKI repository

ASN K is authorised to announce prefix Y

Routing Security using RPKI



Trust Anchors

⚓ RIRs

RPKI repository

ASN K is authorised to announce prefix Y

✓

✗

I have the network Y

K

X

I have the network Y

The RPKI Incident

- On January 3, 2024, a RIPE NCC member experienced a national outage that lasted for several hours

- The outage was caused by unexpected changes made to their RPKI ROAs

The RPKI Incident

- These changes were done by a threat actor that gained access to the RPKI Dashboard in the RIPE NCC LIR Portal

- The threat actor gained access using a **leaked password!**

Impact of the Incident

- Globally routed routes originated by AS12479 dropped from around **9,200** to **7,400**
- Backbone carriers that reject **RPKI-invalid** routes stopped carrying a large portion of the member's IP space
- The outage caused **disruptions** in Internet connectivity and services provided by the member

How the Member Resolved it

- The RIPE NCC member **quickly identified** the issue
  - …and took steps to restore its RPKI certificates
- They worked together with the RIPE NCC for a **resolution**
- **Improved security measures** were taken to prevent this from happening again in the future

Key Lessons Learned

- The importance of **strong passwords** and **multi-factor authentication** (MFA)
- The importance of **network security monitoring**
- The importance of having **a robust incident response plan**

Becoming Resilient

- Use strong passwords
- Implement MFA
- Monitor networks for suspicious activity
- Develop and test an incident response plan
- Regularly monitor RPKI deployments
- Educate staff on the importance of RPKI
    - and the potential impact of outages!

Conclusions

- RPKI is a critical part of Internet routing security
- Learn from the recent RPKI Incident
- Implement the best practices to become more resilient
- Increased investment in RPKI strengthens security and stability

Questions ?

gviviers@ripe.net