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Themenvorschläge

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mit Schwerpunkten:

- Netzsicherheit
- Measurements / Measurement-Tools
- Routing Security

Route-Origin-Validation Data-Plane Measurements on the Internet

Mögliche Form:
BA/MA

Mögliche Sprachen:
Deutsch/Englisch

BGP hijacking is a pressing issue that has not yet been fully resolved. As trust is the basis for a BGP announcement to propagate through the Internet, it is relatively easy for an attacker to announce prefixes belonging to other organizations. Several solutions have been proposed to (partially) solve the problem of BGP hijacking. RPKI is a promising approach that is using Origin-Authentication through certificates to determine whether an entity is allowed to announce a certain prefix or not. We currently perform active measurements on the control-plane (<https://rov.rpki.net>) as well as on the data-plane (RIPE Atlas) to determine the up-to-date status of Route-Origin-Validation.

This thesis will focus on data-plane measurements in order to identify Route-Origin-Validation by performing a ping-sweep of the whole Internet and looking at the responses that are received within our RPKI valid/invalid prefix ranges. By evaluating the received replies, we are able to draw conclusions on how many autonomous systems indeed have routes towards our prefix ranges although they are RPKI invalid.

Outline of this work:

- Elaborate on the methodology to perform outbound Route-Origin-Validation experiments
- Implement the methodology and conduct experiments
- Evaluate the results

Prerequisites:

- Good understanding of Internet Routing, in particular BGP
- Knowledgeable in Python
- Familiarity with measurements is a plus