IETF Hackathon
BGP-ASPA Interop Testing

IETF 112
July 19-23, 2021
Online

Champions:

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I E T F

Hackathon Plan

Goals:

- Develop tools and data sets to facilitate testing emerging BGP route-leak mitigation techniques
  - ASPA – Autonomous System Provider Authorization
    - draft-ietf-sidrops-aspa-profile
    - draft-ietf-sidrops-aspa-verification

Tools:

- We use the NIST BGP-SRx Software Suite V6 that provides reference implementation for:
  - draft-ietf-sidrops-aspa-verification-08+ (update with algorithm correction*)
  - draft-ietf-sidrops-8210bis-03
  - and a test harnesses that enable scripted experiments with RPKI & BGP data sets.
- Source: https://github.com/usnistgov/NIST-BGP-SRx

* https://datatracker.ietf.org/meeting/110/materials/slides-110-sidrops-sriram-aspa-alg-accuracy-01

Plan:

- IETF 112 – develop tools and data sets for testing router implementations of ASPA.
    - Unit tests (already available) and Internet scale tests (still needed)
- Task 1:
    - Create sample Internet scale ASPA data set for use with 8210bis-03 using CAIDA reference data
    - Test harness ASCII format: ASPA <AFI> <CustomerAS> <ProviderAS>+
- Task 2:
    - Create sample BGP UPDATES using RouteViews data.
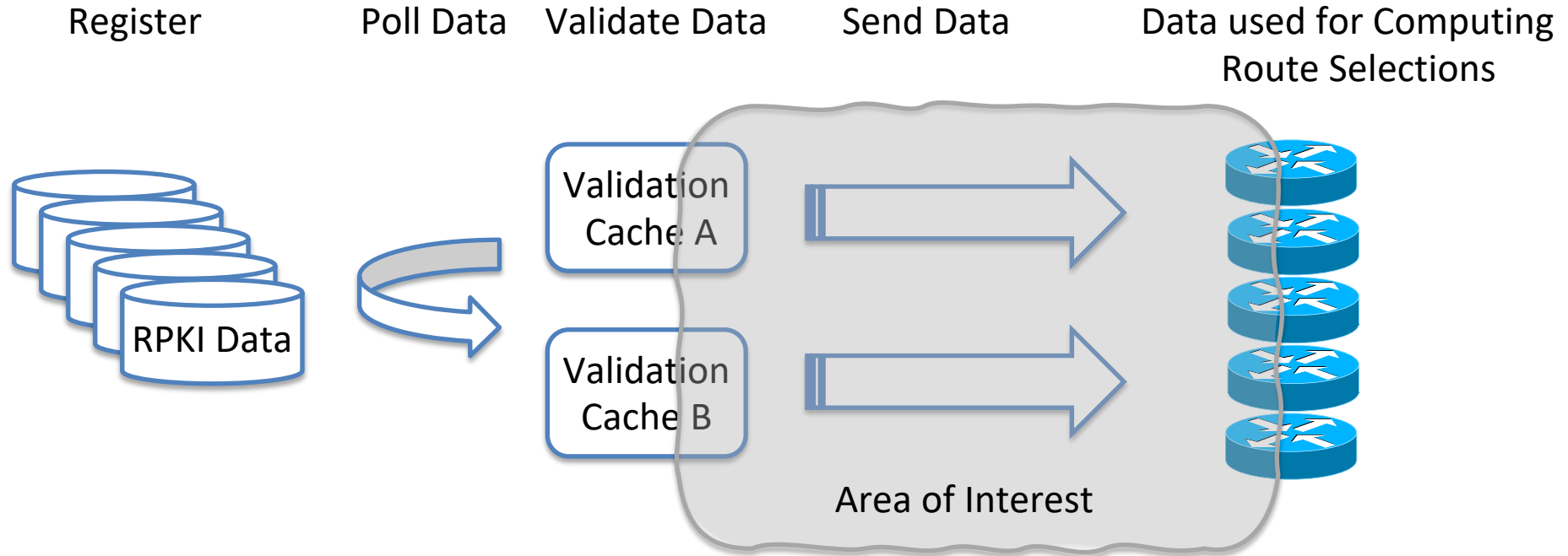
Possible Follow-On Projects:

  - Series of interoperability tests between ASPA router implementations
  - Expand scope to address validator / repository testing of ASPA data.
  - Convert ASPA test data sets into format as specified in
    - draft-ietf-sidrops-aspa-profile-06

Hackathon Goals

- Develop tools and data sets to facilitate testing emerging BGP route-leak mitigation techniques

  - **ASPA – Autonomous System Provider Authorization**
    - draft-ietf-sidrops-aspa-profile
    - draft-ietf-sidrops-aspa-verification

High Level ASPA Data Flow

Register   Poll Data   Validate Data   Send Data   Data used for Computing Route Selections

RPKI Data

Validation Cache A

Validation Cache B

Area of Interest

Tools to be used

- We use the NIST BGP-SRx Software Suite V6 that provides reference implementation for:
  - draft-ietf-sidrops-aspa-verification-08+ (update with algorithm correction*)
  - draft-ietf-sidrops-8210bis-03
  - and test harnesses that enables scripted experiments with RPKI & BGP data sets.

- Source: https://github.com/usnistgov/NIST-BGP-SRx

Tasks for IETF 112 Hackathon

Develop tools and data sets for testing router implementations of ASPA. Unit tests (available) and Internet scale tests (needed)

- Task 1:
  - Create sample Internet scale ASPA data set for use with 8210bis-03 using CAIDA reference data
  - Use Test harness ASCII format:
          ASPA <AFI> <CustomerAS> <ProviderAS>+
- Task 2:
  - Create sample BGP UPDATES using RouteViews or Ripe RIS data.

How will we proceed this week?

- We have daily status meetings where everyone gets a task to accomplish – the schedule will be available on the wiki

- For questions please contact any of the listed Champions by email or IM via MS Teams (same email)

Possible Follow-On Projects

- Series of interoperability tests between ASPA router implementations

- Expand scope to address validator / repository testing of ASPA data.

- Convert ASPA test data sets into format as specified in
  - draft-ietf-sidrops-aspa-profile-06

What got done

- We designed a test framework for generating

  - CAIDA based ASPA script data describing over 180K customer provider relations.

  - Data Pool is downs electable to only use link relations for ASN's within UPDATE stream

  - Specified a result output that can be used to compare between implementations

- Created Data Sets 100, 500, 800, 1K, 10K, and 20K unique AS PATHs using RouteViews and CAIDA Data

The Experimentation

We used RouteViews-3 BGP data, peer AS 701 and CAIDA data from Oct. 1, 2020

- We created a subset of x unique routes.

- We selected only CAIDA data where ASN in each path is listed as customer

- Then we performed ASPA validation

- IUT is private ASN peering with large ISP

The Validation Results

– (v) Valid   -- No route leak detected

– (i) Invalid   -- Route leak detected

– (f) Unknown   -- Insufficient ASPA information

– (u) Unverifiable -- AS_SET in as path

IPS is related to IUT as

– Provider

- v: 94% i: 3% u: 3% ?: 0%

– Customer

- v: 14% i: 18% u: 68% ?: 0%

What is still needed

- More experiments to study gradual deployment of ASPA objects

- For proper performance testing extending framework to use multiple peering sessions

  - Manual possible but it would be nice to have it automated as well

- Other implementations to test against

  - Maybe next hackathon

Wrap Up

Team members:

Oliver Borchert

Lilia Hannachi

Kotikalapudi Sriram

Doug Montgomery

First timers @ IETF/Hackathon:

- all of the above -

NIST BGP-SRx Software
https://github.com/usnistgov/NIST-BGP-SRx

Hackathon Software Scripts
Will be made public in the coming days