YANG Data Model for RPKI to Router Protocol
draft-liu-sidrops-rtr-yang-04

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Overview

• This document defines YANG data models for RPKI-Router Protocol ([RFC6810], [RFC8210], and [I-D.ietf-sidrops-8210bis]).

• Four YANG data models are defined:
  – ietf-rpki-rtr.yang: How to configure and manage the RPKI-Router protocol on routers.
  – ietf-bgp-origin-as-validation.yang: How BGP validates the origination AS of BGP routes based on ROA.
  – ietf-bgp-sec.yang: How BGP validates the BGPsec_PATH attribute of BGP routes.
  – ietf-bgp-aspa.yang: How BGP validates the AS_PATH of BGP routes based on ASAP.
How to configure and manage the RPKI-Router protocol on routers.

```
ietf-rpki-rtr.yang
```

```
rpki-rtr
  cache-server (list)
    server-address
    server-port
    local-address
    local-port
    protocol-version
    preference
    description
    secure-session-enable
    secure-session
  purge-time
  refresh-time
  response-time
  roa-limit
  aspa-limit
  session-state
  session-id
  serial-number
  statistics
  roa-table
  router-key-table
  aspa-table
```

- **Connectivity parameters**
- **Session parameters**
- **Session status and statistics**
- **Records received from a single cash-server**
- **Total records received from all cash-servers**
ietch-rpki-rtr.yang (Cont.)

```
rpki-rtr
  ▼ cache-server
    ▼ ipv4 -> roa (list)
    ▼ ipv6 -> ... (Similar with IPv4)
  ▼ roa-table
    ▼ prefix
      ▼ max-len
      ▼ asn
      ▼ server-address
  ▼ router-key-table -> router-key (list)
    ▼ ski
    ▼ asn
    ▼ key
    ▼ server-address
  ▼ aspa-table
    ▼ ipv4 -> aspa (list)
    ▼ ipv6 -> ... (Similar with IPv4)
```

- Records of IPv4 Prefix PDU
- Records of IPv6 Prefix PDU
- Records of Router Key PDU
- Records of ASPA PDU (IPv4 AFI)
- Records of ASPA PDU (IPv6 AFI)
How BGP validates the origination AS of BGP routes based on ROA.

- For redistributed routes that have no AS-PATH [RFC 8481]
- Check the origin AS validity states in the best-path calculation
- Origin AS validation state of BGP routes [RFC 6881]
- Check the origin AS validity states in BGP export [RFC 8893]
- BGP Prefix Origin Validation State Extended Community [RFC 8097]

Origin-as-validation
- enabled
- redistribution-as

Origin-as-validation [RFC 6881]

ipv4-unicast/ipv6-unicast
- global -> afi-safi
- route-selection-options -> origin-as
  - enabled
  - allow-invalid
  - allow-not-found

BGP enabled redistribution
- allow
- invalid
- not
- found

Send-origin-as-validity
- enabled
- allow-not-found

Export-origin-as-validation
- enabled
- allow-not-found
How BGP validates the BGPsec_PATH attribute [RFC 8205].

- BGPsec validation of BGP routes
- BGPsec validation state of BGP routes
- Check the BGPsec validity states in BGP export
- Check the BGPsec validity states in the best-path calculation

**BGP**
- global -> afi-safi
- neighbor/peer-group -> afi-safi -> ipv4-unicast/ipv6-unicast
  - route-selection-options -> origin-as
    - enabled
    - allow-invalid
  - export-bgpsec-validation -> enabled

- bgpsec-validation -> enabled
- loc-rib -> route -> bgpsec-validity
- ipv4-unicast/ipv6-unicast
How BGP validates the AS_PATH of BGP routes based on ASPA [draft-ietf-sidrops-aspa-verification].

- AS_PATH validation of BGP routes based on ASPA
- ASPA validation state of BGP routes
- Check the ASPA validation states in the best-path calculation
- Role of BGP peer: customer / provider / lateral-peer / ...

```
bgp
  global ->afi-safi
    ipv4-unicast/ipv6-unicast
      route-selection-options -> aspa
        enabled
          allow-invalid
          allow-unknown
    loc-rib -> route -> aspa-verification-state
```

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Next Steps

• Any questions or comments are Welcomed.
Thanks