Yang Data Model for BGP

draft-shaikh-idr-bgp-model-02

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IDR Interim Session Update

Update

- Authors have produced a merged draft

  - merged draft renamed to draft-shaikh-idr-bgp-model-02

- Proposed model incorporates feedback from operators, vendors, and IETF groups (IDR, rtg-yang-coord)

  - base BGP model is being implemented by several vendors (incl. Cisco / XR, Juniper / JUNOS)

- Draft is ready for WG adoption

  - request Chairs to issue a WG adoption call

Questions?

BGP Module organization

- 6 modules

- Operational state uses:

draft-openconfig-netmod-opstate

- Policy uses

draft-shaikh-rtgwg-policy-model

Operational State
Policy Configuration
Neighbor multiprotocol
Neighbor configuration
Multiprotocol configuration
Base protocol configuration

Top level yang

```
+--rw bgp!

   +--rw global

   |   +-- (global-configuration-options)

   +--rw neighbors

   |   +--rw neighbor* [neighbor-address]

   |   +-- (neighbor-configuration-options)

   +--rw peer-groups

      +--rw peer-group* [peer-group-name]

      +-- (neighbor-configuration-options)
```

Users higher level config
- may apply to lower level
- May be overridden at lower level

Levels specific to global
- Neighbor
- Peer-group
- Global

To simplify: Peer Group has all neighbor config options

AFI-SAFI

```
| +--rw afi-safi
| | +--rw afi-safi* [afi-safi-name]
| | +--rw afi-safi-name    identityref
| |     +--rw route-selection-options
| |     +--rw use-multiple-paths!
| |     +--rw apply-policy
| |     +--rw ipv4-unicast!
| |     +--rw ipv6-unicast!
| |     +--rw ipv4-labelled-unicast!
| |     +--rw ipv6-labelled-unicast!
| |     +--rw l3vpn-ipv4-unicast!
| |     +--rw l3vpn-ipv6-unicast!
| |     +--rw l3vpn-ipv4-multicast!
| |     +--rw l3vpn-ipv6-multicast!
| |     +--rw l2vpn-vpls!
| |     +--rw l2vpn-evpn!
```

| Route-selection |
| Multiple Paths |
| Apply-policy |

| ipv4-unicast |
| ipv6-unicast |

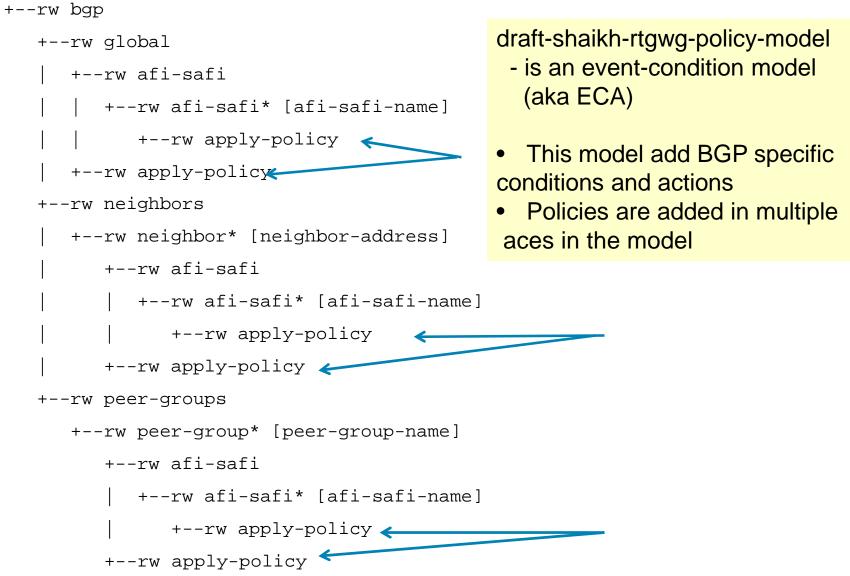| ipv4-labelled-unicast |
| ipv6-labelled-unicast |

| l3vpn-ipv4-unicast |
| l3vpn-ipv6-unicast |
| l3vpn-ipv6-multicast |
| l3vpn-ipv6-multicast |

| l2vpn-vpls |
| l2vpn-evpn |

At multiple points in model

Policy configuration

```
+--rw bgp

   +--rw global

   |   +--rw afi-safi

   |   |   +--rw afi-safi* [afi-safi-name]

   |   |       +--rw apply-policy

   |   +--rw apply-policy

   +--rw neighbors

   |   +--rw neighbor* [neighbor-address]

   |       +--rw afi-safi

   |       |   +--rw afi-safi* [afi-safi-name]

   |       |       +--rw apply-policy

   |       +--rw apply-policy

   +--rw peer-groups

       +--rw peer-group* [peer-group-name]

          +--rw afi-safi

          |   +--rw afi-safi* [afi-safi-name]

          |       +--rw apply-policy

          +--rw apply-policy
```

draft-shaikh-rtgwg-policy-model
  - is an event-condition model
    (aka ECA)

- This model add BGP specific conditions and actions
- Policies are added in multiple aces in the model

Operational Data Overview

- Uses openconfig-netmod-opstate

- _state groupings contained within operational model

- Operational groups may be relevant to one common group and not another

    Example: received, advertised, installed prefix relevant per peer, but not per peer-grouping.

Security Considerations

- Yang data modules are designed to be used within NETCONF over SSH transport

  - Most BGP data is considered sensitive from a security viewpoint.

  - This provides an authenticated and secure channel

  - Alternate transport or data encodign (E.g. JSON or HTTPS) reqire similar mechanisms for authentication and securing access.

  - Looking for feedback

Open config modules

- https://github.com/YangModels/yang/tree/master/experimental/openconfig