More?

REQUIREMENTS FOR BGP MODELING

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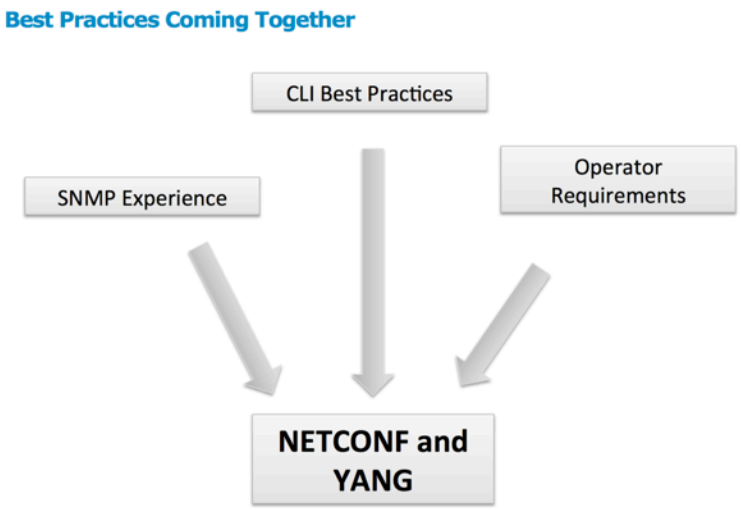
YANG

- RFC 6020/6021 (NETMOD WG)
- Modeling language to define / modularise NETCONF XML
- Modern alternative to SMIv2 (which in turn, modularised ASN.1 in SNMP)
- More than we can explain in a lightning talk.
- See https://ripe68.ripe.net/presentations/181-NETCONF-YANG-tutorial-43.pdf



YANG – A Data Modeling Language for Networking

- Human readable, and easy to learn representation
- Hierarchical configuration data models
- Reusable types and groupings (structured types)
- Extensibility through augmentation mechanisms
- Supports definition of operations (RPCs)
- Formal constraints for configuration validation
- Data modularity through modules and sub-modules
- Well defined versioning rules

Why you should care:

YANG is a full, formal contract language with rich syntax and semantics to build applications on

```
list interface {
        key "name";
        unique "type location";

        leaf name {
          type string;
          reference
            "RFC 2863: The Interfaces Group MIB - ifName";
        }

        leaf description {
          type string;
        }
...
  container statistics {
          config false;
          leaf discontinuity-time {
            type yang:date-and-time;
          }

          leaf in-octets {
            type yang:counter64;
            reference
              "RFC 2863: The Interfaces Group MIB - ifHCInOctets";
          }
```

YANG meets BGP

- http://www.ietf.org/id/draft-zhdankin-netmod-bgp-cfg-01.txt vs http://www.ietf.org/id/draft-shaikh-idr-bgp-model-00.txt)

- NETMOD = Cisco
- IDR = Google, AT&T, MS, BT
- Both quite low level.
- IDR contains more operational facets.
- IDR an agenda item Tuesday (13/11).
- NETMOD not an agenda item (yet).
- IDR seems to have progress!

```
container bestpath {
   description
     "Change the default bestpath selection.";
   choice bestpath-selection {
     case as-path {
       description
         "Configures a BGP routrer to not consider the autonomous system (AS) path
         during best path route selection.";
       leaf ignore-as-path {
         type boolean;
         default "false";
       }
     }
     case compare-routerid {
       description
         "Configures a BGP routrer to compare identical routes received from
          different external peers
          during the best path selection process and to select the route with the
          lowest router ID as the best path.";
       leaf ignore-routerid {
         type boolean;
         default "false";
       }
```

```
     leaf always-compare-med {
       type boolean;
       default "false";
       description
         "Compare multi-exit discriminator (MED) value from
         different ASes when selecting the best route.  The
         default behavior is to only compare MEDs for paths
         received from the same AS.";
     }

     leaf ignore-as-path-length {
       type boolean;
       default "false";
       description
         "Ignore the AS path length when selecting the best path.
         The default is to use the AS path length and prefer paths
         with shorter length.";
     }

     leaf external-compare-router-id {
       type boolean;
       default "true";
       description
         "When comparing similar routes received from external
         BGP peers, use the router-id as a criterion to select
         the active path.";
     }
```

So, what is our point?

- No provision for expressing routing policy (we think)
- How can we simplify asking for abstracted concepts?
  - Best exit from my network for this service should be <X>
  - Prefer these peering prefixes over exchange <Y>
  - etc..
- If YANG to be considered a DSL, are we happy with the scope of the domain?
- Do we need an upper layer which describes policy?
- If you feel strongly about this, send us a mail:

yang@convergence.cx

- Aim to pass on operator feeling at next weeks' IETF.