Core Routing Data Model

draft-ietf-netmod-routing-cfg-04

Ladislav Lhotka

⟨*lhotka@nic.cz*⟩

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Core Data Models at First WGLC

1. M. Bjorklund: *A YANG Data Model for Interface Configuration*,
   `draft-ietf-netmod-interfaces-cfg-05`.

2. M. Bjorklund: *A YANG Data Model for IP Configuration*,
   `draft-ietf-netmod-ip-cfg-05`.

3. L. Lhotka: *A YANG Data Model for Routing Configuration*,
   `draft-ietf-netmod-routing-cfg-04`.

It is still time for additional reviews, please consider reading these documents and giving us feedback (*netmod@ietf.org*).

YANG

Data modelling language for NETCONF, allows for modelling config-
urations, operational state data, RPC methods and notifications. Its
specification is in RFC 6020.

YANG addresses:

- schema,

- semantic constraints,

- textual specification (normative!).

Outstanding features:

- human readability,

- modularity and extensibility.

Core Routing Data Model

Goals:

1. Data model suitable for common router implementations (IPv4, IPv6 and other address families, unicast and multicast, MPLS).

2. Simple setups (single routing table, no route manipulations, static routing) should be able to use the data model immediately.

3. Complicated setups must be possible (multiple routing tables, multiple protocols, controlled redistribution of routes.

4. The data model should be adaptable to proprietary data models of existing devices.

Reusable Components

- **Router instances:** virtual/logical routers. Implementations should specify semantic rules and restrictions (complete separation or controlled exchange of information).
- **Routing protocols:** multiple protocol types and any number of instances of each type. Two (pseudo-)protocols are provided: *direct* and *static*.
- **Routing tables:** one table per address family is mandatory (main), additional tables can be configured.
- **Route filters:** only a skeleton, real filtering framework(s) should be developed separately.

Each routing protocol is connected to one routing table (main by default), routing tables may exchange routes between each other (in one direction or both).

Routes exchanged along protocol-table and table-table connections may be filtered and manipulated by means of route filters.

Main Data Tree

```
+--rw routing
   +--rw router [name]
   |  +--rw name
   |  +--rw router-id?
   |  +--rw description?
   |  +--rw enabled?
   |  +--rw interfaces
   |  |  +--rw interface [name]
   |  |         ...
   |  +--rw routing-protocols
   |  |  +--rw routing-protocol [name]
   |  |         ...
   |  +--rw routing-tables
   |     +--rw routing-table [name]
   |            ...
   +--rw route-filters
          ...
```

Example Setup

```
+--------+
| direct |      +---+    +--------------+      +---+    +--------------+
| routes |--->| F |--->|                |<---| F |<---|              |
+--------+      +---+    |     main      |      +---+    |  additional  |
                        |   routing     |              |   routing    |
+--------+      +---+    |    table      |      +---+    |    table     |
| static |--->| F |--->|                |--->| F |--->|              |
| routes |      +---+    +--------------+      +---+    +--------------+
+--------+                   ^        |                    ^        |
                             |        v                    |        v
                         +---+    +---+                 +---+    +---+
                         | F |    | F |                 | F |    | F |
                         +---+    +---+                 +---+    +---+
                             ^        |                    ^        |
                             |        v                    |        v
                         +----------+                   +----------+
                         | routing  |                   | routing  |
                         | protocol |                   | protocol |
                         +----------+                   +----------+
```

Next Steps

1. Advance the core routing data model – with your help, PLEASE.

   Timely reviews will be highly appreciated.

2. Collaborate on the development of data models for routing protocols and route filters.