

# A YANG Data Model for RIB

Lixing Wang  
Hariharan Ananthakrishnan  
Mach Chen  
Amit Dass  
Sriganesh Kini  
Nitin Bahadur

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# Introduction

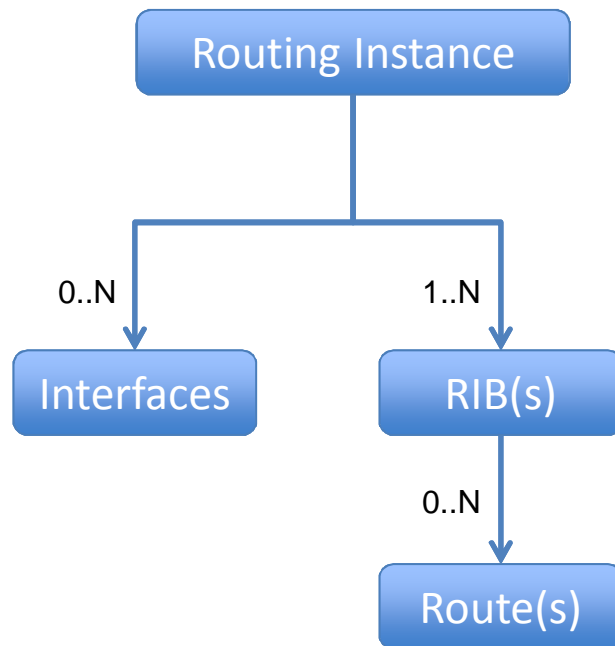
- “ Read/write Routing Information Base(RIB) is an important requirement of I2RS
- “ The RIB Information Model (IM) draft describes what information should be included to model the RIB
  - . The IM draft is mature and stable.
  - . The WG has made an agreement on the content of the RIB IM
- “ The document defines a YANG Data Model for RIB
  - . Totally align with the RIB IM.

# High Level RIB Module Structure

```
module: i2rs-rib
  +--rw nexthop-capacity
  |   ...
  +--rw nexthop-tunnel-encap-capacity
  |   ...
  +--rw routing-instance
    +--rw instance-name      string
    +--rw interface-list* [name]
    |   +--rw name          if:interface-ref
    +--rw router-id?         yang:dotted-quad
    +--rw rib-list* [rib-name]
    |   +--rw rib-name      string
    |   |   ...
    |   +--rw route-list* [route-index]
    |   |   ...

notifications:
  +---n nexthop-resolution-status-change
  |   +--ro nexthop
  |   |   ...
  |   +--ro nexthop-state      nexthop-state-def
  +---n route-change
  |   ...
```

# Routing Instance and RIB Structure



```
+-rw routing-instance
+-rw instance-name      string
+-rw interface-list* [name]
| +-rw name             if:interface-ref
+-rw router-id?         yang:dotted-quad
+-rw rib-list* [rib-name]
    +-rw rib-name        string
    +-rw rib-family      rib-family-def
    +-rw enable-ip-rpf-check? boolean
    +-rw route-list* [route-index]
        ... (refer to sec.2.3)
```

## “ Model a single routing instance

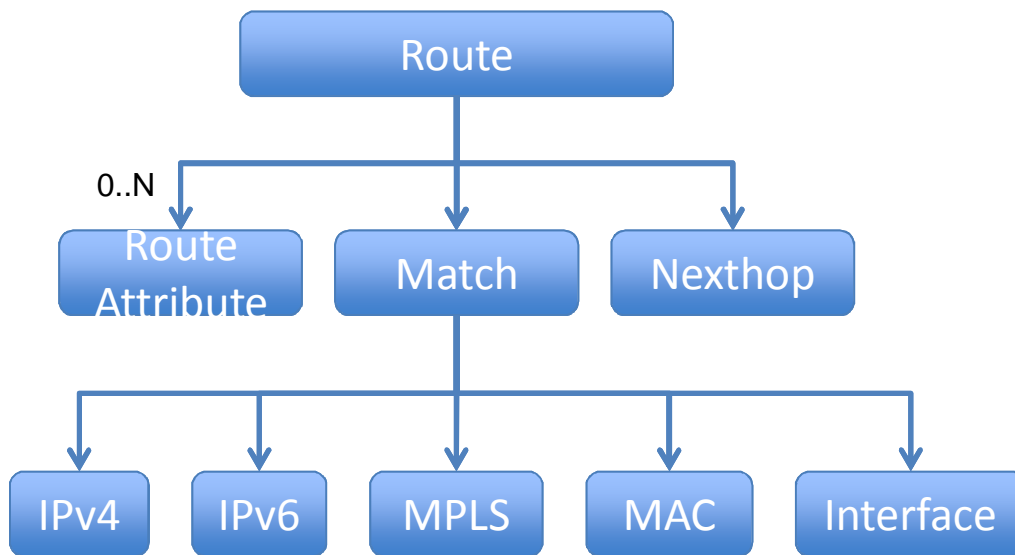
- . Interface list
- . RIB list
  - “ Route list

# RIB Capabilities

- “ Two types of capabilities
  - . Nexthop-capability
  - . Nexthop-tunnel-encap-capability
- “ May define more capabilities in the future

```
+--rw nexthop-capability
|  +--rw support-tunnel?          boolean
|  +--rw support-chains?          boolean
|  +--rw support-list-of-list?    boolean
|  +--rw support-replication?     boolean
|  +--rw support-weighted?        boolean
|  +--rw support-protection?      boolean
|  +--rw lookup-limit?            uint8
+--rw nexthop-tunnel-encap-capability
|  +--rw support-ipv4?            boolean
|  +--rw support-ipv6?            boolean
|  +--rw support-mpls?            boolean
|  +--rw support-gre?             boolean
|  +--rw support-vxlan?           boolean
|  +--rw support-nvgre?           boolean
```

# Route Structure

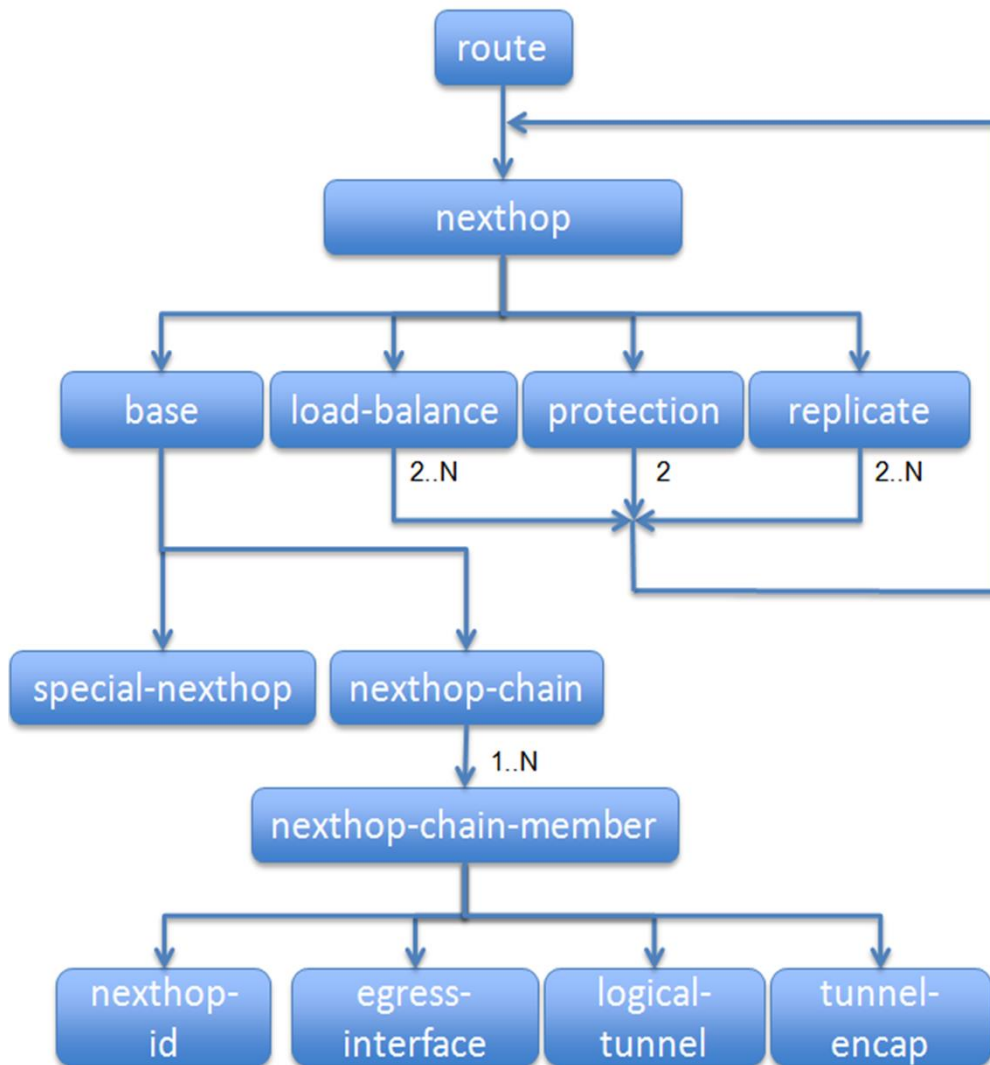


“ Routes are modeled as a list, for each route:

- . Route type
- . Match (IPv4, IPv6, MPLS, MAC and Interface)
- . Nexthop
- . Route statistic
- . Vendor attributes

```
+--rw route-list* [route-index]
+--rw route-index
+--rw route-type
+--rw match
|   +--rw (rib-route-type)?
|   |   +--:(ipv4)
|   |   |   ...
|   |   +--:(ipv6)
|   |   |   ...
|   |   +--:(mpls-route)
|   |   |   ...
|   |   +--:(mac-route)
|   |   |   ...
|   |   +--:(interface-route)
|   |   ...
+--rw nexthop
|   ...
+--rw route-statistic
|   ...
+--rw route-attributes
|   ...
+--rw route-vendor-attributes
```

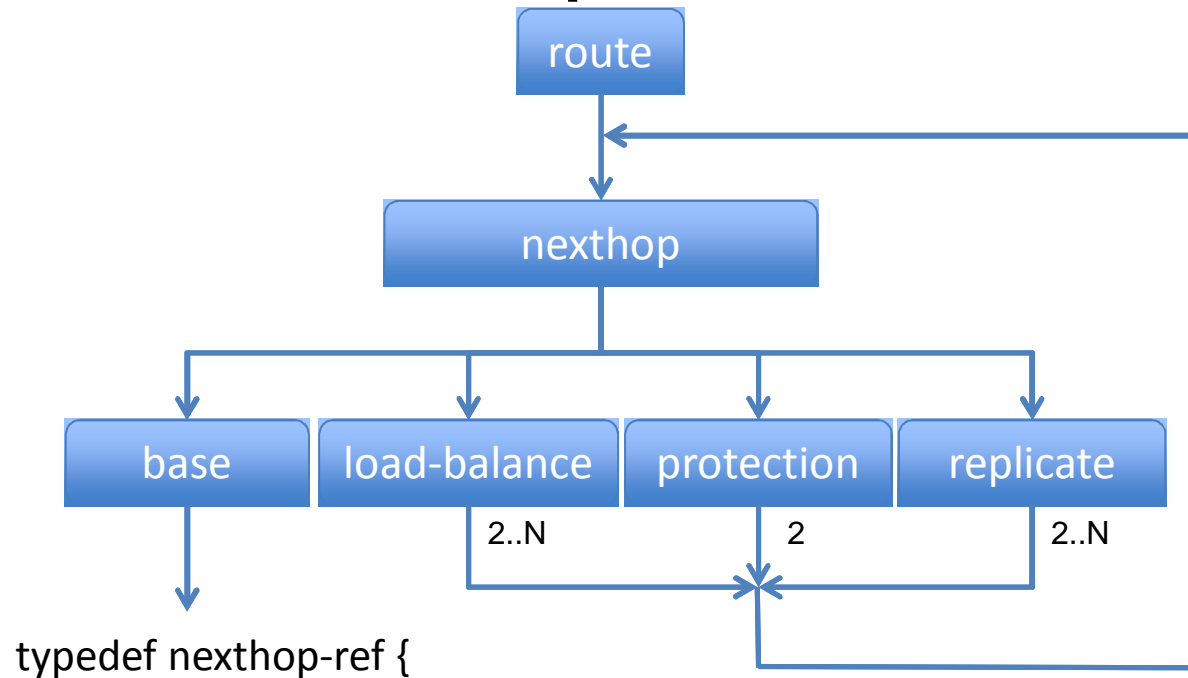
# Nexthop Structure



```

+---rw nexthop
|   +---rw nexthop-id                uint32
|   +---rw (nexthop-type)?
|       +---:(nexthop-base)
|           +---rw nexthop-base
|               +---rw nexthop-chain* [nexthop-chain-id]
|                   +---rw nexthop-chain-id
|                       +---rw (nexthop-chain-type)?
|                           ... (refer to Figure 6)
|       +---:(nexthop-protection)
|           +---rw nexthop-protection-list* [next
|               +---rw nexthop-protection-id      u
|               +---rw nexthop-preference          ne
|               +---rw nexthop                    ne
|       +---:(nexthop-load-balance)
|           +---rw nexthop-lb
|               +---rw nexthop-lbs* [nexthop-lbs-i
|                   +---rw nexthop-lbs-id          ui
|                   +---rw nexthop-lb-weight        nh
|                   +---rw nexthop-lb-member
|       +---:(nexthop-replicate)
|           +---rw nexthop-replicate
|               +---rw nexthop-replicates* [nextho
|                   +---rw nexthop-replicates-id
|                   +---rw nexthop-replicate?
  
```

# Nexthop Recursion



typedef nexthop-ref {

type leafref {

path "/i2rs-rib:routing-instance/i2rs-rib:rib-list" +

"/i2rs-rib:route-list/i2rs-rib:nexthop/i2rs-rib:nexthop-id";

}

}



# Notification

```
notifications:
  +---n nexthop-resolution-status-change
  |   +--ro nexthop
  |   |   ...
  |   +--ro nexthop-state          nexthop-state-def
  +---n route-change
  |   +--ro instance-name          string
  |   +--ro rib-name               string
  |   +--ro rib-family             rib-family-def
  |   +--ro route-index            uint64
  |   +--ro route-type             route-type-def
  |   +--ro match
  |   |   +--ro (rib-route-type)?
  |   |   |   +--:(ipv4)
  |   |   |   |   ...
  |   |   |   +--:(ipv6)
  |   |   |   |   ...
  |   |   |   +--:(mpls-route)
  |   |   |   |   +--ro mpls-label          uint32
  |   |   |   |   +--:(mac-route)
  |   |   |   |   |   +--ro mac-address      uint32
  |   |   |   |   +--:(interface-route)
  |   |   |   |   |   +--ro interface-identifier if:interface-ref
  |   +--ro route-installed-state route-installed-state-def
  |   +--ro route-state            route-state-def
  |   +--ro route-reason            route-reason-def
```

## Next step

- “ WG Polling started
- “ Solicit more reviews and comments and refine the draft