

YANG Data Model for VRRP

draft-liu-rtgwg-yang-vrrp-03

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Agenda

- Goals
- Changes since revision 02
- Model definitions
- Discussion/Next steps

Goals

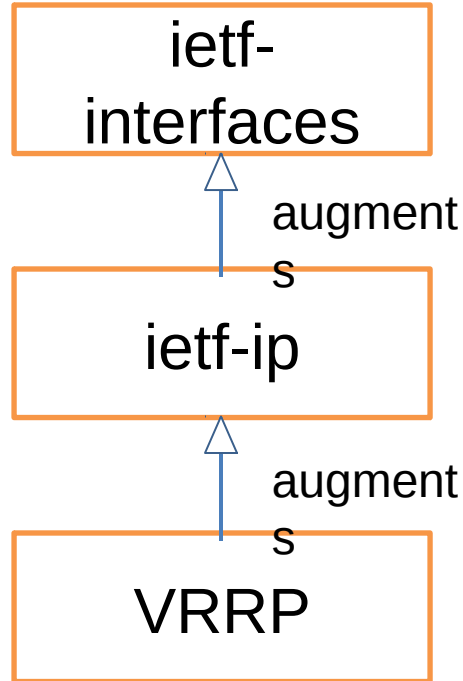
- YANG Data Model for configuring and monitoring the VRRP (Virtual Router Redundancy Protocol)
- Covers configuration, operational states, and notifications.
- Covers VRRP version 2 and VRRP version 3

Changes Since Revision 02

- Added network tracking and interface tracking
 - Requested by Anees as this feature is commonly used by operators
 - This feature allows dynamic priority update based on network or interface status
- Removed RPCs that clear statistics
 - Based on the discussions in NETMOD WG
 - Client can keep track of counters without reset
 - Be consistent with ietf-interface and other models.

Relationship with Other Modules

- Augments ietf-interfaces (RFC7223) and ietf-ip (RFC7277)



Augmentation

ietf-interfaces

ietf-ip

VRRP

```
+--rw interfaces
|  +--rw interface*
|    +-----rw ipv4
|    |           +-----rw vrrp
|    |           +--rw vrrp-instance*
|    +-----rw ipv6
|    |           +-----rw vrrp
|    |           +--rw vrrp-instance*
|
+--ro interfaces-state
|  +--ro interface*
|    +-----ro ipv4
|    |           +-----ro vrrp
|    |           +--ro vrrp-instance*
|    +-----ro ipv6
|    |           +-----ro vrrp
|    |           +--ro vrrp-instance*
|  +-----ro vrrp-global
```

Configuration for IPv4

```
augment /if:interfaces/if:interface/ip:ipv4:
  +--rw vrrp
    +--rw vrrp-instance* [vrid]
      +--rw vrid                               uint8
      +--rw version?                          enumeration
      +--rw log-state-change?                 boolean
      +--rw preempt!
      |   +--rw hold-time?    uint16
      +--rw priority?          uint8
      +--rw accept-mode?       boolean
      +--rw (advertise-interval-choice)?
      |   +--:(v2)
      |   |   +--rw advertise-interval-sec?    uint8
      |   +--:(v3)
      |   |   +--rw advertise-interval-centi-sec?  uint16
      +--rw track
      |   +--rw interfaces
      |   |   +--rw interface* [interface]
      |   |   |   +--rw interface              if:interface-ref
      |   |   |   +--rw priority-decrement?    uint8
      |   +--rw networks
      |   |   +--rw network* [network]
      |   |   |   +--rw network                inet:ipv4-prefix
      |   |   |   +--rw priority-decrement?    uint8
      +--rw virtual-ipv4-addresses
      |   +--rw virtual-ipv4-address* [ipv4-address]
      |   |   +--rw ipv4-address    inet:ipv4-address
```



New

Configuration for IPv6

```
augment /if:interfaces/if:interface/ip:ipv6:
  +--rw vrrp
    +--rw vrrp-instance* [vrid]
      +--rw vrid                               uint8
      +--rw version?                          enumeration
      +--rw log-state-change?                 boolean
      +--rw preempt!
      | +--rw hold-time?    uint16
      +--rw priority?                uint8
      +--rw accept-mode?             boolean
      +--rw advertise-interval-centi-sec?  uint16
    +--rw track
      | +--rw interfaces
      | | +--rw interface* [interface]
      | |   +--rw interface          if:interface-ref
      | |   +--rw priority-decrement? uint8
      | +--rw networks
      |   +--rw network* [network]
      |   +--rw network              inet:ipv6-prefix
      |   +--rw priority-decrement? uint8
    +--rw virtual-ipv6-addresses
      +--rw virtual-ipv6-address* [ipv6-address]
      +--rw ipv6-address            inet:ipv6-address
```



New

Operational States for IPv4

```
augment /if:interfaces-state/if:interface/ip:ipv4:
```

```
  +--ro vrrp
```

```
    +--ro vrrp-instance* [vrid]
```

```
      +--ro vrid                               uint8
```

```
      +--ro version?                           enumeration
```

```
    ... ..
```

```
    +--ro virtual-ipv4-addresses
```

```
      | +--ro virtual-ipv4-address* [ipv4-address]
```

```
      |   +--ro ipv4-address    inet:ipv4-address
```

```
    +--ro track
```

```
      | +--ro interfaces
```

```
        | | +--ro interface* [interface]
```

```
        | |   +--ro interface      if:interface-ref
```

```
        | |   +--ro priority-decrement? uint8
```

```
      | +--ro networks
```

```
        |   +--ro network* [network]
```

```
        |     +--ro network      inet:ipv4-prefix
```

```
        |     +--ro priority-decrement? Uint8
```

```
    +--ro state?                               identityref
```

```
    +--ro is-owner?                             boolean
```

```
    +--ro last-adv-source?                       inet:ip-address
```

```
    +--ro up-time?                             yang:date-and-time
```

```
    +--ro master-down-interval?                 uint32
```

```
    +--ro skew-time?                           uint32
```

```
    +--ro last-event?                           string
```

```
    +--ro new-master-reason?                     enumeration
```



New

Operational States for IPv6

```
augment /if:interfaces-state/if:interface/ip:ipv6:
```

```
  +--ro vrrp
```

```
    +--ro vrrp-instance* [vrid]
```

```
      +--ro vrid                               uint8
```

```
      +--ro version?                           enumeration
```

```
      ... ..
```

```
    +--ro track
```

```
      | +--ro interfaces
```

```
      | | +--ro interface* [interface]
```

```
      | |   +--ro interface                 if:interface-ref
```

```
      | |   +--ro priority-decrement?      uint8
```

```
      | +--ro networks
```

```
      |   +--ro network* [network]
```

```
      |     +--ro network                   inet:ipv6-prefix
```

```
      |     +--ro priority-decrement?      uint8
```

```
  +--ro virtual-ipv6-addresses
```

```
    | +--ro virtual-ipv6-address* [ipv6-address]
```

```
    |   +--ro ipv6-address      inet:ipv6-address
```

```
  +--ro virtual-ipv6-addresses
```

```
    | +--ro virtual-ipv6-address* [ipv6-address]
```

```
    |   +--ro ipv6-address      inet:ipv6-address
```

```
  +--ro state?                           identityref
```

```
  +--ro is-owner?                         boolean
```

```
  +--ro last-adv-source?                  inet:ip-address
```

```
  +--ro up-time?                          yang:date-and-time
```

```
  +--ro master-down-interval?             uint32
```

```
  +--ro skew-time?                        uint32
```

```
  +--ro last-event?                       string
```

```
  +--ro new-master-reason?                 enumeration
```

New

Statistics for IPv4

```
augment /if:interfaces-state/if:interface/ip:ipv4:
```

```
  +--ro vrrp
```

```
    +--ro vrrp-instance* [vrid]
```

```
      +--ro vrid
```

```
          uint8
```

```
      ... ..
```

```
    +--ro statistics
```

```
      +--ro discontinuity-time?
```

```
          yang:date-and-time
```

```
      +--ro master-transitions?
```

```
          yang:counter32
```

```
      +--ro advertisement-recv?
```

```
          yang:counter64
```

```
      +--ro advertisement-sent?
```

```
          yang:counter64
```

```
      +--ro interval-errors?
```

```
          yang:counter64
```

```
      +--ro priority-zero-pkts-rcvd?
```

```
          yang:counter64
```

```
      +--ro priority-zero-pkts-sent?
```

```
          yang:counter64
```

```
      +--ro invalid-type-pkts-rcvd?
```

```
          yang:counter64
```

```
      +--ro address-list-errors?
```

```
          yang:counter64
```

```
      +--ro packet-length-errors?
```

```
          yang:counter64
```

Statistics for IPv6

```
augment /if:interfaces-state/if:interface/ip:ipv6:
```

```
  +--ro vrrp
```

```
    +--ro vrrp-instance* [vrid]
```

```
      +--ro vrid
```

```
          uint8
```

```
      ... ..
```

```
    +--ro statistics
```

```
      +--ro discontinuity-time?
```

```
          yang:date-and-time
```

```
      +--ro master-transitions?
```

```
          yang:counter32
```

```
      +--ro advertisement-recv?
```

```
          yang:counter64
```

```
      +--ro advertisement-sent?
```

```
          yang:counter64
```

```
      +--ro interval-errors?
```

```
          yang:counter64
```

```
      +--ro priority-zero-pkts-rcvd?
```

```
          yang:counter64
```

```
      +--ro priority-zero-pkts-sent?
```

```
          yang:counter64
```

```
      +--ro invalid-type-pkts-rcvd?
```

```
          yang:counter64
```

```
      +--ro address-list-errors?
```

```
          yang:counter64
```

```
      +--ro packet-length-errors?
```

```
          yang:counter64
```

Global Statistics

```
augment /if:interfaces-state:
```

```
  +--ro vrrp-global
```

```
    +--ro virtual-routers?                uint32
```

```
    +--ro interfaces?                     uint32
```

```
    +--ro checksum-errors?                yang:counter64
```

```
    +--ro version-errors?                 yang:counter64
```

```
    +--ro vrid-errors?                    yang:counter64
```

```
    +--ro ip-ttl-errors?                  yang:counter64
```

```
    +--ro global-statistics-discontinuity-time?
```

```
        yang:date-and-time
```

Notifications

notifications:

```
+---n mpls-new-master-event
|  +--ro master-ipaddr?          inet:ipv4-address
|  +--ro new-master-reason?      enumeration
+---n vrrp-protocol-error-event
|  +--ro protocol-error-reason?  enumeration
+---n vrrp-virtual-router-error-event
    +--ro interface?             if:interface-ref
    +--ro ip-version?            enumeration
    +--ro vrid-v4?               leafref
    +--ro vrid-v6?               leafref
    +--ro virtual-router-error-reason? enumeration
```

Next Steps

- Solicit more comments
- Ask for WG adoption