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A YANG Data Model for Virtual Router Redundancy Protocol (VRRP)
draft-liu-rtgwg-yang-vrrp-02.txt

Abstract

This document describes a data model for Virtual Router Redundancy Protocol (VRRP). Both version 2 and version 3 of VRRP are covered.

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[1.](#) Introduction

This document introduces a YANG [[RFC6020](#)] data model for Virtual Router Redundancy Protocol (VRRP) [[RFC3768](#)][[RFC5798](#)]. VRRP provides higher resiliency by specifying an election protocol that dynamically assigns responsibility for a virtual router to one of the VRRP routers on a LAN.

This YANG model supports both version 2 and version 3 of VRRP. VRRP version 2 defined in [[RFC3768](#)] supports IPv4. VRRP version 3 defined in [[RFC5798](#)] supports both IPv4 and IPv6.

[1.1.](#) Terminology

The keywords "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [BCP 14](#), [[RFC2119](#)].

The following terms are defined in [[RFC6020](#)] and are not redefined here:

- o augment

- o data model
- o data node

[2. VRRP YANG model overview](#)

This document defines the YANG module "ietf-vrrp", which has the following structure:

```

module: ietf-vrrp
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 virtual-ipv4-addresses
        +--rw virtual-ipv4-address* [ipv4-address]
        +--rw ipv4-address    inet:ipv4-address
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 virtual-ipv6-addresses
        +--rw virtual-ipv6-address* [ipv6-address]
        +--rw ipv6-address    inet:ipv6-address

```

```

augment /if:interfaces-state/if:interface/ip:ipv4:
  +--ro vrrp
    +--ro vrrp-instance* [vrid]
      +--ro vrid
        uint8

```

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```

  +--ro version?
    enumeration
  +--ro log-state-change?
    boolean
  +--ro preempt!
    | +--ro hold-time?    uint16
  +--ro priority?
    uint8
  +--ro accept-mode?
    boolean
  +--ro (advertise-interval-choice)?
    | +--:(v2)
    | | +--ro advertise-interval-sec?    uint8
    | +--:(v3)
    |   +--ro advertise-interval-centi-sec?  uint16
  +--ro virtual-ipv4-addresses
    | +--ro virtual-ipv4-address* [ipv4-address]
    |   +--ro ipv4-address    inet:ipv4-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?
    new-master-reason-type
  +--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
  {validate-interval-errors}?
    +--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
  {validate-address-list-errors}?
    +--ro packet-length-errors?    yang:counter64
augment /if:interfaces-state/if:interface/ip:ipv6:
  +--ro vrrp
    +--ro vrrp-instance* [vrid]

```

+++ro vrid	uint8
+++ro version?	enumeration
+++ro log-state-change?	boolean

```

+++ro preempt!
|  +++ro hold-time?    uint16
+++ro priority?                uint8
+++ro accept-mode?            boolean
+++ro advertise-interval-centi-sec?  uint16
+++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?        new-master-reason-type
+++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
{validate-interval-errors}?
    +++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
{validate-address-list-errors}?
    +++ro packet-length-errors?   yang:counter64
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

```

```
rpcs:
  +---x clear-vrrp-statistics
```

```
    +---ro input
      +---ro clear-type?    enumeration
      +---ro interface?    if:interface-ref
      +---ro ip-version?    enumeration
      +---ro vrid-v4?       leafref
      +---ro vrid-v6?       leafref
notifications:
  +---n mpls-new-master-event
  | +---ro master-ipaddr?    inet:ipv4-address
  | +---ro new-master-reason? new-master-reason-type
  +---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
```

[3.](#) VRRP YANG module

```
<CODE BEGINS> file "ietf-vrrp@2015-03-19.yang"
module ietf-vrrp {
  namespace "urn:ietf:params:xml:ns:yang:ietf-vrrp";
  // replace with IANA namespace when assigned
  prefix vrrp;

  import ietf-inet-types {
    prefix "inet";
  }

  import ietf-yang-types {
    prefix "yang";
  }

  import ietf-interfaces {
    prefix if;
  }

  import ietf-ip {
```

prefix ip;

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```
}

organization "TBD";
contact "TBD";
description
  "This YANG module defines a model for managing Virtual Router
  Redundancy Protocol (VRRP) version 2 and version 3.";

revision "2015-03-19" {
  description "Initial revision";
  reference
    "RFC 2787: Definitions of Managed Objects for the Virtual
    Router Redundancy Protocol.
    RFC 3768: Virtual Router Redundancy Protocol (VRRP).
    RFC 5798: Virtual Router Redundancy Protocol (VRRP) Version
    3.
    RFC 6527: Definitions of Managed Objects for the Virtual
    Router Redundancy Protocol Version 3 (VRRPv3).";
}

/*
 * Features
 */

feature validate-interval-errors {
  description
    "This feature indicates that the system validates that
    the advertisement interval from advertisement packets
    received is the same as the one configured for the local
    VRRP router.";
}

feature validate-address-list-errors {
  description
    "This feature indicates that the system validates that
    the address list from received packets matches the
    locally configured list for the VRRP router.";
}

/*
```

```
*/

typedef new-master-reason-type {
    type enumeration {
        enum not-master {
            description
                "The virtual router has never transitioned to master
                state,";
        }
        enum priority {
            description "Priority was higher.";
        }
        enum preempted {
            description "The master was preempted.";
        }
        enum master-no-response {
            description "Previous master did not respond.";
        }
    }
    description
        "The reason for the virtual router to transition to master
        state.";
} // new-master-reason-type

/*
 * Identities
 */

identity vrrp-state-type {
    description
        "The type to indicate the state of a virtual router.";
}

identity initialize {
    base vrrp-state-type;
    description
        "Indicates that the virtual router is waiting
        for a startup event.";
}

identity backup {
    base vrrp-state-type;
    description
```


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```
        "Indicates that the virtual router is monitoring the
        availability of the master router.";
    }
    identity master {
        base vrrp-state-type;
        description
            "Indicates that the virtual router is forwarding
            packets for IP addresses that are associated with
            this virtual router.";
    }

    /*
    * Groupings
    */

    grouping vrrp-common-attributes {
        description
            "Group of VRRP attributes common to version 2 and version 3";

        leaf vrid {
            type uint8 {
                range 1..255;
            }
            description "Virtual router ID.";
        }

        leaf version {
            type enumeration {
                enum 2 {
                    description "VRRP version 2.";
                }
                enum 3 {
                    description "VRRP version 3.";
                }
            }
            description "Version 2 or version 3 of VRRP.";
        }

        leaf log-state-change {
            type boolean;
            description
```



```
    "Generates VRRP state change messages each time the VRRP
    instance changes state (from up to down or down to up).";
}

container preempt {
    presence "Present if preempt is enabled.";
    description
        "Enables a higher priority Virtual Router Redundancy
        Protocol (VRRP) backup router to preempt a lower priority
        VRRP master.";
    leaf hold-time {
        type uint16;
        description
            "Hold time, in seconds, for which a higher priority VRRP
            backup router must wait before preempting a lower priority
            VRRP master.";
    }
}

leaf priority {
    type uint8 {
        range 1..254;
    }
    default 100;
    description
        "Configures the Virtual Router Redundancy Protocol (VRRP)
        election priority for the backup virtual router.";
}
} // vrrp-common-attributes

grouping vrrp-v3-attributes {
    description
        "Group of VRRP versin 3 attributes.";

    leaf accept-mode {
        type boolean;
        default false;
        description
            "Controls whether a virtual router in Master state will
            accept packets addressed to the address owner's IPvX address
            as its own if it is not the IPvX address owner. The default
```

is false. Deployments that rely on, for example, pinging the address owner's IPvX address may wish to configure accept-mode to true.

Note: IPv6 Neighbor Solicitations and Neighbor Advertisements MUST NOT be dropped when accept-mode is false.";

```
}
}

grouping vrrp-ipv4-attributes {
  description
    "Group of VRRP attributes for IPv4.";

  uses vrrp-common-attributes;

  uses vrrp-v3-attributes {
    when "version = 3" {
      description "Applicable only to version 3.";
    }
  }
}

choice advertise-interval-choice {
  description
    "The options for the advertisement interval at which VRRPv2
    or VRRPv3 advertisements are sent from the specified
    interface.";

  case v2 {
    when "version = 2" {
      description "Applicable only to version 2.";
    }
    leaf advertise-interval-sec {
      type uint8 {
        range 1..254;
      }
      default 1;
      description
        "Configures the interval that Virtual Router
        Redundancy Protocol Version 2 (VRRPv2) advertisements
        are sent from the specified interface.";
    }
  }
}
```

```
    }

    case v3 {
        when "version = 3" {
            description "Applicable only to version 3.";
        }
        leaf advertise-interval-centi-sec {
            type uint16 {
                range 1..4095;
            }
            units centiseconds;
            default 100;
            description
                "Configures the interval that Virtual Router
                 Redundancy Protocol version 3 (VRRPv3) advertisements
                 are sent from the specified interface.";
        }
    }
} // advertise-interval-choice

container virtual-ipv4-addresses {
    description
        "Configures the virtual IP address for the Virtual Router
         Redundancy Protocol (VRRP) interface.";

    list virtual-ipv4-address {
        key "ipv4-address";
        max-elements 16;
        description
            "Virtual IP addresses for a single VRRP instance. For a
             VRRP owner router, the virtual address must match one
             of the IP addresses configured on the interface
             corresponding to the virtual router.";

        leaf ipv4-address {
            type inet:ipv4-address;
            description
                "Virtual IPv4 address.";
        }
    } // virtual-ipv4-address
} // virtual-ipv4-addresses
```

```
} // grouping vrrp-ipv4-attributes

grouping vrrp-ipv6-attributes {
  description
    "Group of VRRP attributes for IPv6.";

  uses vrrp-common-attributes;

  uses vrrp-v3-attributes {
    when "version = 3" {
      description "Uses VRRP version 3 attributes.";
    }
  } // uses vrrp-v3-attributes

  leaf advertise-interval-centi-sec {
    type uint16 {
      range 1..4095;
    }
    units centiseconds;
    default 100;
    description
      "Configures the interval that Virtual Router
      Redundancy Protocol version 3 (VRRPv3) advertisements
      are sent from the specified interface.";
  }

  container virtual-ipv6-addresses {
    description
      "Configures the virtual IP address for the Virtual Router
      Redundancy Protocol (VRRP) interface.";
    list virtual-ipv6-address {
      key "ipv6-address";
      max-elements 2;
      description
        "Two IPv6 addresses are allowed. The first one must be
        a link-local address and the second one can be a
        link-local or global address.";

      leaf ipv6-address {
        type inet:ipv6-address;
        description
```

```
        "Virtual IPv6 address.";
    }
    } // virtual-ipv6-address
  } // virtual-ipv6-addresses
} // grouping vrrp-ipv6-attributes

grouping vrrp-state-attributes {
  description
    "Group of VRRP state attributes.";

  leaf state {
    type identityref {
      base vrrp-state-type;
    }
    description
      "Operational state.";
  }

  leaf is-owner {
    type boolean;
    description
      "Set to true if this virtual router is owner.";
  }

  leaf last-adv-source {
    type inet:ip-address;
    description
      "Last advertised IPv4/IPv6 source address";
  }

  leaf up-time {
    type yang:date-and-time;
    description
      "The time when this virtual router
      transitioned out of init state.";
  }

  leaf master-down-interval {
    type uint32;
    units centiseconds;
    description
```

```
        "Time interval for backup virtual router to declare
        Master down.";
    }

    leaf skew-time {
        type uint32;
        units microseconds;
        description
            "Calculated based on the priority and advertisement
            interval configuration command parameters. See RFC 3768.";
    }

    leaf last-event {
        type string;
        description
            "Last reported event.";
    }

    leaf new-master-reason {
        type new-master-reason-type;
        description
            "Indicates the reason for the virtual router to transition
            to master state.";
    }

    container statistics {
        description
            "VRRP statistics.";

        leaf discontinuity-time {
            type yang:date-and-time;
            description
                "The time on the most recent occasion at which any one or
                more of the VRRP statistic counters suffered a
                discontinuity.  If no such discontinuities have occurred
                since the last re-initialization of the local management
                subsystem, then this node contains the time that the
                local management subsystem re-initialized itself.";
        }

        leaf master-transitions {
```



```
    type yang:counter32;
    description
      "The total number of times that this virtual router's
       state has transitioned to master";
  }

  leaf advertisement-recv {
    type yang:counter64;
    description
      "The total number of VRRP advertisements received by
       this virtual router.";
  }

  leaf advertisement-sent {
    type yang:counter64;
    description
      "The total number of VRRP advertisements sent by
       this virtual router.";
  }

  leaf interval-errors {
    if-feature validate-interval-errors;
    type yang:counter64;
    description
      "The total number of VRRP advertisement packets
       received with an advertisement interval
       different than the one configured for the local
       virtual router";
  }

  leaf priority-zero-pkts-rcvd {
    type yang:counter64;
    description
      "The total number of VRRP packets received by the
       virtual router with a priority of 0.";
  }

  leaf priority-zero-pkts-sent {
    type yang:counter64;
    description
      "The total number of VRRP packets sent by the
```

```
        virtual router with a priority of 0.";
    }

    leaf invalid-type-pkts-rcvd {
        type yang:counter64;
        description
            "The number of VRRP packets received by the virtual
            router with an invalid value in the 'type' field.";
    }

    leaf address-list-errors {
        if-feature validate-address-list-errors;
        type yang:counter64;
        description
            "The total number of packets received with an
            address list that does not match the locally
            configured address list for the virtual router.";
    }

    leaf packet-length-errors {
        type yang:counter64;
        description
            "The total number of packets received with a packet
            length less than the length of the VRRP header.";
    }
} // container statistics
} // grouping vrrp-state-attributes

grouping vrrp-global-state-attributes {
    description
        "Group of VRRP global state attributes.";

    leaf virtual-routers {
        type uint32;
        description "Number of configured virtual routers.";
    }

    leaf interfaces {
        type uint32;
        description "Number of interface with VRRP configured.";
    }
}
```

```
leaf checksum-errors {
  type yang:counter64;
  description
    "The total number of VRRP packets received with an invalid
    VRRP checksum value.";
  reference "RFC 5798, Section 5.2.8";
}

leaf version-errors {
  type yang:counter64;
  description
    "The total number of VRRP packets received with an unknown
    or unsupported version number.";
  reference "RFC 5798, Section 5.2.1";
}

leaf vrid-errors {
  type yang:counter64;
  description
    "The total number of VRRP packets received with a VRID that
    is not valid for any virtual router on this router.";
  reference "RFC 5798, Section 5.2.3";
}

leaf ip-ttl-errors {
  type yang:counter64;
  description
    "The total number of VRRP packets received by the
    virtual router with IP TTL (Time-To-Live) not equal
    to 255.";
  reference "RFC 5798, Sections 5.1.1.3 and 5.1.2.3";
}

leaf global-statistics-discontinuity-time {
  type yang:date-and-time;
  description
    "The time on the most recent occasion at which one of
    router-checksum-errors, router-version-errors,
    router-vrid-errors, and ip-ttl-errors suffered a
    discontinuity."
```

```
        If no such discontinuities have occurred since the last
        re-initialization of the local management subsystem,
        then this object will be 0.";
    }
} // vrrp-global-state-attributes

/*
 * Configuration data nodes
 */

augment "/if:interfaces/if:interface/ip:ipv4" {
    description "Augment IPv4 interface.";

    container vrrp {
        description
            "Configures the Virtual Router Redundancy Protocol (VRRP)
            version 2 or version 3 for IPv4.";

        list vrrp-instance {
            key vrid;
            description
                "Defines a virtual router, identified by a virtual router
                identifier (VRID), within IPv4 address space.";

            uses vrrp-ipv4-attributes;
        }
    }
} // augment ipv4

augment "/if:interfaces/if:interface/ip:ipv6" {
    description "Augment IPv6 interface.";

    container vrrp {
        description
            "Configures the Virtual Router Redundancy Protocol (VRRP)
            version 3 for IPv6.";

        list vrrp-instance {
            must "version = 3" {
                description

```

```
        "IPv6 is only supported by version 3.";
    }
    key vrid;
    description
        "Defines a virtual router, identified by a virtual router
        identifier (VRID), within IPv6 address space.";

    uses vrrp-ipv6-attributes;
} // list vrrp-instance
} // container vrrp
} // augment ipv6

/*
 * Operational state data nodes
 */

augment "/if:interfaces-state/if:interface/ip:ipv4" {
    description "Augment IPv4 interface state.";

    container vrrp {
        description
            "State information for Virtual Router Redundancy Protocol
            (VRRP) version 2 for IPv4.";

        list vrrp-instance {
            key vrid;
            description
                "States of a virtual router, identified by a virtual router
                identifier (VRID), within IPv4 address space.";

            uses vrrp-ipv4-attributes;
            uses vrrp-state-attributes;
        } // list vrrp-instance
    }
}

augment "/if:interfaces-state/if:interface/ip:ipv6" {
    description "Augment IPv6 interface state.";

    container vrrp {
        description
```

```
    "State information of the Virtual Router Redundancy Protocol
    (VRRP) version 2 or version 3 for IPv6.";

    list vrrp-instance {
        key vrid;
        description
            "States of a virtual router, identified by a virtual router
            identifier (VRID), within IPv6 address space.";

        uses vrrp-ipv6-attributes;
        uses vrrp-state-attributes;
    } // list vrrp-instance
}

augment "/if:interfaces-state" {
    description "Specify VRRP state data at the global level.";

    container vrrp-global {
        description
            "State information of the Virtual Router Redundancy Protocol
            (VRRP) at the global level";

        uses vrrp-global-state-attributes;
    }
}

/*
 * RPCs
 */

rpc clear-vrrp-statistics {
    description
        "Clears Virtual Router Redundancy Protocol (VRRP) statistics.";

    input {
        leaf clear-type {
            type enumeration {
                enum all {
                    description
                        "Clears all VRRP statistics.";
                }
            }
        }
    }
}
```

```
    }
    enum global {
        description
            "Clears global VRRP statistics.";
    }
    enum all-interface {
        description
            "Clears VRRP statistics for all interfaces.";
    }
    enum interface {
        description
            "Clears VRRP statistics for the specified interface.";
    }
    enum virtual-router {
        description
            "Clears VRRP statistics for the specified virtual
            router.";
    }
    enum scheduler {
        description "Clear VRRP scheduler statistics.";
    }
}
description
    "Specify the type of information to be cleared.";
}

leaf interface {
    when "../clear-type = 'interface' or "
        + "../clear-type = 'virtual-router'" {
        description
            "Valid only when clear-type is interface.";
    }
    type if:interface-ref;
    description
        "Specify the interface for which statistics area
        to be cleared.";
}

leaf ip-version {
    when "../clear-type = 'virtual-router'" {
        description
```

```
        "Valid only when clear-type is virtual-router.";
    }
    type enumeration {
        enum 4 {
            description "IPv4";
        }
        enum 6 {
            description "IPv6";
        }
    }
    description "Specify the IP version.";
}

leaf vrid-v4 {
    when "'../clear-type = virtual-router' and"
        + "'../ip-version = 4'" {
        description
            "Valid only when clear-type is virtual-router.";
    }
    type leafref {
        path "/if:interfaces/if:interface"
            + "[if:name = current()../interface]/ip:ipv4/vrrp/"
            + "vrrp-instance/vrid";
    }
    description
        "Specify the virtual router for which statistics are
        to be cleared.";
}

leaf vrid-v6 {
    when "'../clear-type = virtual-router' and"
        + "'../ip-version = 6'" {
        description
            "Valid only when clear-type is virtual-router.";
    }
    type leafref {
        path "/if:interfaces/if:interface"
            + "[if:name = current()../interface]/ip:ipv6/vrrp/"
            + "vrrp-instance/vrid";
    }
    description
```



```
        "Specify the virtual router for which statistics are to
        be cleared.";
    }
} // input
} // rpc clear-vrrp-statistics

/*
 * Notifications
 */

notification mpls-new-master-event {
    description
        "Notification event for a change of VRRP new master.";
    leaf master-ipaddr {
        type inet:ipv4-address;
        description
            "IPv4 or IPv6 address of the new master.";
    }
    leaf new-master-reason {
        type new-master-reason-type;
        description
            "Indicates the reason for the virtual router to transition
            to master state.";
    }
}

notification vrrp-protocol-error-event {
    description
        "Notification event for a VRRP protocol error.";
    leaf protocol-error-reason {
        type enumeration {
            enum checksum-error {
                description
                    "A packet has been received with an invalid VRRP checksum
                    value.";
            }
            enum version-error {
                description
                    "A packet has been received with an unknown or
                    unsupported version number.";
            }
        }
    }
}
```

```
    enum vrid-error {
      description
        "A packet has been received with a VRID that is not valid
        for any virtual router on this router.";
    }
    enum ip-ttl-error {
      description
        "A packet has been received with IP TTL (Time-To-Live)
        not equal to 255.";
    }
  }
  description
    "Indicates the reason for the protocol error.";
}

notification vrrp-virtual-router-error-event {
  description
    "Notification event for a error happened on a virtual router.";
  leaf interface {
    type if:interface-ref;
    description
      "Indicates the interface for which statistics area
      to be cleared.";
  }
  leaf ip-version {
    type enumeration {
      enum 4 {
        description "IPv4";
      }
      enum 6 {
        description "IPv6";
      }
    }
    description "Indicates the IP version.";
  }
  leaf vrid-v4 {
    type leafref {
      path "/if:interfaces/if:interface"
        + "[if:name = current()/../interface]/ip:ipv4/vrrp/"
        + "vrrp-instance/vrid";
    }
  }
}
```

```
    }
    description
      "Indicates the virtual router on which the event has
      occurred.";
  }

  leaf vrid-v6 {
    type leafref {
      path "/if:interfaces/if:interface"
        + "[if:name = current()/../interface]/ip:ipv6/vrrp/"
        + "vrrp-instance/vrid";
    }
    description
      "Indicates the virtual router on which the event has
      occurred.";
  }
  leaf virtual-router-error-reason {
    type enumeration {
      enum interval-error {
        description
          "A packet has been received with an advertisement
          interval different than the one configured for the local
          virtual router";
      }
      enum address-list-error {
        description
          "A packet has been received with an address list that
          does not match the locally configured address list for
          the virtual router.";
      }
      enum packet-length-error {
        description
          "A packet has been received with a packet length less
          than the length of the VRRP header.";
      }
    }
    description
      "Indicates the reason for the virtual router error.";
  }
}
}
```

<CODE ENDS>

[4. Security Considerations](#)

The configuration, state, action and notification data defined in this document are designed to be accessed via the NETCONF protocol [[RFC6241](#)]. The data-model by itself does not create any security implications. The security considerations for the NETCONF protocol are applicable. The NETCONF protocol used for sending the data supports authentication and encryption.

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