YANG Data Model for IPv6 Neighbor Discovery

draft-ietf-6man-ipv6-neighbor-discovery-yang-02

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Recap - What does this model cover

- Existing YANG definitions
  - *ietf-ip.yang* [RFC8344] covers **basic ARP** and **IPv6 ND** functionalities
  - *ietf-ipv6-router-advertisements.yang* [RFC8349] covers **Router Advertisement**
  - *draft-ietf-rtgwg-arp-yang-model* extends **ARP** YANG functionalities
- This draft covers the **additional configuration and management of IPv6 ND and related functions** that are not covered by the above YANG model, including
  - IPv6 Address Resolution & Redirect
  - Proxy Neighbor Advertisement
  - Neighbor Unreachability Detection (NUD)
  - Duplicate Address Detection (DAD)
  - Enhanced DAD
  - ND Statistics

Changes since IETF 123

- Move from RTGWG to **6MAN**
- Change the model name to ***"ietf-ipv6-nd"***
- Add nodes about ***Enhanced DAD***
- Remove nodes about ***Secure ND & Secure ND Proxy***
- Add ***Appendix.B Coverage of IPv6 ND Functions in YANG Modules***
  - RFC 4861, 4862, 4941, 7527
  - ietf-ip, ietf-ipv6-router-advertisements, ietf-ipv6-nd

RFC (Sec)	Function/Parameter	Covered by	Path
4861 s5.1	Neighbor Cache	ietf-ip	/if:interfaces/if:interface/ip:ipv6/ip:neighbor
4862 s5.1	Prefix List (AdvPrefixList)	ietf-ipv6-router-advertisements	/if:interfaces/if:interface/ip:ipv6/v6ur:prefix-list
4861 s6.2.1	IsRouter	ietf-ip	/if:interfaces/if:interface/ip:ipv6/ip:forwarding
4861 s6.2.1	AdvSendAdvertisements	ietf-ipv6-router-advertisements	/if:interfaces/if:interface/ip:ipv6/v6ur:ipv6-router-advertisements
4861 s6.2.1	MaxRtrAdvInterval	ietf-ipv6-router-advertisements	/if:interfaces/if:interface/ip:ipv6/v6ur:max-rtr-adv-interval

```
module: ietf-ipv6-nd
  +--rw nd
     +--rw stale-timeout?   uint32

  augment /if:interfaces/if:interface/ip:ipv6:
    +--rw nd
       +--rw dynamic-discovery?   boolean
       +--rw nud?                 boolean
       +--rw reachable-time?      uint32
       +--rw ns-interval?         uint32
       +--rw stale-timeout?       uint32
       +--rw redirect?            boolean
       +--rw proxy-na
       |  +--rw inter-vlan-proxy?   boolean
       |  +--rw all-proxy?          boolean
       +--rw enhanced-dad
       |  +--rw enable?                        boolean
       |  +--rw enhanced-dad-auto-resolve?    boolean
       +--ro statistics
          +--ro in-ns-pkts?           yang:counter32
          +--ro in-na-pkts?           yang:counter32
          +--ro in-rs-pkts?           yang:counter32
          +--ro in-ra-pkts?           yang:counter32
          +--ro in-redirect-pkts?     yang:counter32
          +--ro out-ns-pkts?          yang:counter32
          +--ro out-na-pkts?          yang:counter32
          +--ro out-rs-pkts?          yang:counter32
          +--ro out-ra-pkts?          yang:counter32
          +--ro out-redirect-pkts?    yang:counter32
  augment
/if:interfaces/if:interface/ip:ipv6/ip:neighbor:
    +--ro age?   uint32
```

Next steps

- Comments are welcome

Thanks!

YANG excerpts

RFC8344: A YANG Data Model for **IP Management**

```
module: ietf-ip
  augment /if:interfaces/if:interface:
    +--rw ipv4!
    |  +--rw enabled?      boolean
    |  +--rw forwarding?   boolean
    |  ...
    |  +--rw neighbor* [ip]
    |     +--rw ip           inet:ipv4-address-no-zone
    |     +--rw link-layer-address  yang:phys-address
    |     +--ro origin?              neighbor-origin
    +--rw ipv6!
       +--rw enabled?                     boolean
       +--rw forwarding?                  boolean
       |  ...
       +--rw neighbor* [ip]
       |  +--rw ip           inet:ipv6-address-no-zone
       |  +--rw link-layer-address  yang:phys-address
       |  +--ro origin?              neighbor-origin
       |  +--ro is-router?           empty
       |  +--ro state?               enumeration
       +--rw dup-addr-detect-transmits?   uint32
       +--rw autoconf
          ...
```

RFC8349: A YANG Data Model for **Routing Management**

```
augment /if:interfaces/if:interface/ip:ipv6:
   +--rw ipv6-router-advertisements
      +--rw send-advertisements?    boolean
      +--rw max-rtr-adv-interval?   uint16
      +--rw min-rtr-adv-interval?   uint16
      +--rw managed-flag?           boolean
      +--rw other-config-flag?      boolean
      +--rw link-mtu?               uint32
      +--rw reachable-time?         uint32
      +--rw retrans-timer?          uint32
      +--rw cur-hop-limit?          uint8
      +--rw default-lifetime?       uint16
      +--rw prefix-list
         +--rw prefix* [prefix-spec]
            +--rw prefix-spec          inet:ipv6-prefix
            +--rw (control-adv-prefixes)?
               +--:(no-advertise)
               |  +--rw no-advertise?         empty
               +--:(advertise)
                  +--rw valid-lifetime?       uint32
                  +--rw on-link-flag?         boolean
                  +--rw preferred-lifetime?   uint32
                  +--rw autonomous-flag?      boolean
```