A YANG Data Model for DHCP Configuration

(draft-liu-dhc-dhcp-yang-model-00)

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Basis

- This model contains three roles of a DHCP system: DHCP server, DHCP relay, and DHCP client
  - a device could be either one of the roles, or a combination of two or three roles
  - when a device is configured multiple roles, the roles are independent with each other
  - this model is only a container for the roles, there is no intrinsic relationship between the roles
- This model is dedicated for DHCPv4 configuration, NOT including DHCPv6

DHCP Relay

```
+--relay
  |  +--rw dhcpRelayIfCfgs
  |  |  +--rw dhcpRelayIfCfg* [ifName]
  |  |     +--rw ifName                  string
  |  |     +--rw enable                  boolean
  |  |     +--rw serverGroupName         string
  |  |     +--rw serverAddress           inet:ipv4-address
  |  +--rw dhcpRelayServerGroups
  |  |  +--rw dhcpRelayServerGroup* [serverGroupName]
  |  |     +--rw serverGroupName         string
  |  |     +--rw vpnName                 if:interface-ref
  |  |     +--rw sourceIP                inet:ip-address
  |  |     +--rw gateway                 inet:ip-address
  |  |     +--rw serverAddress           enum
  |  |     +--r dhcpRelaySerGrpStats
  |  |        +--r dhcpRelaySerGrpStat* [serverIpAddr]
  |  |           +--r serverIpAddr              inet:ipv4-address
  |  |           +--r pktsReceiveFromClient     uint32
  |  |           +--r discoverPktsReceive       uint32
  |  |           +--r requestPktsReceive        uint32
  |  |                    ...
  |  +--r dhcpRelayStatistics
  |     +--r badPacketsRecvd                 uint32
  |     +--r packetsRecvdFromClient          uint32
  |     +--r discoverPacketsRecvd            uint32
  |     +--r requestPacketsRecvd             uint32
                 ...
```

- The relay function is configured in a per interface manner.
  - “dhcpRelayIfCfg” is general relay configurations
- There might be multiple DHCP servers (for high reliable, load balancing etc.)
  - The servers could combined as multiple groups
  - each group is binding to a specific relay configuration ("dhcpRelayIfCfgs")

DHCP Server

```
+--server
  |  +--rw common
  |  |  +--rw  pingPacketNumber  uint8
  |  |  +--rw  pingPacketTimeOut uint16
  |  +--rw globalIpPools
  |  |  +--rw globalIpPool*  [ipPoolName]
  |  |  |  +--rw ipPoolName     string
  |  |  |  +--rw vpnInstance    string
  |  |  |  +--rw gatewayIp
  |  |  |  +--rw gatewayIp    inet:ipv4-address
  |  |  |  +--rw gatewayMask  inet:ipv4-address
  |  |  +--rw sections
  |  |  |   +--rw section*  [sectionIndex]
  |  |  |     +--rw sectionIndex      uint16
  |  |  |     +--rw sectionStartIp    inet:ipv4-address
  |  |  |     +--rw sectionEndIp      inet:ipv4-address
  |  |  |     +--r ipPoolSectionStat
                        ...
  |  |  +--rw leaseTime
  |  |  |  +--rw day    uint16
  |  |  |  +--rw hour   uint8
  |  |  |  +--rw minute uint8
  |  |  +--rw domainNameServer  inet:ipv4-address
  |  |  +--rw domainName        string
  |  |  +--rw NbnsServer        inet:ipv4-address
  |  |  +--rw NbNodeType        enum
  |  |  +--rw UserDefOptions
  |  |  |  +--rw UserDefOptions*  [optionCode]
  |  |  |     +--rw optionCode    uint8
  |  |  |     +--rw ipAddress     inet:ipv4-address
  |  |  |     +--rw optionString  string
  |  |  |     +--rw optionHex     string
  |  |  +--r ipPoolStat
  |  |           ...
  |  +--r packetStatistics
           ...
```

- **“common”**
  - Configuration for address pinging
- **“globalIpPools”**
  - IP address pool configuration
  - DNS configuration
  - User defined opitons

DHCP Client

```
+--client
   +--rw dhcpClientIfs
     +--rw dhcpClientIf* [ifName]
     +--rw ifName  string
     +--rw enable  boolean
     +--r dhcpClientStatus
     |  +--r status          enum
     |  +--r clientIpAddr     inet:ipv4-address
     |  +--r dnsServerIpAddr  inet:ipv4-address
     +--r dhcpClientIfStatistics
       +--r discoverCount uint32
       +--r requestCount  uint32
       +--r declineCount  uint32
       +--r releaseCount  uint32
       +--r informCount   uint32
       +--r offerCount    uint32
       +--r ackCount      uint32
       +--r nakCount      uint32
```

- DHCP client is also managed in a per interface
- Mostly is statistics

Feedbacks from the YANG Doctor Advice Session

- Consider separating the models
  - if the roles normally are not configured together in one device, it would be better to separate them into different models, to avoid confusion/complexity for configuration
  - WG opinion?
- Add client statics in server module
- Name issue
  - e.g. “globalipPool” -> “global-ip-pool”

Next Steps

- Reviews will be appreciate very much!
- A useful work in DHC WG?

Comment?
Thank you!