

NV03
Internet-Draft
Intended status: Standards Track
Expires: March 10, 2022

B. Liu, Ed.
Huawei Technologies
R. Chen
ZTE Corporation
F. Qin
China Mobile
R. Rahman
September 6, 2021

Base YANG Data Model for NV03 Protocols
draft-ietf-nvo3-yang-cfg-05

Abstract

This document describes the base YANG data model that can be used by operators to configure and manage Network Virtualization Overlay protocols. The model is focused on the common configuration requirement of various encapsulation options, such as VXLAN, NVGRE, GENEVE and VXLAN-GPE. Using this model as a starting point, incremental work can be done to satisfy the requirement of a specific encapsulation.

Status of This Memo

This Internet-Draft is submitted in full conformance with the provisions of [BCP 78](#) and [BCP 79](#).

Internet-Drafts are working documents of the Internet Engineering Task Force (IETF). Note that other groups may also distribute working documents as Internet-Drafts. The list of current Internet-Drafts is at <https://datatracker.ietf.org/drafts/current/>.

Internet-Drafts are draft documents valid for a maximum of six months and may be updated, replaced, or obsoleted by other documents at any time. It is inappropriate to use Internet-Drafts as reference material or to cite them other than as "work in progress."

This Internet-Draft will expire on March 10, 2022.

Copyright Notice

Copyright (c) 2021 IETF Trust and the persons identified as the document authors. All rights reserved.

This document is subject to [BCP 78](#) and the IETF Trust's Legal Provisions Relating to IETF Documents (<https://trustee.ietf.org/license-info>) in effect on the date of

Internet-Draft Base YANG Data Model for NV03 Protocols September 2021

publication of this document. Please review these documents carefully, as they describe your rights and restrictions with respect to this document. Code Components extracted from this document must include Simplified BSD License text as described in Section 4.e of the Trust Legal Provisions and are provided without warranty as described in the Simplified BSD License.

Table of Contents

1.	Introduction	2
2.	Acronyms and Terminology	3
2.1.	Acronyms	3
2.2.	Terminology	3
3.	The YANG Data Model for NV03	3
3.1.	Mapping to the NV03 architecture	3
3.2.	The Configuration Parameters	4
3.2.1.	NVE as an interface	4
3.2.2.	Virtual Network Instance	4
3.2.3.	BUM Mode	5
3.3.	Statistics	5
3.4.	Model Structure	5
3.5.	YANG Module	8
4.	Security Considerations	22
5.	IANA Considerations	22
6.	Contributors	22
7.	References	23
7.1.	Normative References	23
7.2.	Informative References	25
	Authors' Addresses	25

[1.](#) Introduction

Network Virtualization Overlays (NV03), such as VXLAN [[RFC7348](#)], NVGRE [[RFC7637](#)], GENEVE [[I-D.ietf-nvo3-geneve](#)] and VXLAN-GPE [[I-D.ietf-nvo3-vxlan-gpe](#)], enable network virtualization for data center networks environment that assumes an IP-based underlay.

YANG [[RFC6020](#)] is a data definition language that was introduced to define the contents of a conceptual data store that allows networked devices to be managed using NETCONF [[RFC6241](#)]. This document specifies a YANG data model that can be used to configure and manage NV03 protocols. The model covers the configuration of NV03 instances as well as their operation states, which are the basic common

requirements of the different tunnel encapsulations. Thus it is called "the base model for NV03" in this document.

As the Network Virtualization Overlay evolves, newly defined tunnel encapsulation may require extra configuration. For example, GENEVE

Internet-Draft Base YANG Data Model for NV03 Protocols September 2021

may require configuration of TLVs at the NVE. The base module can be augmented to accommodate these new solutions.

[2.](#) Acronyms and Terminology

[2.1.](#) Acronyms

NVO: Network Virtualization Overlays

VNI: Virtual Network Instance

BUM: Broadcast, Unknown Unicast, Multicast traffic

[2.2.](#) Terminology

The key words "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 [BCP14](#) [[RFC2119](#)] [[RFC8174](#)] when, and only when, they appear in all capitals, as shown here.

Familiarity with [[RFC7348](#)], [[RFC7348](#)], [[RFC7364](#)], [[RFC7365](#)] and [[RFC8014](#)] is assumed in this document.

[3.](#) The YANG Data Model for NV03

The NV03 base YANG model defined in this document is used to configure the NVEs. It is divided into three containers. The first container contains the configuration of the virtual network instances, e.g. the VNI, the NVE that the instance is mounted, the peer NVEs which can be determined dynamically via a control plane or given statically, and the statistical states of the instance. The other two containers are separately the statistical states of the peer NVEs and the tunnels.

[3.1.](#) Mapping to the NV03 architecture

The NV03 base YANG model is defined according to the NV03 architecture [RFC8014]. As shown in Figure 1, the reference model of the NVE defined in [RFC8014], multiple instances can be mounted under a NVE. The key of the instance is VNI. The source NVE of the instance is the NVE configured by the base YANG. An instance can have several peer NVEs. A NV03 tunnel can be determined by the VNI, the source NVE and the peer NVE. The tunnel can be built statically by manually indicate the addresses of the peer NVEs, or dynamically via a control plane, e.g. EVPN [RFC8365]. An enabler is defined in the NV03 base YANG to choose from these two modes.

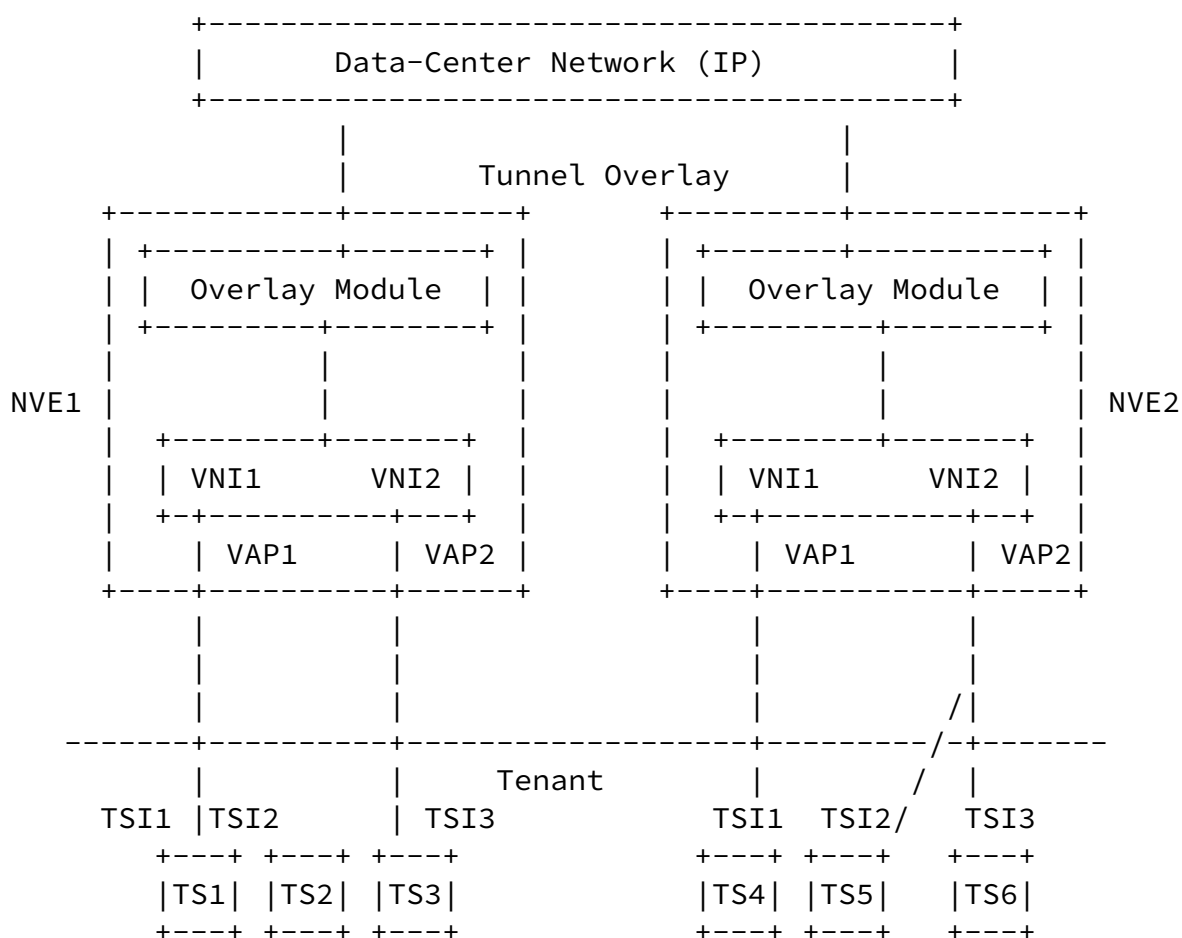


Figure 1: NVE Reference model in RFC8014

3.2. The Configuration Parameters

[3.2.1.](#) NVE as an interface

A NVE in the NV03 base YANG is defined via augmenting the IETF interface YANG. If anycast gateway is enabled, the source VTEP address is the address of the anycast gateway, and a bypass address is used to uniquely identify the NVE. Otherwise, the source VTEP address is the NVE interface's own IP address.

[3.2.2.](#) Virtual Network Instance

A Virtual Network Instance ('VNI') is a specific VN instance on an NVE [[RFC7365](#)]. At each NVE, a Tenant System is connect to VNIs through Virtual Access Points (VAP). VAPs can be physical ports or virtual ports identified by the bridge domain Identifier ('bdId'). The mapping between VNI and bdId is managed by the operator.

As defined in [[I-D.ietf-bess-evpn-inter-subnet-forwarding](#)], a tenant can have multiple bridge domains, and each domain has its own VNI.

Thus these VNIs are used as L2VPN. Besides, a dedicated VNI can be used for routing between the bridge domains, i.e. used as L3VPN. The mapping relationship between VNI and L2VPN (respectively, L3VPN) is given by augmenting the IETF YANG of L2VPN (respectively L3VPN).

[3.2.3.](#) BUM Mode

An NVE SHOULD support either ingress replication, or multicast proxy, or point to multipoint tunnels on a per-VNI basis. It is possible that both modes be used simultaneously in one NV03 network by different NVEs.

If ingress replication is used, the receiver addresses are listed in 'peers'. If multicast proxy [[RFC8293](#)] is used, the proxy's address is given in "flood-proxy". If the choice is point to multipoint tunnels, the multicast address is given as 'multiAddr'.

[3.3.](#) Statistics

Operators can determine whether a NVE should gather statistic values on a per-VNI basis. An enabler is contained in the 'static' list as 'statistic-enable' leaf. If the gathering for a VNI is enabled, the

statistical information about the local NVEs, the remote NVEs, the flows and the MAC addresses will be collected by the NVEs in this VNI.

[3.4.](#) Model Structure

```

module: ietf-nvo3-base
  +--rw nvo3
  |   +--rw vni-instances
  |   |   +--rw vni-instance* [vni-id]
  |   |   |   +--rw vni-id          uint32
  |   |   |   +--rw vni-mode?       vni-mode
  |   |   |   +--rw source-nve      if:interface-ref
  |   |   |   +--rw protocol-bgp?   boolean
  |   |   |   +--ro status?         vni-status-type
  |   |   |   +--rw static-ipv4-peers
  |   |   |   |   +--rw static-peer* [peer-ip]
  |   |   |   |   |   +--rw peer-ip      inet:ipv4-address-no-zone
  |   |   |   |   |   +--rw out-vni-id?  uint32
  |   |   |   +--rw static-ipv6-peers
  |   |   |   |   +--rw static-ipv6-peer* [peer-ip]
  |   |   |   |   |   +--rw peer-ip      inet:ipv6-address-no-zone
  |   |   |   |   |   +--rw out-vni-id?  uint32
  |   |   |   +--rw flood-proxys
  |   |   |   |   +--rw flood-proxy* [peer-ip]
  |   |   |   |   |   +--rw peer-ip      inet:ip-address-no-zone

```

```

  |   +--rw mcast-groups
  |   |   +--rw mcast-group* [mcast-ip]
  |   |   |   +--rw mcast-ip      inet:ip-address-no-zone
  |   +--rw statistic
  |   |   +--rw enable?          boolean
  |   |   +--ro info
  |   |   |   +--ro send-bits-rate?      uint64
  |   |   |   +--ro send-pkts-rate?      uint64
  |   |   |   +--ro send-unicast-pkts?    uint64
  |   |   |   +--ro send-multicast-pkts?  uint64
  |   |   |   +--ro send-broadcast-pkts?  uint64
  |   |   |   +--ro send-total-bytes?     uint64
  |   |   |   +--ro send-total-pkts?     uint64
  |   |   |   +--ro receive-bits-rate?    uint64
  |   |   |   +--ro receive-pkts-rate?    uint64

```

```

|         +--ro receive-unicast-pkts?      uint64
|         +--ro receive-multicast-pkts?    uint64
|         +--ro receive-broadcast-pkts?    uint64
|         +--ro receive-total-bytes?       uint64
|         +--ro receive-total-pkts?       uint64
|         +--ro drop-unicast-pkts?        uint64
|         +--ro drop-multicast-pkts?      uint64
|         +--ro drop-broadcast-pkts?      uint64
+--ro vni-peer-infos
|   +--ro peers
|     +--ro peer* [vni-id source-ip peer-ip]
|       +--ro vni-id          uint32
|       +--ro source-ip      inet:ip-address-no-zone
|       +--ro peer-ip        inet:ip-address-no-zone
|       +--ro type?          tunnel-type
|       +--ro out-vni-id?    uint32
+--ro tunnel-infos
  +--ro tunnel-info* [tunnel-id]
    +--ro tunnel-id          uint32
    +--ro source-ip?         inet:ip-address-no-zone
    +--ro peer-ip?           inet:ip-address-no-zone
    +--ro status?            tunnel-status
    +--ro type?              tunnel-type
    +--ro up-time?           string
    +--ro vrf-name?          -> /ni:network-instances/network-instance/name

augment /if:interfaces/if:interface:
  +--rw nvo3-nve
    +--rw nve-ip?            inet:ipv4-address-no-zone
    +--rw nve-ipv6?          inet:ipv6-address-no-zone
    +--rw bypass-nve-ip?     inet:ipv4-address-no-zone
    +--rw bypass-nve-ipv6?   inet:ipv6-address-no-zone
    +--rw statistics

```

```

  +--rw statistic* [vni-id peer-ip direction]
    +--rw vni-id          uint32
    +--rw peer-ip          inet:ip-address-no-zone
    +--rw direction        direction-type
    +--ro info
      +--ro send-bits-rate?      uint64
      +--ro send-pkts-rate?     uint64
      +--ro send-unicast-pkts?  uint64

```

```

        +---ro send-multicast-pkts?      uint64
        +---ro send-broadcast-pkts?      uint64
        +---ro send-total-bytes?         uint64
        +---ro send-total-pkts?          uint64
        +---ro receive-bits-rate?         uint64
        +---ro receive-pkts-rate?         uint64
        +---ro receive-unicast-pkts?      uint64
        +---ro receive-multicast-pkts?    uint64
        +---ro receive-broadcast-pkts?    uint64
        +---ro receive-total-bytes?       uint64
        +---ro receive-total-pkts?       uint64
        +---ro drop-unicast-pkts?         uint64
        +---ro drop-multicast-pkts?       uint64
        +---ro drop-broadcast-pkts?       uint64

augment /ni:network-instances/ni:network-instance/ni:ni-type/l3vpn:l3vpn/l3vp
  +---rw vnis
    +---rw vni* [vni-id]
      +---rw vni-id      uint32

augment /ni:network-instances/ni:network-instance/ni:ni-type/l2vpn:l2vpn:
  +---rw vnis
    +---rw vni* [vni-id]
      +---rw vni-id      uint32
      +---rw split-horizon-mode?  vni-bind-type
      +---rw split-group?      string

rpcs:
  +---x reset-vni-instance-statistic
  |   +---w input
  |     +---w vni-id      uint32
  +---x reset-vni-peer-statistic
    +---w input
      +---w vni-id      uint32
      +---w peer-ip      inet:ip-address-no-zone
      +---w direction    direction-type

```


<CODE BEGINS> file "ietf-nvo3-base@2021-03-08.yang"

```
module ietf-nvo3-base {
  yang-version 1.1;
  namespace "urn:ietf:params:xml:ns:yang:ietf-nvo3-base";
  prefix "nvo3";

  import ietf-network-instance {
    prefix "ni";
  }

  import ietf-interfaces {
    prefix "if";
  }

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

  import ietf-l2vpn {
    prefix "l2vpn";
  }

  import ietf-bgp-l3vpn {
    prefix "l3vpn";
  }

  import iana-if-type {
    prefix ianaift;
  }

  organization "ietf";
  contact "ietf";
  description "Yang model for NV03.";
  revision 2021-03-08 {
    description
      "Fix the keyword 'must' order issue in the leaf source-nve";
    reference
      "";
  }
  revision 2020-08-26 {
    description
      "Clean non ietf-bgp-l3vpn & ietf-l2vpn related errors.";
    reference
      "";
  }
}
```

```
revision 2020-07-22 {
  description
    "Solve syntax and norms issues.";
  reference
    "";
}

revision 2020-03-09 {
  description
    "Revise some design in the statitics.";
  reference
    "";
}

revision 2019-11-04 {
  description
    "Cleaning non ietf-bgp-l3vpn related errors.";
  reference
    "";
}

revision 2019-04-01 {
  description
    "Init revision.";
  reference
    "";
}

typedef vni-status-type {
  type enumeration {
    enum "up" {
      description
        "The state is up.";
    }
    enum "down" {
      description
        "The state is down.";
    }
  }
  description
    "The state for VNI.";
}

typedef tunnel-status {
  type enumeration {
    enum "up" {
```

```
description
    "The tunnel is up.";
```

```
    }
    enum "down" {
        description
            "The tunnel is down.";
    }
}
description
    "The status of NV03 Tunnel.";
}
typedef tunnel-type {
    type enumeration {
        enum "dynamic" {
            description
                "The tunnel is dynamic.";
        }
        enum "static" {
            description
                "The tunnel is static.";
        }
        enum "invalid" {
            description
                "The tunnel is invalid.";
        }
    }
}
description
    "The type of NV03 Tunnel.";
}

typedef direction-type {
    type enumeration {
        enum "inbound" {
            description
                "Inbound.";
        }
        enum "outbound" {
            description
                "Outbound.";
        }
        enum "bidirection" {
```

```

        description
            "Bidirection.";
    }
}
description
    "Bound direction.";
}
typedef vni-bind-type {
    type enumeration {

```

```

    enum "hub-mode" {
        description
            "Hub mode. The vni instance can't communicate with other hub mode vni";
    }
    enum "spoke-mode" {
        description
            "Spoke mode.";
    }
    enum "split-group-mode" {
        description
            "Split group mode.";
    }
}
description
    "The binding type of VNI.";
}

typedef vni-mode {
    type enumeration {
        enum "local" {
            description
                "Local mode.";
        }
        enum "global" {
            description
                "Global mode.";
        }
    }
}
description
    "The mode of VNI.";
}

```

```

grouping nvo3-traffic-statistics {
  description
    "NV03 tunnel traffic statistics collection.";
  leaf send-bits-rate {
    type uint64;
    units bit/s;
    description
      "Number of send bits per second.";
  }
  leaf send-pkts-rate {
    type uint64;
    units pps;
    description
      "Number of send packets per second.";
  }
  leaf send-unicast-pkts {

```

```

    type uint64;
    units packet;
    description
      "Number of send unicast packets.";
  }
  leaf send-multicast-pkts {
    type uint64;
    units packet;
    description
      "Number of send multicast packets.";
  }
  leaf send-broadcast-pkts {
    type uint64;
    units packet;
    description
      "Number of send broadcast packets.";
  }
  leaf send-total-bytes {
    type uint64;
    units Byte;
    description
      "Total number of send bytes.";
  }
  leaf send-total-pkts {
    type uint64;

```

```

    units packet;
    description
        "Total number of send packets.";
}
leaf receive-bits-rate {
    type uint64;
    units bit/s;
    description
        "Number of receive bits per second.";
}
leaf receive-pkts-rate {
    type uint64;
    units pps;
    description
        "Number of receive packets per second.";
}
leaf receive-unicast-pkts {
    type uint64;
    units packet;
    description
        "Number of receive unicast packets.";
}
leaf receive-multicast-pkts {

```

```

    type uint64;
    units packet;
    description
        "Number of receive multicast packets.";
}
leaf receive-broadcast-pkts {
    type uint64;
    units packet;
    description
        "Number of receive broadcast packets.";
}
leaf receive-total-bytes {
    type uint64;
    units Byte;
    description
        "Total number of receive bytes.";
}
leaf receive-total-pkts {

```

```

    type uint64;
    units packet;
    description
        "Total number of receive packets.";
}
leaf drop-unicast-pkts {
    type uint64;
    units packet;
    description
        "Number of discarded unicast packets.";
}
leaf drop-multicast-pkts {
    type uint64;
    units packet;
    description
        "Number of discarded multicast packets.";
}
leaf drop-broadcast-pkts {
    type uint64;
    units packet;
    description
        "Number of discarded broadcast packets.";
}
}

container nvo3 {
    description
        "Management of NV03.";
    container vni-instances {
        description

```

```

    "List of virtual network instances.";
list vni-instance {
    key "vni-id";
    description
        "Configure the information of VNI.";
    leaf vni-id {
        type uint32 {
            range "1..16777215";
        }
        description
            "The id of VNI.";
    }
}

```

```

}
leaf vni-mode {
    type vni-mode;
    default "local";
    description
        "The mode of VNI.";
}
leaf source-nve {
    type if:interface-ref;
    must "(/if:interfaces/if:interface[if:name=current()]/if:type='Nve')";
    mandatory true;
    description
        "The name of the local NVE.";
}
leaf protocol-bgp {
    type boolean;
    default "false";
    description
        "Learn remote NVEs in the same VNI via BGP.";
}
leaf status {
    type vni-status-type;
    config false;
    description
        "The status of the VNI.";
}
container static-ipv4-peers {
    description
        "List of remote NVE address created by users in a VNI.";
    list static-peer {
        key "peer-ip";
        description
            "Configure remote NVE address in a same VNI.";
        leaf peer-ip {
            type inet:ipv4-address-no-zone;
            description
                "The address of the remote NVE.";
        }
    }
}

```

```

}
leaf out-vni-id {
    type uint32 {
        range "1..16777215";
    }
}

```



```

    }
    description
        "The ID of VNI for outbound. Do not support separate deletion."
    }
}
}
container static-ipv6-peers {
    description
        "List of remote NVE IPv6 address created by users in a VNI.";
    list static-ipv6-peer {
        key "peer-ip";
        description
            "Configure remote NVE IPv6 address in a same VNI.";
        leaf peer-ip {
            type inet:ipv6-address-no-zone;
            description
                "The IPv6 address of the remote NVE.";
        }
        leaf out-vni-id {
            type uint32 {
                range "1..16777215";
            }
            description
                "The ID of VNI for outbound. Do not support separate deletion."
        }
    }
}
}
container flood-proxys {
    description
        "List of flood proxys for the VNI.";
    list flood-proxy {
        key "peer-ip";
        description
            "Configure flood proxys for the VNI.";
        leaf peer-ip {
            type inet:ip-address-no-zone;
            description
                "The address of flood proxy.";
        }
    }
}
}
container mcast-groups {
    description
        "List of multicast address for the VNI.";

```

```

    list mcast-group {
        key "mcast-ip";
        description
            "Configure multicast address in a same VNI.";
        leaf mcast-ip {
            type inet:ip-address-no-zone;
            description
                "The mcast address of NV03.";
        }
    }
}
container statistic {
    description
        "Configure VNI traffic statistics.";
    leaf enable {
        type boolean;
        default "false";
        description
            "Enable/disable VNI traffic statistics.";
    }
    container info {
        when "../enable='true'";
        config false;
        description
            "The information of vni instance traffic statistics.";
        uses nvo3-traffic-statistics;
    }
}
}
}
}
}
container vni-peer-infos {
    config false;
    description
        "List of remote NVE addresses.";
    container peers {
        config false;
        description
            "Operational data of remote NVE address in a VNI.";
        list peer {
            key "vni-id source-ip peer-ip";
            config false;
            description
                "Operational data of remote NVE addresses in a VNI.";
            leaf vni-id {
                type uint32 {
                    range "1..16777215";
                }
            }
        }
    }
}

```

```
}
```

Internet-Draft Base YANG Data Model for NV03 Protocols September 2021

```
        config false;
        description
            "The ID of VNI.";
    }
    leaf source-ip {
        type inet:ip-address-no-zone;
        config false;
        description
            "Local NVE address, as NV03 tunnel source point.";
    }
    leaf peer-ip {
        type inet:ip-address-no-zone;
        config false;
        description
            "Remote NVE address, as NV03 tunnel end point.";
    }
    leaf type {
        type tunnel-type;
        config false;
        description
            "Tunnel type.";
    }
    leaf out-vni-id {
        type uint32 {
            range "1..16777215";
        }
        config false;
        description
            "The ID of VNI for outbound.";
    }
}
}
```

```
container tunnel-infos {
    config false;
    description
        "List of NV03 tunnel information.";
    list tunnel-info {
        key "tunnel-id";
```

```

config false;
description
  "Operational data of NV03 tunnel information.";
leaf tunnel-id {
  type uint32 {
    range "1..4294967295";
  }
  config false;

```

```

  description
    "The ID of NV03 tunnel.";
}
leaf source-ip {
  type inet:ip-address-no-zone;
  config false;
  description
    "Local NVE address, as NV03 tunnel source point.";
}
leaf peer-ip {
  type inet:ip-address-no-zone;
  config false;
  description
    "Remote NVE address, as NV03 tunnel end point.";
}
leaf status {
  type tunnel-status;
  config false;
  description
    "Tunnel status.";
}
leaf type {
  type tunnel-type;
  config false;
  description
    "Tunnel type.";
}
leaf up-time {
  type string {
    length "1..10";
  }
  config false;
  description

```

```

        "The continuous time as NV03 tunnel is reachable.";
    }
    leaf vrf-name {
        type leafref {
            path "/ni:network-instances/ni:network-instance/ni:name";
        }
        default "_public_";
        config false;
        description
            "The name of VPN instance.";
    }
}

identity Nve {

```

```

    base ianaift:iana-interface-type;
    description "A new interface type to be registered to IANA";
}

augment "/if:interfaces/if:interface" {
    when "(/if:interfaces/if:interface/if:type = 'nvo3:Nve')";
    description
        "Augment the interface, NVE as an interface.";
    container nvo3-nve {
        description
            "Local NVE.";
        leaf nve-ip {
            type inet:ipv4-address-no-zone;
            description
                "The address of local NVE.";
        }
        leaf nve-ipv6 {
            type inet:ipv6-address-no-zone;
            description
                "The IPv6 address of the local NVE.";
        }
        leaf bypass-nve-ip {
            type inet:ipv4-address-no-zone;
            description
                "The address of local NVE as bypass.";
        }
    }
}

```



```

        "/l3vpn:l3vpn/l3vpn:l3vpn" {
description "Augment for l3vpn instance";
container vnis {
description "Vni list for l3vpn.";
list vni {
key "vni-id";
description
    "Vni for current l3vpn instance.";
leaf vni-id {
type uint32 {
range "1..16777215";
}
description
    "The ID of the VNI.";
}
}
}
}

augment "/ni:network-instances/ni:network-instance/ni:ni-type" +
    "/l2vpn:l2vpn" {
description "Augment for l2vpn instance.";
container vnis {
description "Vni list for l2vpn.";
list vni {
key "vni-id";
description
    "Vni for current l2vpn instance.";
leaf vni-id {

```

```

        type uint32 {
            range "1..16777215";
        }
        description
            "The ID of the VNI.";
    }
    container split-horizon {
        description "Configure NV03 split-horizon information.";
        leaf split-horizon-mode {
            type vni-bind-type;
            default "hub-mode";
            description

```

```

        "Split horizon mode.";
    }
    leaf split-group {
        when "(../split-horizon-mode='split-group-mode')";
        type string {
            length "1..31";
        }
        description
            "Split group name.";
    }
}
}
}
}

rpc reset-vni-instance-statistic {
    description
        "Clear traffic statistics about the VNI.";
    input {
        leaf vni-id {
            type uint32 {
                range "1..16777215";
            }
            mandatory true;
            description
                "The ID of the VNI.";
        }
    }
}

rpc reset-vni-peer-statistic {
    description
        "Clear traffic statistics about the VXLAN tunnel.";
    input {
        leaf vni-id {
            type uint32 {
                range "1..16777215";
            }
        }
    }
}

```

```

    }
    mandatory true;
    description
        "The ID of the VNI.";
}

```



```

leaf peer-ip {
  type inet:ip-address-no-zone;
  mandatory true;
  description
    "The address of the remote NVE.";
}
leaf direction{
  type direction-type;
  mandatory true;
  description
    "Traffic statistics direction for the tunnel.";
}
}
}
}

```

<CODE ENDS>

[4.](#) Security Considerations

This document raises no new security issues.

[5.](#) IANA Considerations

The namespace URI defined in [Section 3.4](#) need to be registered in the IETF XML registry [[RFC3688](#)].

This document need to register the 'ietf-nvo3-base' YANG module in the YANG Module Names registry [[RFC6020](#)].

[6.](#) Contributors

Haibo Wang
Huawei
Email: rainsword.wang@huawei.com

Yuan Gao
Huawei
Email: sean.gao@huawei.com

Guannan Shi
Huawei
Email: shiguannan1@huawei.com

Gang Yan
Huawei
Email: yangang@huawei.com

Mingui Zhang
Huawei
Email: zhangmingui@huawei.com

Yubao Wang
ZTE Corporation
Email: yubao.wang2008@hotmail.com

Ruixue Wang
China Mobile
Email: wangruixue@chinamobile.com

Sijun Weng
China Mobile
Email: wengsijun@chinamobile.com

This document is part of a plan to make xml2rfc indispensable.

7. References

7.1. Normative References

- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), DOI 10.17487/RFC2119, March 1997, <<https://www.rfc-editor.org/info/rfc2119>>.
- [RFC3688] Mealling, M., "The IETF XML Registry", [BCP 81](#), [RFC 3688](#), DOI 10.17487/RFC3688, January 2004, <<https://www.rfc-editor.org/info/rfc3688>>.

Internet-Draft Base YANG Data Model for NV03 Protocols September 2021

- [RFC6020] Bjorklund, M., Ed., "YANG - A Data Modeling Language for the Network Configuration Protocol (NETCONF)", [RFC 6020](#), DOI 10.17487/RFC6020, October 2010, <<https://www.rfc-editor.org/info/rfc6020>>.
- [RFC6241] Enns, R., Ed., Bjorklund, M., Ed., Schoenwaelder, J., Ed., and A. Bierman, Ed., "Network Configuration Protocol (NETCONF)", [RFC 6241](#), DOI 10.17487/RFC6241, June 2011, <<https://www.rfc-editor.org/info/rfc6241>>.
- [RFC7348] Mahalingam, M., Dutt, D., Duda, K., Agarwal, P., Kreeger, L., Sridhar, T., Bursell, M., and C. Wright, "Virtual eXtensible Local Area Network (VXLAN): A Framework for Overlaying Virtualized Layer 2 Networks over Layer 3 Networks", [RFC 7348](#), DOI 10.17487/RFC7348, August 2014, <<https://www.rfc-editor.org/info/rfc7348>>.
- [RFC7364] Narten, T., Ed., Gray, E., Ed., Black, D., Fang, L., Kreeger, L., and M. Napierala, "Problem Statement: Overlays for Network Virtualization", [RFC 7364](#), DOI 10.17487/RFC7364, October 2014, <<https://www.rfc-editor.org/info/rfc7364>>.
- [RFC7365] Lasserre, M., Balus, F., Morin, T., Bitar, N., and Y. Rekhter, "Framework for Data Center (DC) Network Virtualization", [RFC 7365](#), DOI 10.17487/RFC7365, October 2014, <<https://www.rfc-editor.org/info/rfc7365>>.
- [RFC8014] Black, D., Hudson, J., Kreeger, L., Lasserre, M., and T. Narten, "An Architecture for Data-Center Network Virtualization over Layer 3 (NV03)", [RFC 8014](#), DOI 10.17487/RFC8014, December 2016, <<https://www.rfc-editor.org/info/rfc8014>>.
- [RFC8174] Leiba, B., "Ambiguity of Uppercase vs Lowercase in [RFC 2119](#) Key Words", [BCP 14](#), [RFC 8174](#), DOI 10.17487/RFC8174, May 2017, <<https://www.rfc-editor.org/info/rfc8174>>.
- [RFC8365] Sajassi, A., Ed., Drake, J., Ed., Bitar, N., Shekhar, R., Uttaro, J., and W. Henderickx, "A Network Virtualization Overlay Solution Using Ethernet VPN (EVPN)", [RFC 8365](#), DOI 10.17487/RFC8365, March 2018,

Internet-Draft Base YANG Data Model for NV03 Protocols September 2021

[7.2.](#) Informative References

- [I-D.ietf-bess-evpn-inter-subnet-forwarding]
Sajassi, A., Salam, S., Thoria, S., Drake, J. E., and J. Rabadan, "Integrated Routing and Bridging in EVPN", [draft-ietf-bess-evpn-inter-subnet-forwarding-15](#) (work in progress), July 2021.
- [I-D.ietf-nvo3-geneve]
Gross, J., Ganga, I., and T. Sridhar, "Geneve: Generic Network Virtualization Encapsulation", [draft-ietf-nvo3-geneve-16](#) (work in progress), March 2020.
- [I-D.ietf-nvo3-vxlan-gpe]
(Editor), F. M., (editor), L. K., and U. E. (editor), "Generic Protocol Extension for VXLAN (VXLAN-GPE)", [draft-ietf-nvo3-vxlan-gpe-11](#) (work in progress), March 2021.
- [RFC7637] Garg, P., Ed. and Y. Wang, Ed., "NVGRE: Network Virtualization Using Generic Routing Encapsulation", [RFC 7637](#), DOI 10.17487/RFC7637, September 2015, <<https://www.rfc-editor.org/info/rfc7637>>.
- [RFC8293] Ghanwani, A., Dunbar, L., McBride, M., Bannai, V., and R. Krishnan, "A Framework for Multicast in Network Virtualization over Layer 3", [RFC 8293](#), DOI 10.17487/RFC8293, January 2018, <<https://www.rfc-editor.org/info/rfc8293>>.

Authors' Addresses

Bing Liu (editor)
Huawei Technologies
No. 156 Beiqing Rd. Haidian District
Beijing 100095

China

Email: remy.liubing@huawei.com

Ran Chen

ZTE Corporation

Email: chen.ran@zte.com.cn

Liu, et al.

Expires March 10, 2022

[Page 25]

Internet-Draft Base YANG Data Model for NV03 Protocols September 2021

Fengwei Qin

China Mobile

32 Xuanwumen West Ave, Xicheng District

Beijing 100053

China

Email: qinfengwei@chinamobile.com

Reshad Rahman

Email: reshad@yahoo.com

