Yang Data Model for VxLAN Protocol

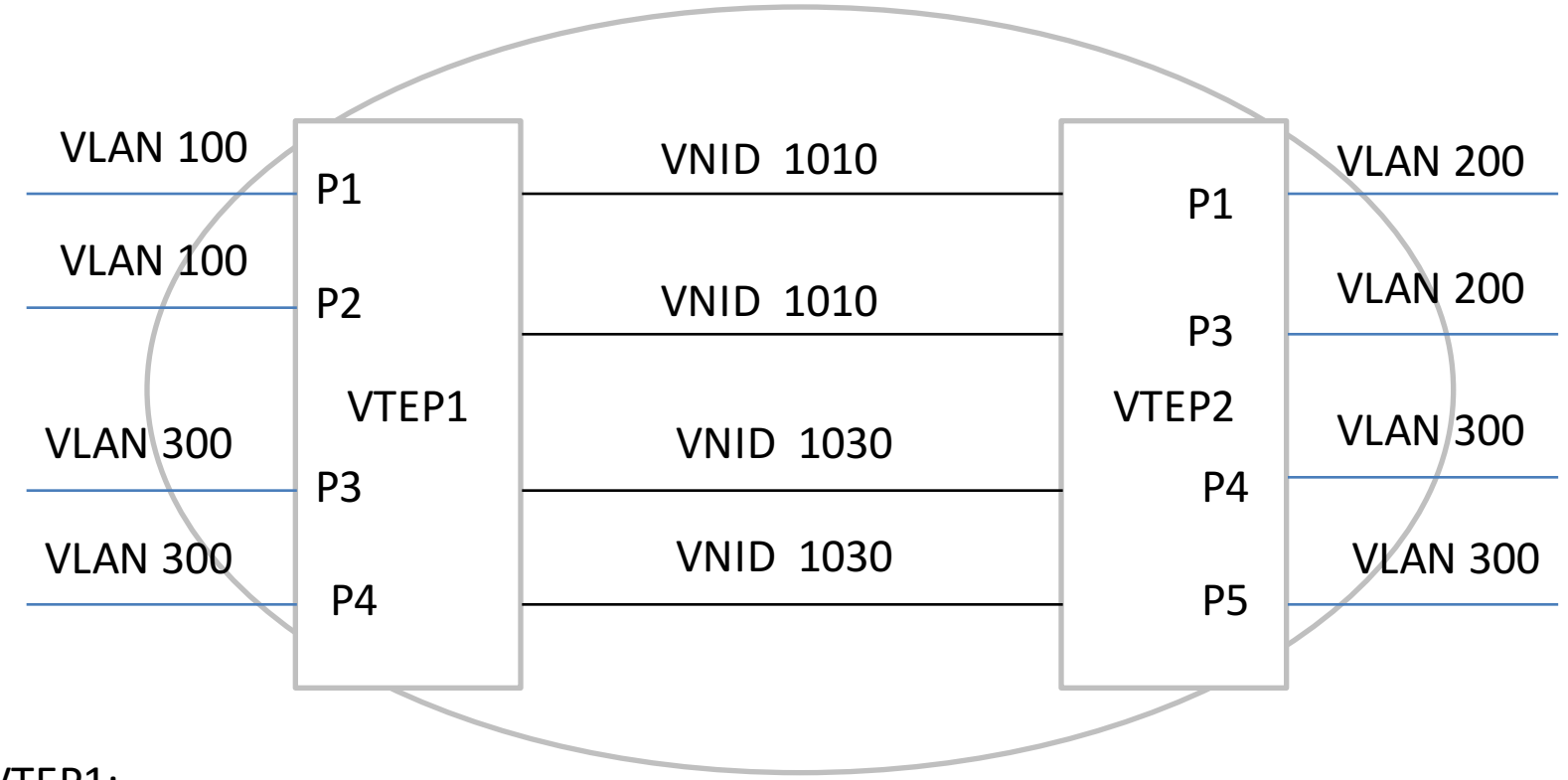
draft-chen-nvo3-vxlan-yang-02.txt

Fangwei Hu (ZTE)
Ran Chen(ZTE)
Mallik. Mahalingam (Springpath)
Qiang. Zu (Ericsson)

VxLAN Access Type

- VLAN-1:1 : a VxLAN VNI maps to one VLAN ID.
- VLAN- n:1 : a VxLAN VNI maps to several VLAN IDs.
- VLAN-l2-interface: VxLAN VNI bindings to a vlan id and a Layer 2 interface
- L3-interface: VxLAN VNI bindings to a layer 3 interface
- Mac: VxLAN VNI bindings to a MAC address

VLAN 1:1



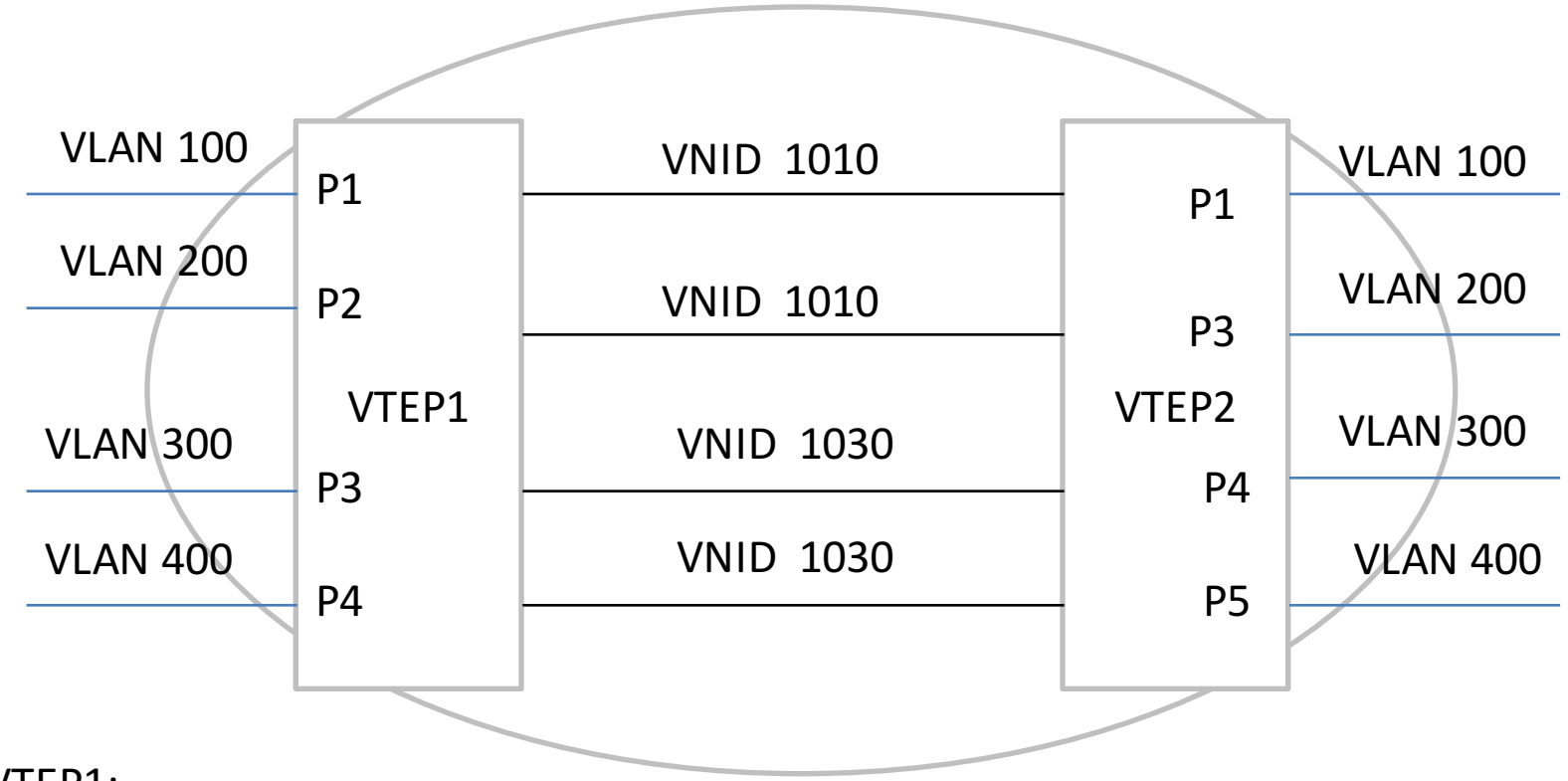
VTEP1:

- P1, P2 belongs to VLAN 100
- P3, P4 belongs to VLAN 300
- VLAN 100 ~ VNID 1010
- VLAN 300 ~VNID 1030

VTEP2:

- P1, P3 belongs to VLAN 200
- P4, P5 belongs to VLAN 300
- VLAN 200 ~ VNID 1010
- VLAN 300 ~VNID 1030

VLAN n:1



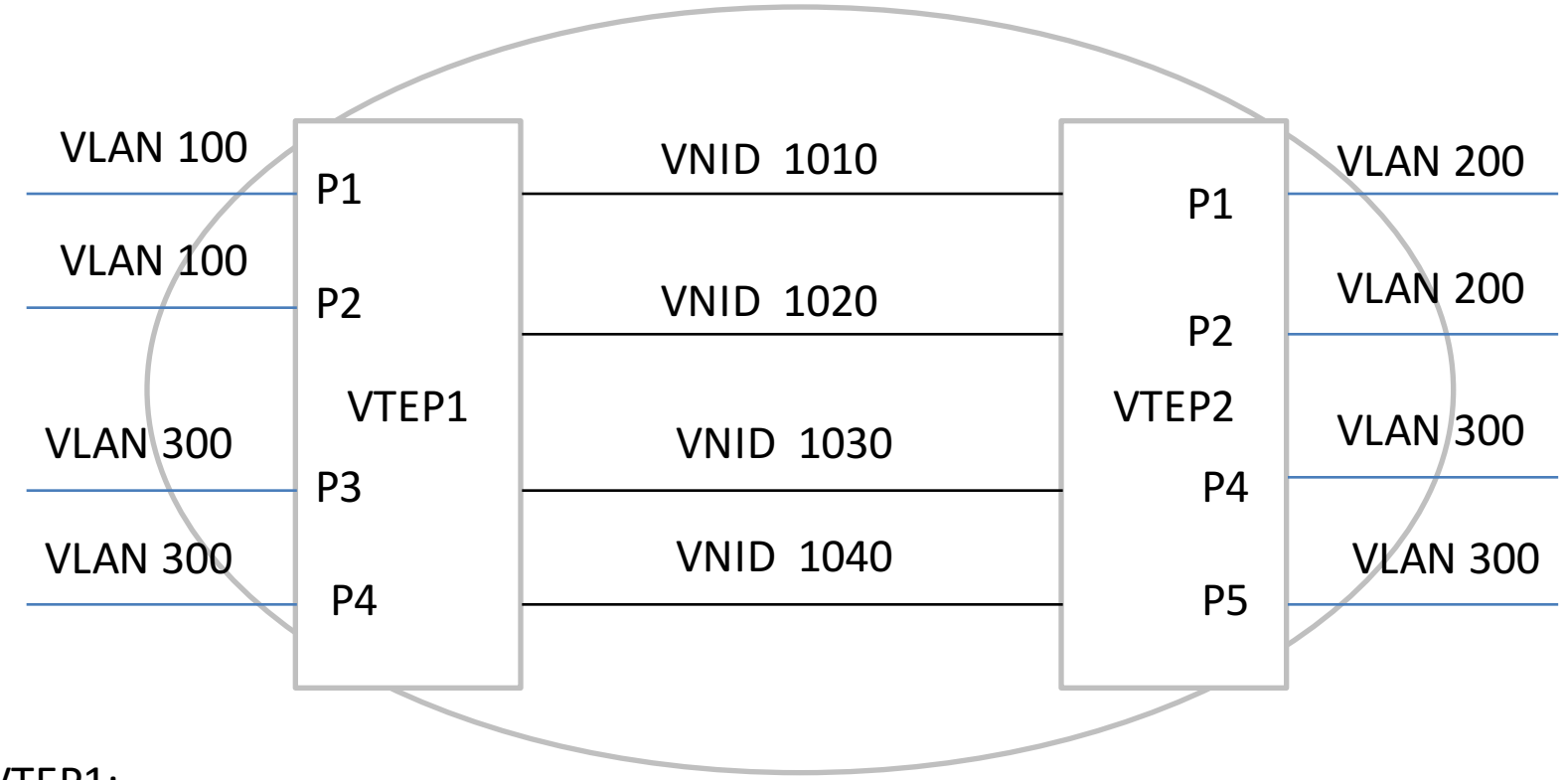
VTEP1:

- VLAN 100, VLAN 200 ~ VNID 1010
- VLAN 300, VLAN 400 ~ VNID 1030

VTEP2:

- VLAN 100 ,VLAN 200~ VNID 1010
- VLAN 300, VLAN 400 ~VNID 1030

VLAN-L2-Interface



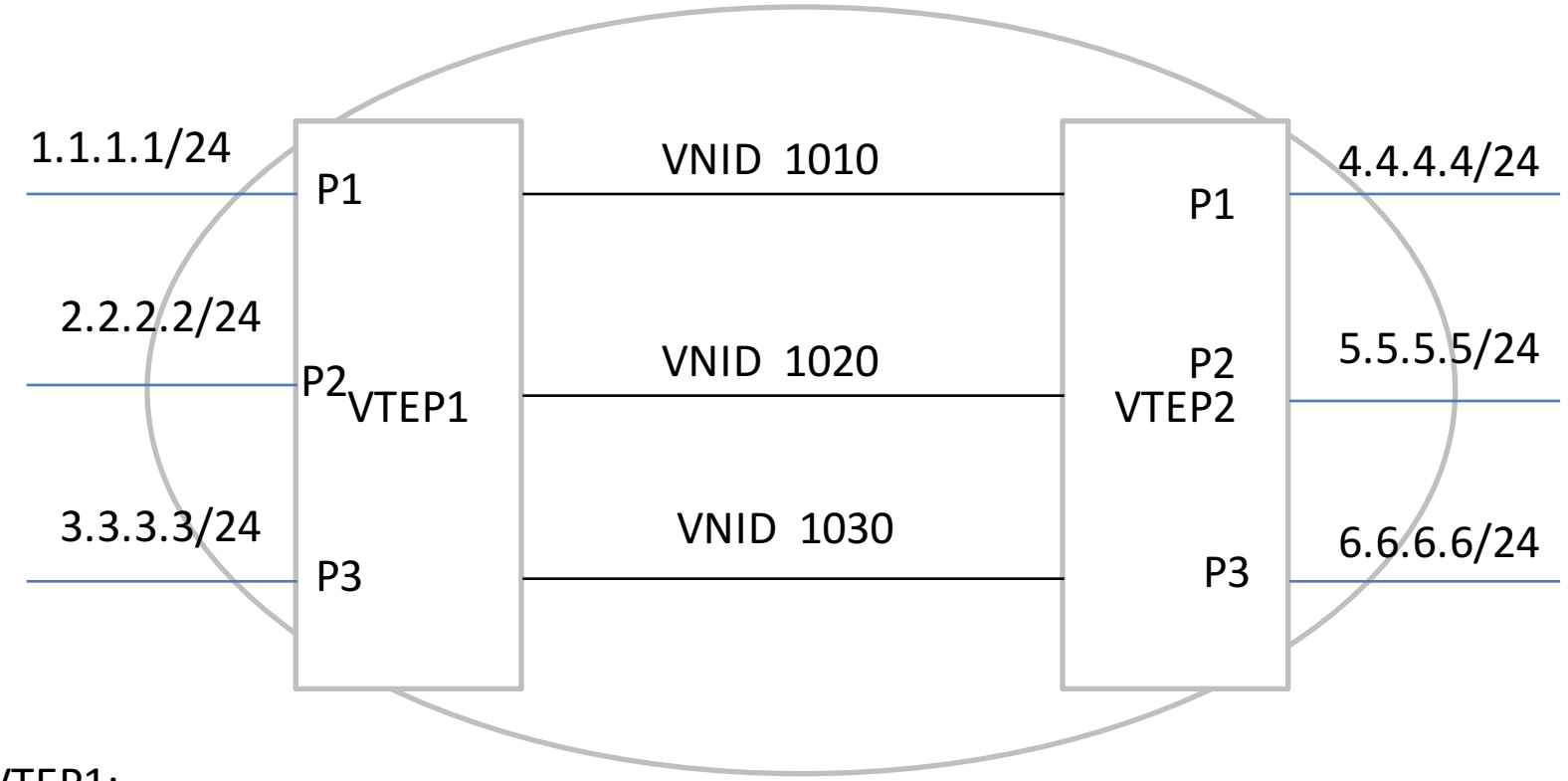
VTEP1:

- VLAN 100 + P1 ~ VNID 1010
- VLAN 100 + P2 ~ VNID 1020
- VLAN 300 + P3 ~ VNID 1030
- VLAN 300 + P4 ~ VNID 1040

VTEP2:

- VLAN 200 + P1 ~ VNID 1010
- VLAN 200 + P2 ~ VNID 1020
- VLAN 300 + P4 ~ VNID 1030
- VLAN 300 + P5 ~ VNID 1040

L3 interface



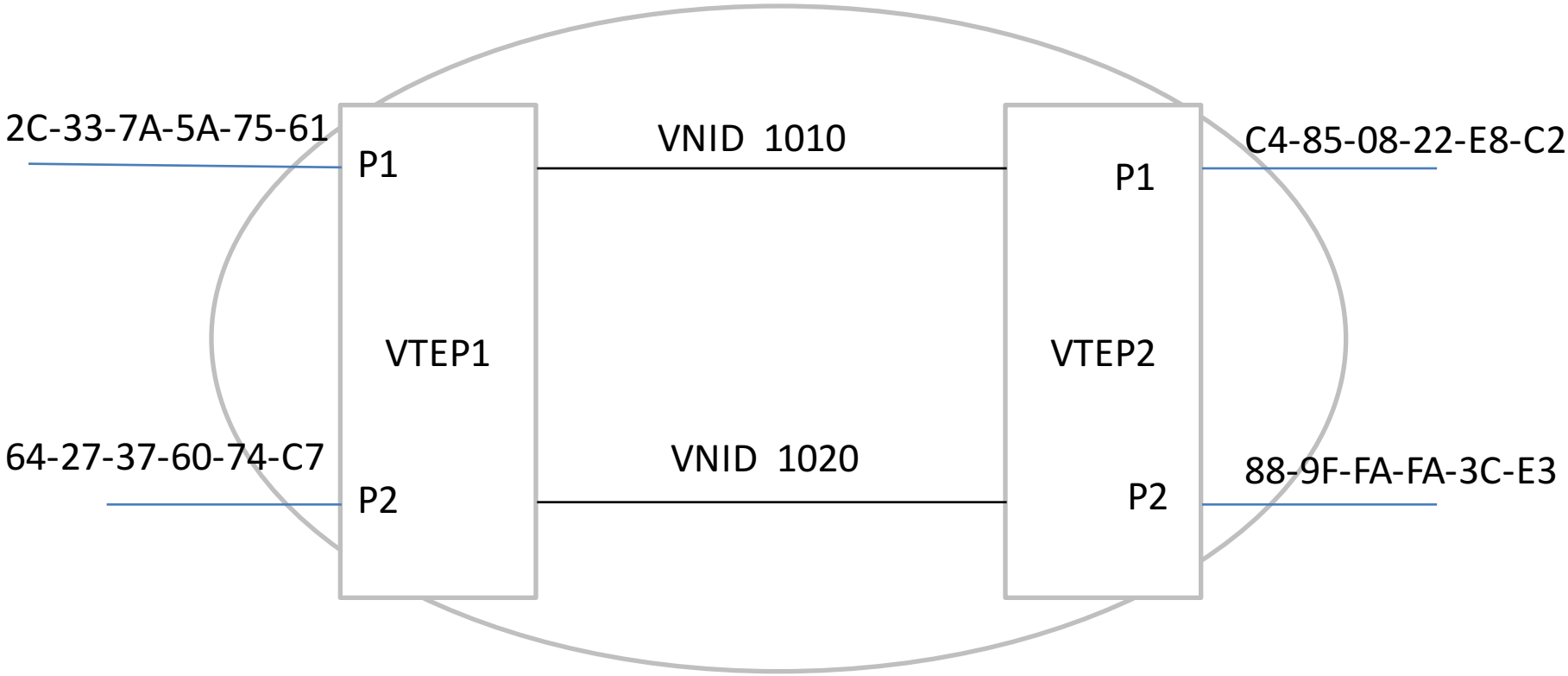
VTEP1:

- P1 ~ VNID 1010
- P2 ~ VNID 1020
- P3~ VNID 1030

VTEP2:

- P1 ~ VNID 1010
- P2 ~ VNID 1020
- P3~ VNID 1030

MAC



VTEP1:

- MAC 1(2C-33-7A-5A-75-61)~ VNID 1010
- MAC 2 (64-27-37-60-74-C7) ~ VNID 1020

VTEP2:

- MAC 1(C4-85-08-22-E8-C2)~ VNID 1010
- MAC 2 (88-9F-FA-FA-3C-E3) ~ VNID 1020

VLAN 1:1 vs. VLAN n:1

- VLAN 1:1
  - The VLAN ID mapping to VTEP1 and the remote VTEP2 can be different for a VXLAN VNID.
    - VTEP1 : VLAN 100 ~ VNID 1010, VLAN 300 ~VNID 1030
    - VTEP2: VLAN 200 ~ VNID 1010, VLAN 300 ~VNID 1030
  - The inner tag handling mode can be discard-inner-vlan mode and no-discard-inner-vlan mode
- VLAN n:1
  - The VLAN ID mapping to VTEP 1 and the remote VTEP2 must be same for a VXLAN VNID
    - VTEP1 : VLAN 100, VLAN 200 ~ VNID 1010, VLAN 300, VLAN 400 ~ VNID 1030
    - VTEP2: VLAN 100 ,VLAN 200~ VNID 1010, VLAN 300, VLAN 400 ~VNID 1030
  - The inner tag handling mode must be no-discard-inner –vlan mode.

VLAN 1:1 vs. VLAN-L2-interface

- VLAN 1:1
  - A VXLAN VNID maps to several ports.
    - VTEP1 :
      - VLAN 100(P1,P2) ~ VNID 1010
- VLAN-L2-interface
  - A VxLAN VNID only maps to one port.
    - VTEP1:
      - VLAN 100 + P1 ~ VNID 1010
      - VLAN 100 + P2 ~ VNID 1020

VxLAN Access Type Configuration

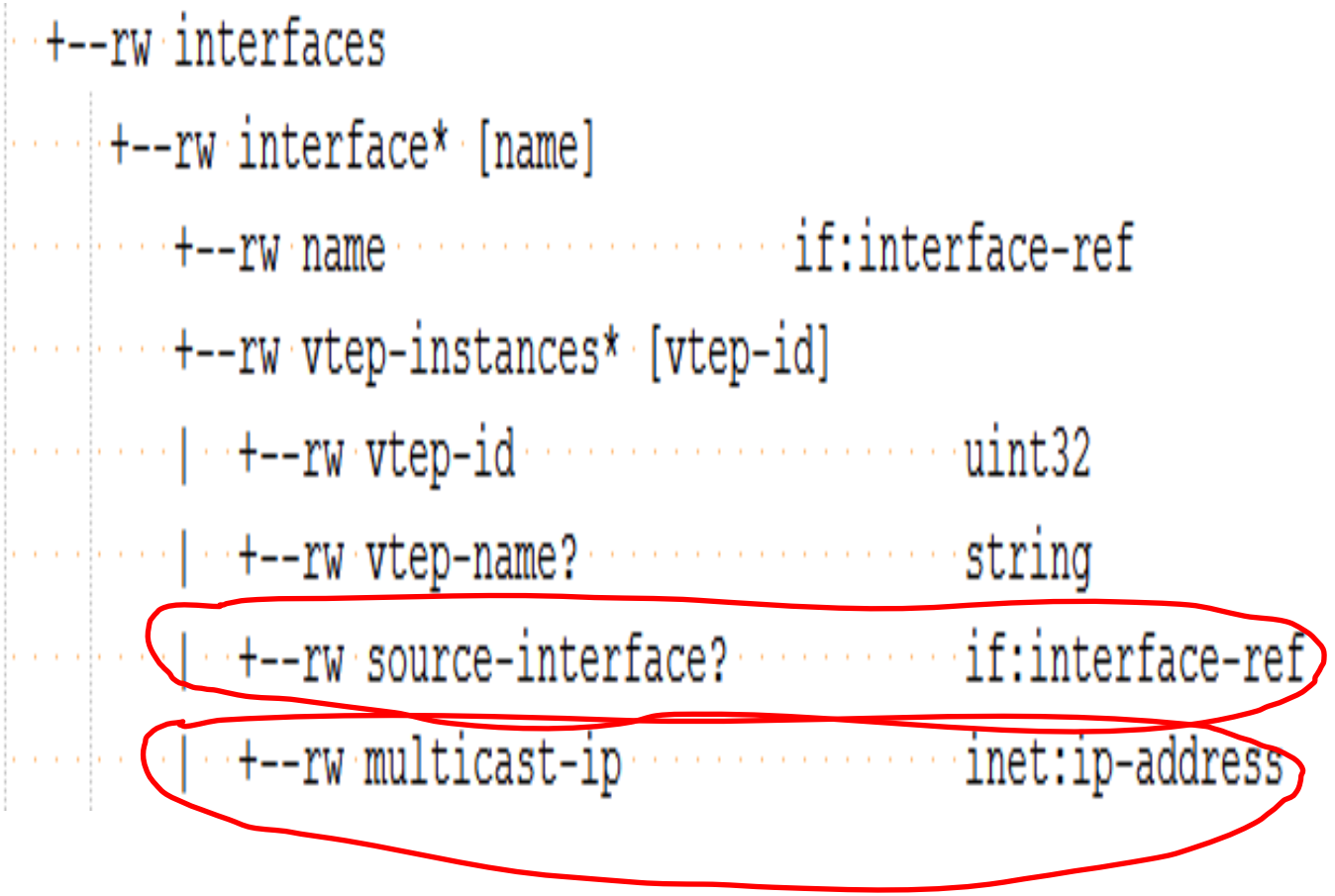
```
module: ietf-vxlan
   +--rw vxlan
      +--rw vxlan-instance* [vxlan-id]
      |  +--rw vxlan-id                    vxlan-id
      |  +--rw (vxlan-access-types)?
      |  |  +--:(access-type-vlan)
      |  |  |  +--rw access-type-vlan?          access-type-vlan
      |  |  |  +--rw access-vlan-list* [vlan-id]
      |  |  |     +--rw vlan-id    vlan
      |  |  +--:(access-type-mac)
      |  |  |  +--rw access-type-mac?           empty
      |  |  |  +--rw mac                        yang:mac-address
      |  |  +--:(access-type-l2interface)
      |  |  |  +--rw access-type-l2interface?   empty
      |  |  |  +--rw vlan-id                    vlan
      |  |  |  +--rw interface-name             if:interface-ref
      |  |  +--:(access-type-l3interface)
      |  |     +--rw access-type-l3interface?   empty
      |  |     +--rw map-l3interface* [interface-name]
      |  |        +--rw interface-name    if:interface-ref
```

VxLAN Control Plane

- PIM-SM + data plane learning
- Static tunnel
- EVPN Protocol

VxLAN Control Plane (I)

PIM-SM + data plane learning



VxLAN Control Plane (II)

- Static Tunnel

```
+--rw interfaces
   +--rw interface* [name]
      +--rw name                          if:interface-ref
      ...  ...
      +--rw static-vxlan-tunnel* [vxlan-tunnel-id]
         +--rw vxlan-tunnel-id       uint32
         +--rw vxlan-tunnel-name?    string
         +--rw address-family* [af]
            +--rw af                          address-family-type
            +--rw tunnel-source-ip?           address-family-type
            +--rw tunnel-destination-ip?      address-family-type
            +--rw bind-vxlan-id* [vxlan-id]
               +--rw vxlan-id     vxlan-id
```

VxLAN Control Plane (III)

- EVPN

```
+--rw vxlan-instance* [vxlan-id]
|  +--rw vxlan-id                          vxlan-id
...   ...
|  +--rw vxlan-evpn
|     +--rw route-distinguisher?    string
|     +--rw vpn-targets* [rt-value]
|        +--rw rt-value     string
|        +--rw rt-type      bgp-rt-type
```

Inner Tag handling mode

- discard-inner-vlan mode
  - The inner VLAN tag will be stripped when encapsulating the VxLAN frame
- no-discard-inner-vlan mode
  - The inner VLAN tag will not stripped when encapsulating the VxLAN frame
- If the access type is VLAN n:1, it must configure to be as no-discard-inner-vlan mode.

Operational State Model

```
+--ro vxlan-state
   +--ro vxlan-instance
   |  +--ro vxlan-id?                          vxlan-id
   |  +--ro (vxlan-access-types)?
   |  |  +--:(access-type-vlan)
   |  |  |  +--ro access-type-vlan?            access-type-vlan
   |  |  |  +--ro access-vlan* [vlan-id]
   |  |  |     +--ro vlan-id                   vlan
   |  |  +--:(vxlan-access-mac)
   |  |  |  +--ro access-type-mac?             empty
   |  |  |  +--ro mac?                         yang:mac-address
   |  |  +--:(vxlan-access-l2interface)
   |  |  |  +--ro access-type-l2interface?     empty
   |  |  |  +--ro vlan-id?                     vlan
   |  |  |  +--ro interface-name?              if:interface-ref
   |  |  +--:(vxlan-access-l3interface)
   |  |     +--ro access-type-l3interface?     empty
   |  |     +--ro map-l3interface* [interface-name]
   |  |        +--ro interface-name            if:interface-ref
   |  +--ro vxlan-evpn
   |     +--ro route-distinguisher?            string
   |     +--ro vpn-targets* [rt-value]
   |        +--ro rt-value                     string
   |        +--ro rt-type                      bgp-rt-type
   +--ro vtep-instance
   |  +--ro vtep-id?                           uint32
   |  +--ro vtep-name?                         string
   |  +--ro source-interface?                  if:interface-ref
   |  +--ro multicast-ip?                      inet:ip-address
   |  +--ro inner-vlan-handling-mode?          inner-vlan-handling-mode
   |  +--ro bind-vxlan-id* [vxlan-id]
   |     +--ro vxlan-id                        vxlan-id
   +--ro static-vxlan-tunnel* [vxlan-tunnel-id]
      +--ro vxlan-tunnel-id                    uint32
      +--ro vxlan-tunnel-name?                 string
      +--ro address-family* [af]
         +--ro af                              address-family-type
         +--ro tunnel-source-ip?               address-family-type
         +--ro tunnel-destination-ip?          address-family-type
         +--ro bind-vxlan-id* [vxlan-id]
            +--ro vxlan-id                     vxlan-id
```

Next Step

- Comments welcome
- WG adoption ☺

Thanks!