NVO3 introduction and VDP new requirements
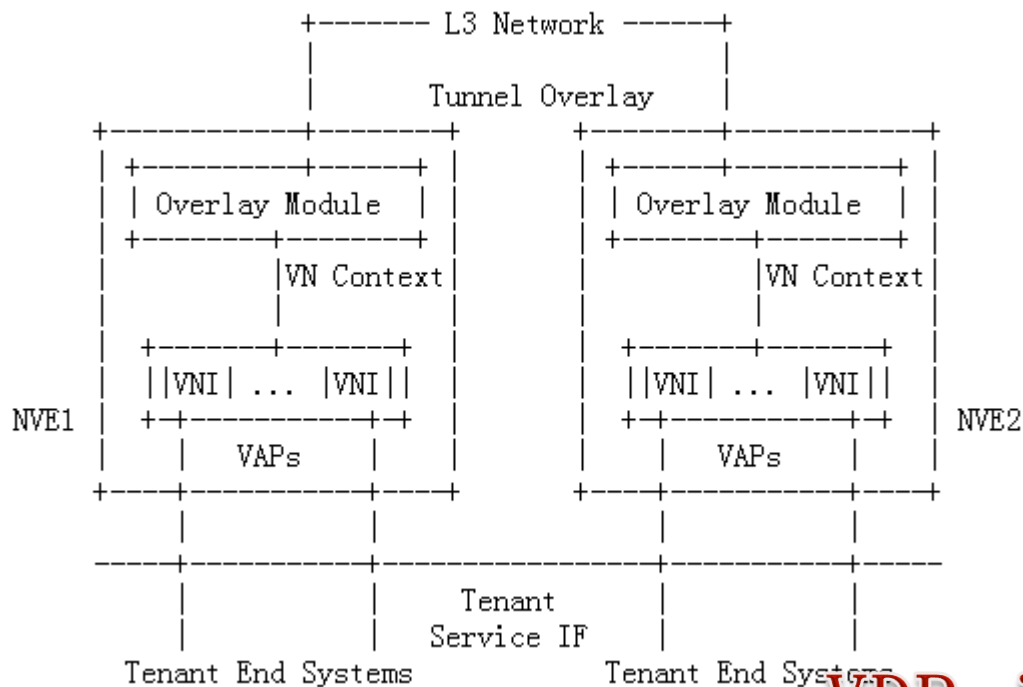
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*N*etwork *V*irtualization *O*verlays

- Target: Support for multi-tenancy, with reqs:
  - Traffic isolation
  - Address independence
  - Support the placement and migration of VMs
- Basic idea:
  - Creating overlay by assigning a global unique VN Name and VNID for each overlay network(DCVPN)
  - Deploy a Network Virtualization Edge(VPNGW) at edge of the overlay network
  - VNID is indicated in tunnel encapsulation.

Example Framework – NVE on ToR SW

```
                +------- L3 Network ------+
                |                         |
                |     Tunnel Overlay      |
                |                         |
    +-----------+---------+   +-----------+---------+
    | +-------+-------+ |   | +-------+-------+ |
    | | Overlay Module | |   | | Overlay Module | |
    | +-------+-------+ |   | +-------+-------+ |
    |         |VN Context| |   |         |VN Context| |
    |         |         | |   |         |         | |
    |   +-----+-----+   | |   |   +-----+-----+   | |
    |   ||VNI| ... |VNI||   | |   ||VNI| ... |VNI||   | |
NVE1|   +-+---------+-+   | |   |   +-+---------+-+   | |NVE2
    |     |   VAPs   |     | |   |     |   VAPs   |     | |
    +-----+----------+----+ |   +-----+----------+----+ |
          |          |     |         |          |     |
    ------+----+-----+------+   ------+----+-----+------+
          |    |     Tenant  |         |    |
          |    |   Service IF|         |    |
 Tenant End Systems        Tenant End Systems
```

NVE: Network Virtualization E...
VAP: Virtual Access Point
VNI : Virtual Network Instanc...

VDP is valid in L2 cas...

Basic Reqs on TES-NVE protocol:
- Membership of which VNI (VSIID/or add a VN Name field)
- VM connectivity (Associate, De-associate, S-bit, M-bit)

Optional Reqs
- Inner address and local VID (Filter info), only useful while network between TES and NVE is L2

More Cases

- **L3 case:** NVE is on a router, i.e. L3 connection between TES and NVE

- **Indirect L2/L3 case**: NVE is on SW/Router9316503 but there are other devices between TES and NVE, e.g. bridge

L3 case

- Special Reqs to VDP
  - No Filter infor (MAC/VLAN) is needed
  - VDP need to be carried on protocol supported by router:
    - Either enable router to support ECP
    - Or enable VDP to be carried in another protocol, and Hypervisor need to support that protocol too
    - Will this also require CDCP be supported by router?

Indirect L2/L3 case

- Special Reqs on VDP
  - VDP should traverse more than bridges
    - Maybe use the intermediate bridges as relay?
    - Or update VDP to transmit to non-adjacent bridge?

Can we do something in DCB?