Network as a service requirement in cloud datacenter

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Motivation

- With public cloud, network capabilities can be sold by data center operators to tenants in the data center
  - IP address, VLAN, bandwidth, load balancing, firewall, …
- There is a need for NAAS (Network As A service): providing end to end virtual network for tenants with the capabilities
  - Providers manage physical network; tenants manage virtual network
- Traditional technologies may become the bottleneck of public cloud service, e.g. number of VLANs
- The document describes requirements of NAAS for cloud data centers

Isolation of different tenants

- Traffic of different tenants should be isolated by vpn (layer 2 or layer 3, by vlan tag, mpls tag, etc.)
- Network services (e.g. load balancing, firewall) of different tenants should also need to be isolated
- Each tenant has a logically isolated network; able to plan and reuse IP, VLAN resources

Simplicity of logical network

- Tenant’ s logical network should be simple and intuitive, often presented by a GUI
- Typical logical network contains an L2 switch, an L3 gateway, an edge router, a load balancer, a firewall and some security devices
- All links and devices are logical, mapped to the physical network.

Bandwidth guarantee

- Tenants should be allocated and guaranteed end to end bandwidth of the logical networks
  - Bandwidth between server and TOR, between TOR and L3 gateway, between L3 gateway to LB/FW, outbound bandwidth edge router, etc.
  - Logical bandwidth allocation also mapped to physical network, limited by physical bandwidth

Self network management

- Each tenant manage and configure their own logical network
  - Permission of network management
  - Self planning for traffic and strategies, e.g. load balancing, firewall
- Operator is responsible for the physical network

Thanks!

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