

Virtual Networks: Start with something simple

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Let's consider a likely user?

- Cloud Provider
 - > Needs to charge for physical resources
 - Queues, B/W, etc
 - > Needs to charge for name space
 - MAC addresses??
 - VLAN tags??
 - IP addresses??
 - > Can charge for network functionality
 - DHCP servers
 - Firewall
 - Routers
 - Load balancers
 - Other functionality...

Cloud environment?

- Cloud operator
 - > A large/flat L2 network
 - > Some L2 networks connected by a layer 3 device
 - > Need to keep things simple
 - > Tunnels, MAC-in-MAC, etc. gets too complex
- Cloud customer wants
 - > Predictability of resources and performance
 - > Flexibility in playing with IP addresses/subnets
 - > Ability to partition their own traffic and resources

One simple solution?

- Allow the cloud operator to specify Virtual Networks and associated resources/policies and allocate these to VN “owner/users”:
 - > Example identification/partitioned items:
 - > Set of VLAN tags
 - > Set of MAC addresses for Virtual Machines (or a MAC address prefix IP style)
 - > Any L2 ACLs
 - > Resource/Policies:
 - > Consists of some physical resources like B/W, queue length, QoS, etc.
 - Be flexible in protocols to encourage device/hardware-specific enhancements from different vendors
- Virtual Network “owner/user” gets to assign his own IP address and any layer 3 or higher functionality
 - > But administration isolated per VN, and packet-visibility and performance isolation remain as “acid test”

What needs to be done?

- OpenFlow has made some good progress in defining things at individual component/link level
- Some components exist... but
 - > No unified way to create, describe and disseminate VN information among a set of network and server hardware
 - > SNMP extensions