Open vSwitch in Neutron

Performance Challenges and Hardware Offload

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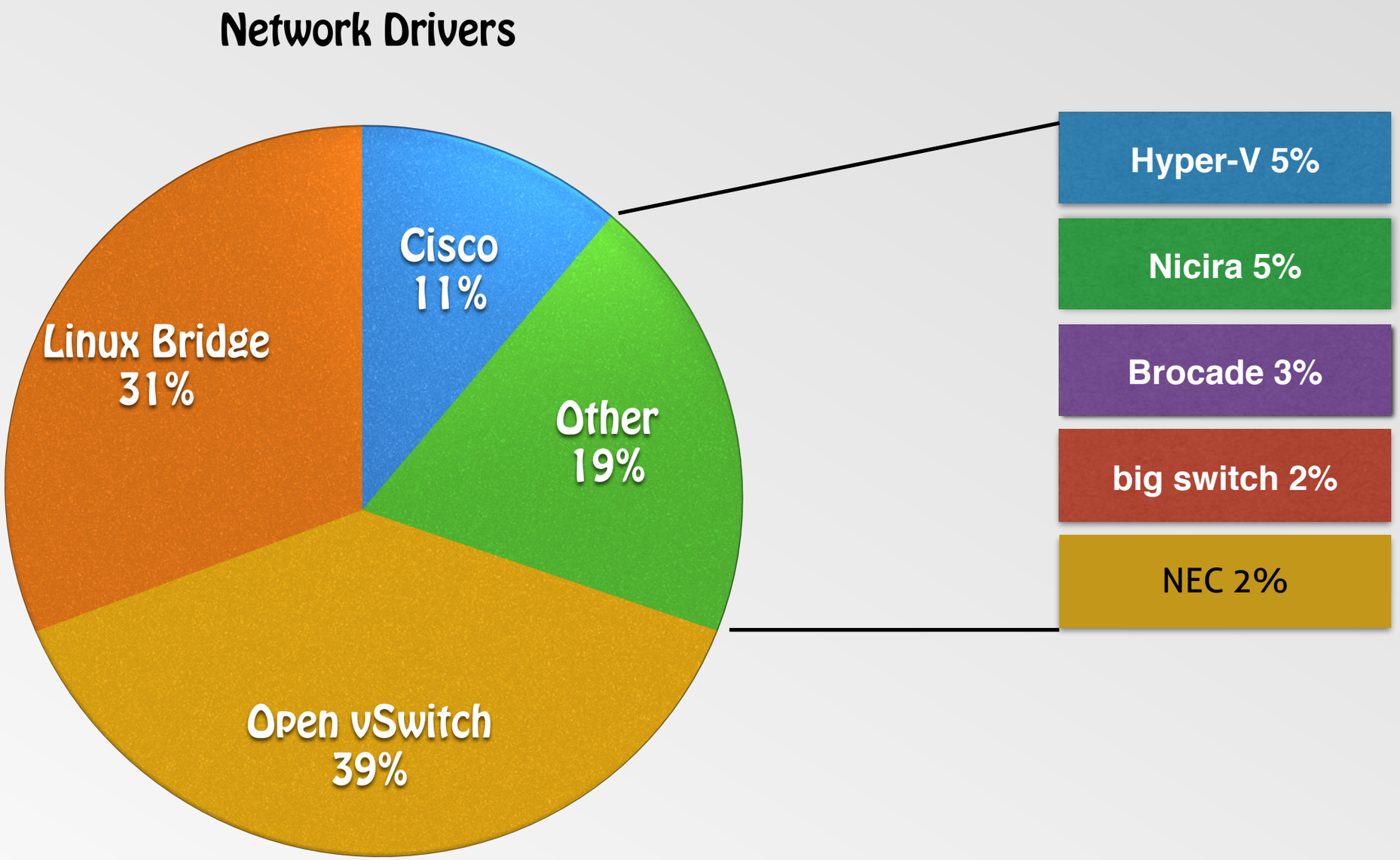
197 Deployments



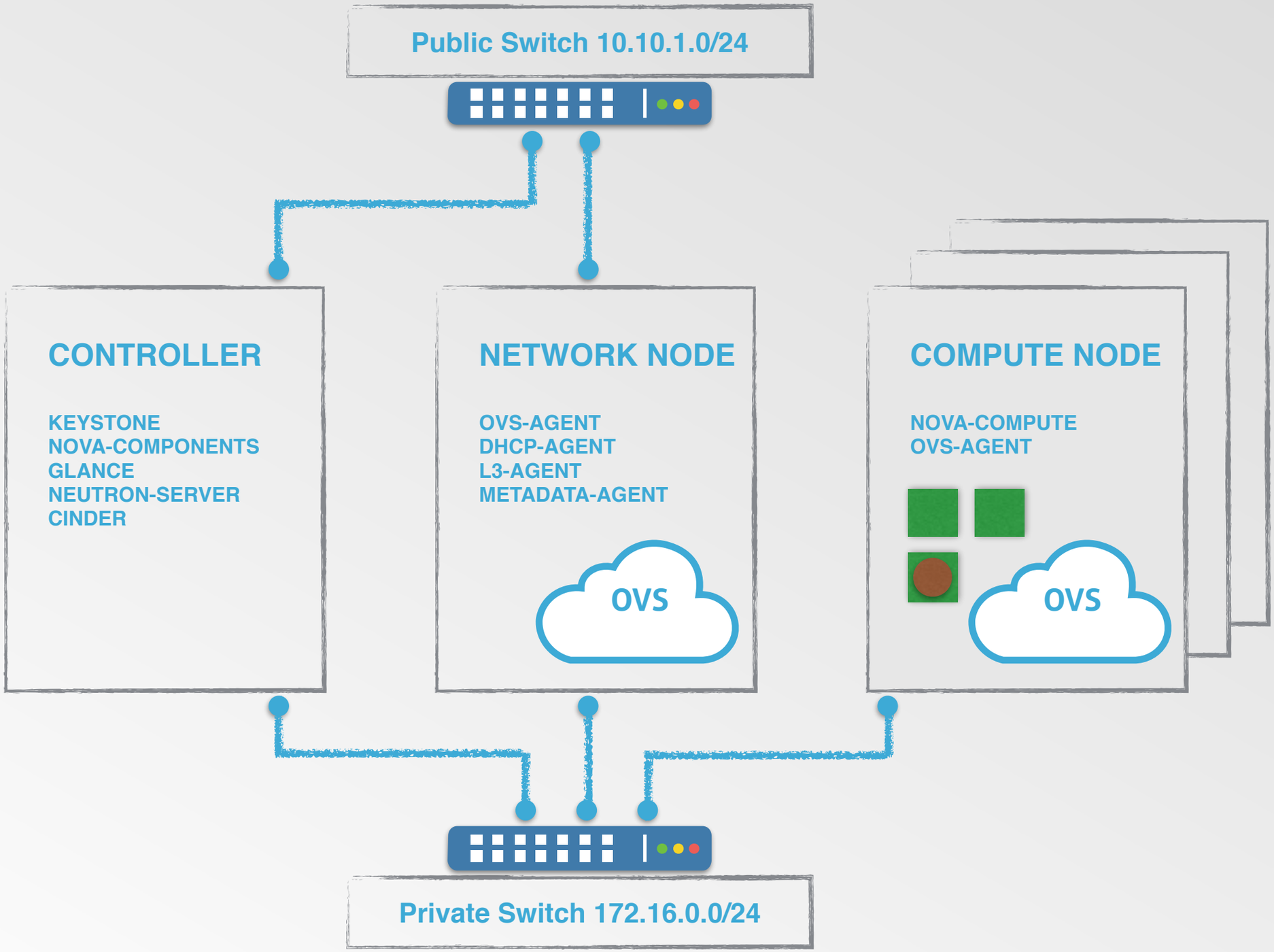
Source Reference: http://www.openstack.org/summit/portland-2013/session-videos/presentation/openstack-user-committee-update-and-survey-results

Agendas

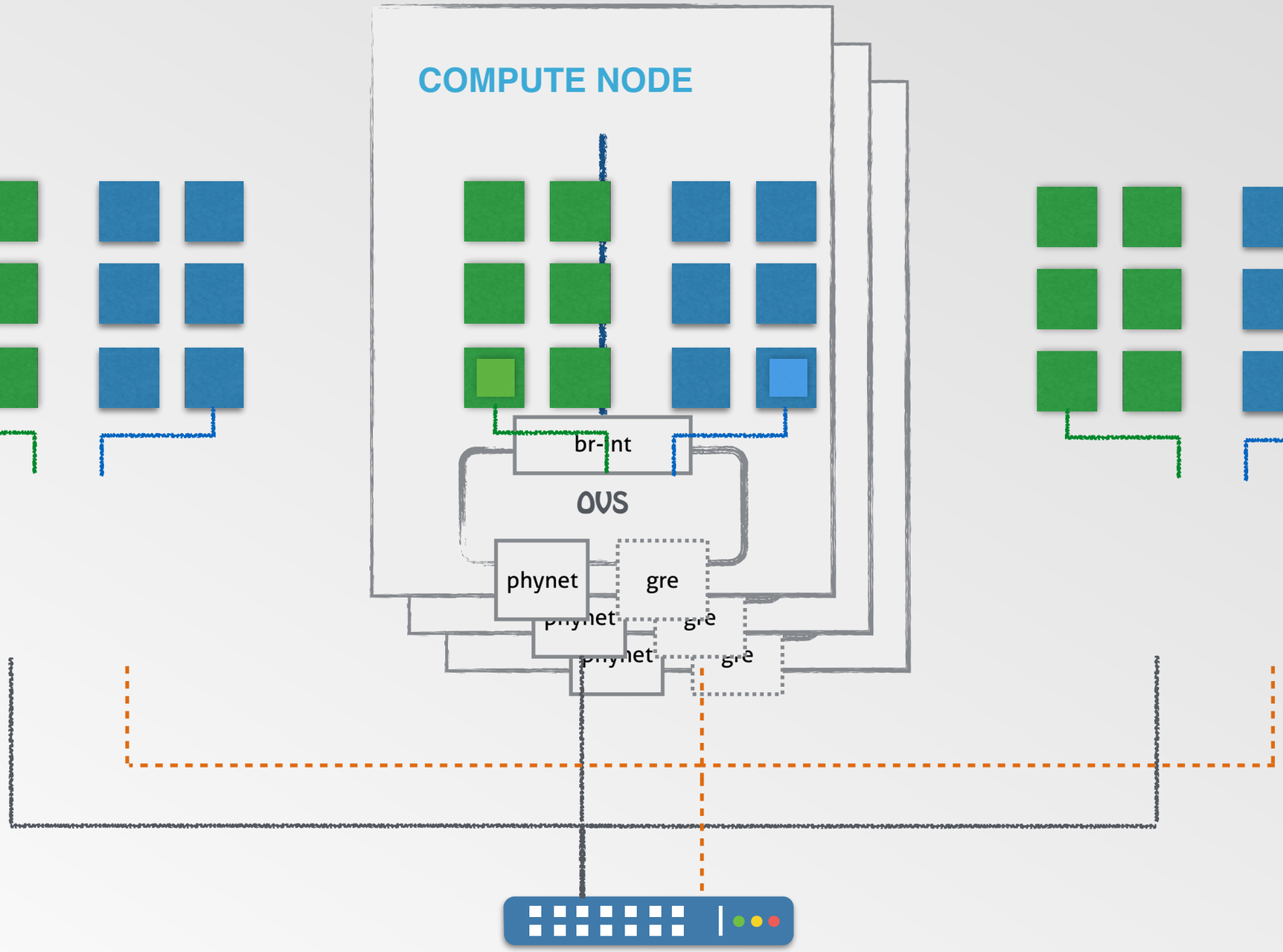
1. Open vSwitch usages in Neutron
2. Open vSwitch & Openflow
3. Problem Statement
4. Acceleration Solutions

Open vSwitch usages in Neutron

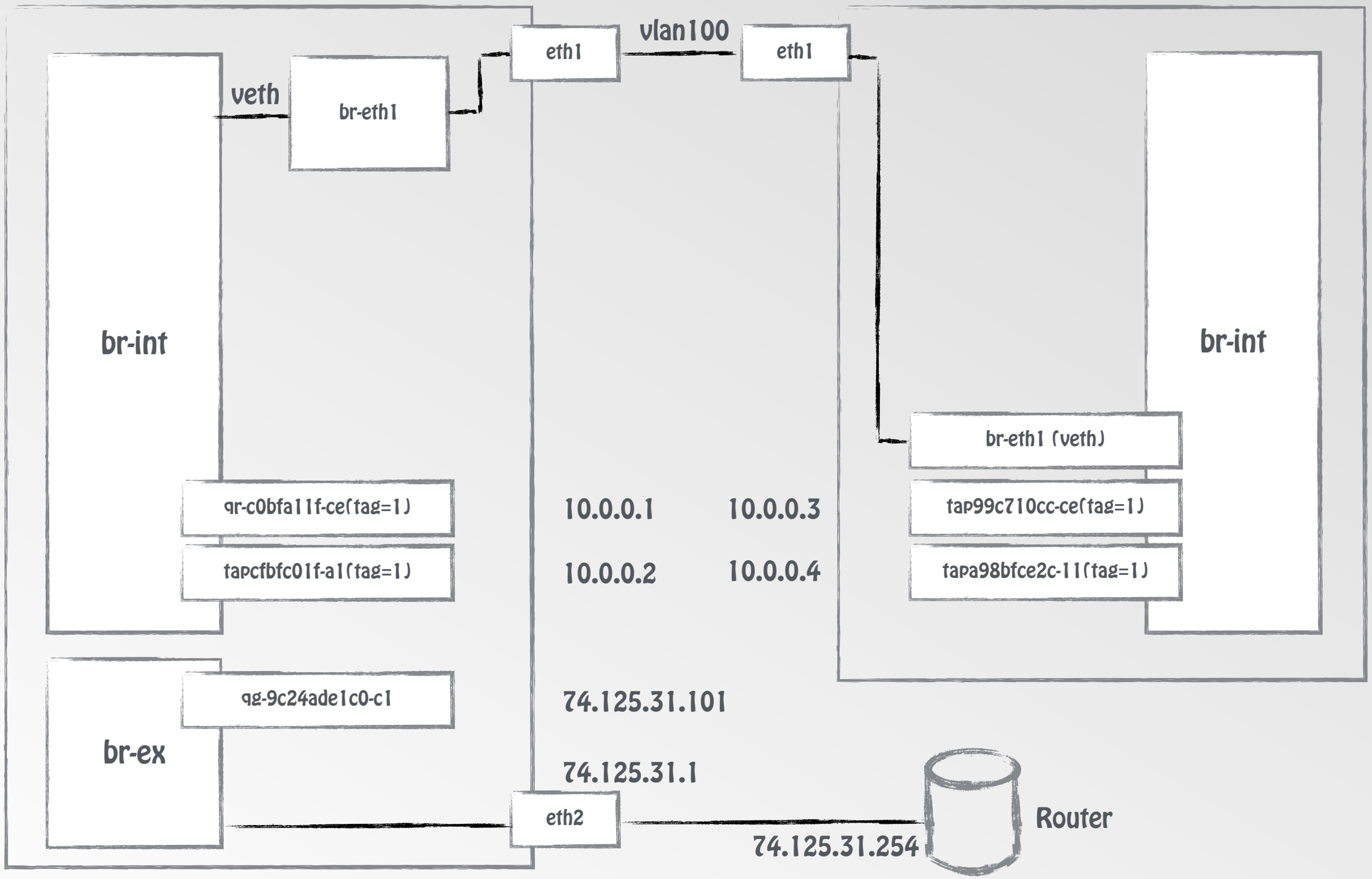
Popular Deployment



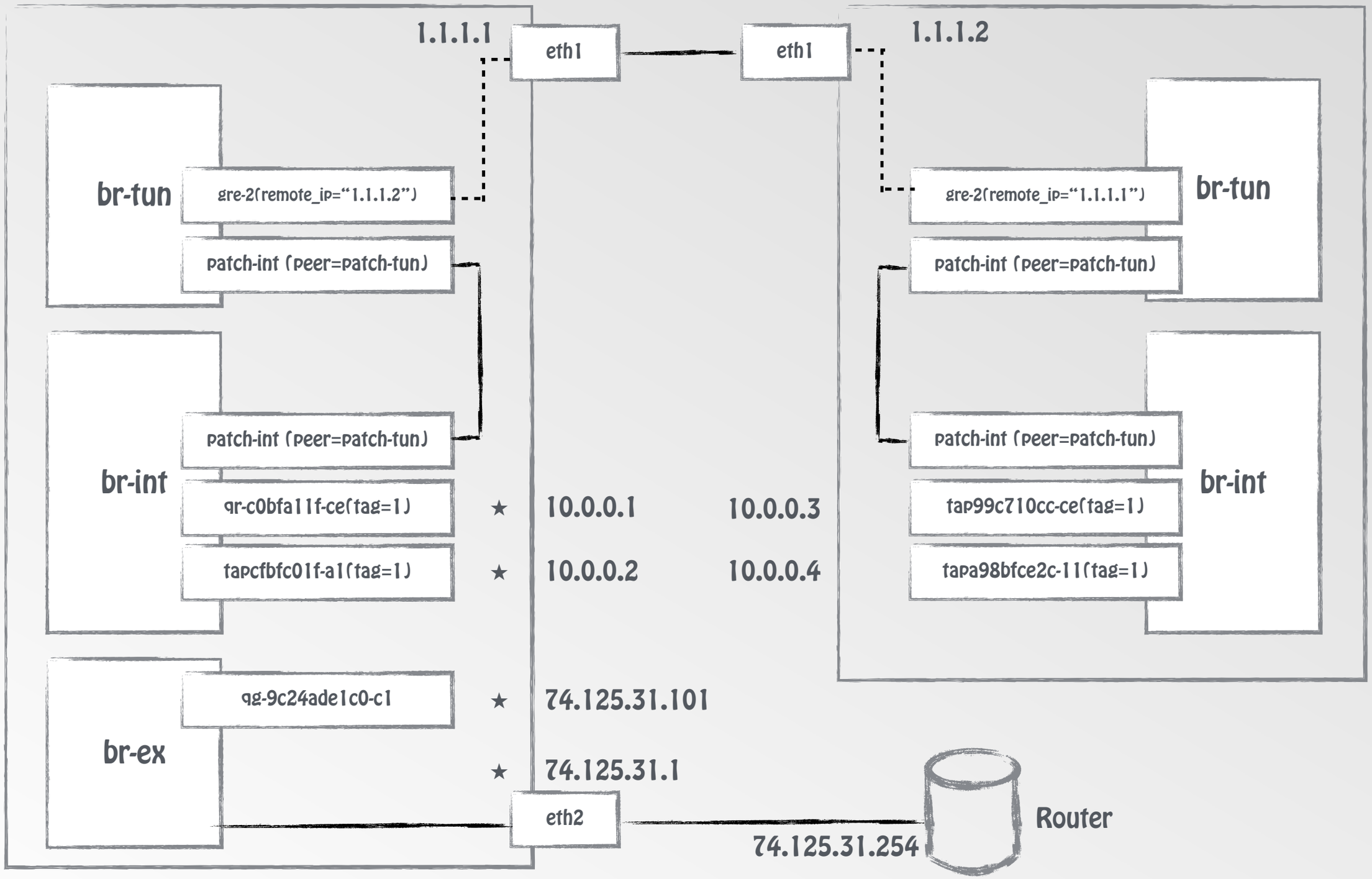
VM Traffic Path



VLAN Bridges

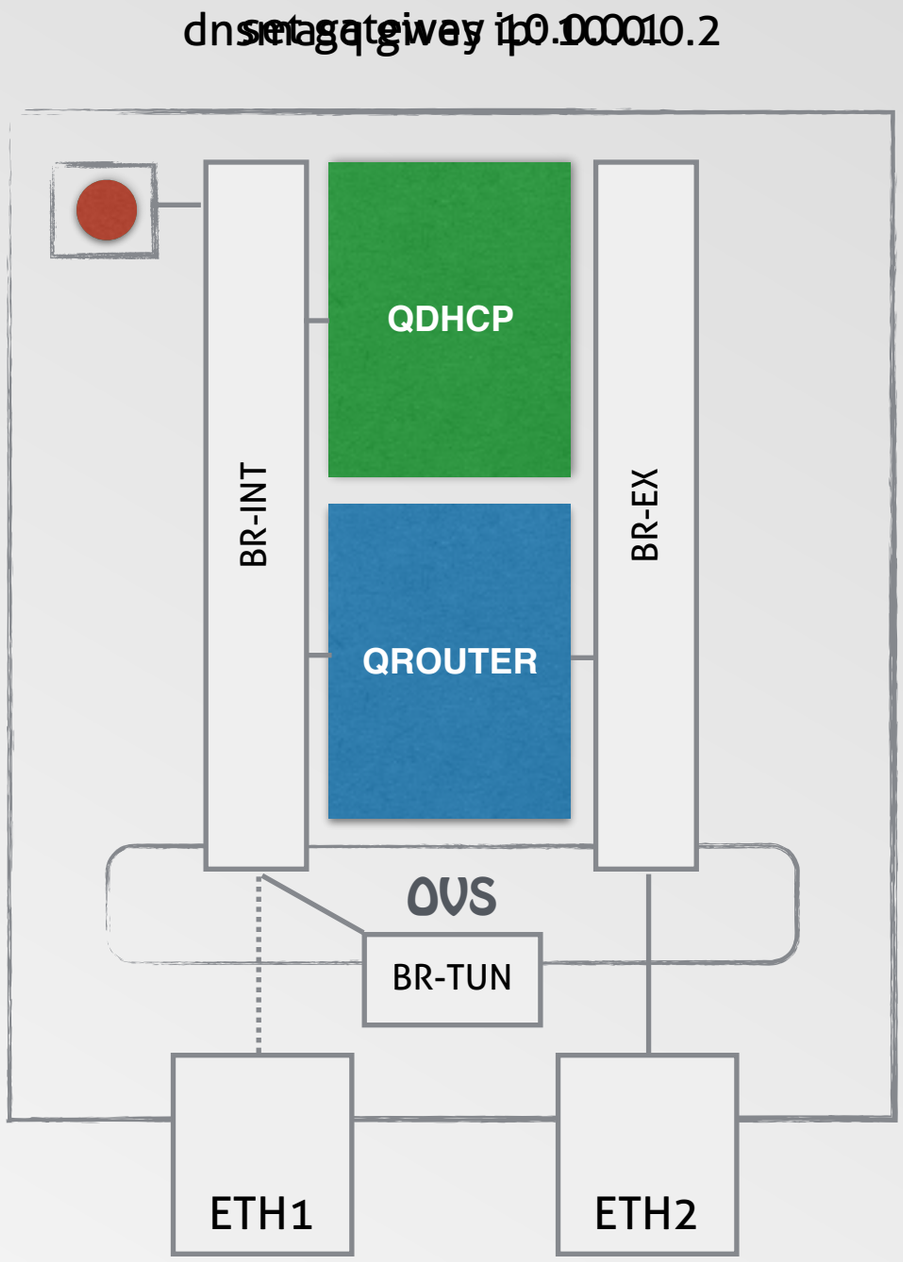


GRE Bridges

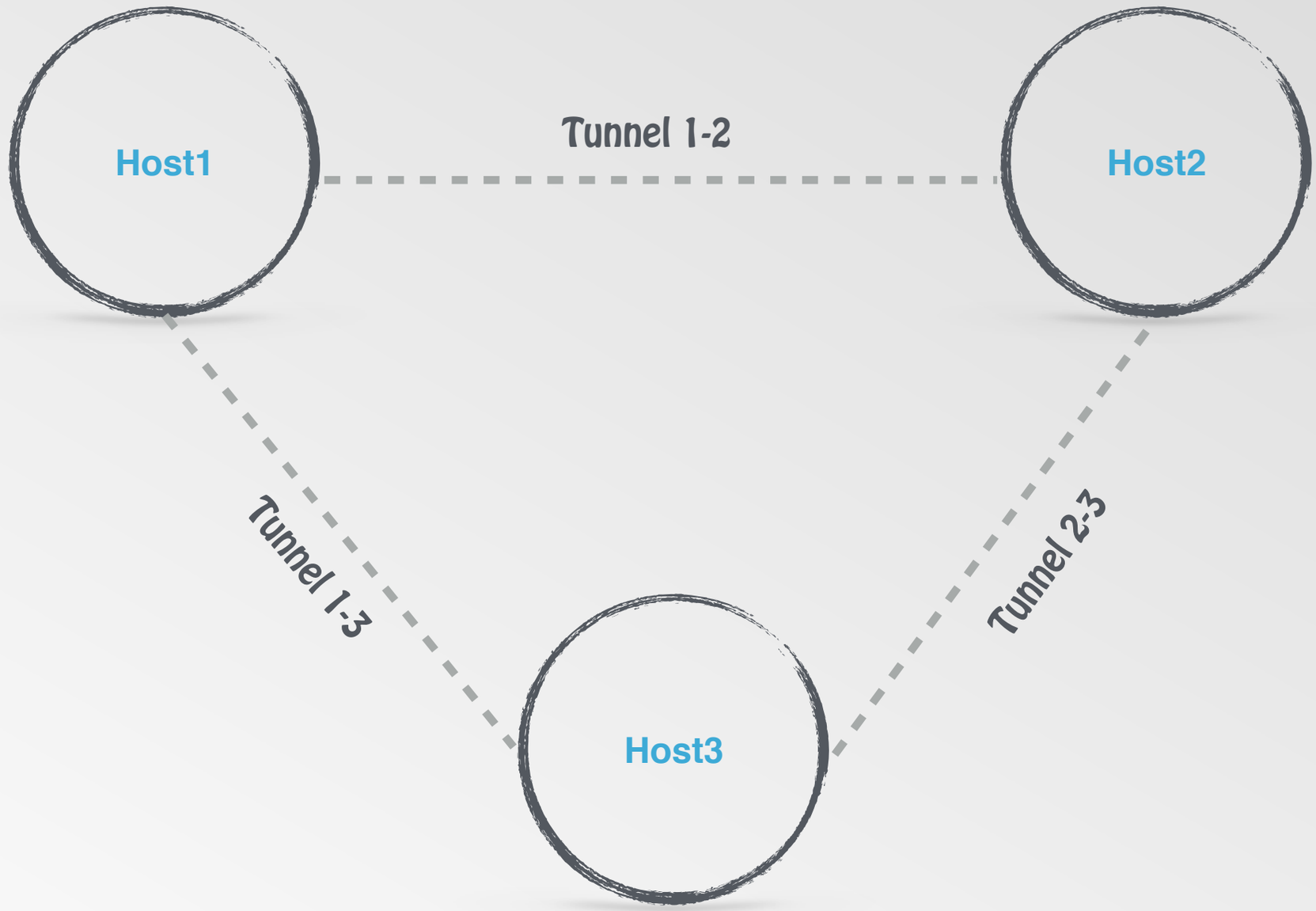

1.1.1.1
eth1
eth1
1.1.1.2
br-tun
gre-2(remote_ip="1.1.1.2")
patch-int (peer=patch-tun)
gre-2(remote_ip="1.1.1.1")
br-tun
patch-int (peer=patch-tun)
br-int
qr-c0bfa11f-ce(tag=1)
★
10.0.0.1
10.0.0.3
tapcfbfc01f-a1(tag=1)
★
10.0.0.2
10.0.0.4
patch-int (peer=patch-tun)
br-int
tap99c710cc-ce(tag=1)
tapa98bfce2c-11(tag=1)
br-ex
qg-9c24ade1c0-c1
★
74.125.31.101
★
74.125.31.1
eth2
74.125.31.254
Router

Neutron Workflow

1. Start Neutron-Server
2. Start Open vSwitch Agent
3. Start L3-Agent
4. Start DHCP-Agent
5. Start METADATA-Agent
6. Create Networks
7. Create Routers
8. Boot VMs

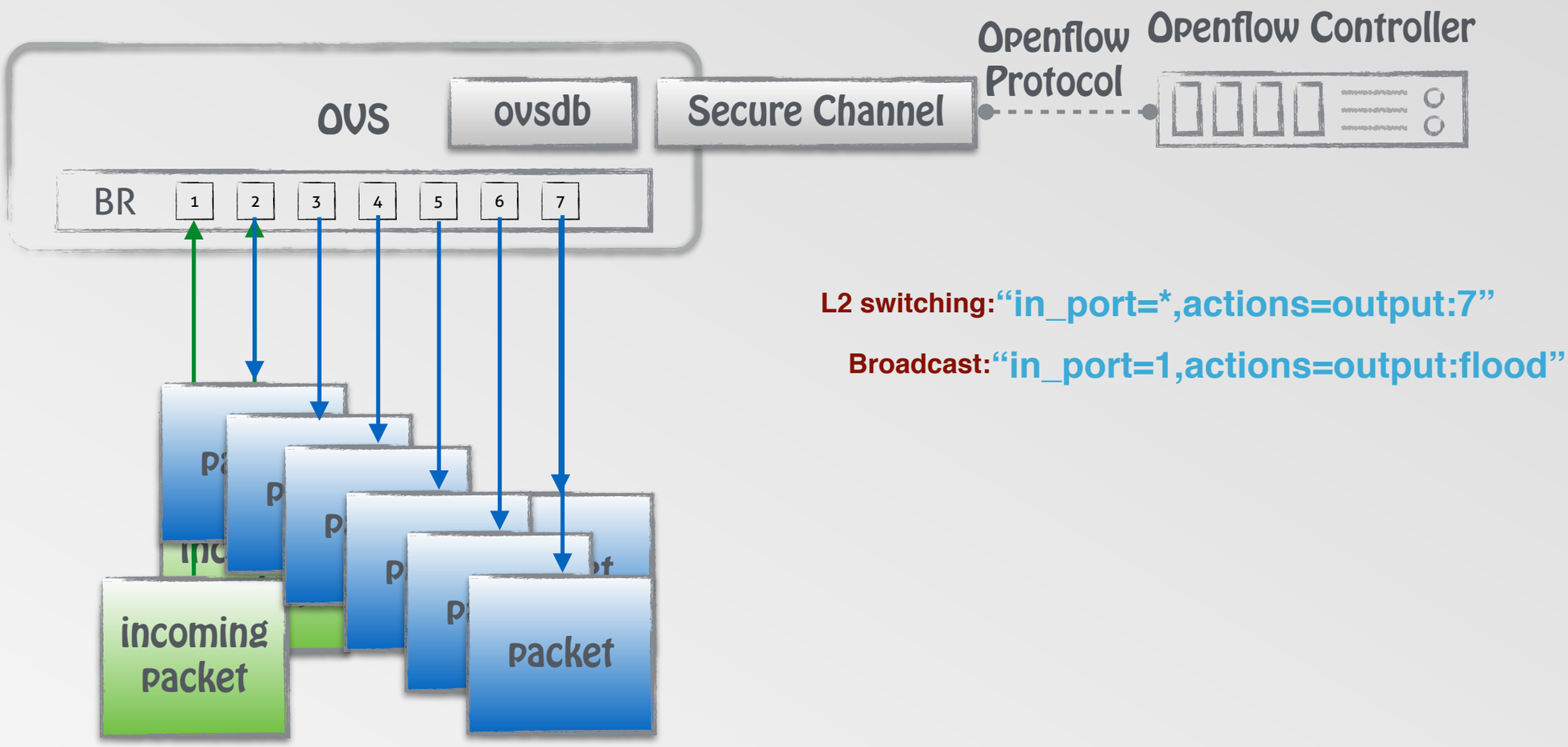


GRE Tunnel



Open vSwitch & Openflow

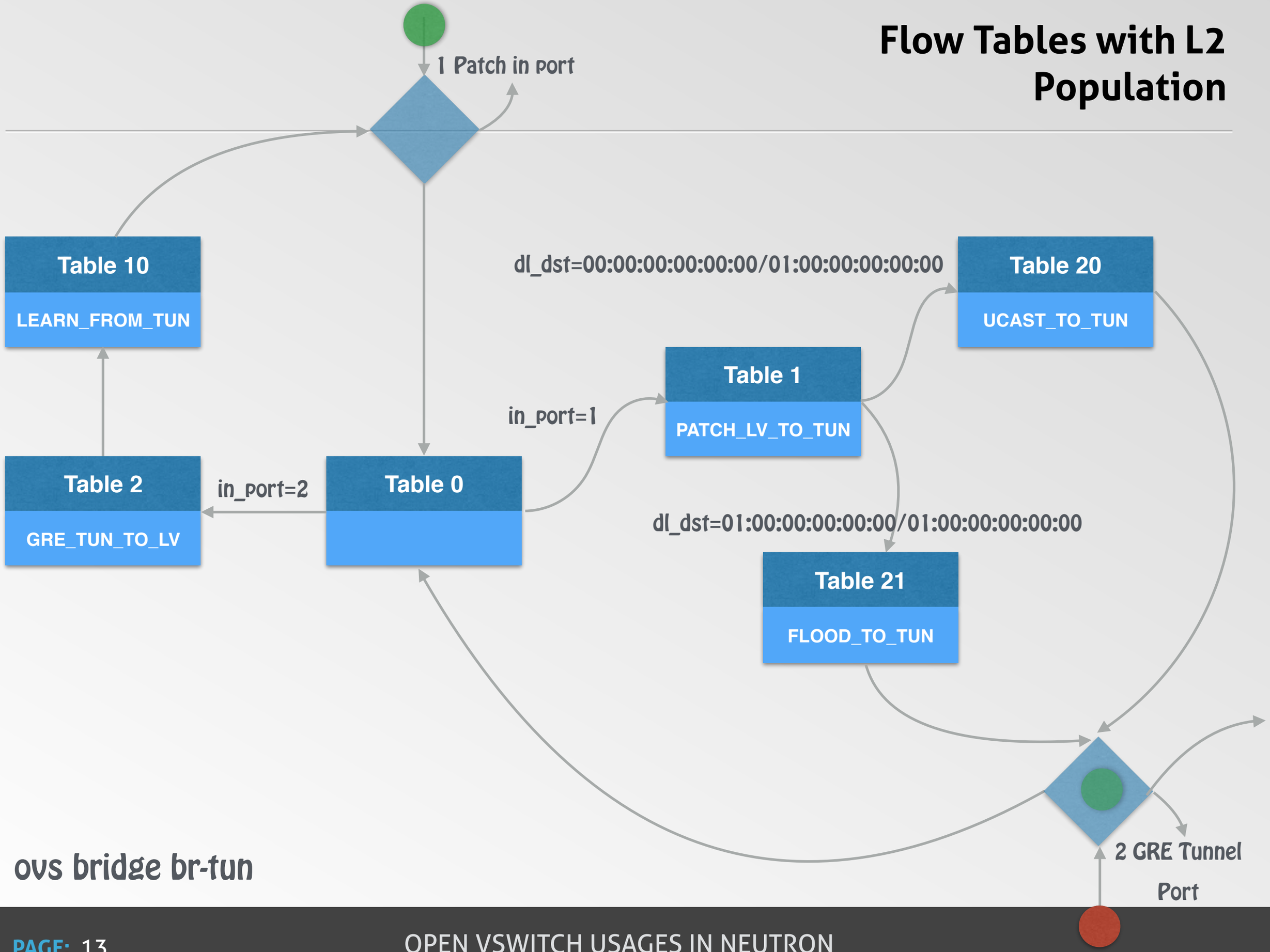
Open vSwitch & Openflow



L2 switching:"in_port=*,actions=output:7"

Broadcast:"in_port=1,actions=output:flood"

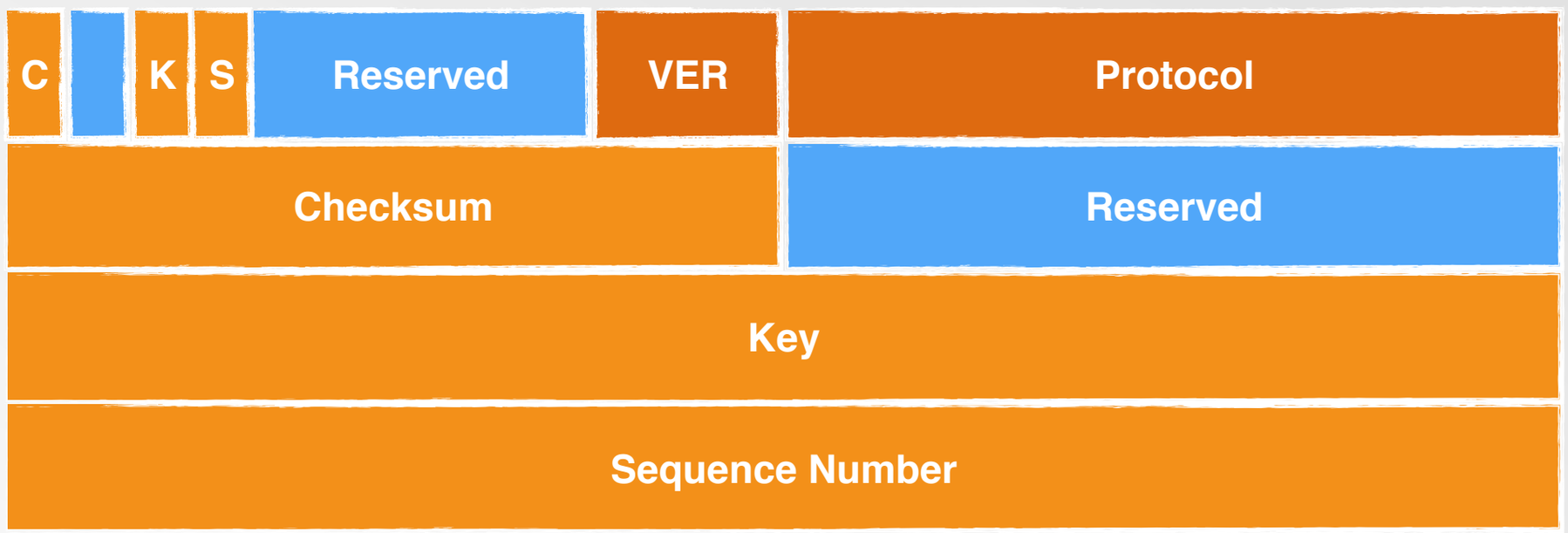
Flow Tables with L2 Population



ovs bridge br-tun

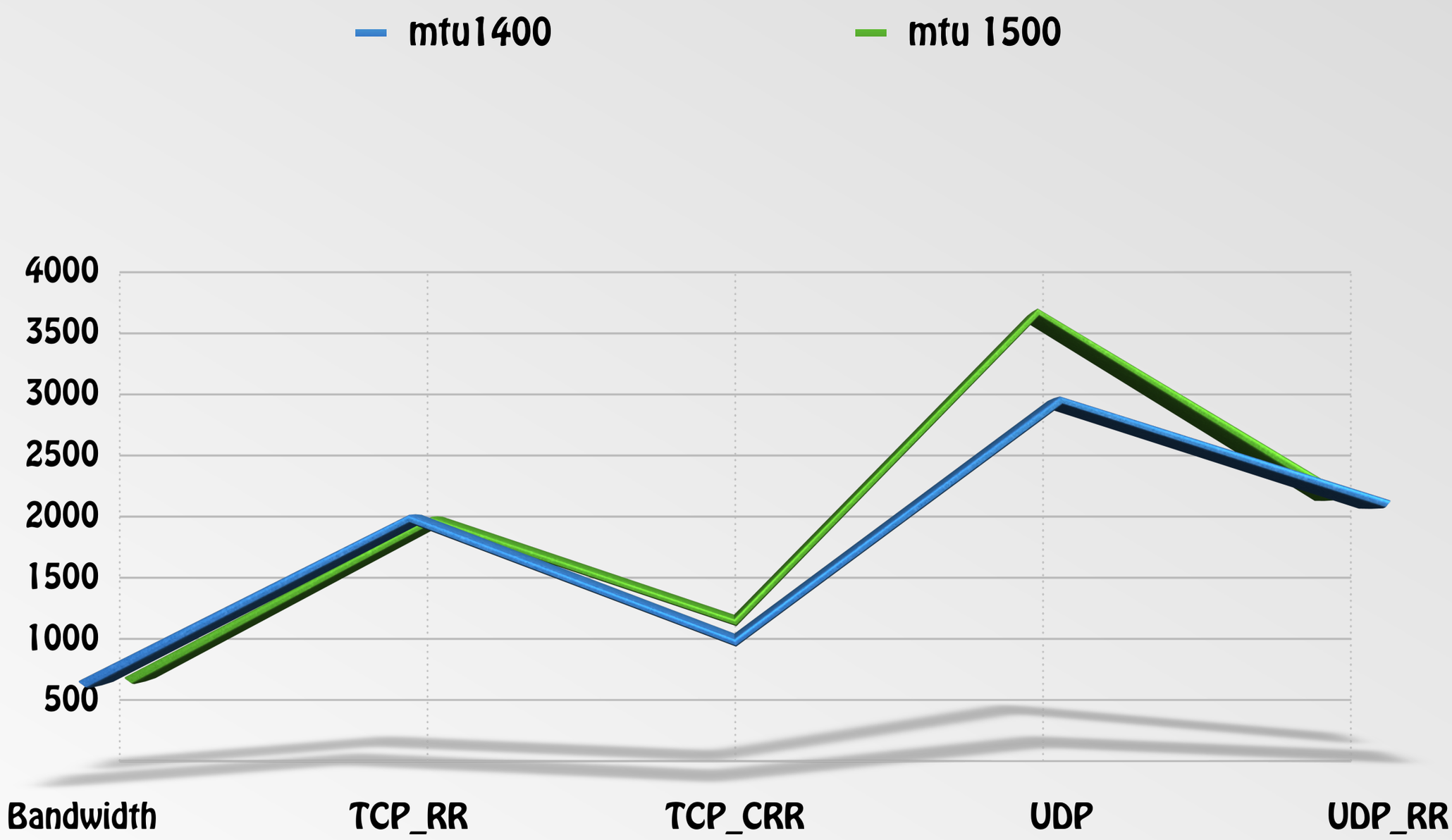
Problem Statement

GRE Head



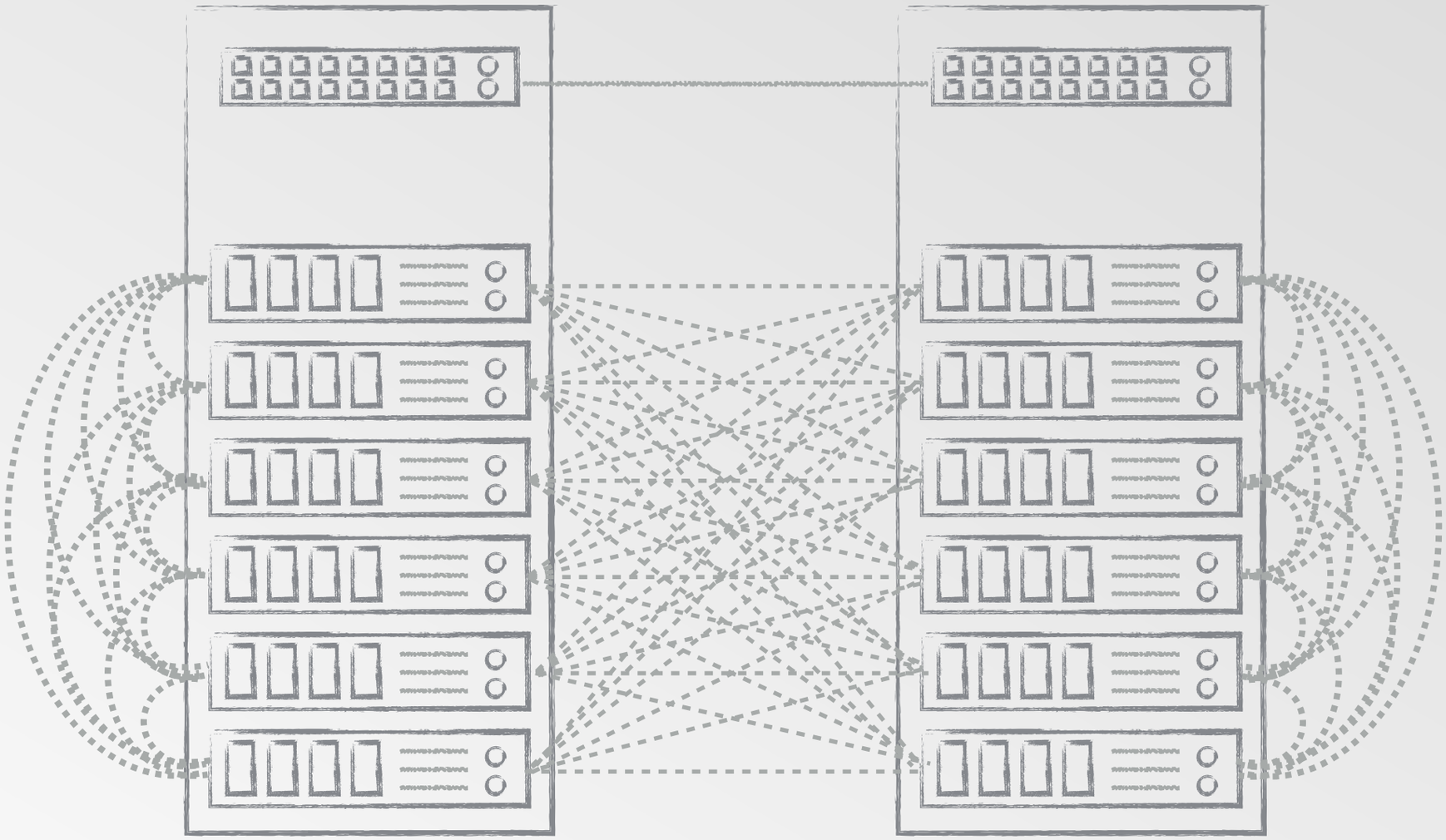
HTTP Server MTU Compatible Problem

MTU Comparison



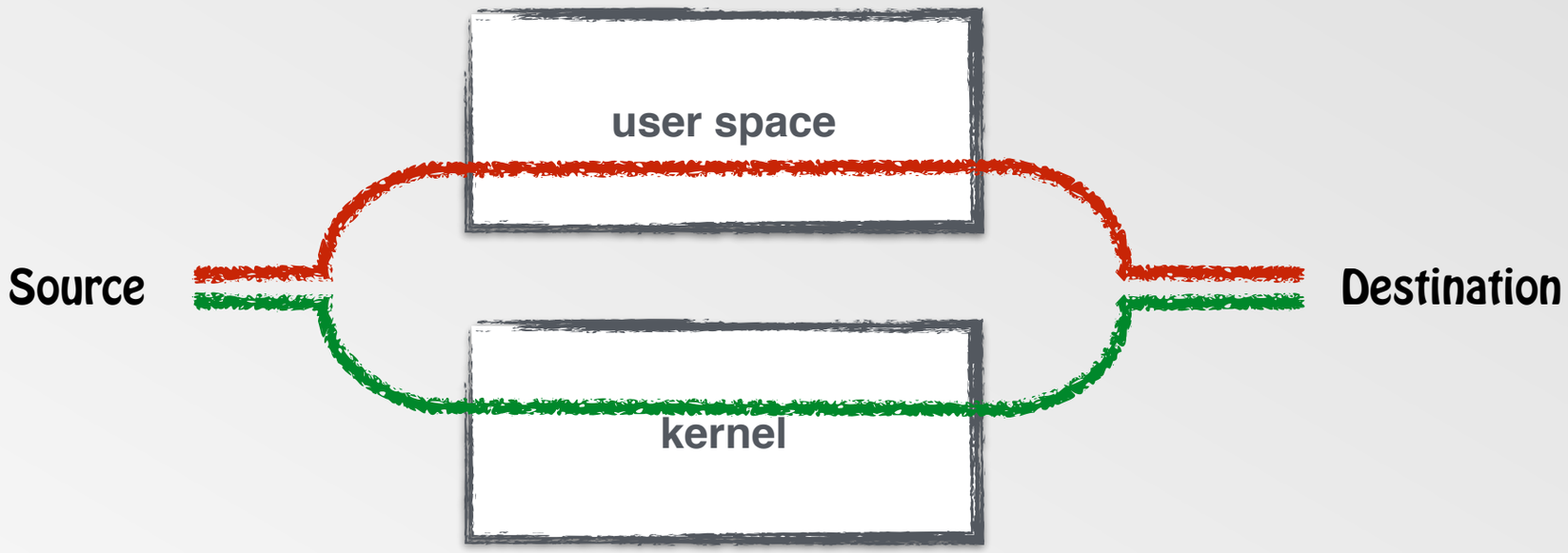
GRE Tunnel Extensibility

Tunnels: N - 1

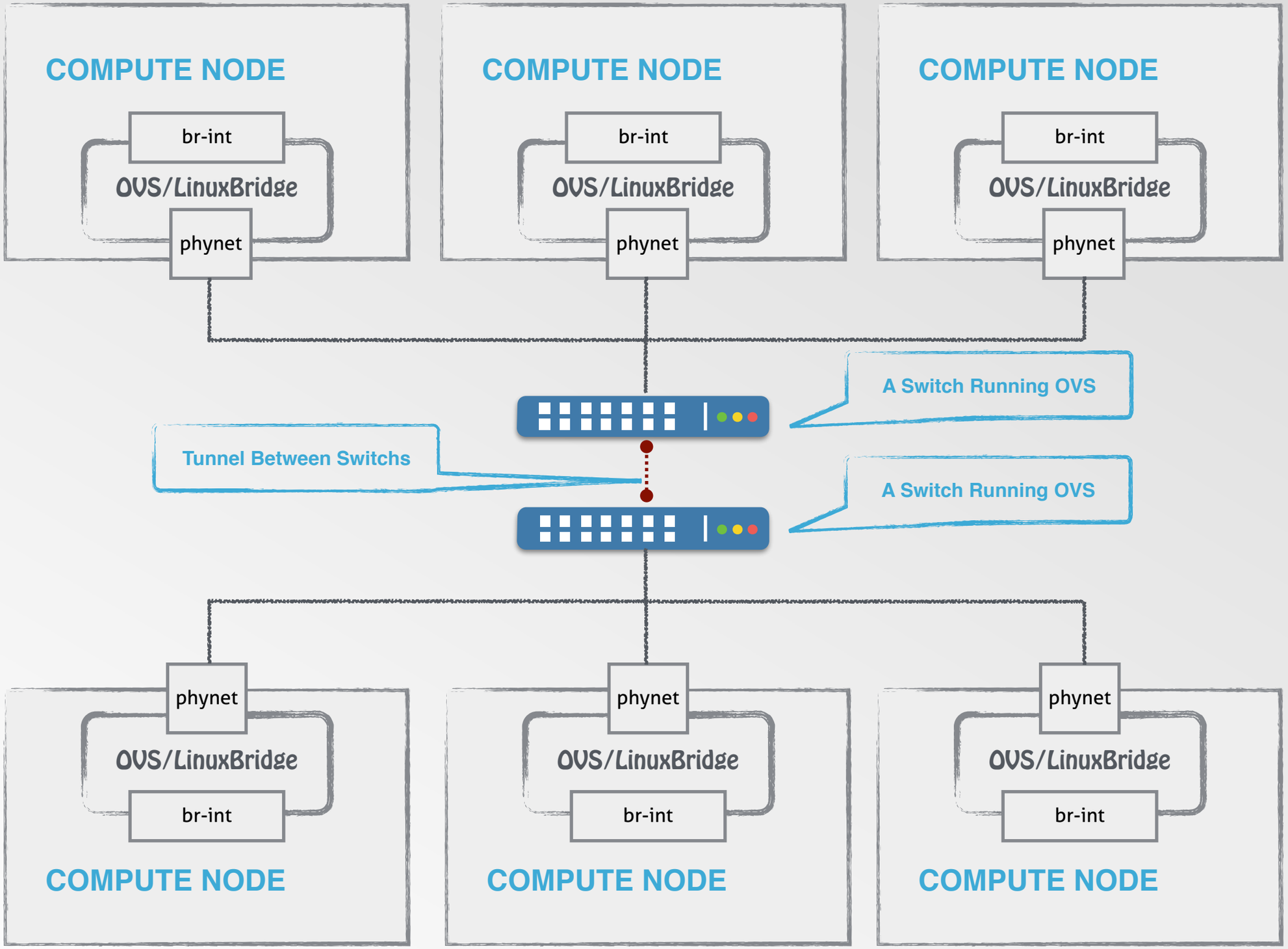


Flow Match

- First Packet
- Subsequent



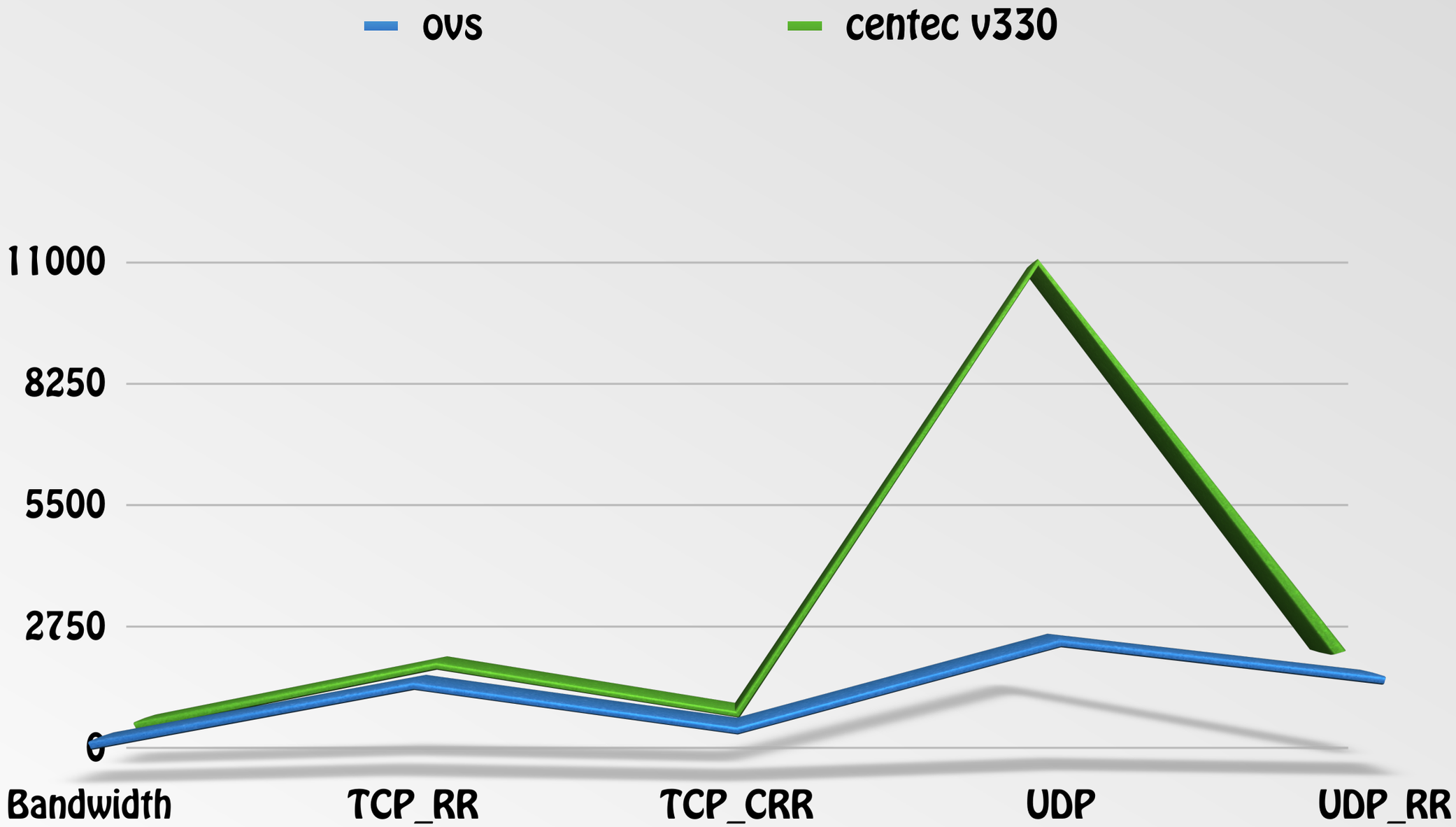
Improved Architecture



Other Solutions

- Flow Matching
  - DPDK, PF_RING, netmap
- GRE Tunnel
  - VxLAN

OVS Hardware Comparison



OVS Debugging Tips

- Test basic connectivity
- Use tcpdump to see if expected packets are on the wire
- Try it without OVS
- Use “ovs-ofctl dump-flows bridge” to see if packets hit the flows

Thanks!

That's all for today

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