

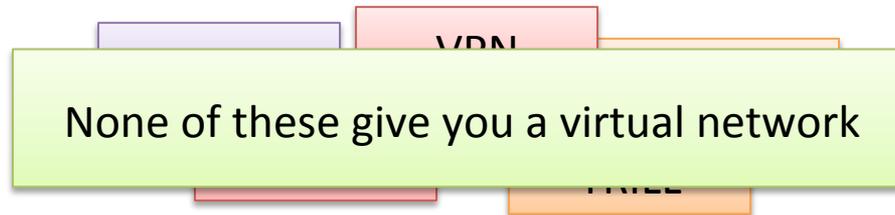
Network Virtualization

A brief Intro

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Open Networking Lab

What is Network Virtualization?



They merely virtualize one aspect of a network

Topology Virtualization

- Virtual links
- Virtual nodes
- Decoupled from physical network

Address Virtualization

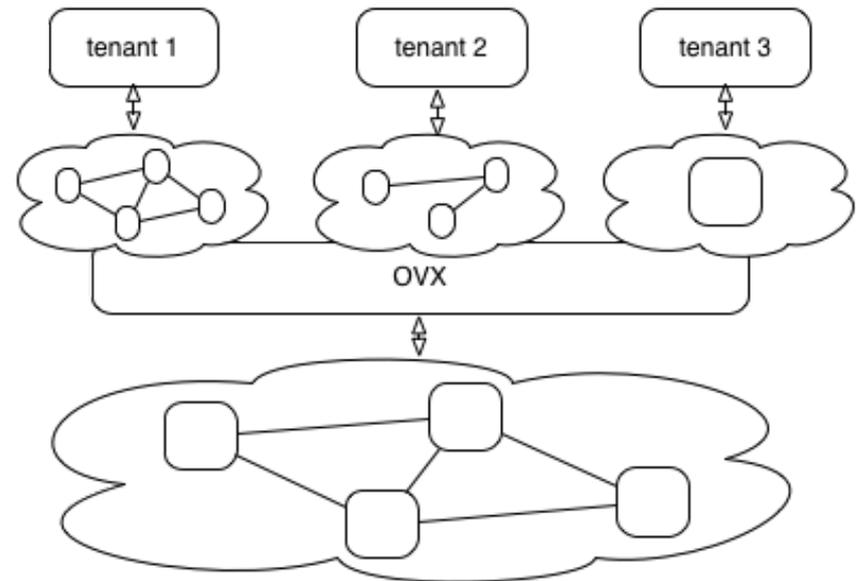
- Virtual Addressing
- Maintain current abstractions
- Add some new ones

Policy Virtualization

- Who controls what?
- What guarantees are enforced?

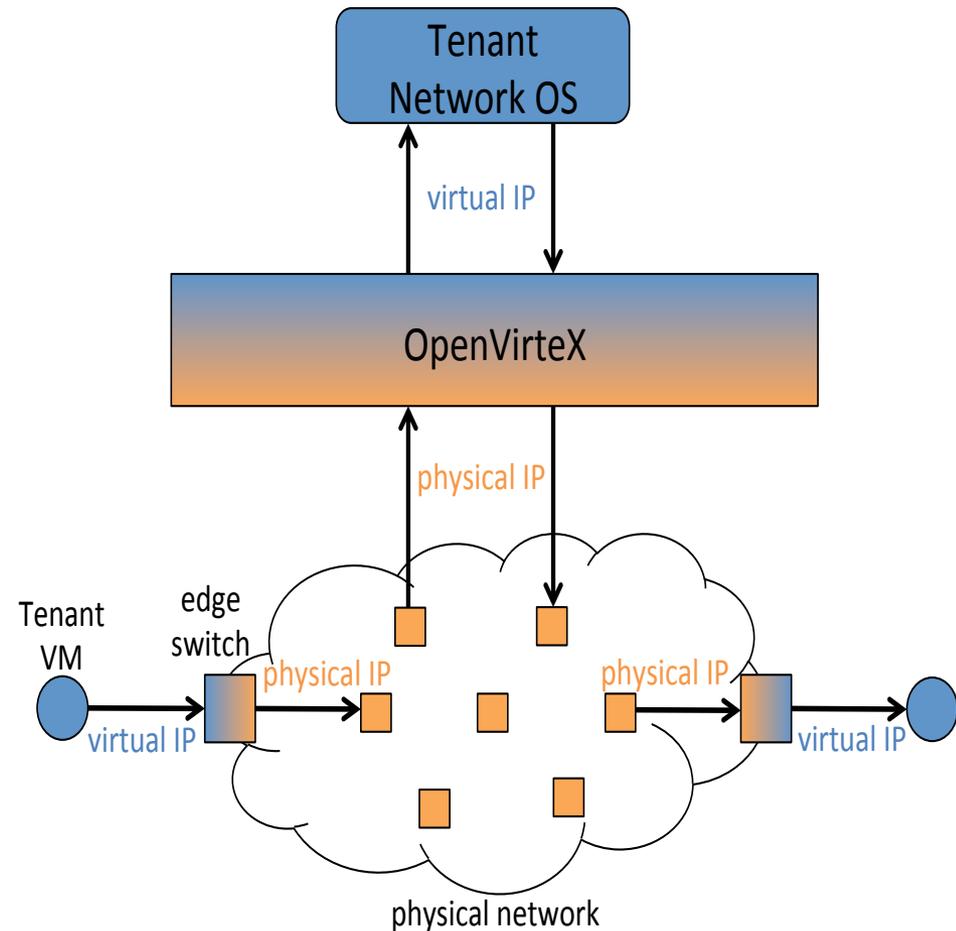
Topology Virtualisation

- Physical Network decoupled from virtual network
- OpenVirteX exposes the topology to upstream controllers
- In essence, the idea is to abstract the topology.

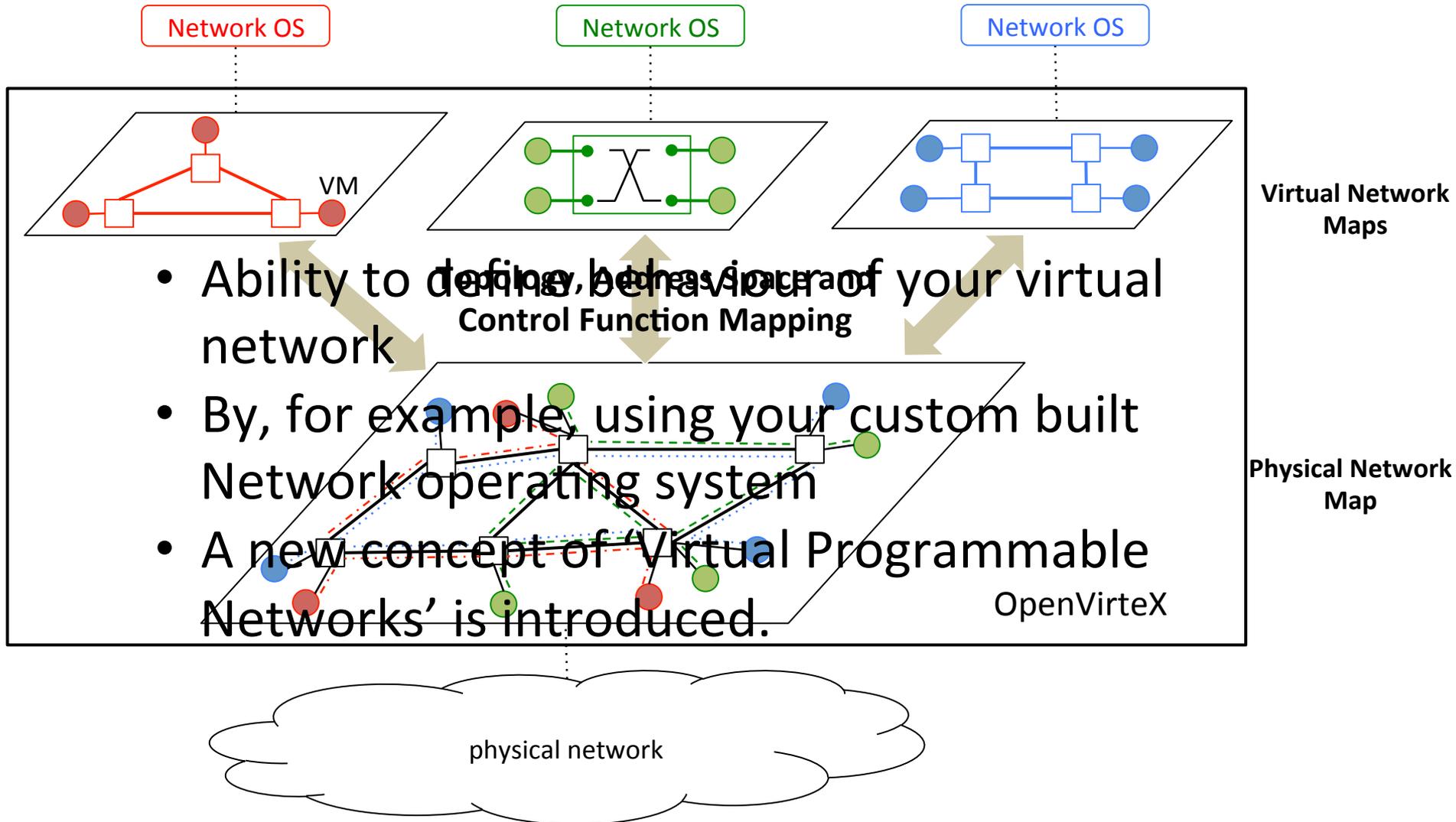


Address Virtualisation

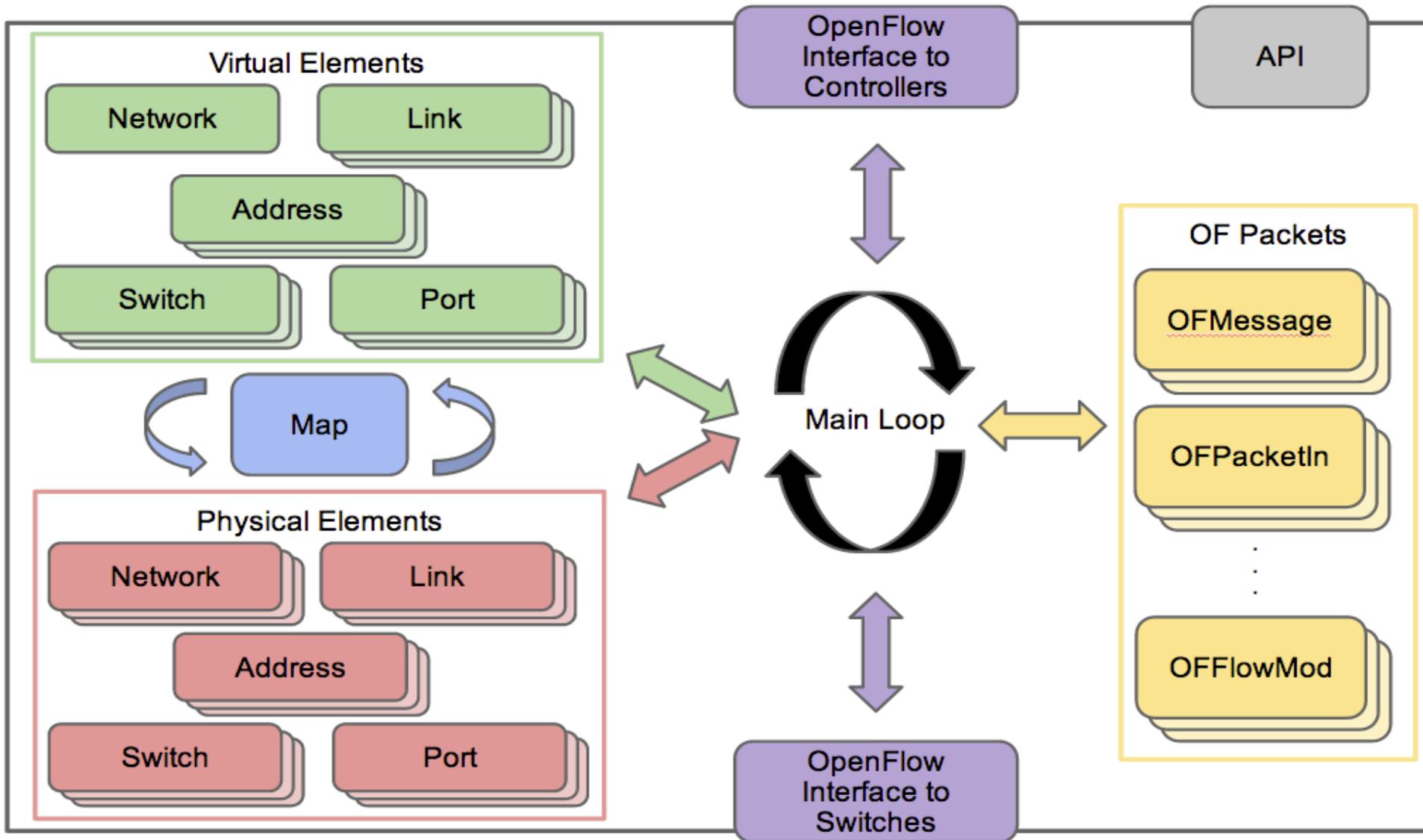
- Need a way to discriminate which tenant is responsible for what.
- 2 and half known approaches:
 - Rewriting of headers
 - Encapsulation of packets
 - Arbitrary purposing of header bits.
- Implementation dependent on desired level of control.



Policy Virtualisation



OpenVirteX Design



Current Status

- OpenVirteX 0.0.1 has been implemented
 - Going through bugfix and code cleanup iterations
 - Java Implementation
- High Level Features:
 - Topology Virtualization
 - Address Isolation
 - Start/Stop Virtual elements
 - Ability to specify backup routes
 - Resiliency
- Upcoming Features:
 - Virtual Network pausing
 - Virtual Network Snapshotting and Migration
 - External Connectivity (as well as inter virtual networks)
- Work in progress with AT&T Foundry for Quantum plugin
 - Extending quantum API and implementation
 - Planning a demonstration

Conclusion

- Complete decoupling of virtual and physical
- Tenant can specify virtual topology to OpenVirteX
- Tenants retain control of their network
- The entire network is available for programming