



# OpenStack Orchestrated Service Chaining

Su-Hun YUN, Hideyuki Tai, Masashi Kudo

NEC

#ODSummit

# Agenda

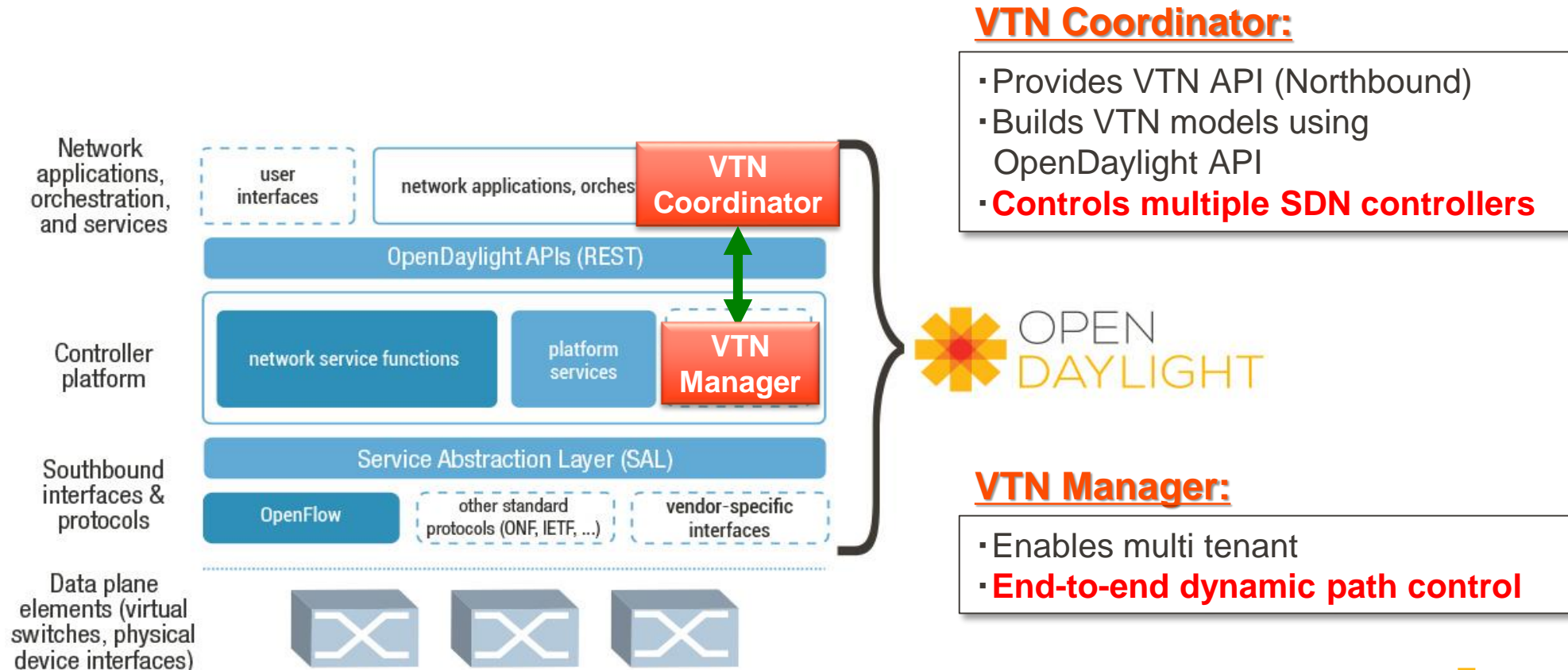
- Virtual Tenant Network (VTN) in ODL
  - VTN models
  - Service Chaining
  - OpenStack integration
- Demo



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# Service Chaining with Virtual Tenant Network

# OpenDaylight Virtual Tenant Network (VTN) Project







# - Lithium

DLUX

VTN Coordinator

OpenStack Neutron

SDNI Wrapper

Network Applications Orchestrations & Services

AAA AuthN Filter  
OpenDaylight APIs REST/RESTCONF/NETCONF

Base Network Function  
OpenFlow Stats Manager  
OpenFlow Switch Manager  
OpenFlow Forwarding Rules Mgr  
L2 Switch  
Host Tracker  
Topology Processing

Network Services  
Service Function Chaining  
Reservation  
Virtual Private Network  
Virtual Tenant Network Mgr.  
Unified Secure Channel Mgr  
Link Aggregation Ctl Protocol  
OVSDB Neutron  
Device Discovery, Identification & Driver Management  
LISP Service  
DOCSIS Abstraction  
SNMP4SDN

Network Abstractions (Policy/Intent)  
ALTO Protocol Manager  
Network Intent Composition  
Group Based Policy Service

Platform Services  
Authentication, Authorization & Accounting  
Neutron Northbound  
Persistence  
SDN Integration Aggregator  
Time Series Data Repository

Controller Platform Services/Applications

Data Store (Config & Operational) Service Abstraction Layer/Core Messaging (Notifications / RPCs)

OpenFlow 1.0 1.3 TTP OVSDB NETCONF LISP BGP PCEP CAPWAP OPFLEX SXP SNMP USC SNBI HTTP CoAP LACP PCMM/C OPS

Southbound Interfaces & Protocol Plugins

OpenFlow Enabled Devices

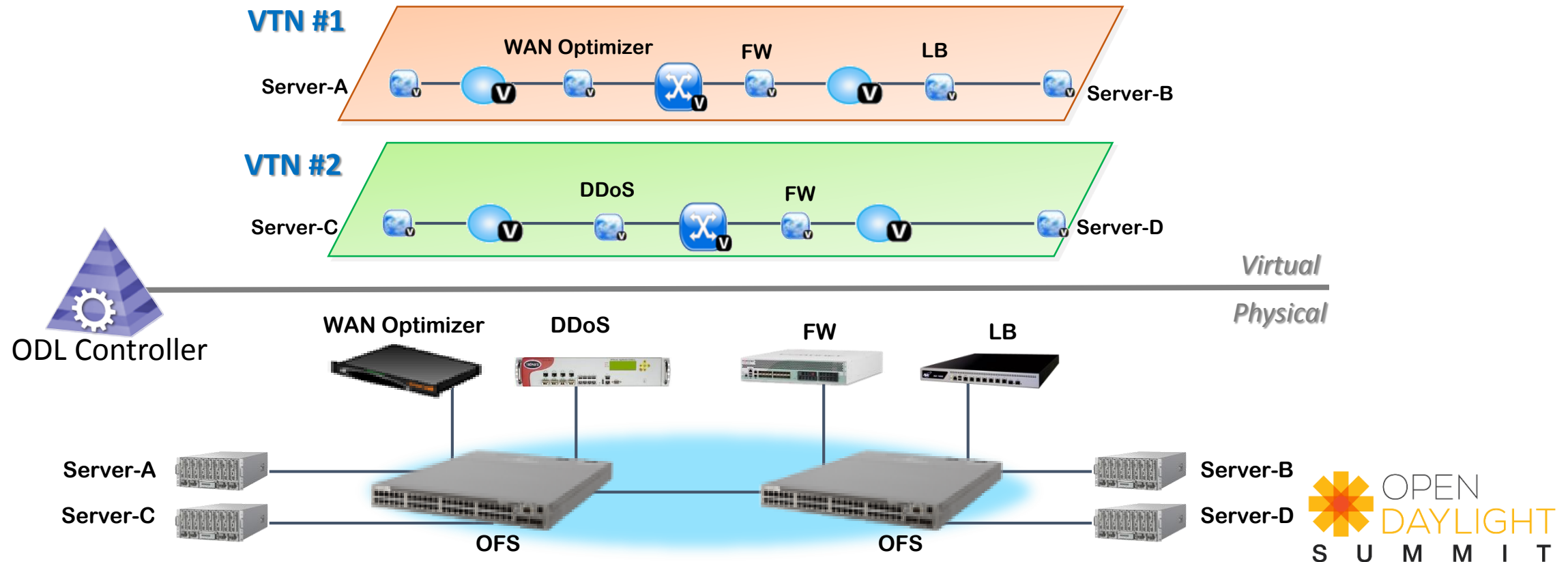
Open vSwitches

Additional Virtual & Physical Devices

Data Plane Elements (Virtual Switches, Physical Device Interfaces)









# VTN (Virtual Tenant Network)

- Network virtualization for multi tenant, traffic isolation, abstraction of physical network



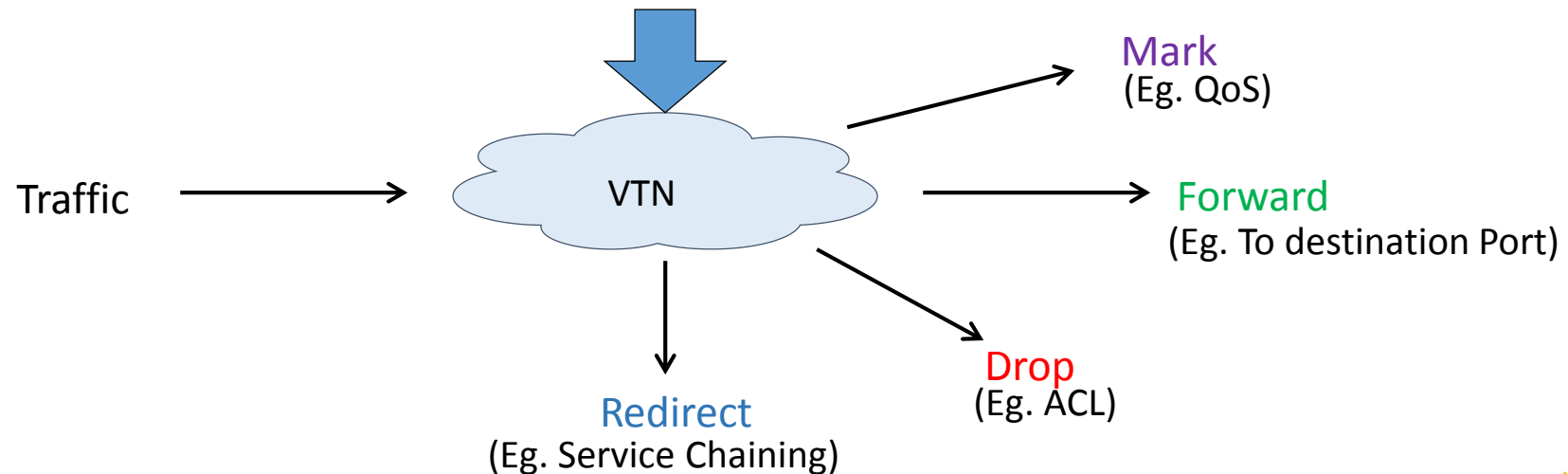
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# VTN Models

Policy Target			Description
VTN			logical representation of virtual network
Virtual node (vNode)	vBridge		logical representation of L2 switch function
	vRouter		logical representation of L3 router function
	vTerminal		Logical representation of virtual node that is connected to an interface mapped to a physical port
	vTunnel		logical representation of Tunnel (consists of vTEPs and vBypass(es))
	vTEP		logical representation of Tunnel End Point (TEP)
	vBypass		logical representation of connectivity between controlled networks
Virtual Interface	Interface		representation of end point on the virtual node (VM, servers, appliance, vBridge, vRouter, etc)

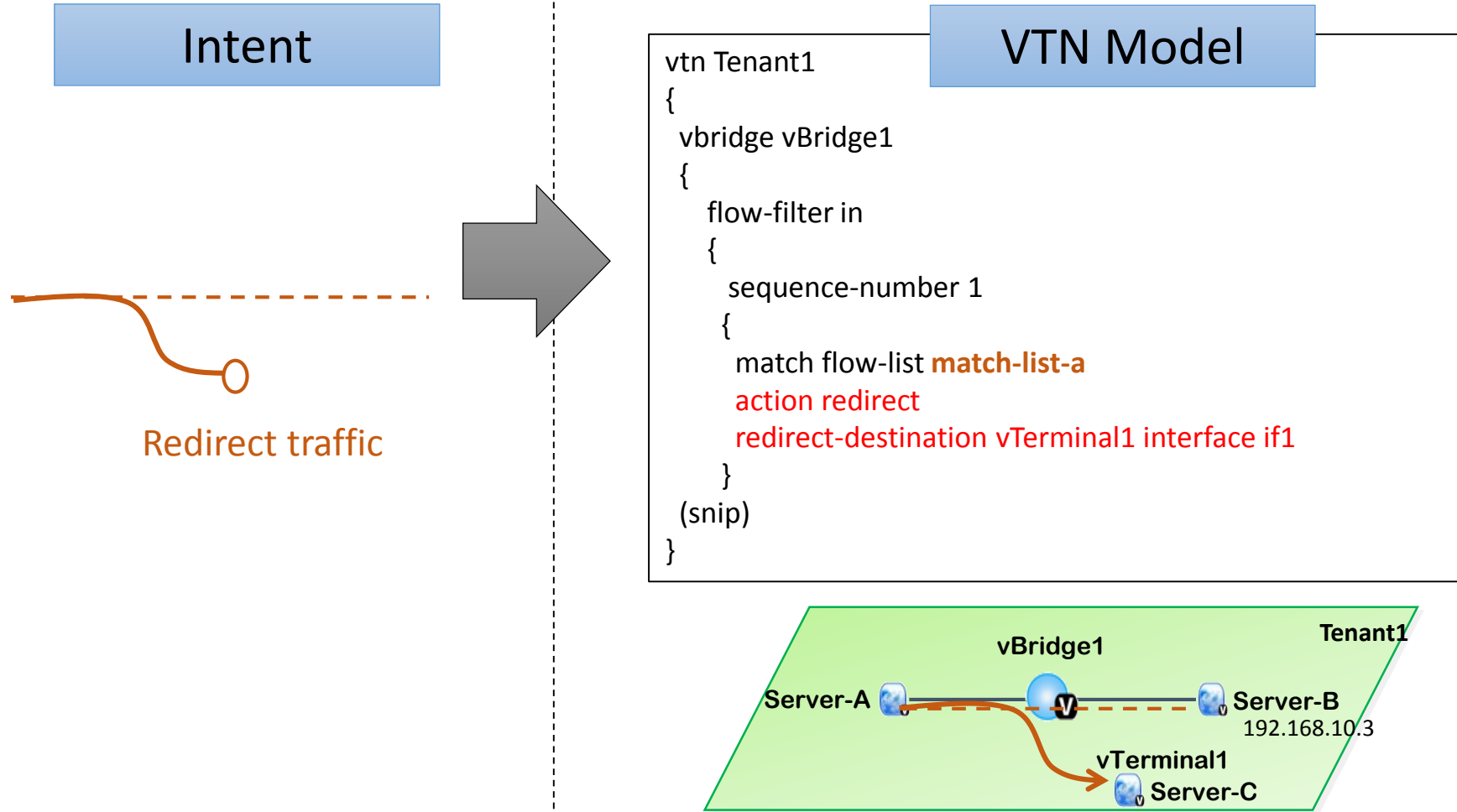
# Intent based actions

- Define matching conditions (12 tuples)
- Apply intent and actions



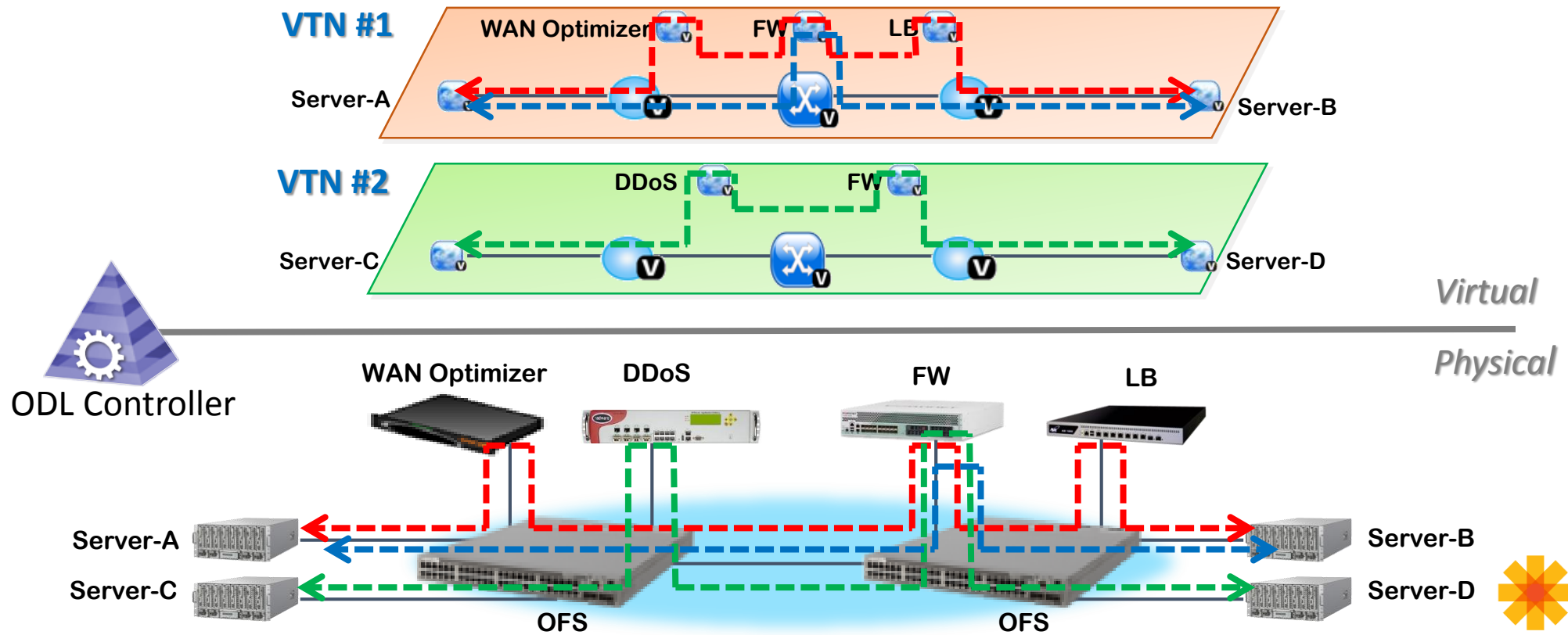


# Traffic redirection



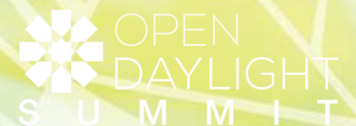
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# Service Chaining on VTN



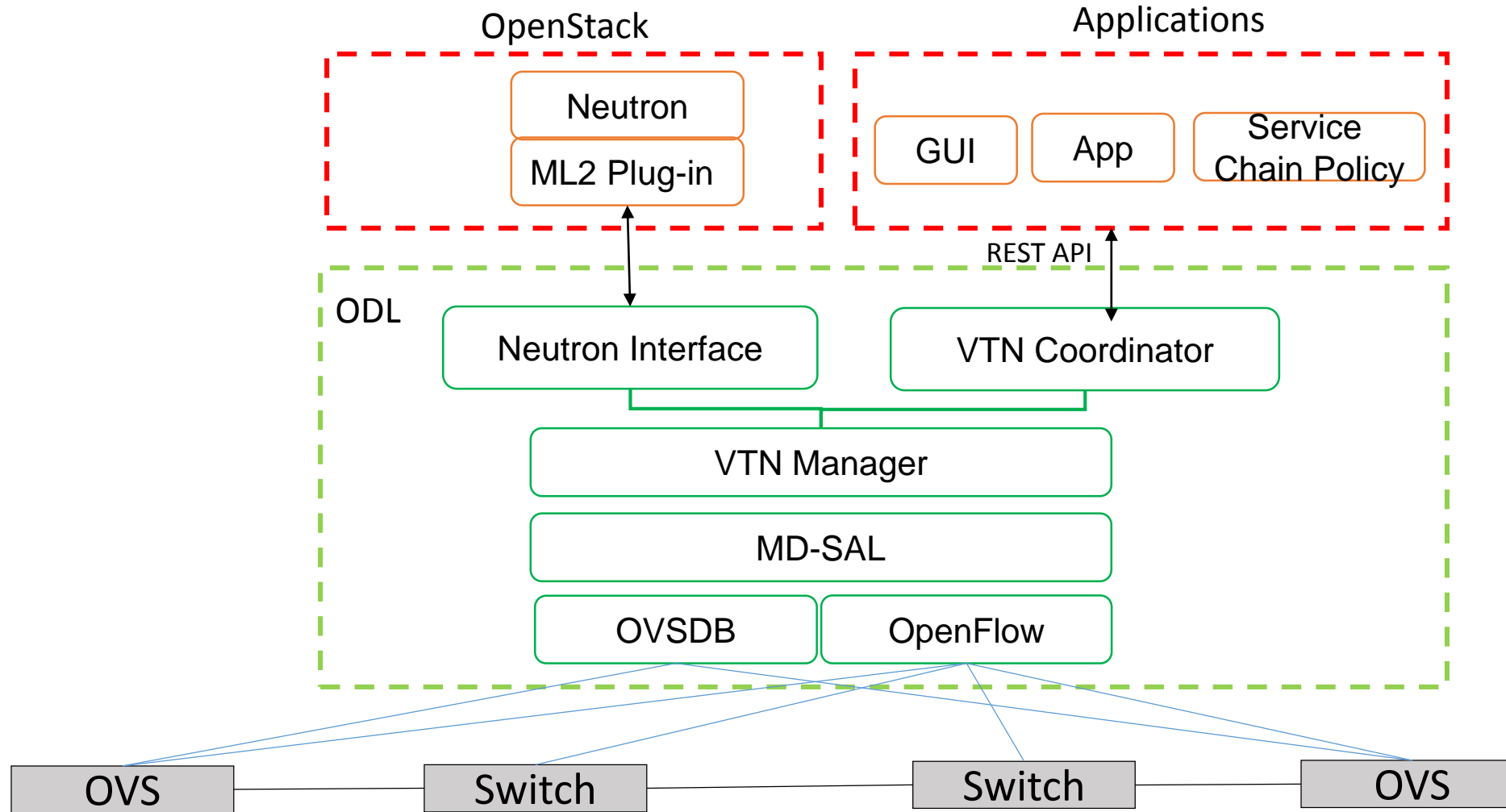
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# OpenStack and VTN

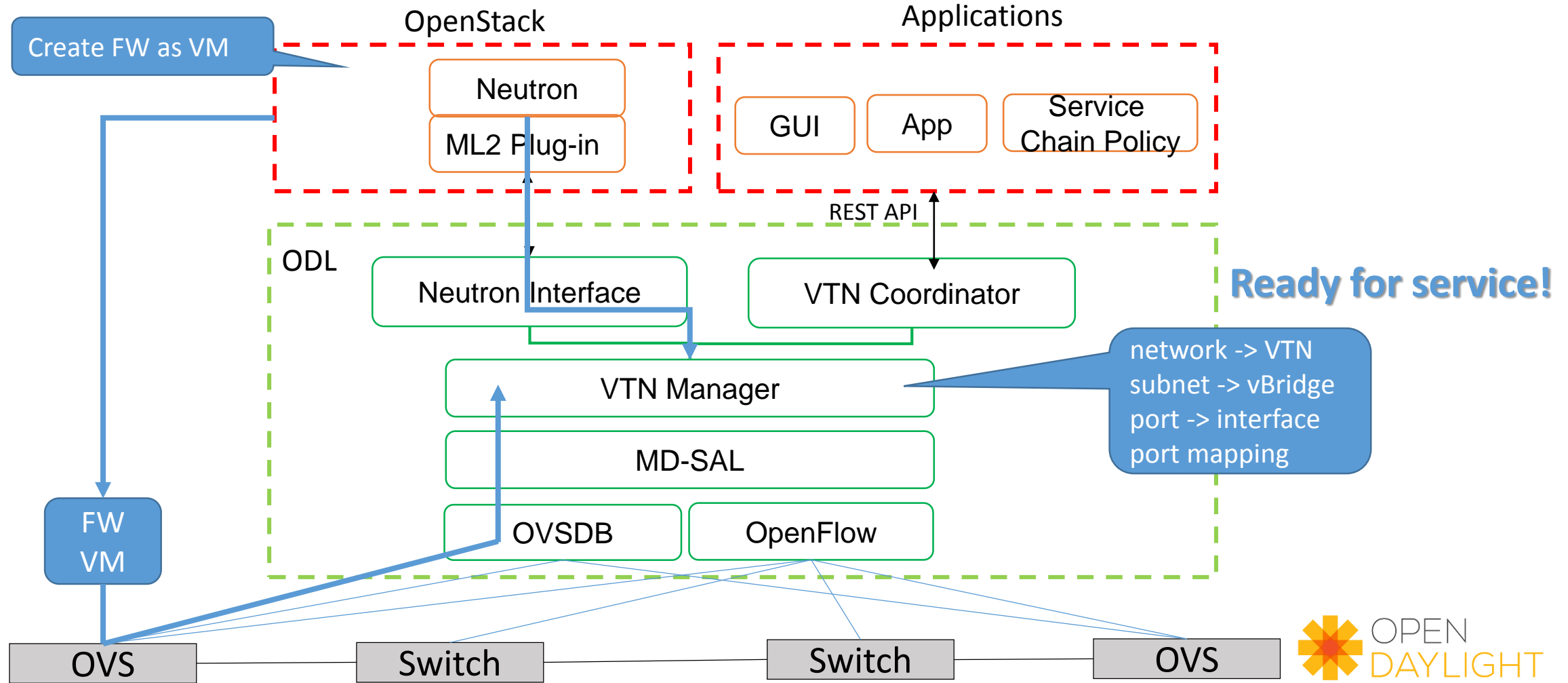


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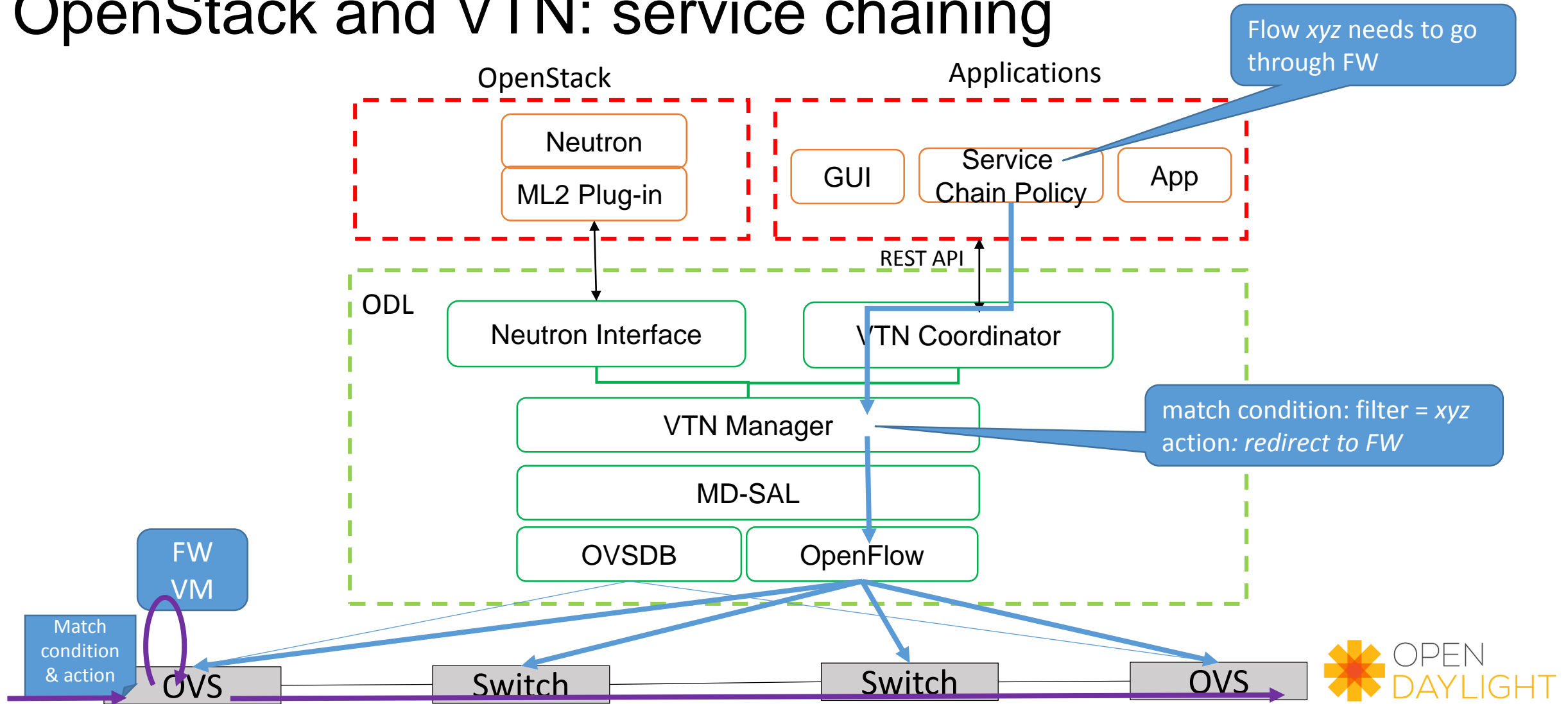
# OpenStack and VTN



# OpenStack and VTN : Automatic mapping



# OpenStack and VTN: service chaining





# Demo

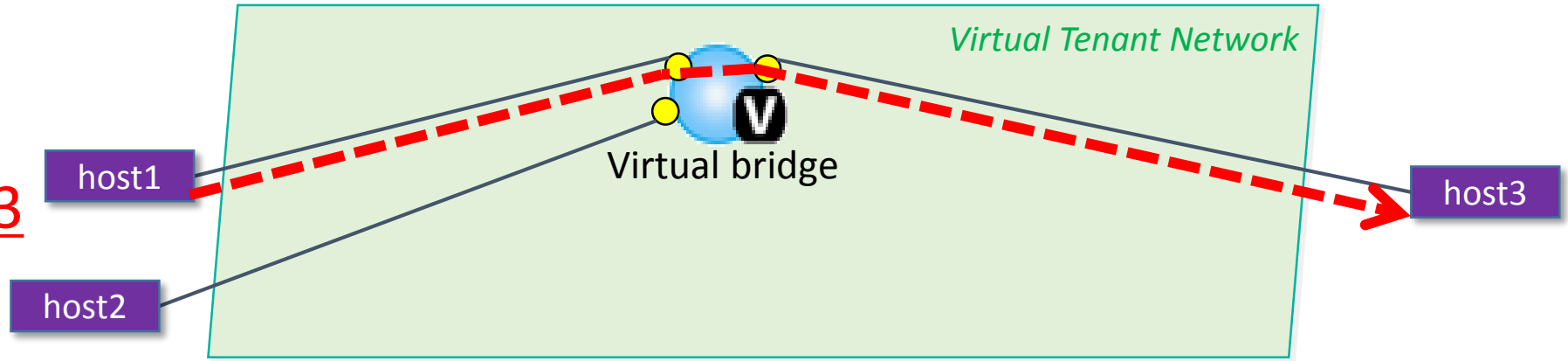
# Demo Features

- Seamless integration with OpenStack
- Ability to insert service functions dynamically
- Not require NSH capability, work with OpenFlow switches
- Ability to visualize end-to-end flows



# Overview

host1 to host3



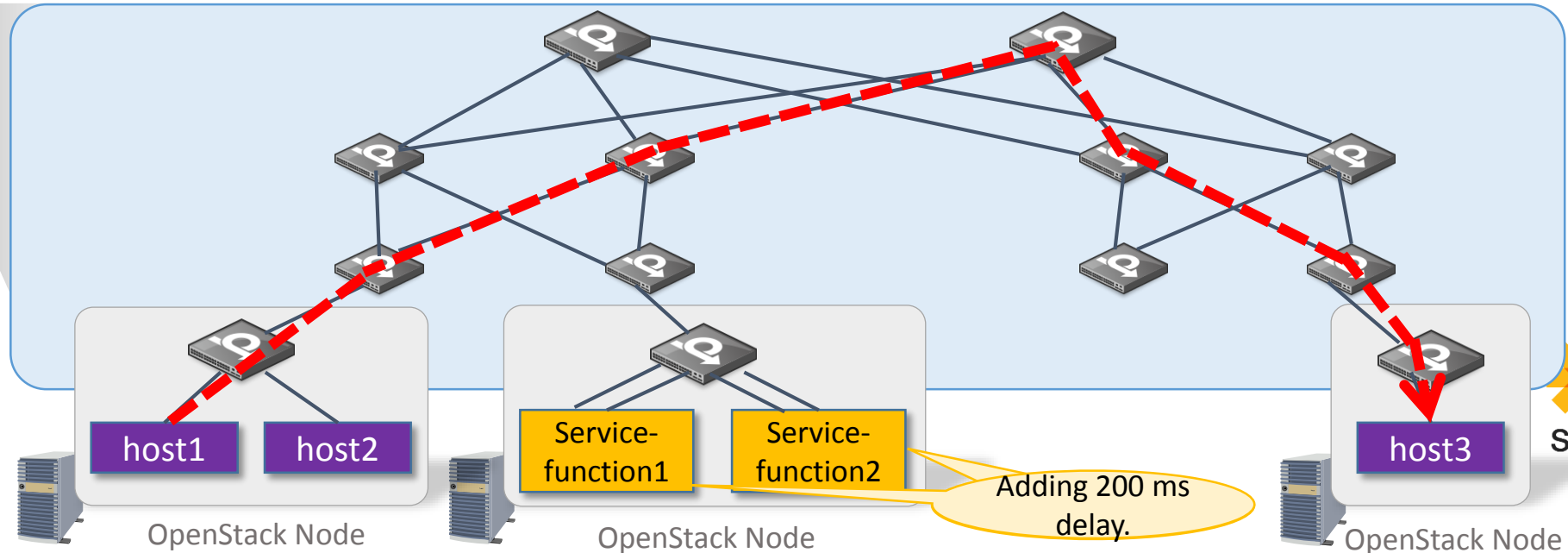
Service-function1

Service-function2

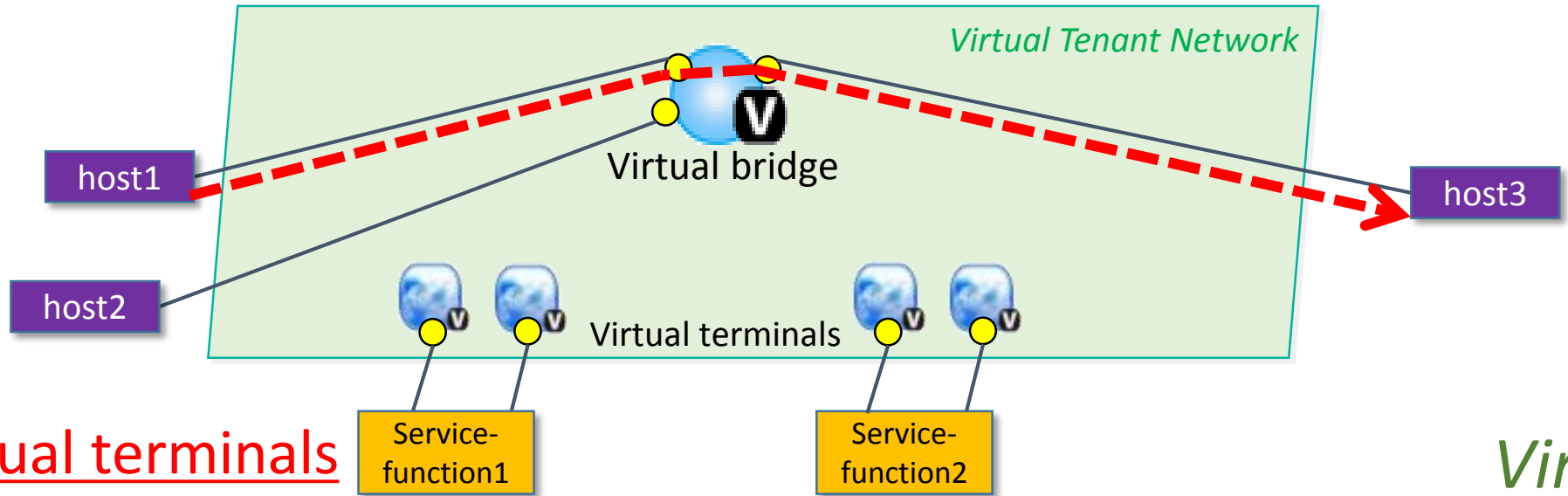
*Virtual*



*Physical*

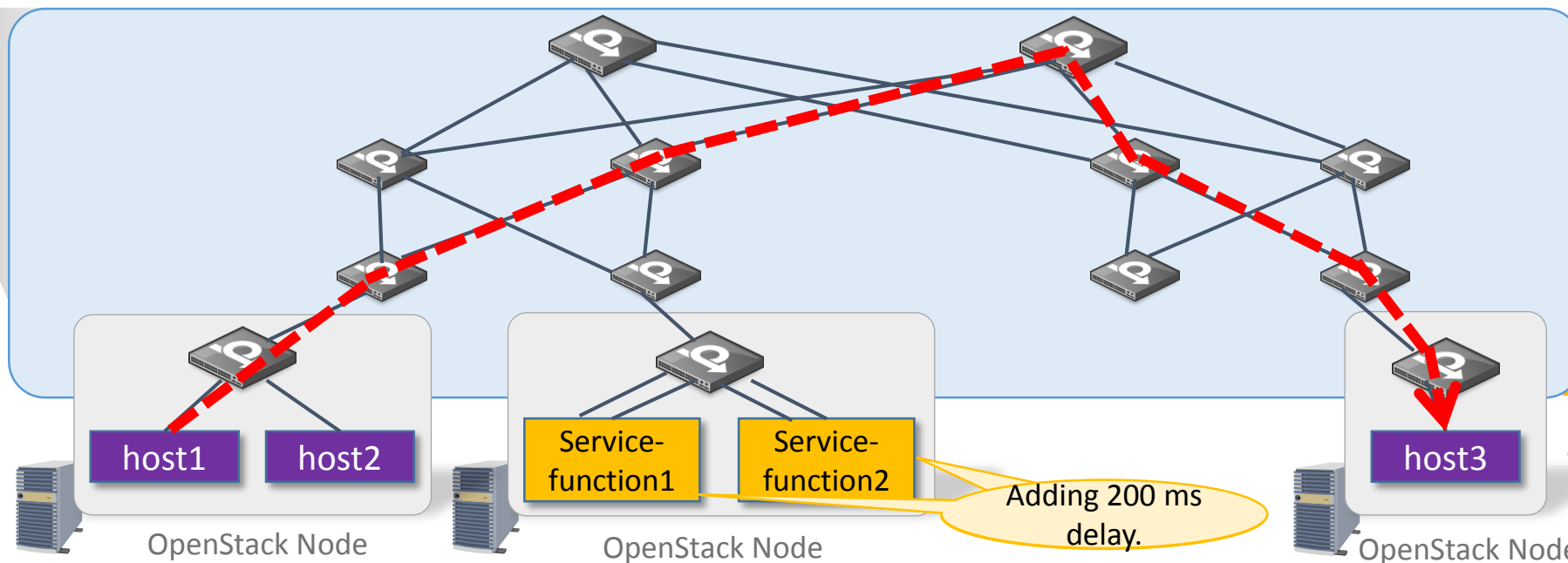


# Overview



## Creating virtual terminals

*Virtual*

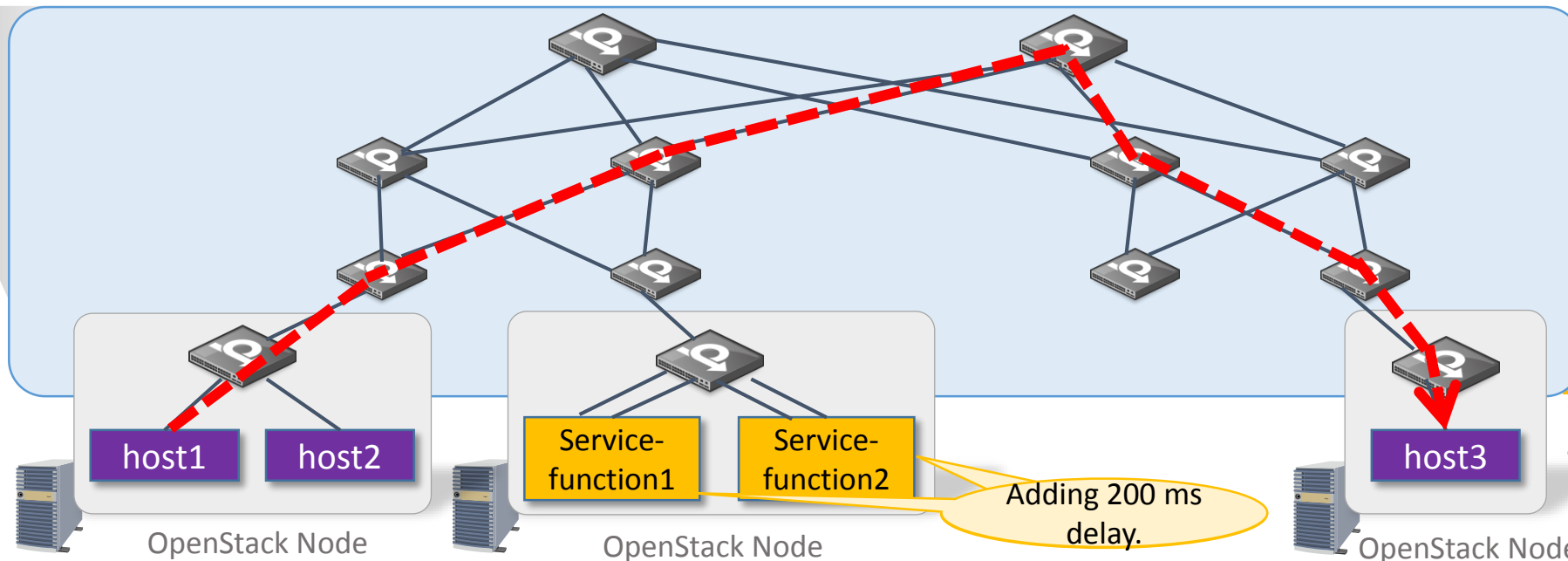
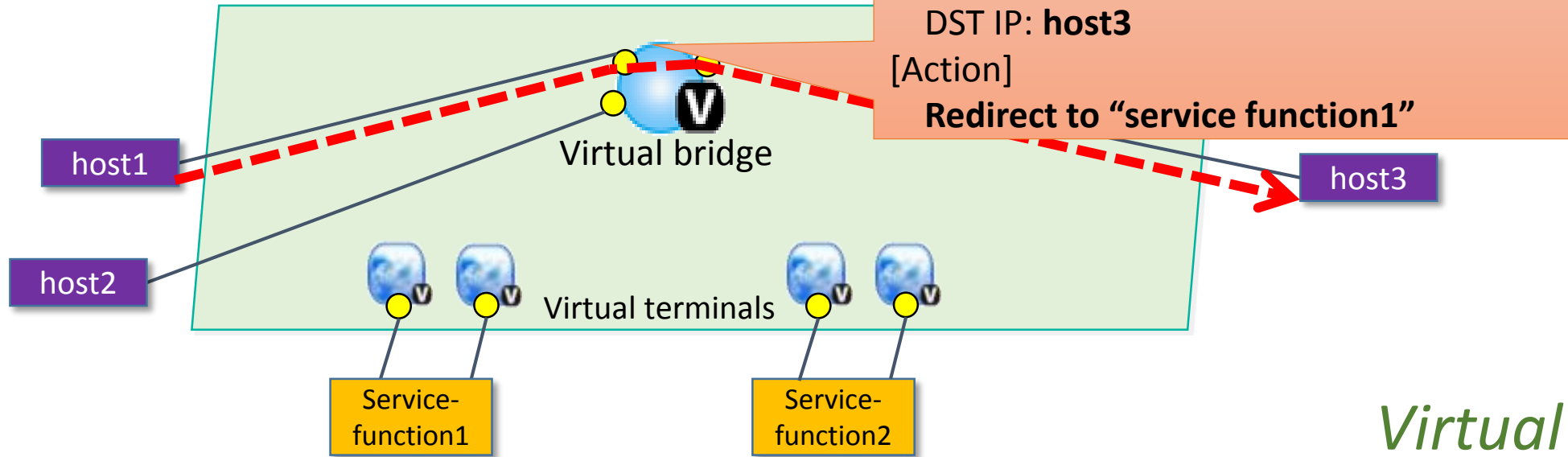


*Physical*



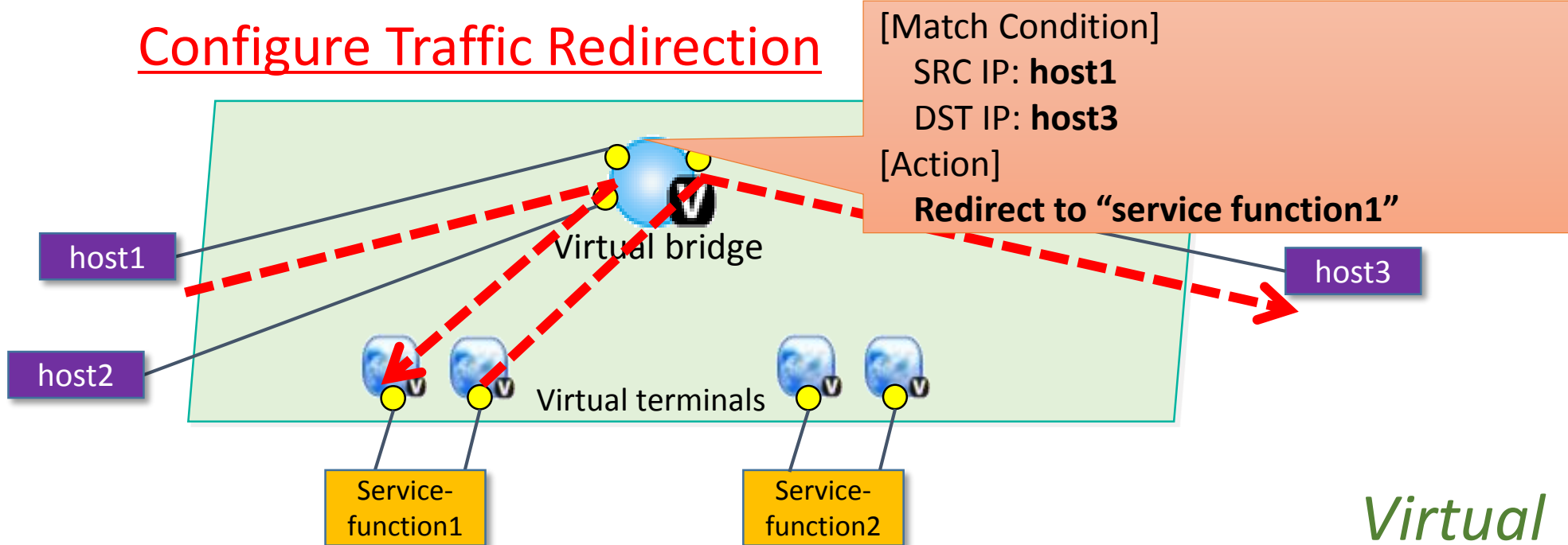
# Overview

## Configure Traffic Redirection

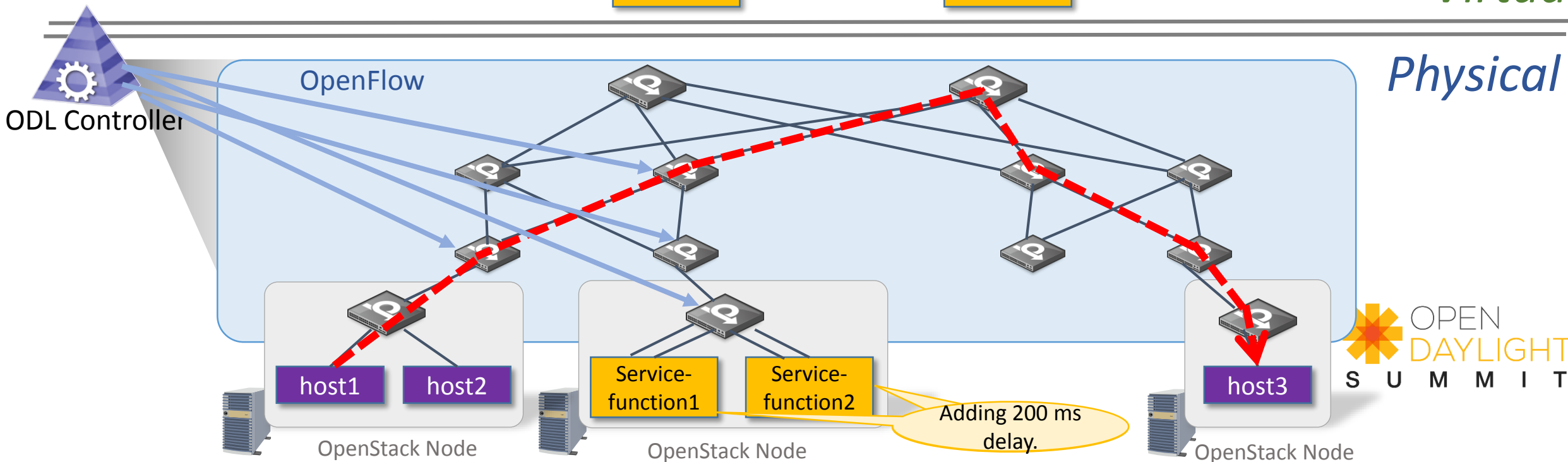


# Overview

## Configure Traffic Redirection



*Virtual*



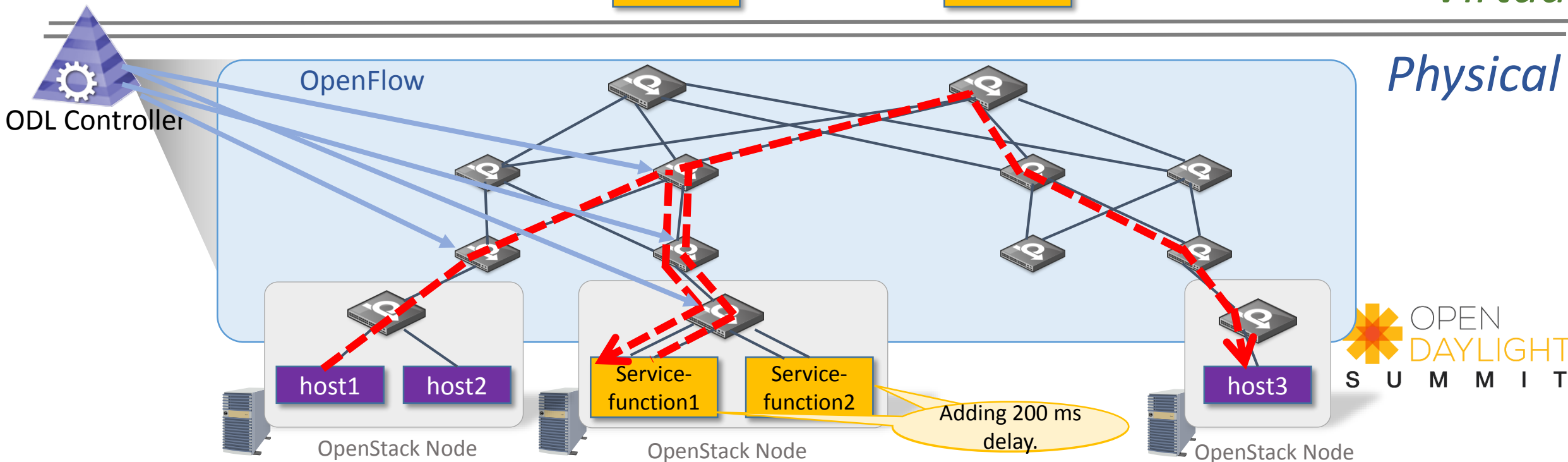
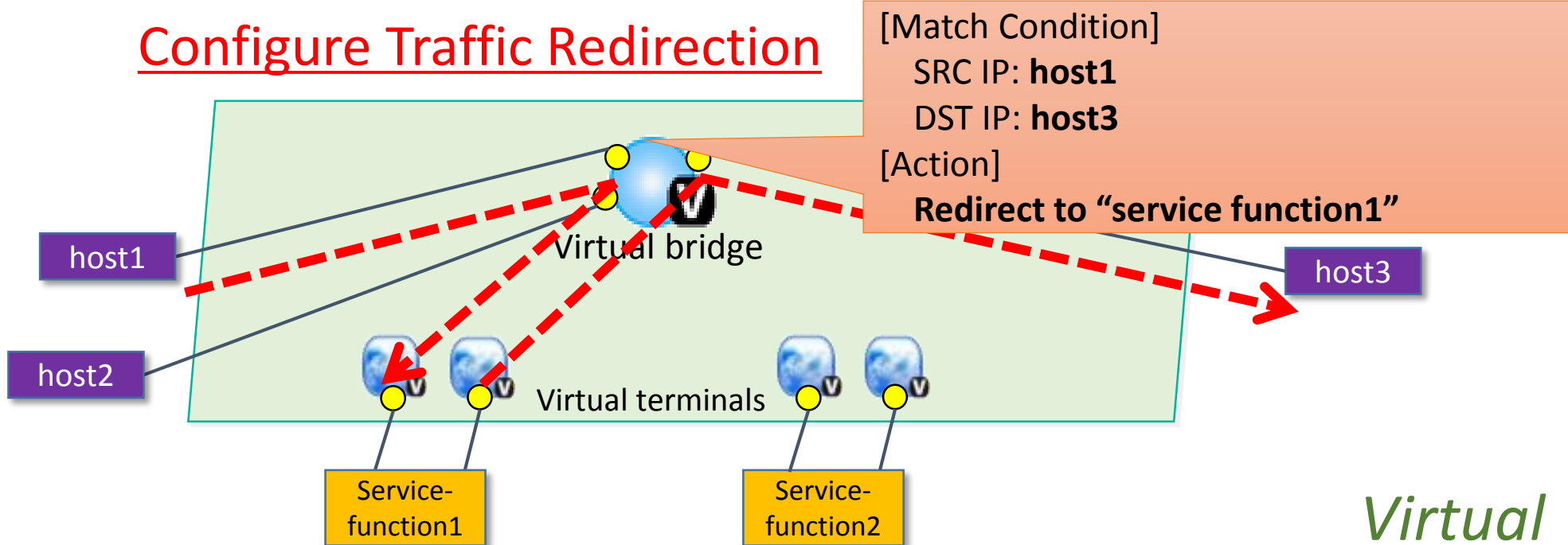
*Physical*





# Overview

## Configure Traffic Redirection



# Demo Software Components

- OpenDaylight Lithium
  - odl-vtn-manager-rest enabled
  - odl-vtn-manager-neutron enabled
  - VTN Coordinator
- GUI for VTN Coordinator
- OpenStack Juno



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# Deployment



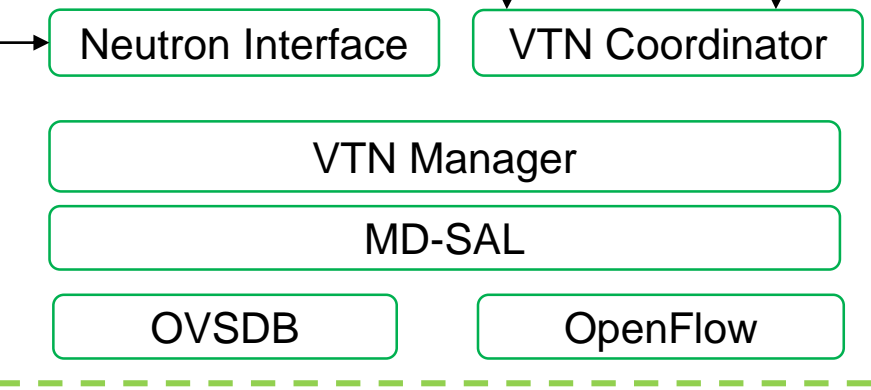
Demo Operation



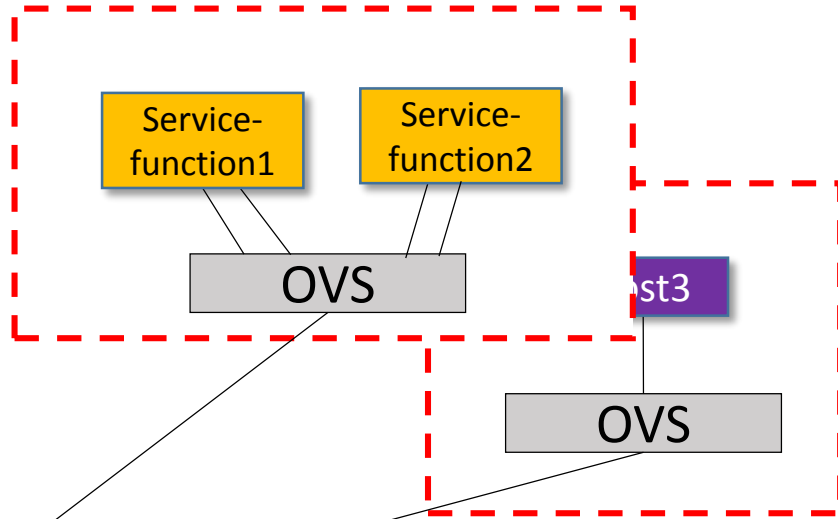
Applications



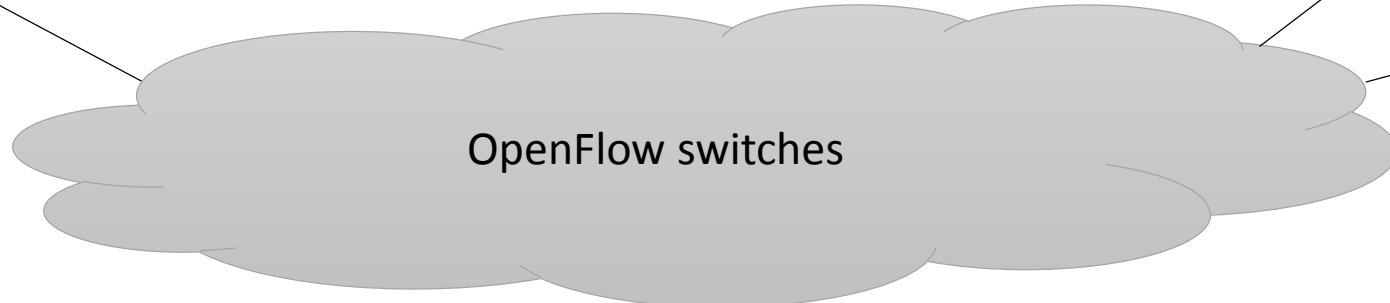
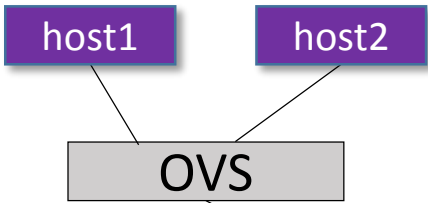
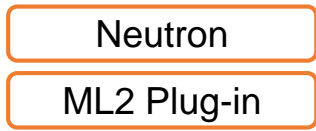
OpenDaylight



OpenStack (Compute Node)



OpenStack (Control Node)



# What to expect from VTN in Beryllium?

- Integration with the SFC project
- Provide VTN visualization and configuration support in DLUX

Thank You



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