



Open Platform for NFV (OPNFV)

ONOS Framework (ONOSFW)  
Project Proposal v1.1

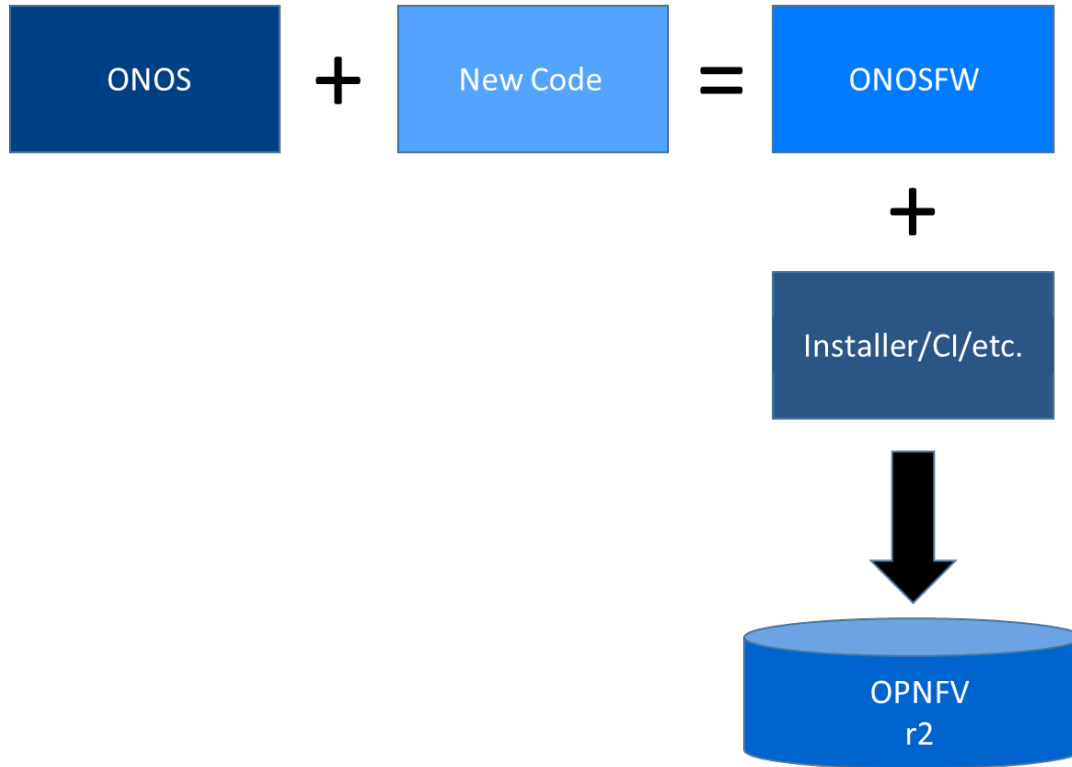
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# Contents

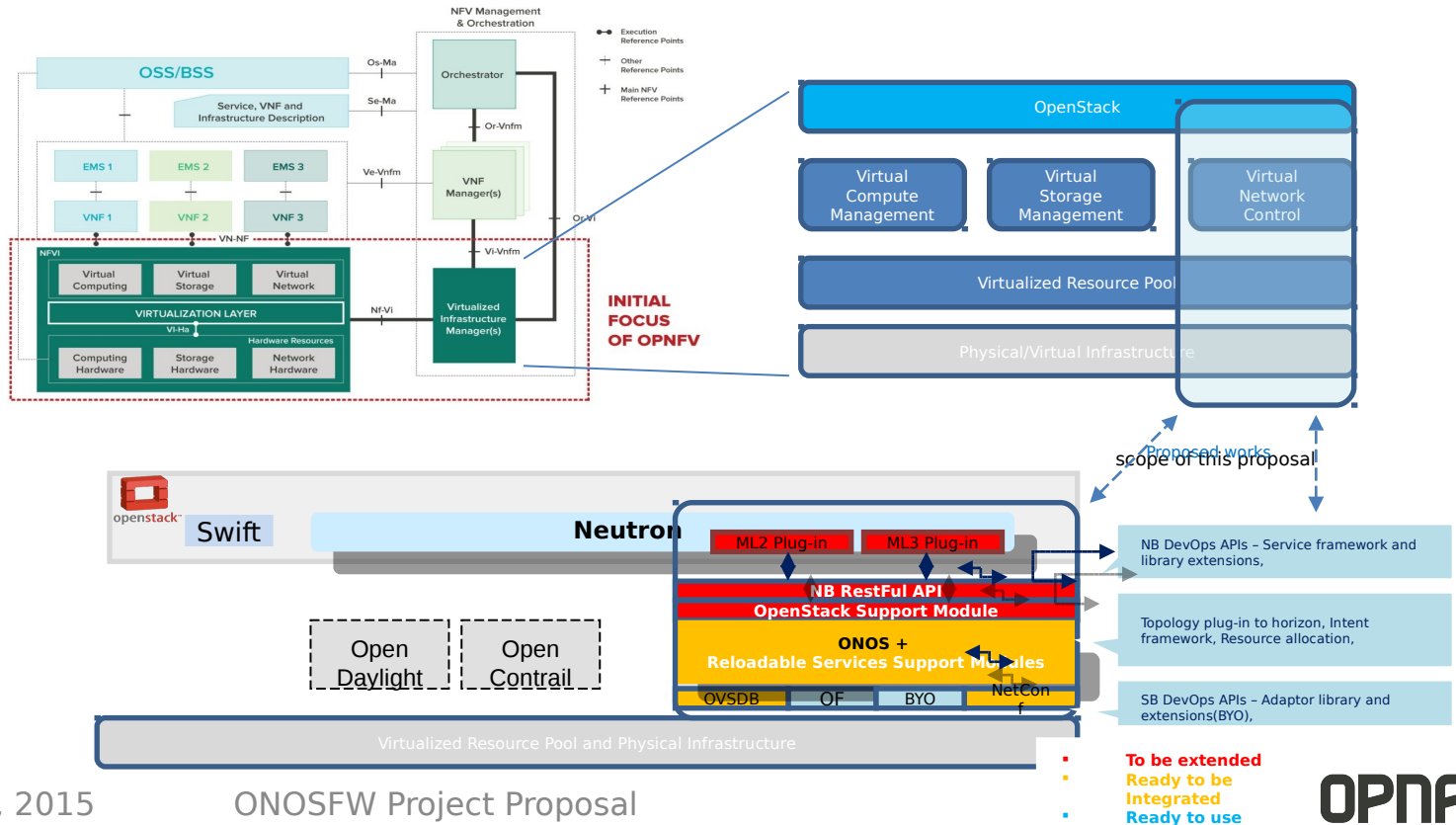
- ONOSFW Framework for OPNFV/Structure Reference
- Interact and integrate with OpenStack projects
- Relationship with other OPNFV projects
- Supporting broader open initiatives
- Use cases Examples (control and message flows)



# ONOSFW Relation to OPNFV

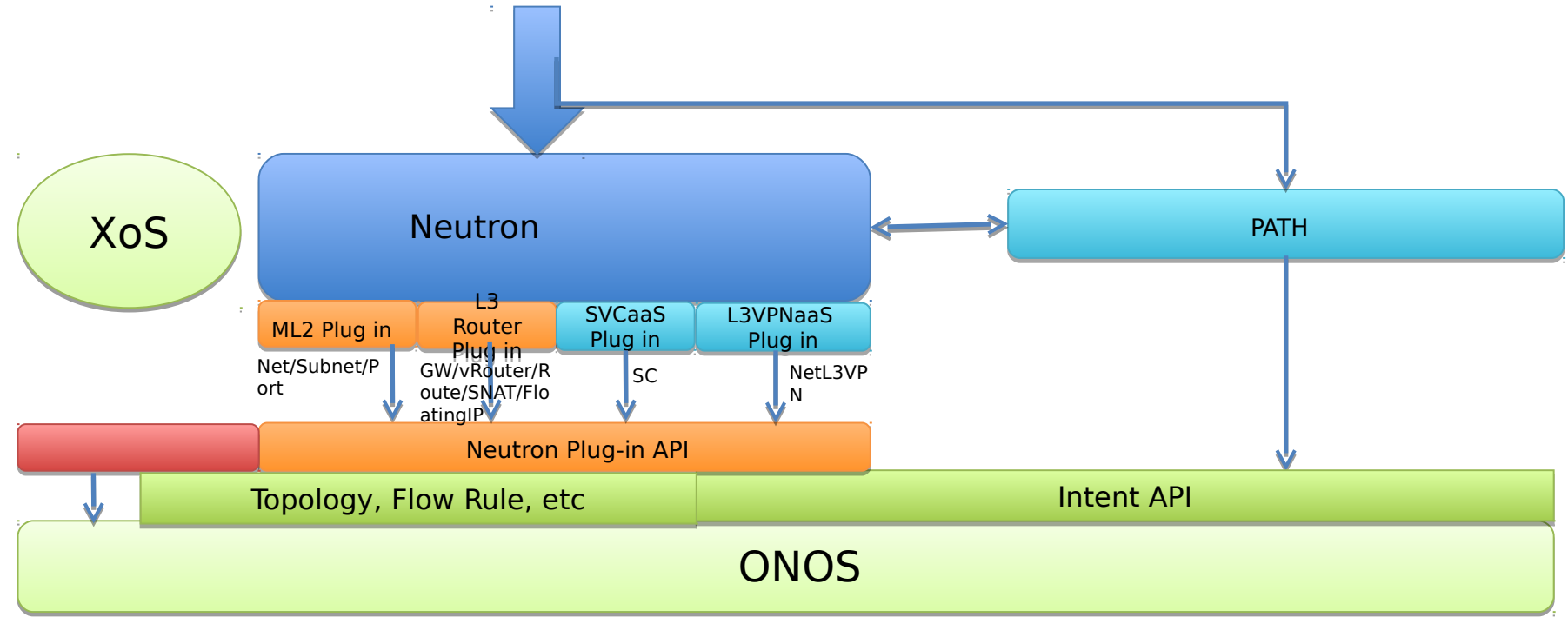


# Reference: Where ONOSFW is in OPNFV



# OPNFV Upstream Project Scope

Setup PATH



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OVS

OVX

Upstream Project

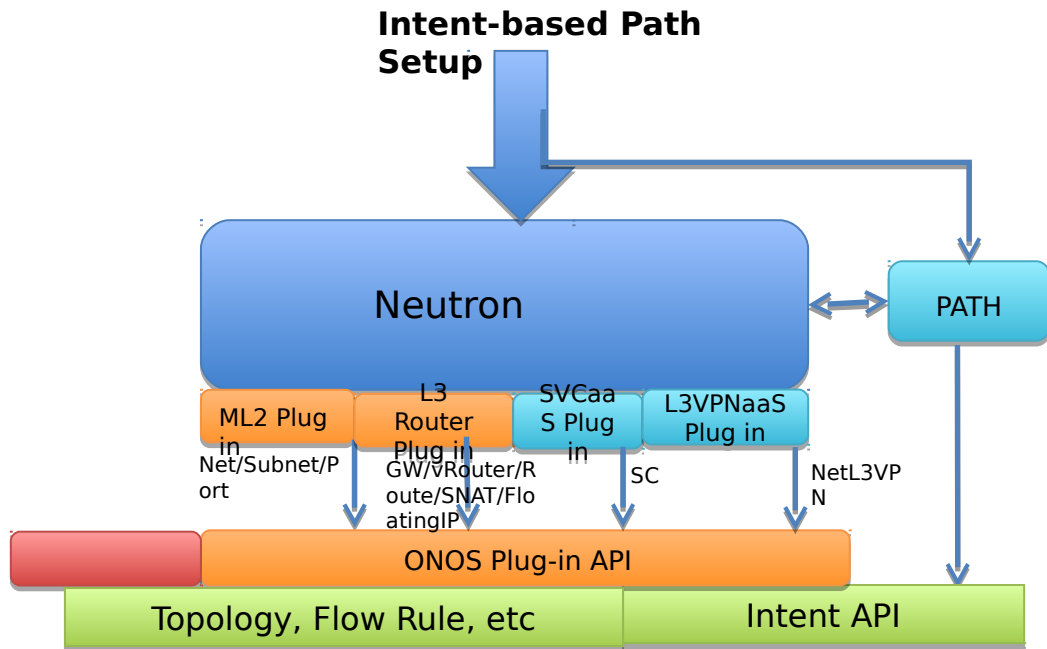
OPNFV Rel2

OPNFV Rel3

Future Development



# OPNFV Upstream - Openstack and ONOS



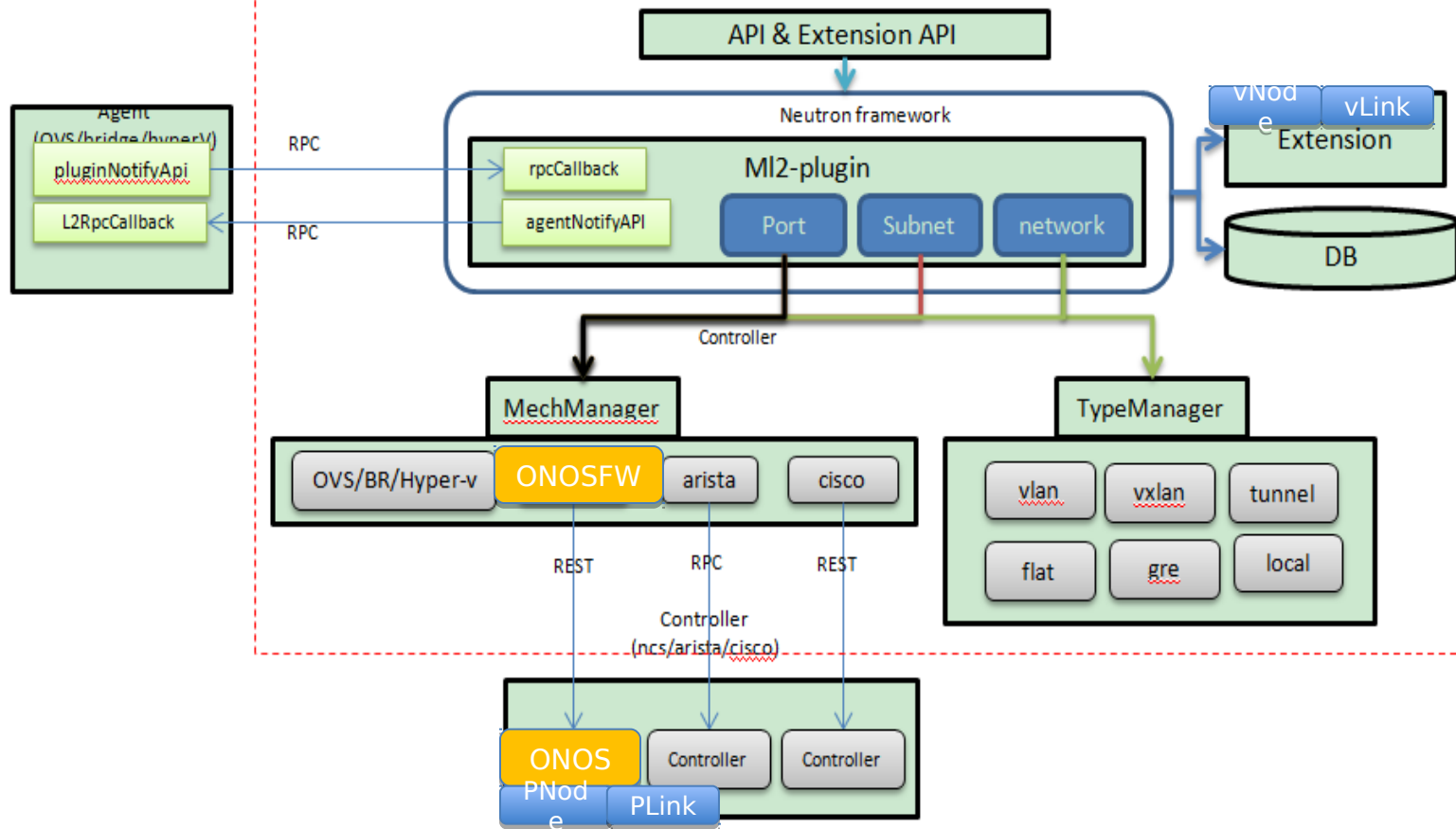
- ONOSFW R1: (OPNFV R2)
- ✓ ONOS Neutron ML2 Plug-in
  - ✓ ONOS Neutron ML2 Driver
  - ✓ ONOS Neutron L3 Plugin
  - ✓ ONOS Neutron L3 Driver
  - ✓ Existing IPV6(PD/RA/IPAM) ,VR/DVR BPs in Openstack.
  - ✓ Horizon ONOS Plug-in and OSC CLI
  - ✓ ONOSFW Orch. For Keystone-ONOS ID
  - ✓ System integration and test
- ONOSFW R2: (OPNFV R3)
1. BP for Congress for Policy
  2. Add Driver in ONOSFW for more Controllers
  3. Add intent-based PATH manager
  4. Neutron API for Intent
  5. Consolidate HA & Perf. Bench Marks
  6. System integration and test

- Future development
1. Extend ONOSFW NB to support different open source cloud management
  2. support for possible unifies NBI ?

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# ML2 ONOSFW Driver and ONOS



# Upstream Collaboration for Development

Project	Specs	Packages	Start	End
ONOSFW	ONOSFW	Openstack (L)+ onos(R1.2)	Spec by May 23	November 10
Neutron	API extension	BP in Neutron (L)	Spec by May 23	October 23
Horizon/ osc	GUI for ONOSFW and CLI for same	BP in Horizon (L)	Spec by May 23	October 23
Onosfw Keystone onos	ID Management / Phy Infra + Virt. Infra	HL Orchestration (onosfw R1) -> BP in Keystone (L) /onos(R1.3)	Spec by May 23	October 23
Congress	Policy /Intent	BP in Congress (L)	Spec by May 23	October 23
Octopus	Automation	Scripts for Build/TEST/CD	Spec by May 23	Ongoing

ONOSFW Project Proposal



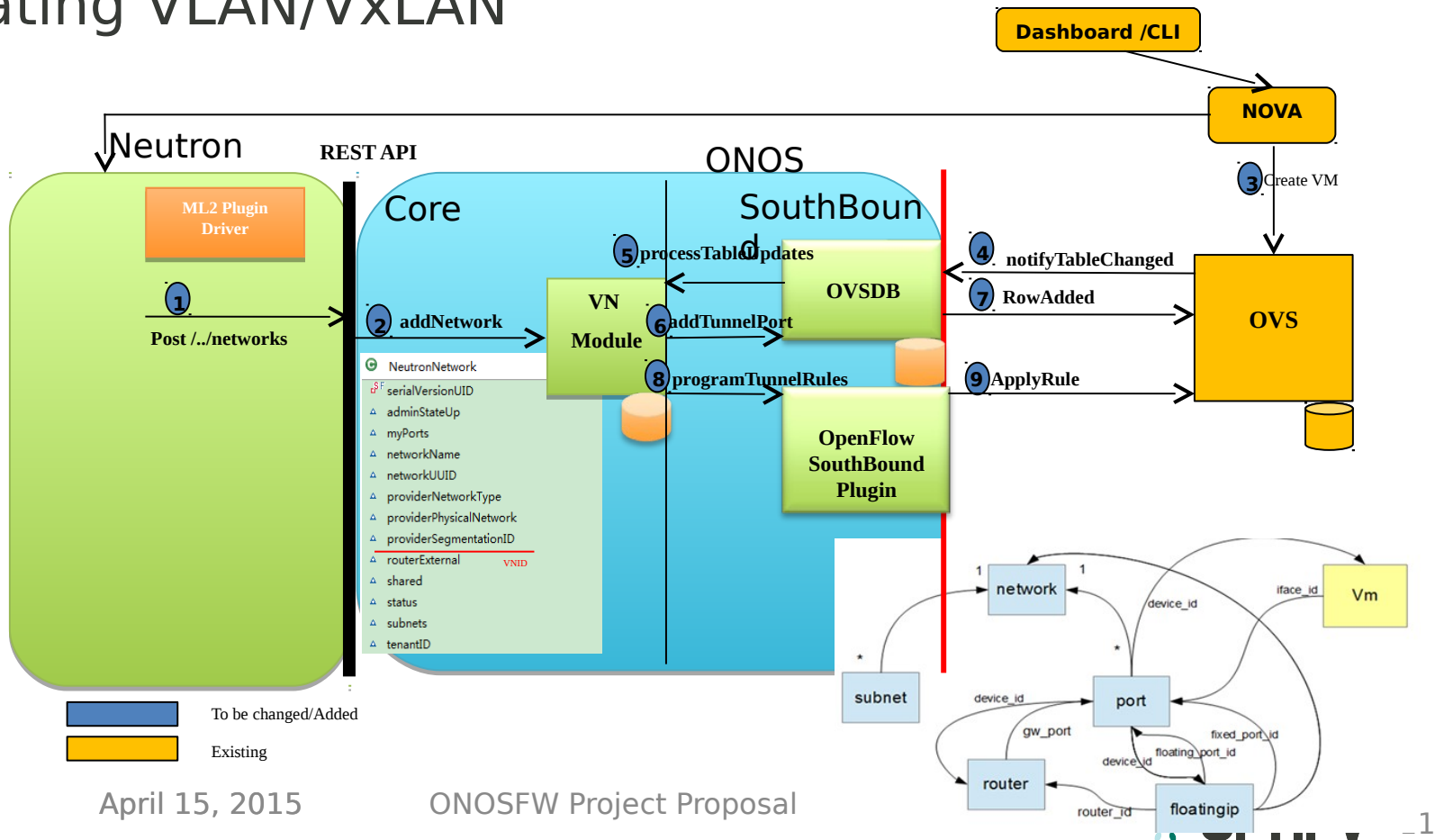
# Upstream Collaboration for Development Integration(Cont )

Project	Specs	Package	Start	End
Neutron	API	ML2 Plug (L)	Spec by May 23	October 23
Neutron	REST calls	ML2 Driver (L)	Spec by May 23	October 23
OVSDB	ONOS SB	OVSDB(R1.3)	Spec by May 23	October 23
Congress	Optional	Policy /Rules (L)	Spec by May 23	October 23
Nova	Optional	KVM	N/A	

# OPNFV Projects cross-collaboration

	OPNFV Project	ONOSFW	Test Cases	Attributes
1	IPv6 Enabled OPNFV	Use case 1 (CO), Use case 2 MNO	IPv6 Topology	Prefix Delegation
2	Multi-Site OPNFV	Distributed ONOS Core	Parallelism	Distribute Clusters
3	Congress	Intent	Policy	API
4	Promise/vimnbi	Intent NBI	Resource Rsvn	API
5	VNFFG	Path/Link	Graph	API
6	Doctor	Link/State	Notification	API
7	Elevator	Package	Updates	API
8	DP Acceleration	Flow	Cluster	Per Controller

# Creating VLAN/VxLAN



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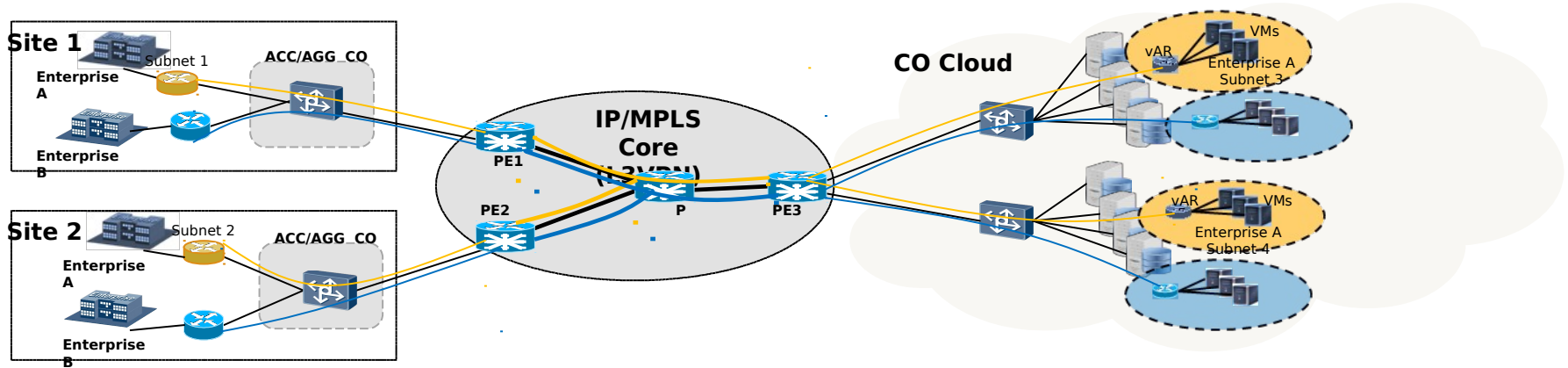
ONOSFW Project Proposal

# Message or Control flow for VxLAN Control

- os> neutron net-create net1  
neutron subnet-create net1 10.10.1.0/24 --name sub1  
neutron router-create r1  
neutron router-interface-add r1 sub1  
os> neutron net-create ext-net1 -  
router:external=True  
neutron router-gateway-set r1 ext-net1  
os> nova create server vm1 imageRef link1 flavorRef m1 networks

```
ml2_conf.ini
[ml2]
type_drivers=local,flat,vlan,gre,vxlan
Mechanism_drivers=onosfw,l2population
Tenant_network_type=vxlan
External_network_type=flat
[ml2_type_vlan]
Vni_range = 1:65535 (1...24bits)
[database]
Connection=mysql://...
[onos]
Local_ip = 192.0.2.24
Enable_tunneling=True
[agent]
Tunnel_type=vxlan
L2_population=True
```

# Enterprise L3VPN and vAR in CO Use Case



## Virtual Router

- › Enterprise/Tenant Virtual Network Routing
- › VPN Secure Connection, FW, QoS, Load Balancing

...

# Links to related Open Source Projects

- ONOS wiki
  - <http://onosproject.org/>
- OpenVirteX (OVX) – Programmable Virtual Network
  - <http://ovx.onlab.us/>
- XOS, cloud operating system
  - <http://www.opencloud.us/>
- ONOSFW forum
  - <http://forum.onosfw.com>





# Thank You...

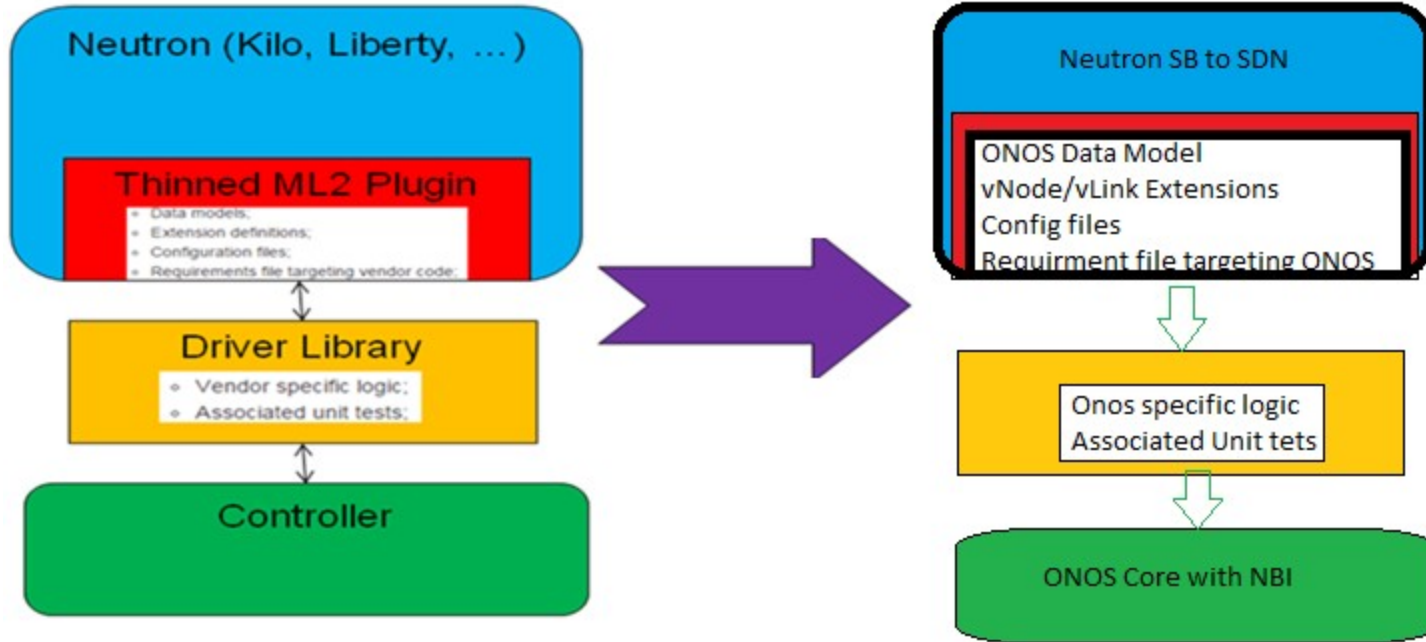
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# Appendix 1: Feature list for ONOSFW Release 1 & 2

Scenarios	Functionalities
Neutron L2/L3 Network service	Neutron ML2 and L3 Router APIs
	VxLAN tunnel Setup
Inter-VM communication within same subnet	MAC Table installation
	Install a policy for capturing ARP packet (Flow Rule)
	ARP Proxy
Inter-subnet , Inter VM communication for the same tenant (private-private subnet communication)	Router resource allocation and assign a Gateway for Tenant
	Routing service
Inter-subnet , Inter VM communication for the same tenant (private-public communication)	Tenant SNAT/Floating IP service



## Appendix 2: Neutron SB Plug-in for SDN NBI



# Appendix 2.1 - ONOS ML2 Plug-in APIs

Neutron element	API	Action	Notes
Network	/v2.0/Network	get	Lists Network to which the specified tenant has access.
	/v2.0/Network	post	Creates single or multiple Network in a single request.
	/v2.0/Network/{network_id}	get	Shows information for a specified network.
	/v2.0/Network/{network_id}	put	Updates a specified network.
	/v2.0/Network/{network_id}	delete	Deletes a specified network and its associated resources.
Subnet	/v2.0/subnets	get	Lists subnets to which the specified tenant has access.
	/v2.0/subnets	post	Creates single or multiple subnets on a specified network.
	/v2.0/subnets/{subnet_id}	get	Shows information for a specified subnet.
	/v2.0/subnets/{subnet_id}	put	Updates a specified subnet.
	/v2.0/subnets/{subnet_id}	delete	Deletes a specified subnet.
port	/v2.0/ports	get	Lists ports to which the tenant has access.
	/v2.0/ports	post	Creates single or multiple ports on a specified network.
	/v2.0/ports/{port_id}	get	Shows information for a specified port.
	/v2.0/ports/{port_id}	put	Updates a specified port.
	/v2.0/ports/{port_id}	delete	Deletes a specified port.

# Appendix 2.2 - ONOS ML2 Plug-in APIs for v2.1 extensions

Neutron element	API	Action	Notes
vNode	/v2.1/vNode	get	Lists vNode to which the specified tenant has access.
	/v2.1/vNode	post	Creates single or multiple vNode in a single request.
	/v2.1/vNode/{pNode_id}	get	Shows information for a specified vNode.
	/v2.0/vNode/{pNode_id}	put	Updates a specified vNode.
	/v2.1/vNode/{pNode_id}	delete	Deletes a specified vNode and its associated resources.
vLink	/v2.0/vLinks	get	Lists vLinks to which the specified tenant has access.
	/v2.1/vLink{vNode_Id,vNode_Id}.	post	Creates single or multiple vLink on a specified network.
	/v2.0/vLink/{vLink_Id}	get	Shows information for a specified vLink.
	/v2.1/vLink/{vLink_Id}	put	Updates a specified vLink.
	/v2.0/vLink/{vLink_id}	delete	Deletes a specified vLink.
MapVnet2Pnet	/v2.1/netns-phynet	get	Lists vNet to which the tenant has access.
	/v2.1/netns-phynet	post	Creates single or multiple vNets on a specified pNet.
	/v2.1/netns-phynet/{pnet_id}	get	Shows information for a specified vNet on pNet.
	/v2.1/netns-phynet/{pnet_id}	put	Updates a specified vNet on a pNet.
	/v2.1/netns-phynet/{pnet_id}	delete	Deletes a specified vNet on a pNet.

## Appendix 3: ONOS Router Driver

- APIs supported
  - Port create/delete
  - SNAT enable/disable
  - Floating IP NAT rule
  - Routing processing
- RESTful agent, used to communicate with ONOS



# Appendix 3.1: ONOS ML3 Plug-in APIs

Neutron element	API	Action	Notes
L3VPN	/v2.0/L3VPN	get	Lists L3VPN to which the specified tenant has access.
	/v2.0/L3VPN	post	Creates single or multiple L3VPN in a single request.
	/v2.0/L3VPN/{l3vpn_id}	get	Shows information for a specified L3VPN.
	/v2.0/L3VPN/{l3vpn_id}	put	Updates a specified L3VPN.
	/v2.0/L3VPN/{l3vpn_id}	delete	Deletes a specified L3VPN and its associated resources.
FW	/v2.0/vfw	get	Lists vfw to which the specified tenant has access.
	/v2.0/vfw	post	Creates single or multiple vfw on a specified network.
	/v2.0/vfw/{fw_id}	get	Shows information for a specified vfw.
	/v2.0/vfw/{fw_id}	put	Updates a specified vfw.
	/v2.0/vfw/{fw_id}	delete	Deletes a specified vfw.
VR	/v2.0/vr	get	Lists vr to which the tenant has access.
	/v2.0/vr	post	Creates single or multiple vr on a specified network.
	/v2.0/vr/{vrt_id}	get	Shows information for a specified vr.
	/v2.0/vr/{vr_id}	put	Updates a specified vr.
	/v2.0/vr/{vrt_id}	delete	Deletes a specified vr.

# Appendix 4.1 : ONOSFW as input track of OCTOPUS

