OVN WITH DYNAMIC ROUTING

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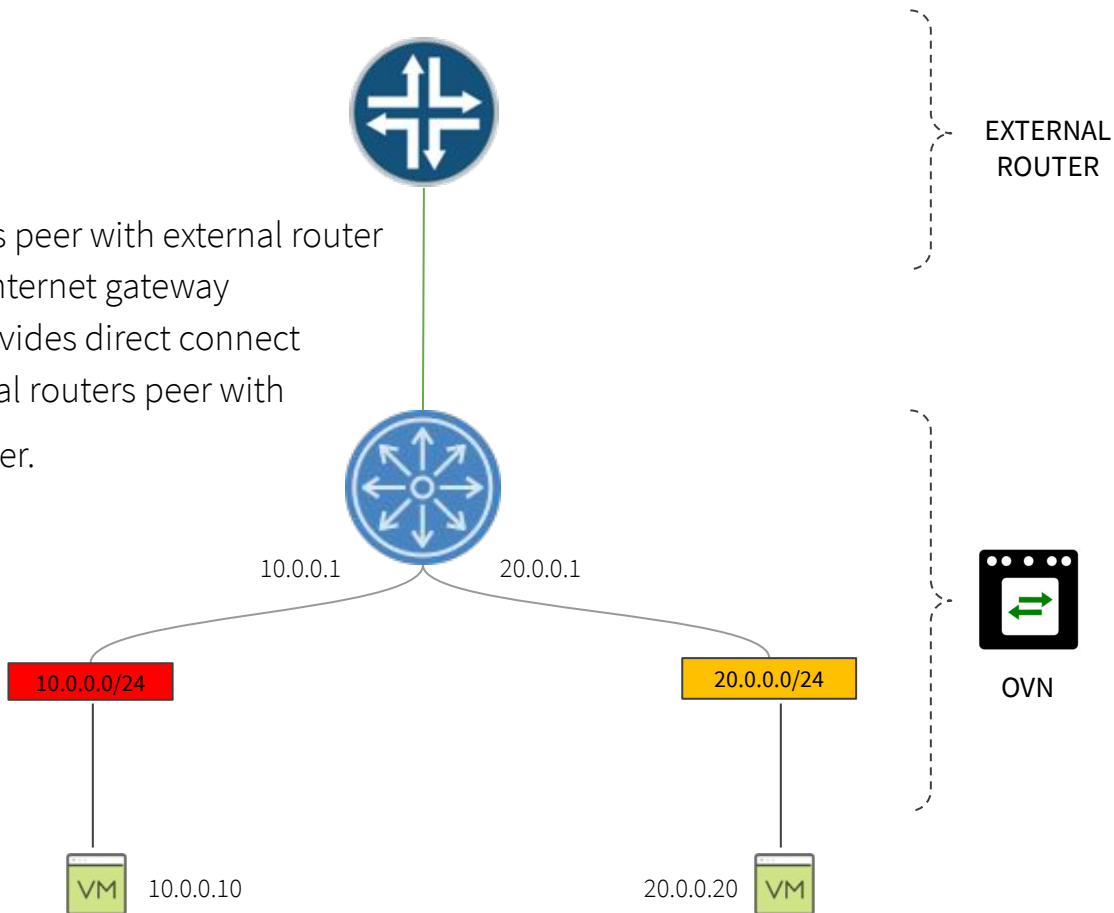
Greg A Smith
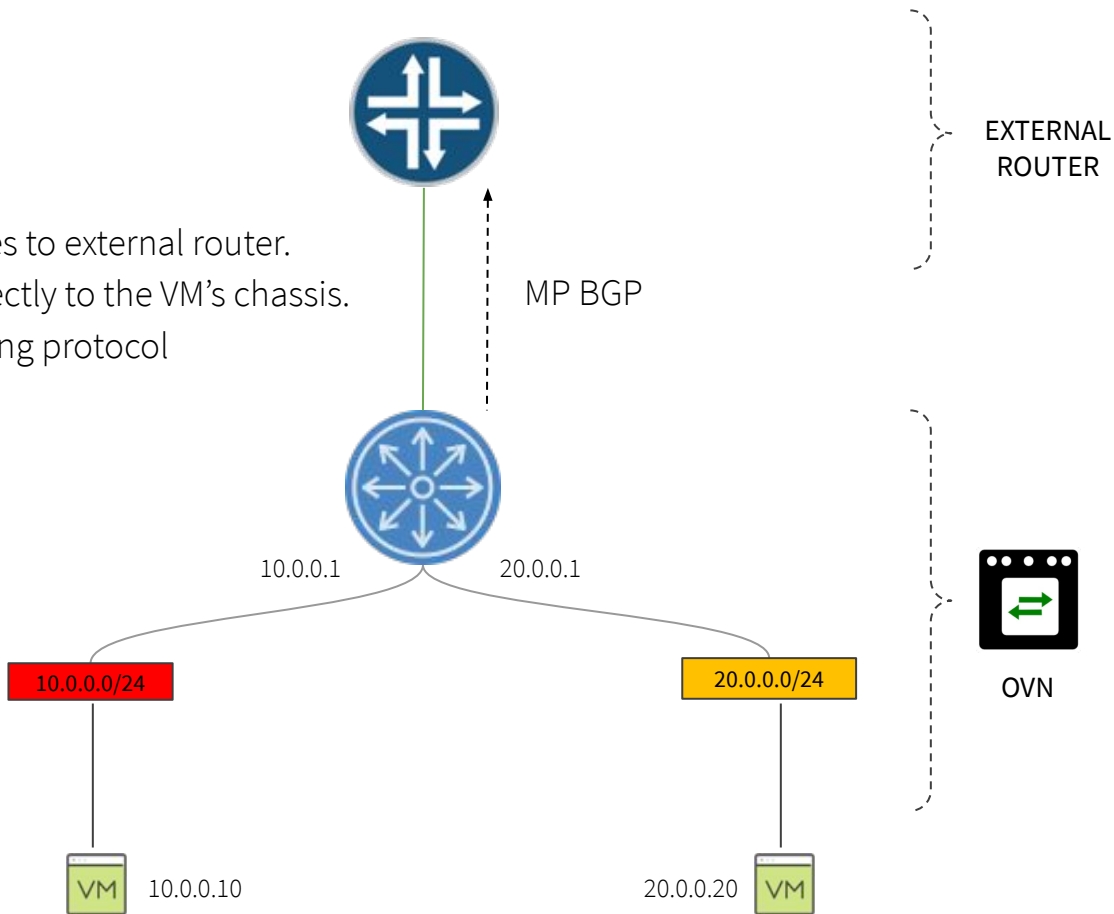
Nutanix Inc.

Outline

Why
What
How

Why?

Xi

- OVN logical routers peer with external router
- External router is internet gateway
- External router provides direct connect
- Multiple OVN logical routers peer with
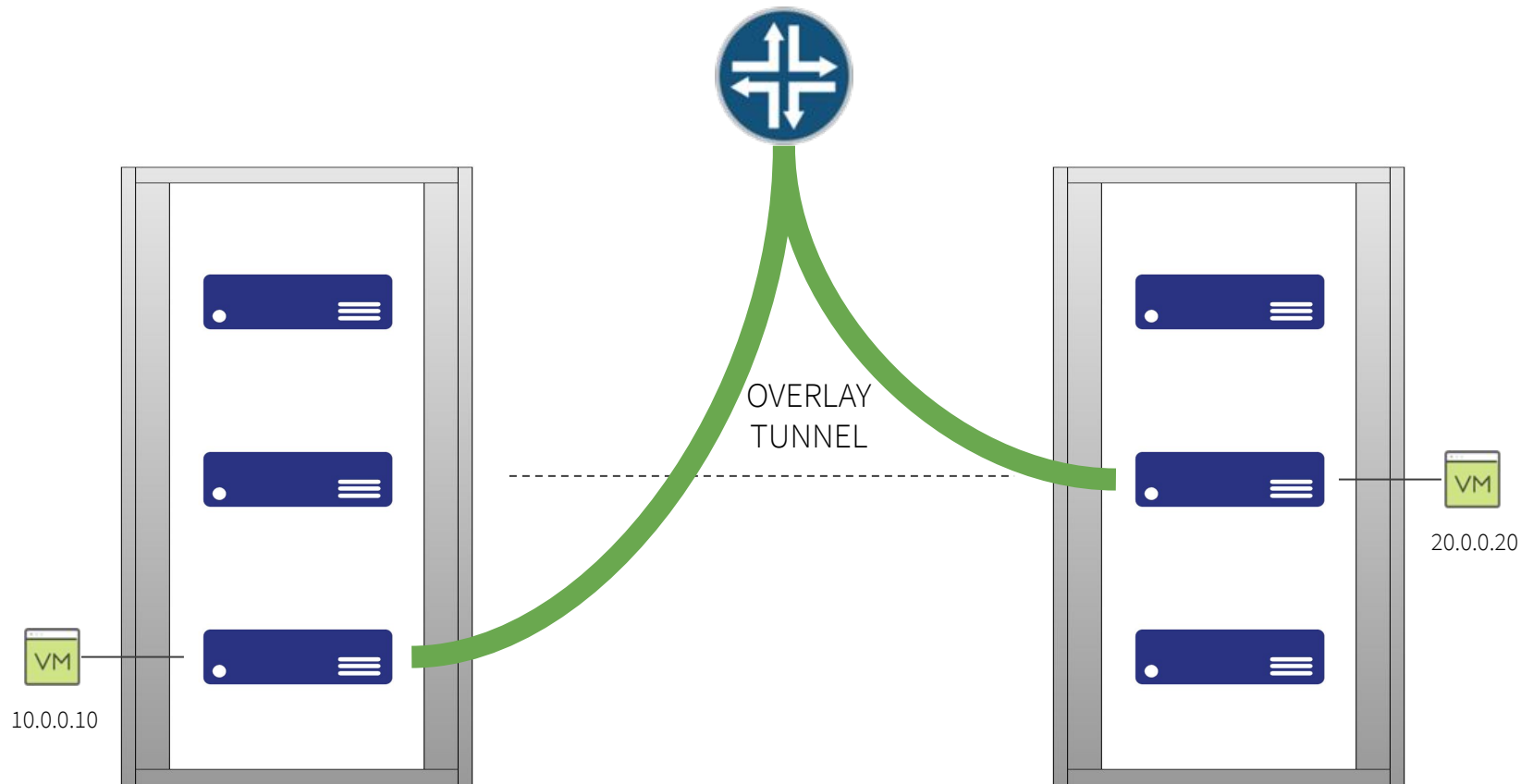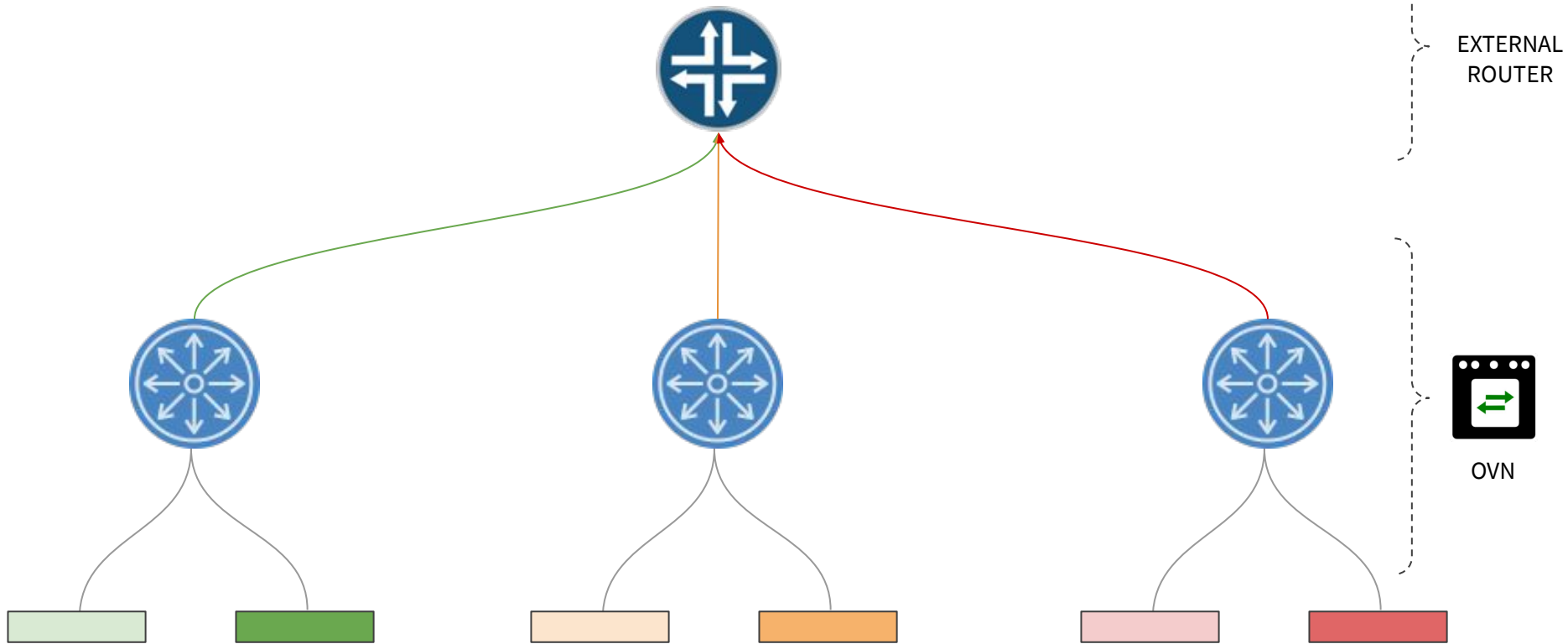
  same external router.

EXTERNAL
ROUTER

10.0.0.1   20.0.0.1

OVN

10.0.0.0/24   20.0.0.0/24

VM 10.0.0.10   20.0.0.20 VM

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Xi

● Advertise /32 routes to external router.
● Forward traffic directly to the VM's chassis.
● Use standard routing protocol

MP BGP

EXTERNAL
ROUTER

OVN

10.0.0.1   20.0.0.1

10.0.0.0/24   20.0.0.0/24

VM 10.0.0.10   20.0.0.20 VM

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Xi

OVERLAY
TUNNEL

20.0.0.20

10.0.0.10

Xi

EXTERNAL
ROUTER

OVN

OVN DYNAMIC ROUTING

- OVN does not have native dynamic routing support.
- Difficult to adopt in non openstack environments.
- Management plane has to write its own adaptor.

- Add native dynamic routing support.
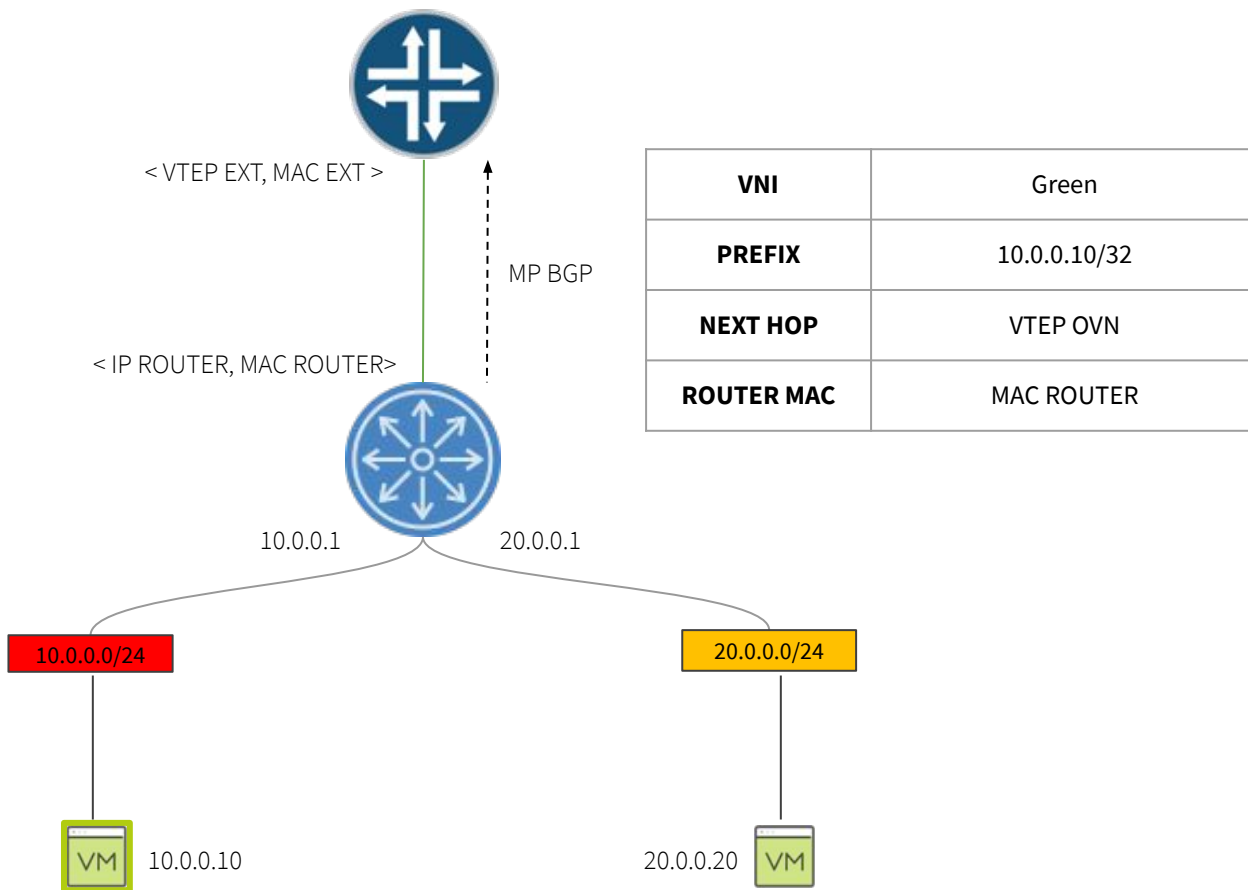- Makes it "batteries included" with OVN.

What?

- Integrate with non OVN VTEPs
  - Switches
  - Routers

- Use standard protocols
  - EVPN

EVPN (RFC 7432)

- MAC reachability in control plane

- Works with multiple underlay technologies
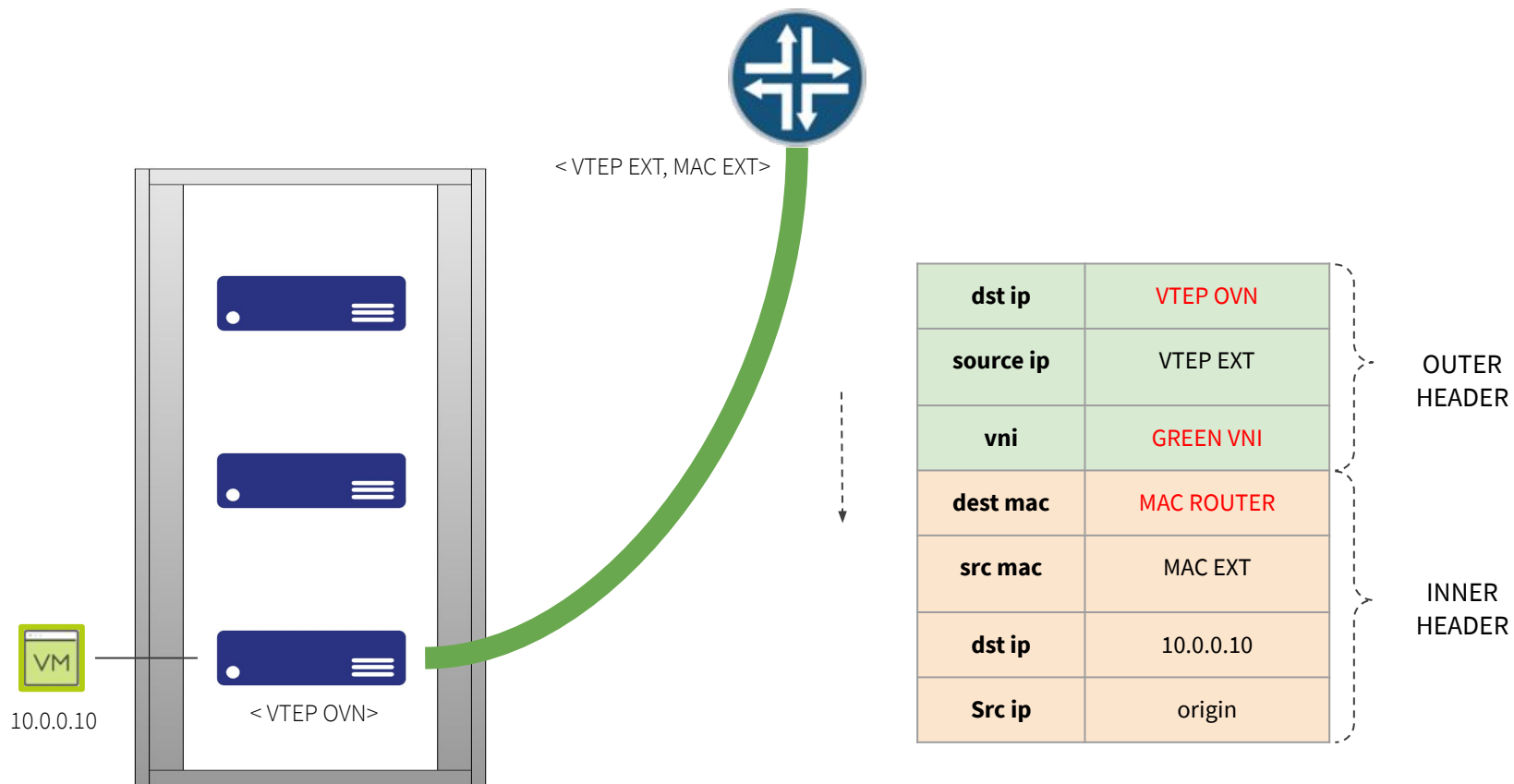 - VXLAN, GENEVE, GRE etc.

- Multi tenant BGP-based

< VTEP EXT, MAC EXT >

MP BGP

< IP ROUTER, MAC ROUTER>

VNI	Green
PREFIX	10.0.0.10/32
NEXT HOP	VTEP OVN
ROUTER MAC	MAC ROUTER

10.0.0.1   20.0.0.1

10.0.0.0/24   20.0.0.0/24

VM 10.0.0.10   20.0.0.20 VM

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WHY WHAT

< VTEP EXT, MAC EXT>

< VTEP OVN>

10.0.0.10

dst ip	VTEP OVN
source ip	VTEP EXT
vni	GREEN VNI
dest mac	MAC ROUTER
src mac	MAC EXT
dst ip	10.0.0.10
Src ip	origin

OUTER HEADER

INNER HEADER

OVN DYNAMIC ROUTING

- Add dynamic routing capability in OVN.
- Use FRR as the protocol stack.
  - Catching up as standard protocol stack
  - Modular architecture
- Read OVN DB and advertise using MP BGP.

How?

FRR (Free Range Routing)

bgpd	ripd	ospfd	··················

- Open source IP routing suite
- Supports BGP EVPN
- Forked from Quagga
- Modular architecture
  - Each routing protocol has its own code.
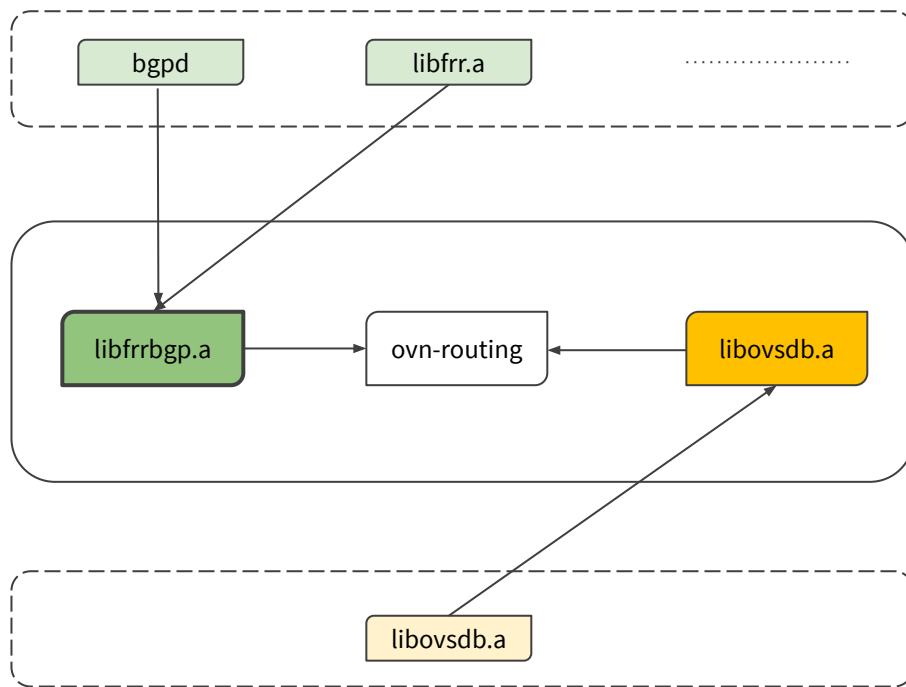 - Easy to add new protocols.
  - Easy to integrate individual protocols.

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OVN-ROUTING

- Centralized daemon
- Links with BGP module of FRR.
  - **More protocols can be linked on need basis.**
- Reads config from OVN DBs
- Uses FRR BGP for route advertisements.
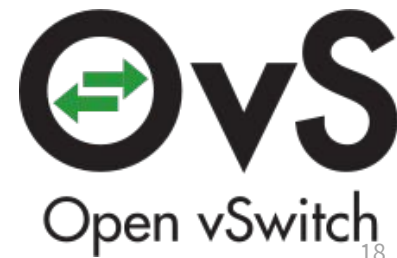
OVN-ROUTING

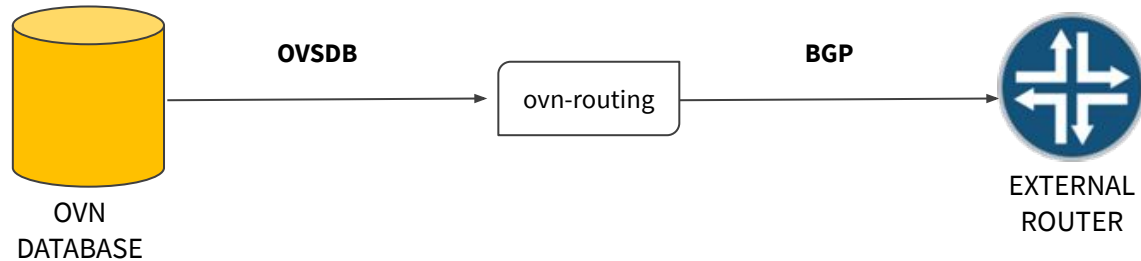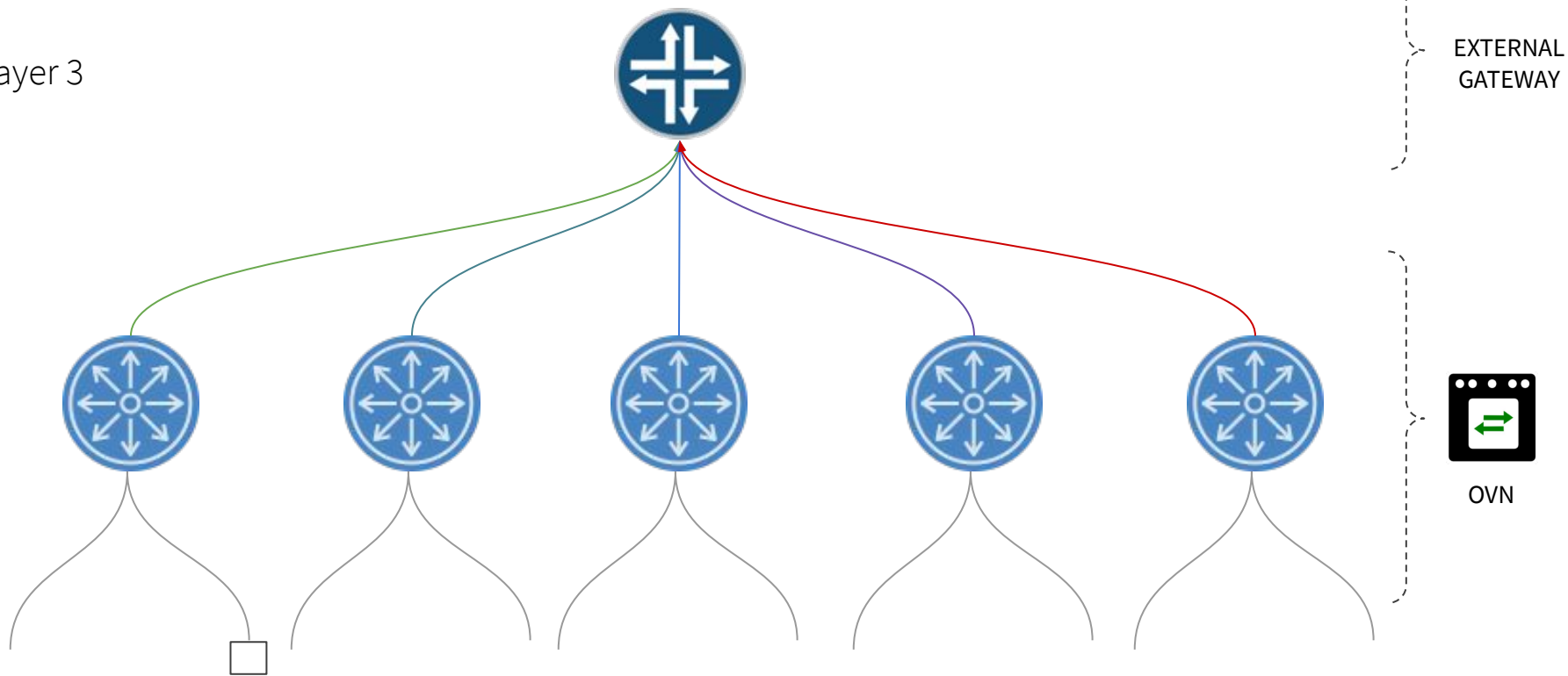## OVN-ROUTING

Open Items?

- Configuration mechanism
  - Rely on OVN Northbound DB or introduce a new one.

- Avoid reading from southbound DB ?
  - Natural to have a top down approach for vm location.
  - Enhance Northbound to add VM location?

Questions
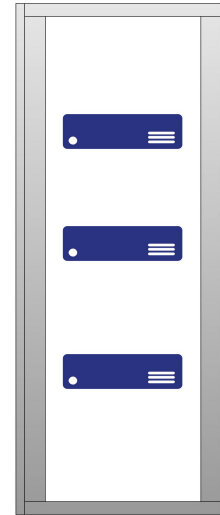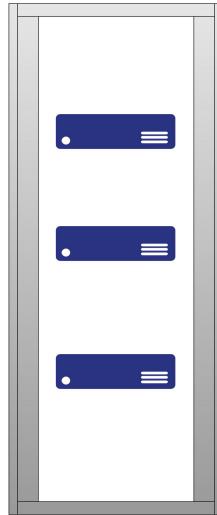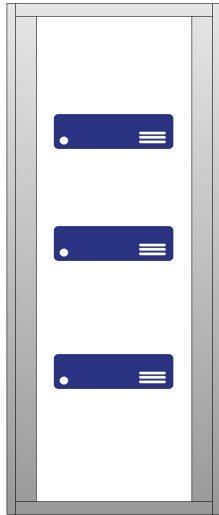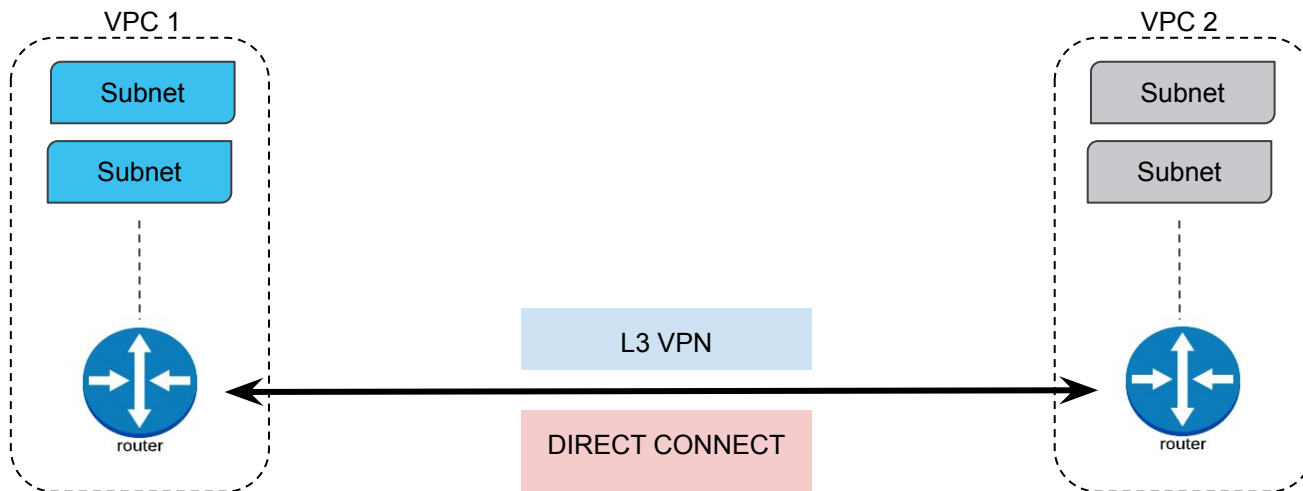
Layer 3

EXTERNAL
GATEWAY

OVN

Layer 3

Layer 3

Enterprise Cloud OS

Xi

VPC 1

Subnet

Subnet

router

L3 VPN

DIRECT CONNECT

VPC 2

Subnet

Subnet

router

MAP EVPN TO USE CASES

MP BGP

EXTERNAL
GATEWAY

10.0.0.1   20.0.0.1

10.0.0.0/24   20.0.0.0/24

CURRENT STATUS

OVN DYNAMIC ROUTING