



Building Distributed, Service Rich SDNs

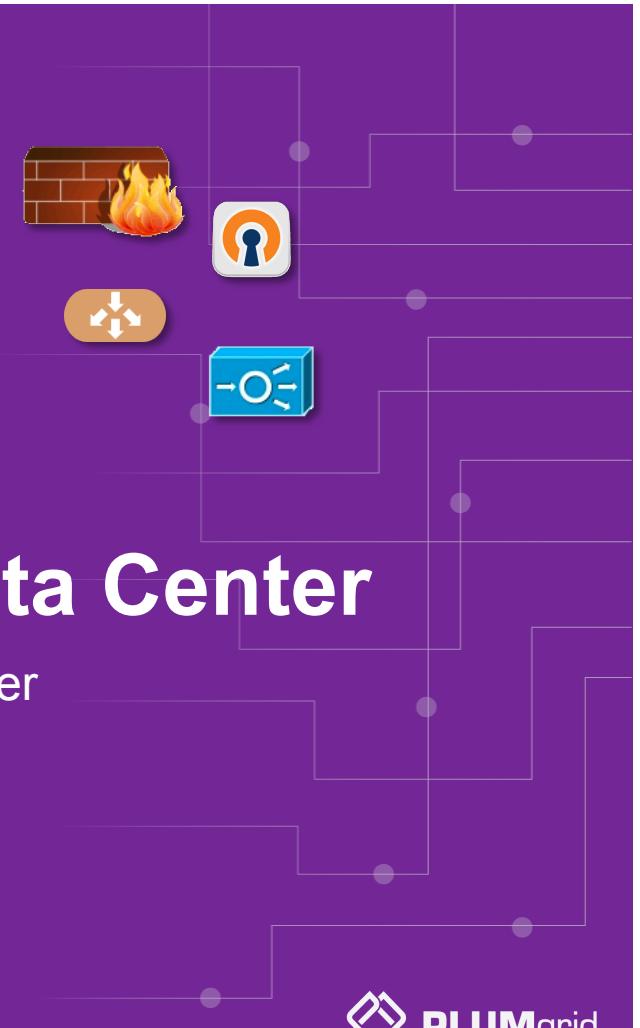
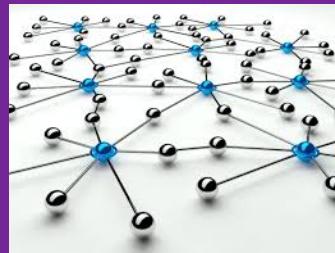
Gaetano Borgione
Jan 28, 2016

Distinguished Engineer, CTO Office

Agenda

- Service Adoption in Cloud Data Centers
- Service Integration Case Study
- OpenStack Service Integration
 - Physical Appliance Use Cases
 - Virtual Appliance Use Cases
- Demo
- Wrapping-up

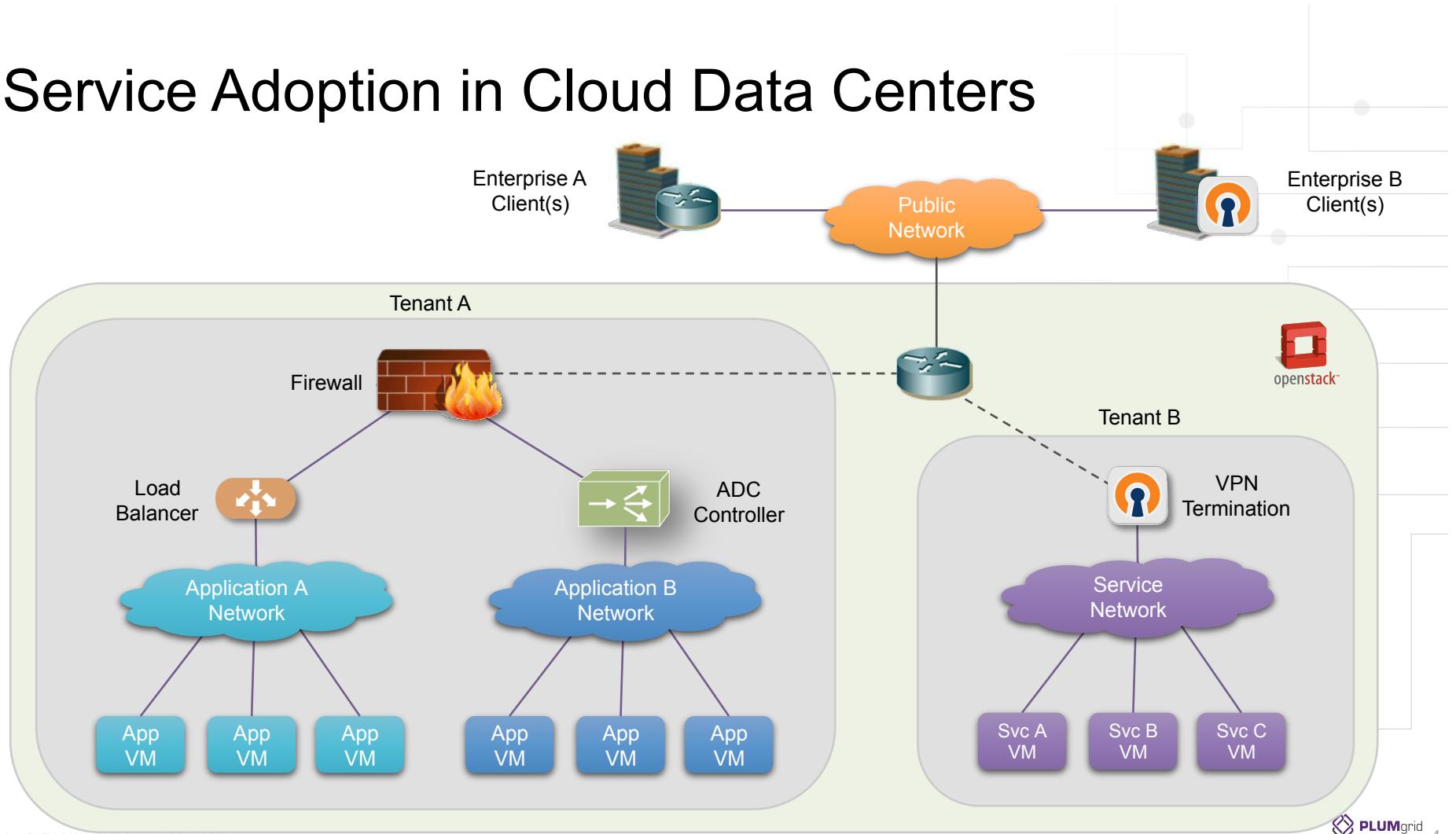




Service Adoption in Cloud Data Center

...an overview on Networks and Services coming together

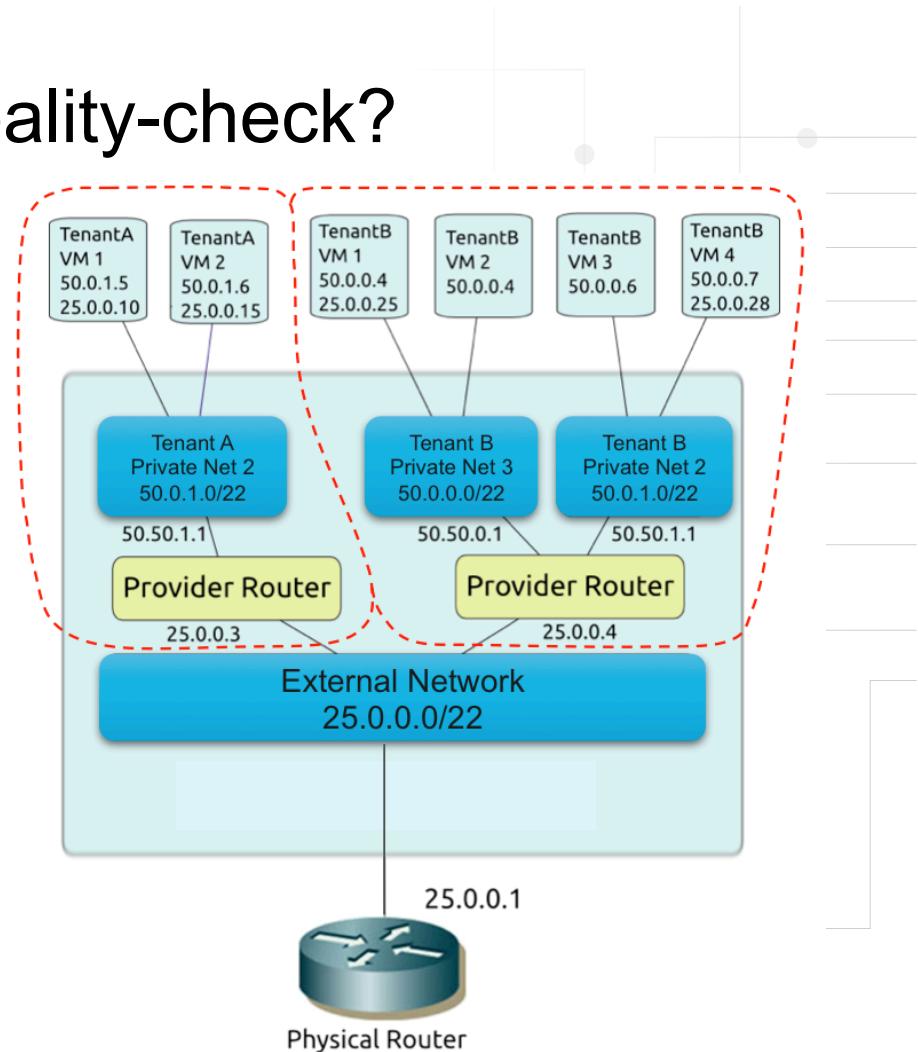
Service Adoption in Cloud Data Centers



...OpenStack Networking reality-check?

Per-Tenant Routers w/t Private Networks

- Tenant create Networks, linking them to a Router
- Ad-hoc model for Tenant-defined multi-tier applications, with each tier as separate network behind a Router
- Multiple Routers make possible overlapping IP space among Tenant subnets
- Access to External Network via SNAT / Floating IP



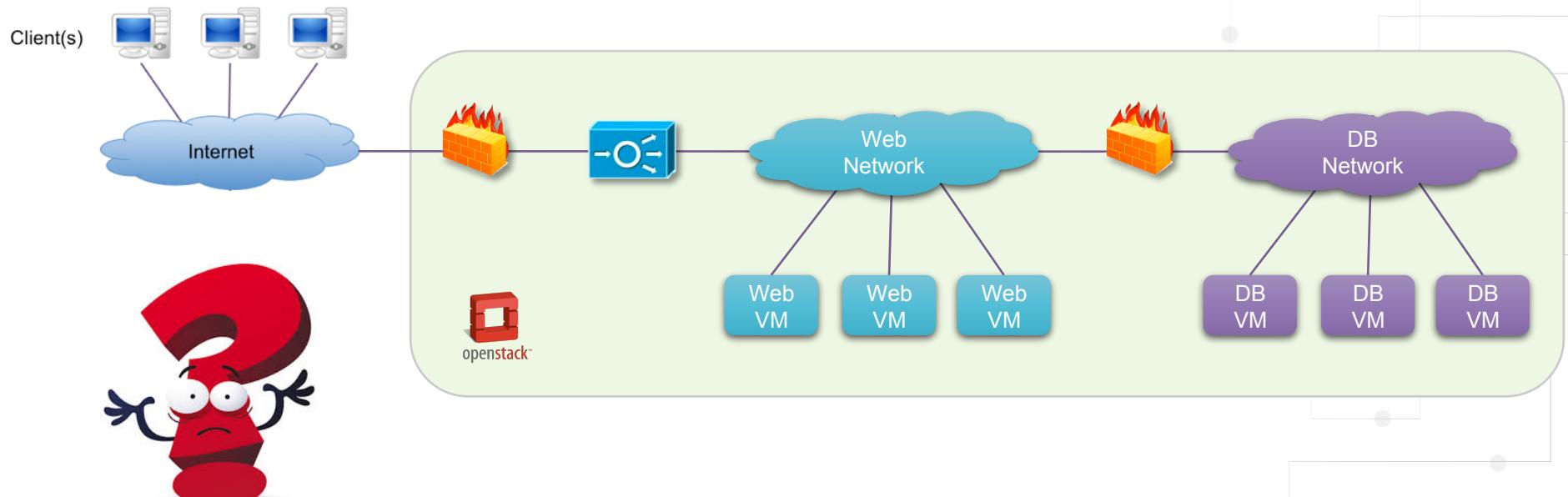
The usual questions...

- How can Services be integrated within OpenStack topologies ?
- How does the Provisioning workflow / Data Path insertion looks like ?
- What are my options if do need to reuse my existing Physical Equipment ?
 - Investment Protection
 - Better Performance
 - Gradual migration from Physical to Virtual
- What options do I have if the Virtual Networking flexibility of OpenStack / Neutron is not sufficient for my needs ?

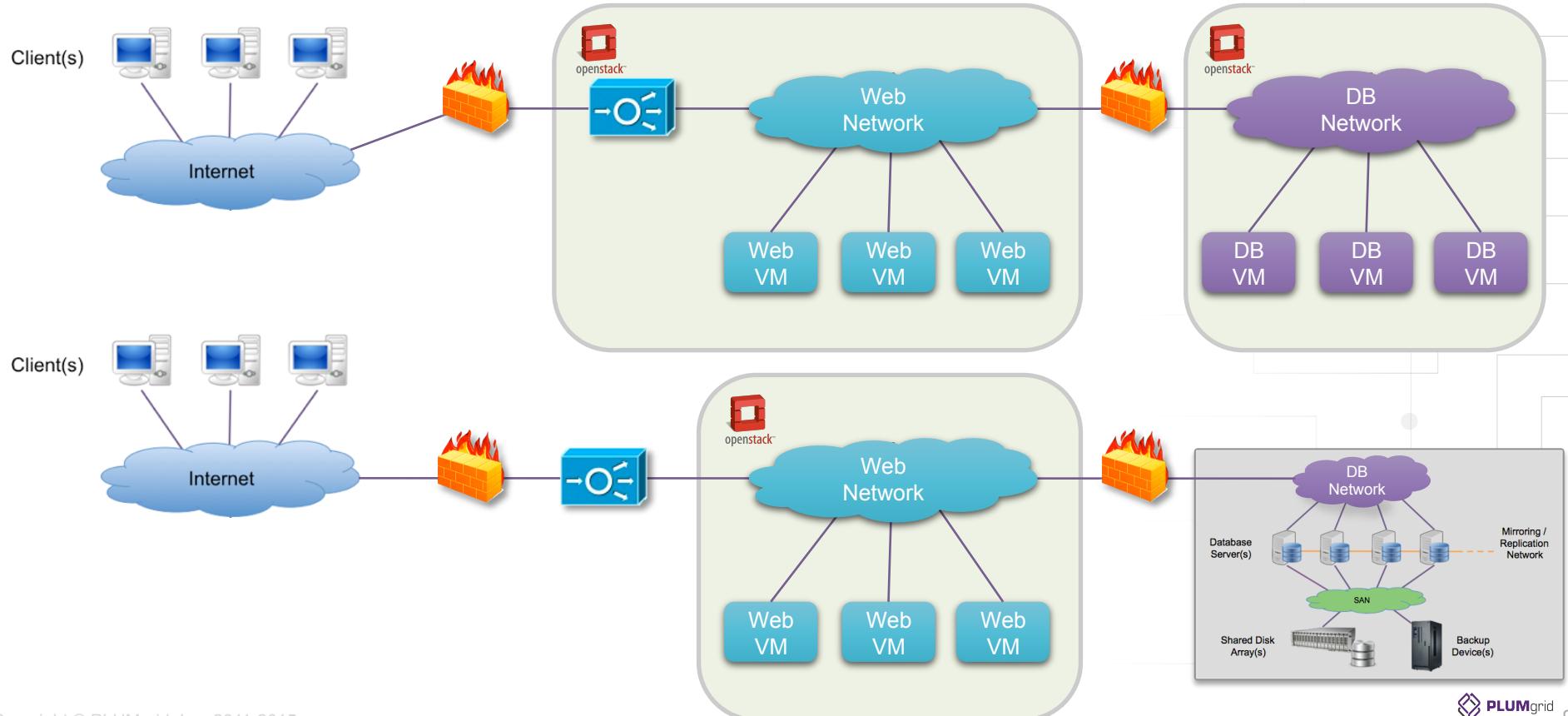
Service Integration Case Study



Service-Enabled Multi-Tier Application, Virtual



Service-Enabled Multi-Tier Application, Hybrid



OpenStack Service Integration

Physical Appliance



Service Integration Use Case

- Integration with Physical Appliance
 - VLAN Segmentation
 - Global Routing space
 - Native VXLAN Integration
- Integration with Virtual Appliance
 - Centralized Services
 - HA Proxy
 - Commercial Virtual Appliance
 - Distributed Services



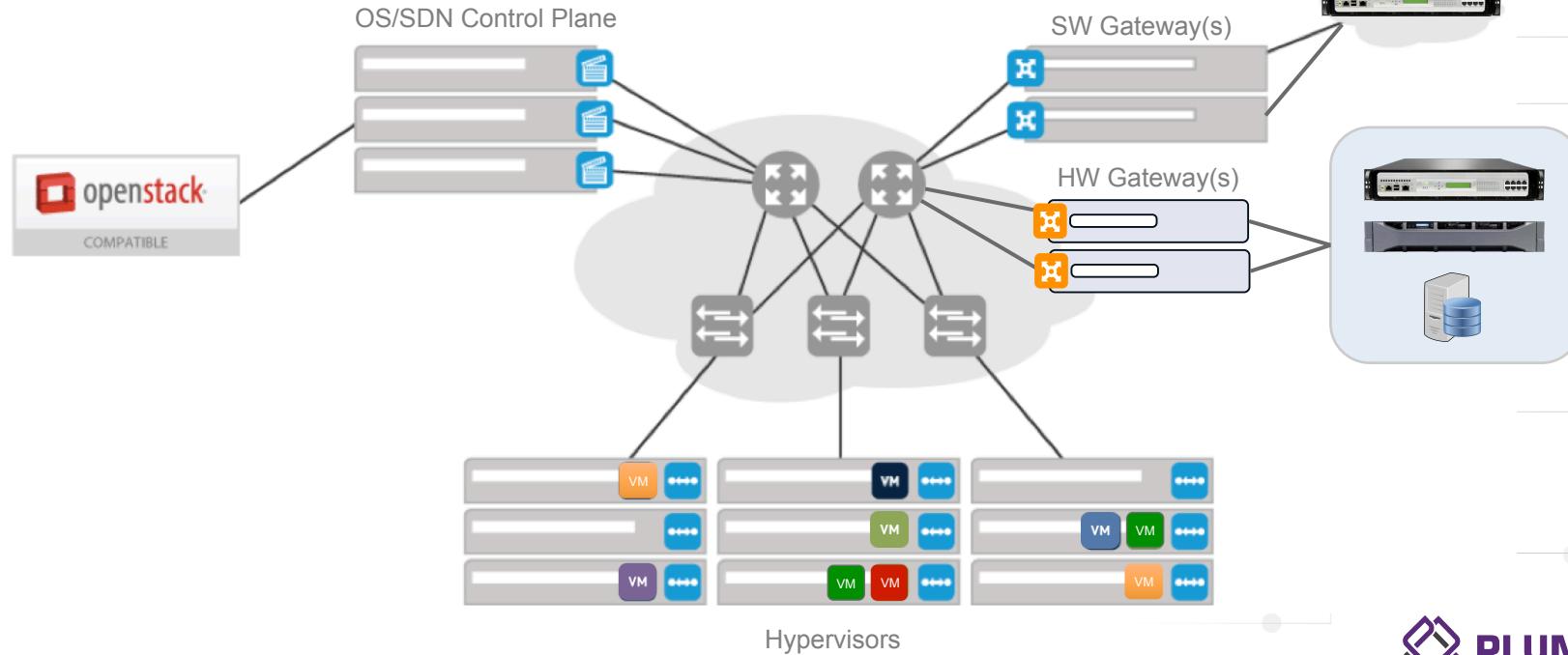
Service Deployment Workflow under OpenStack

Physical Appliance

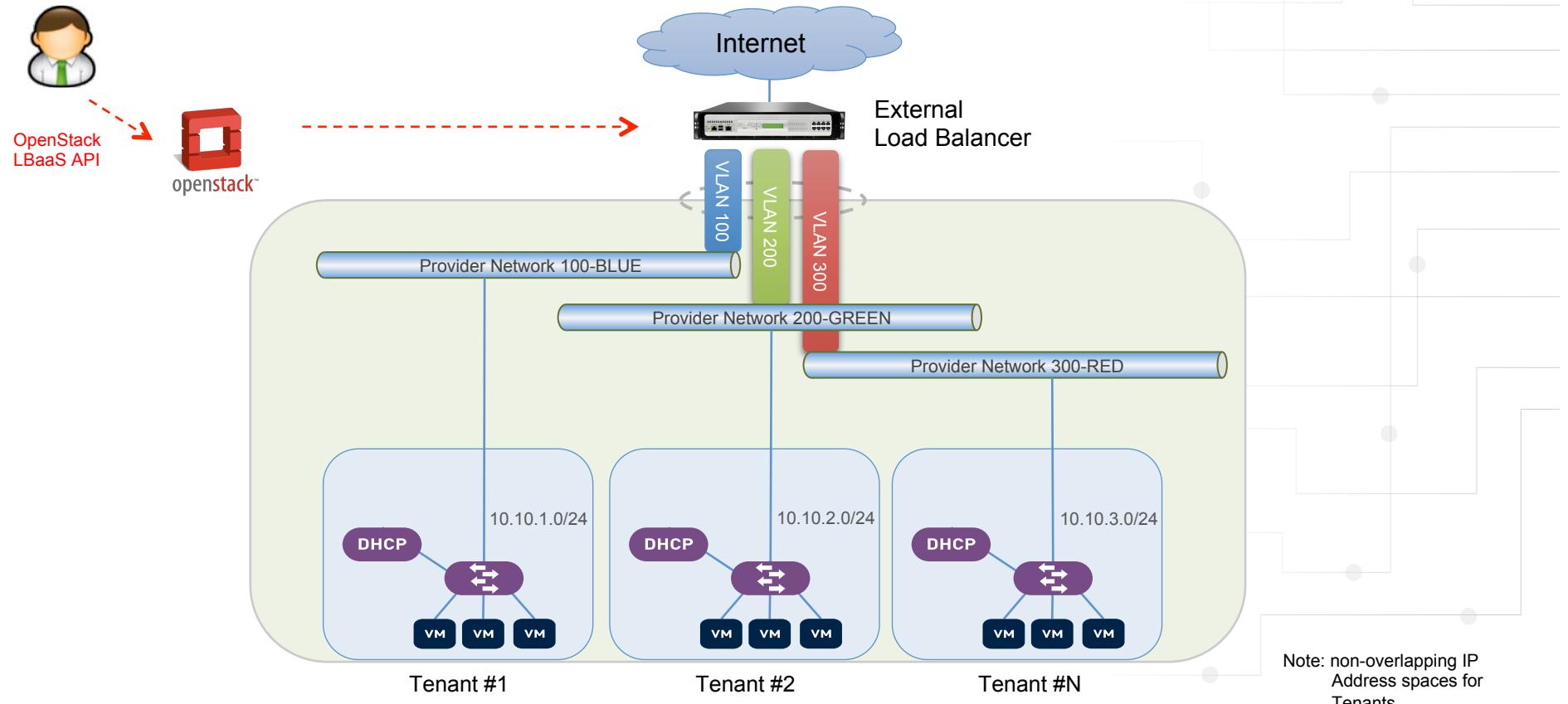
- Service Provisioning
 - Form Factor: *Physical*
 - High Availability options
- Service Configuration
 - Service plug-in for solutions supported by vendors
 - Ad-Hoc configuration via vendor-specific Management Interface
- Service Connectivity
 - SDN solution to onboard exposed **Physical** Service Interface(s) onto Networks provisioned in OpenStack via **Gateways** (SW and/or HW)

Integration with Physical Appliance: connectivity options

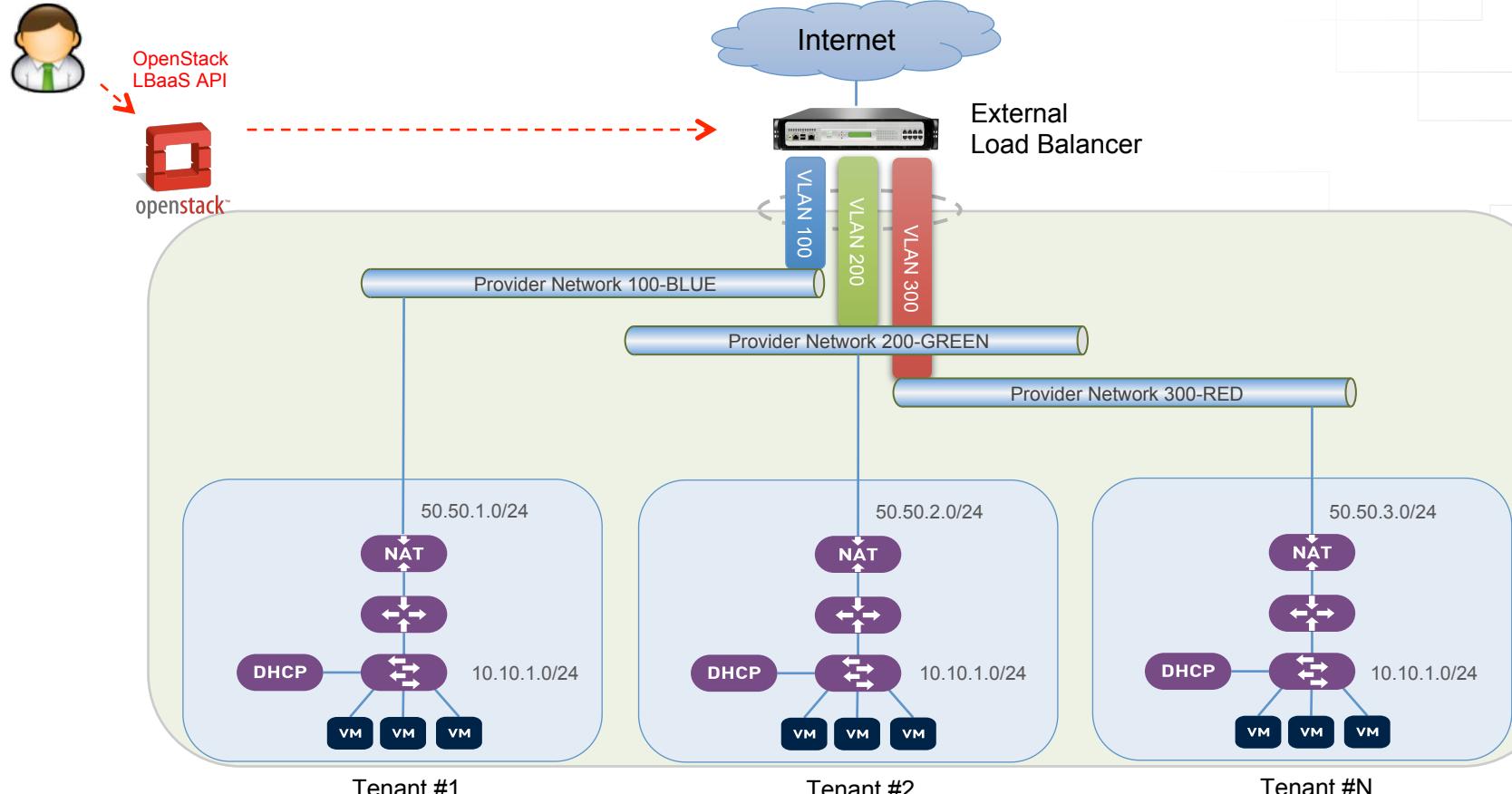
Physical Infrastructure View



VLAN Segmentation model: Tenant VLANs

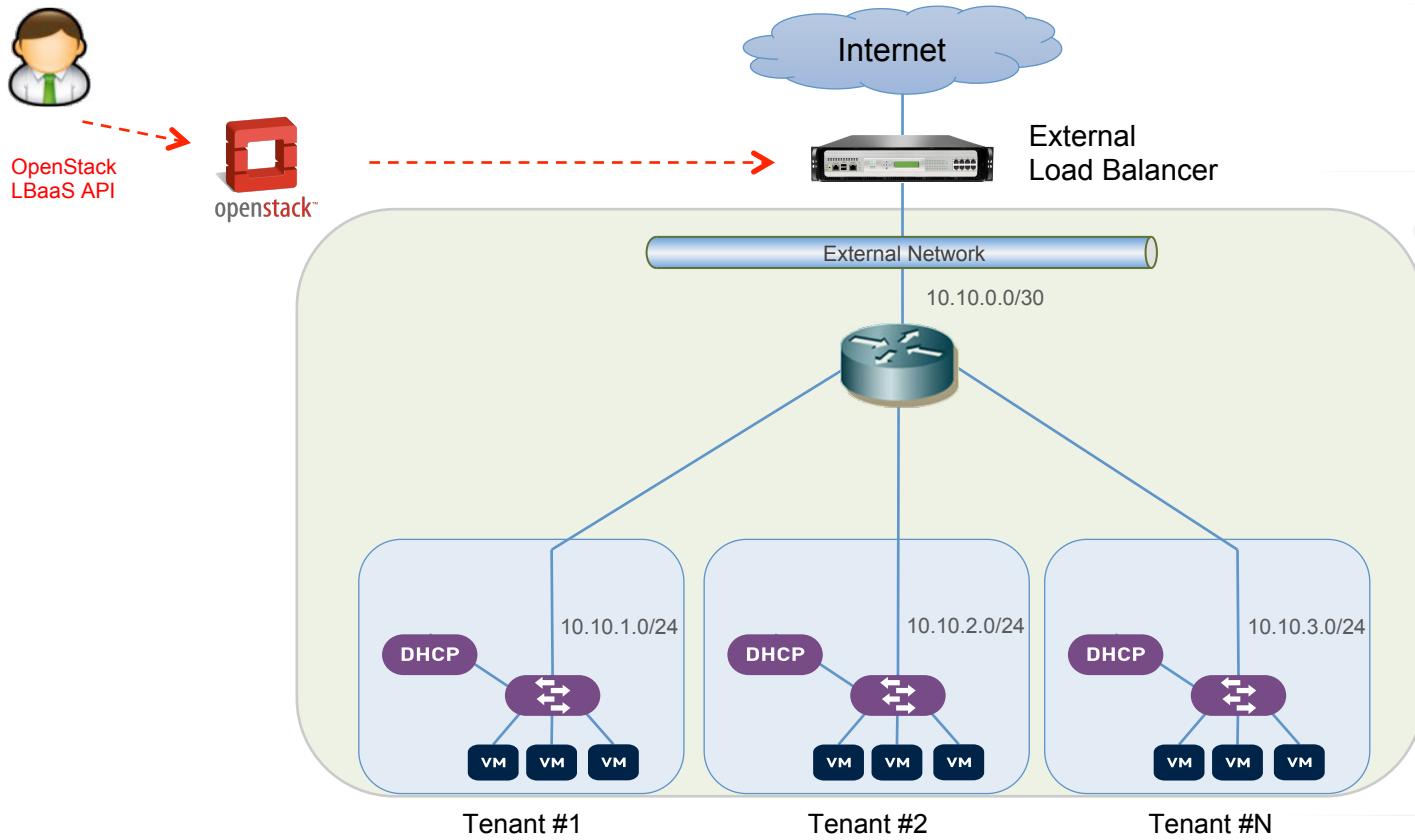


Overlapping Tenant's IP Address spaces w/t floating IPs



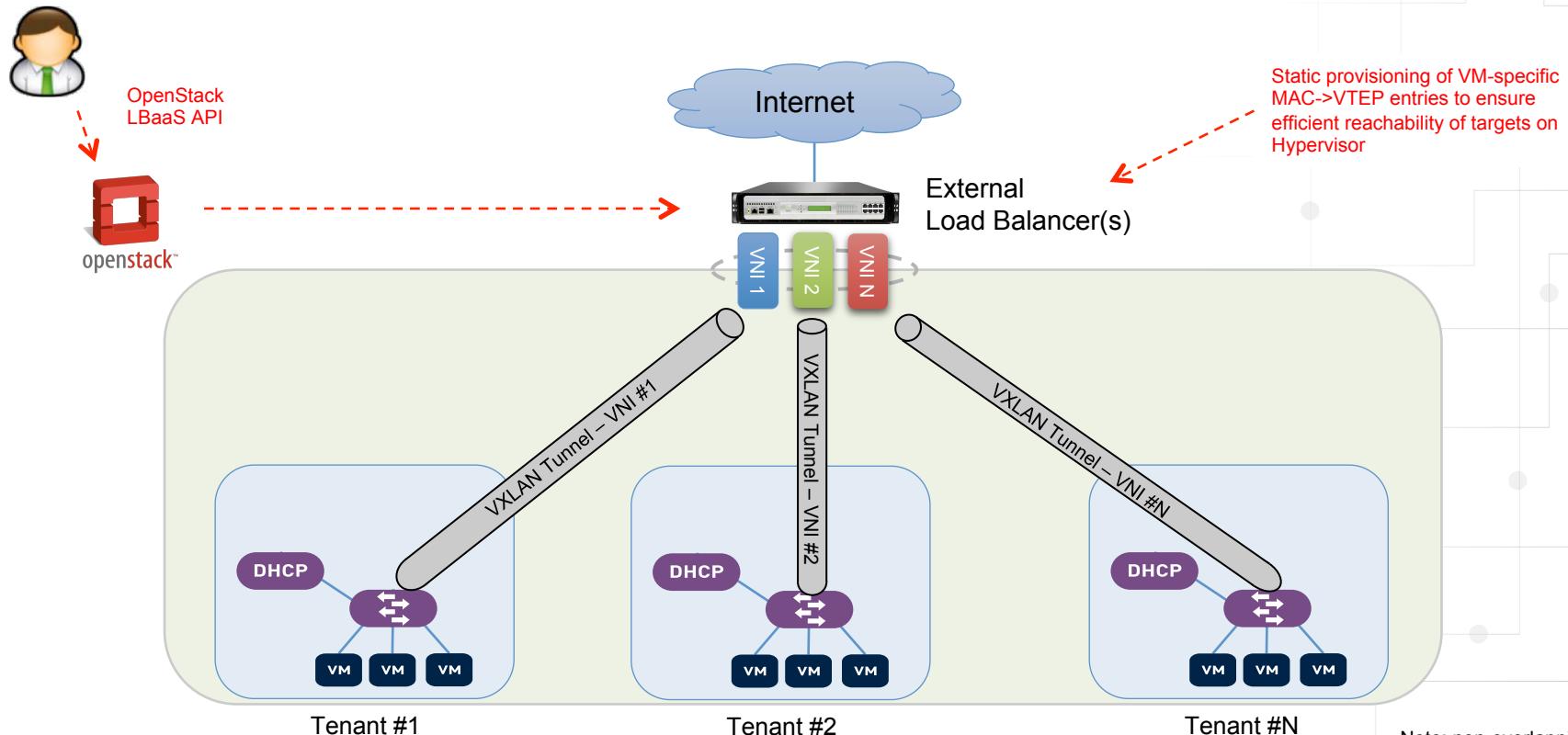
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Global Routing model: shared Router on Admin Tenant



Note: non-overlapping IP Address spaces for Tenants

Native VXLAN Integration model



Note: non-overlapping IP Address spaces for Tenants

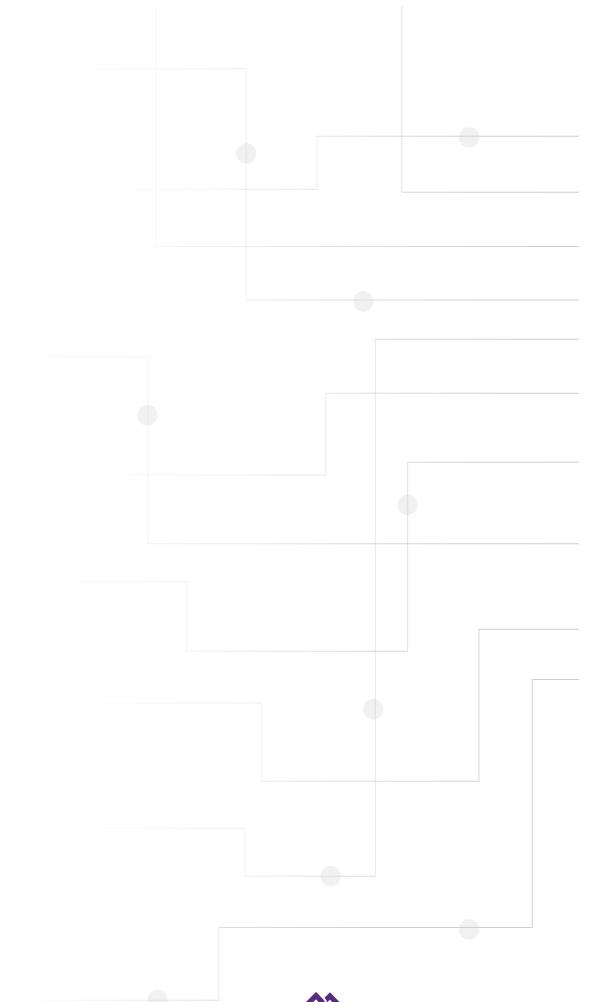
OpenStack Service Integration

Virtual Appliance



Service Integration Use Case

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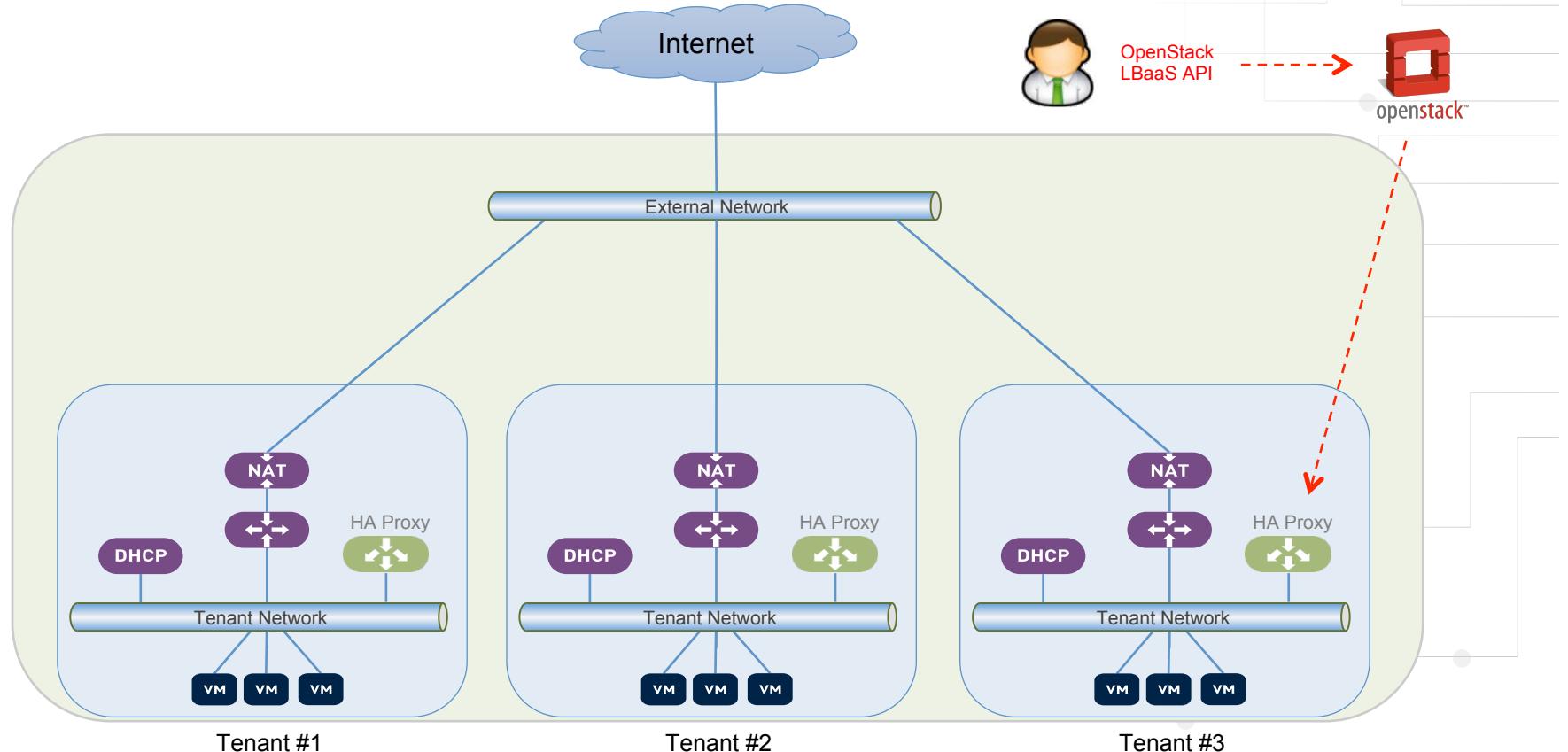


Service Deployment Workflow under OpenStack

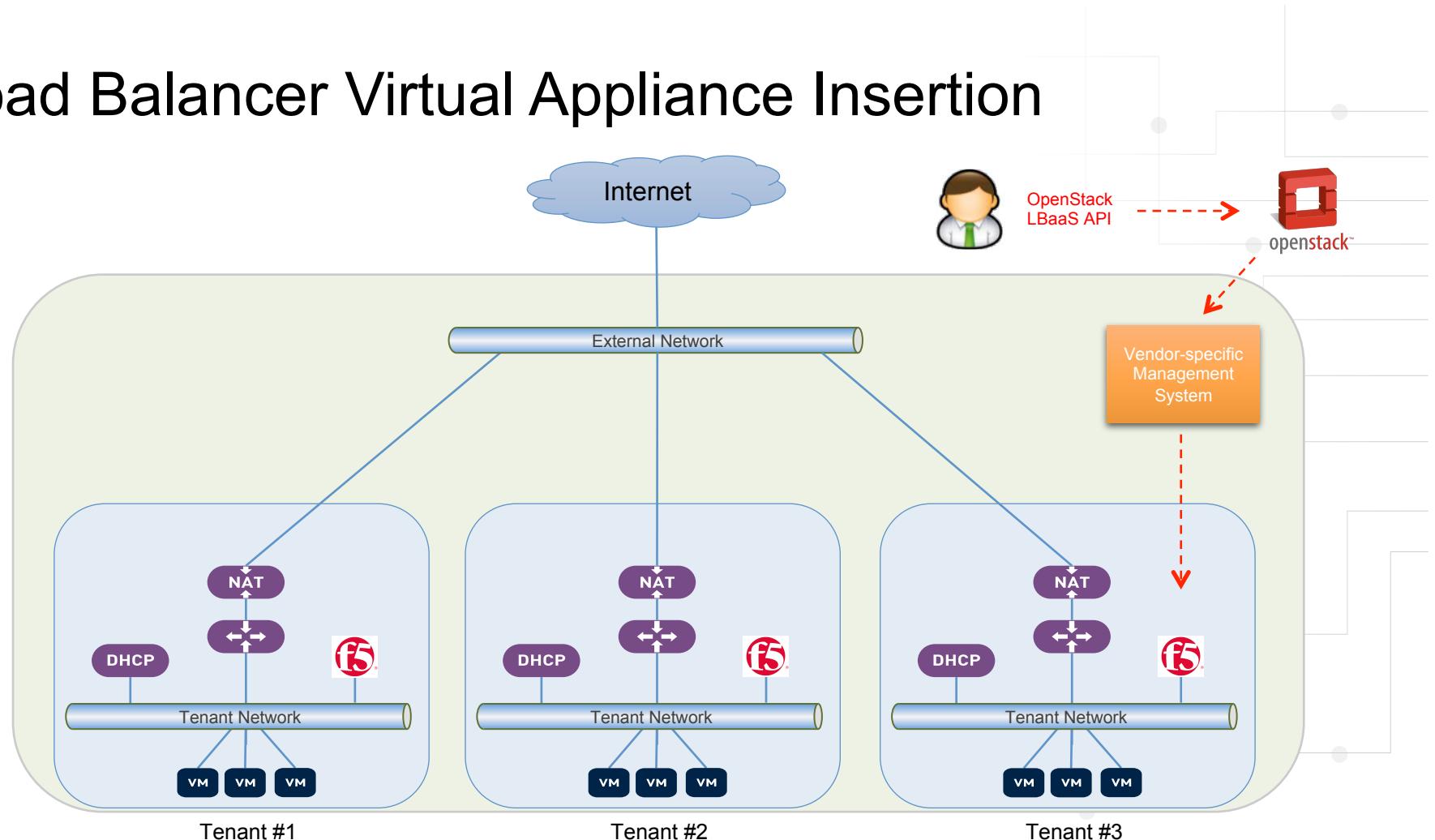
Virtual Appliance

- Service Provisioning
 - Form Factor: *Virtual Machine* or *Docker Container*
 - High Availability options
 - Placement Algorithm: RR, Resource Utilization Criteria, Affinity Properties (distributed services)
- Service Configuration
 - Service plug-in for solutions supported by vendors ***or*** Standard plug-ins for Services provided by default within OpenStack
 - Ad-Hoc configuration via vendor-specific Management Interface
- Service Connectivity
 - SDN solutions to onboard exposed **Virtual** Service Interface(s) onto Networks provisioned in OpenStack

HA-Proxy insertion via LBaaS plugin



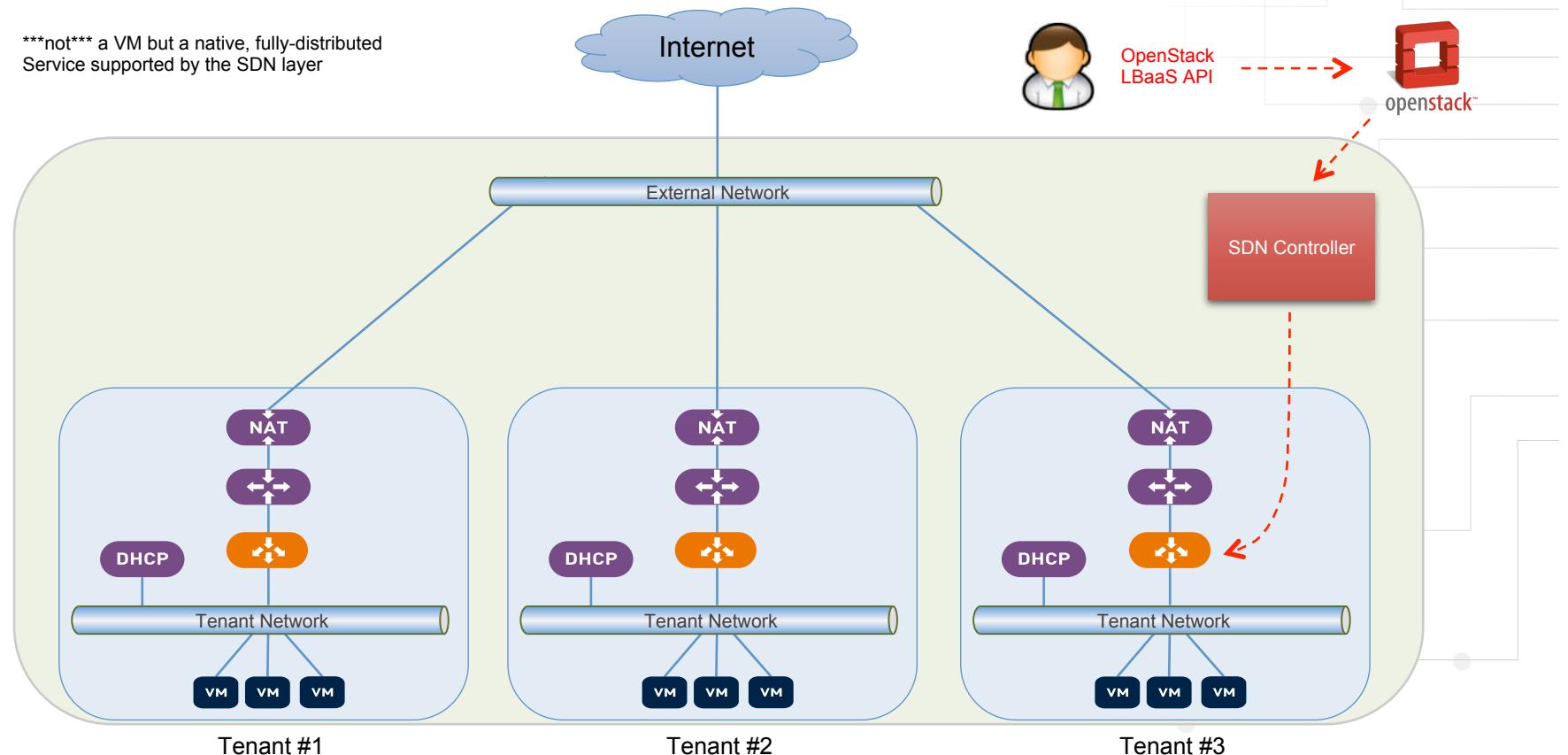
Load Balancer Virtual Appliance Insertion



Distributed Load Balancer



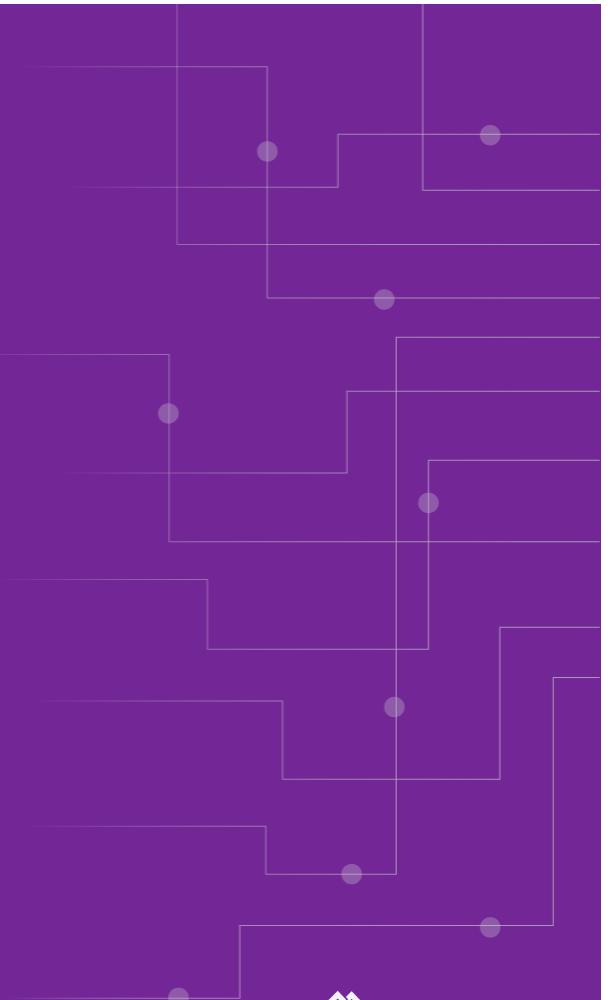
not a VM but a native, fully-distributed Service supported by the SDN layer



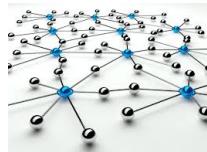
DEMO TIME !!!



Wrapping-Up...



Take-Away notes...



Networking + Services

Better TOGETHER !!!



Best of Breed



Open Standards





THANK YOU!

Keep in Touch and Contact Us

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