



OpenStack

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OpenStack is a Collaboration



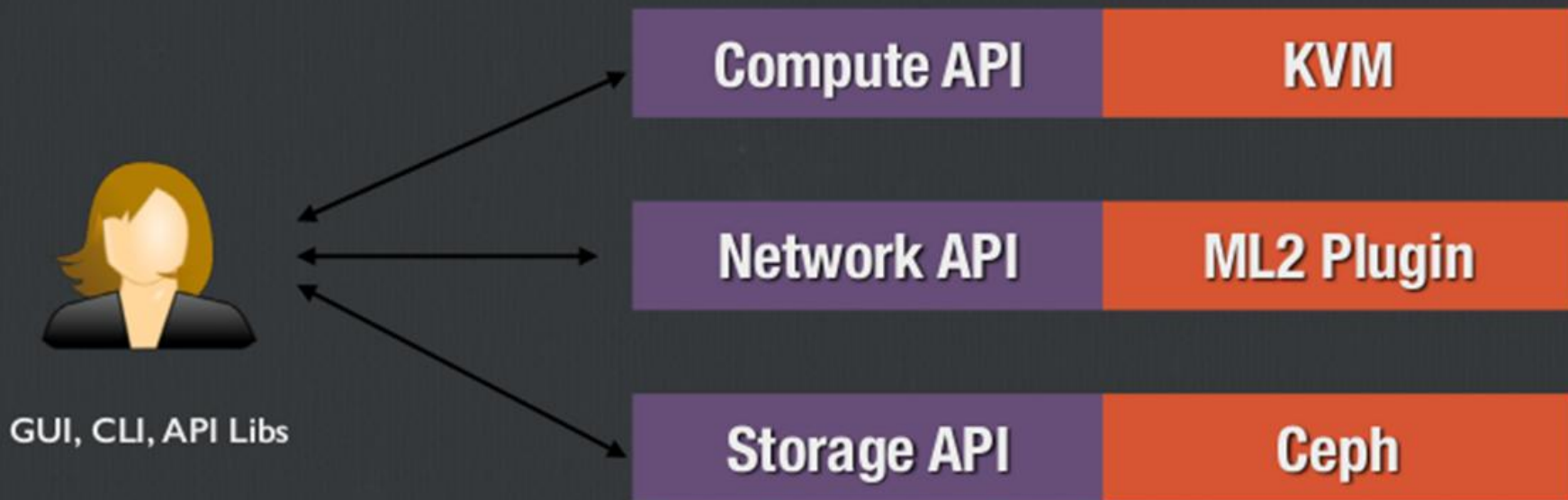
<http://superuser.openstack.org/articles/report-from-the-mid-cycle-meetup-for-operators>

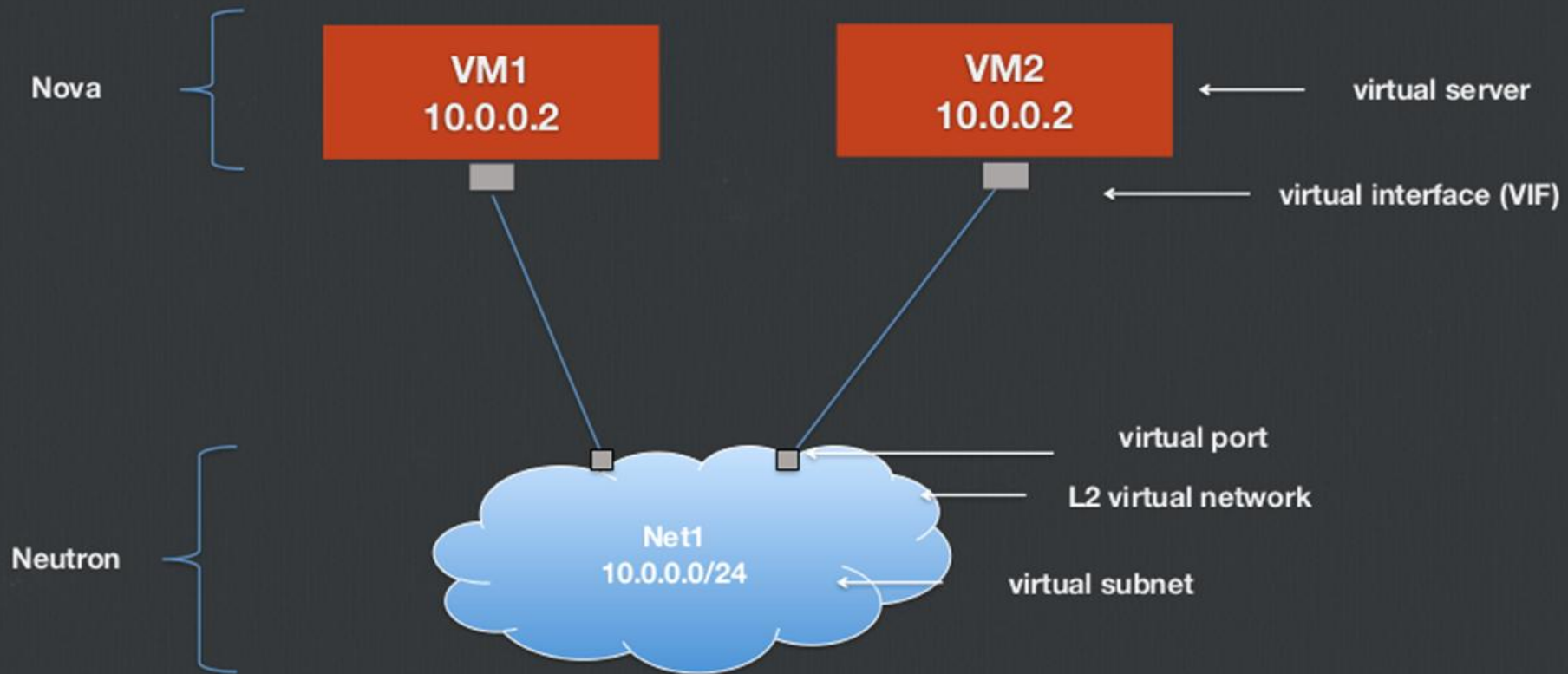
OpenStack Networking Design Goals

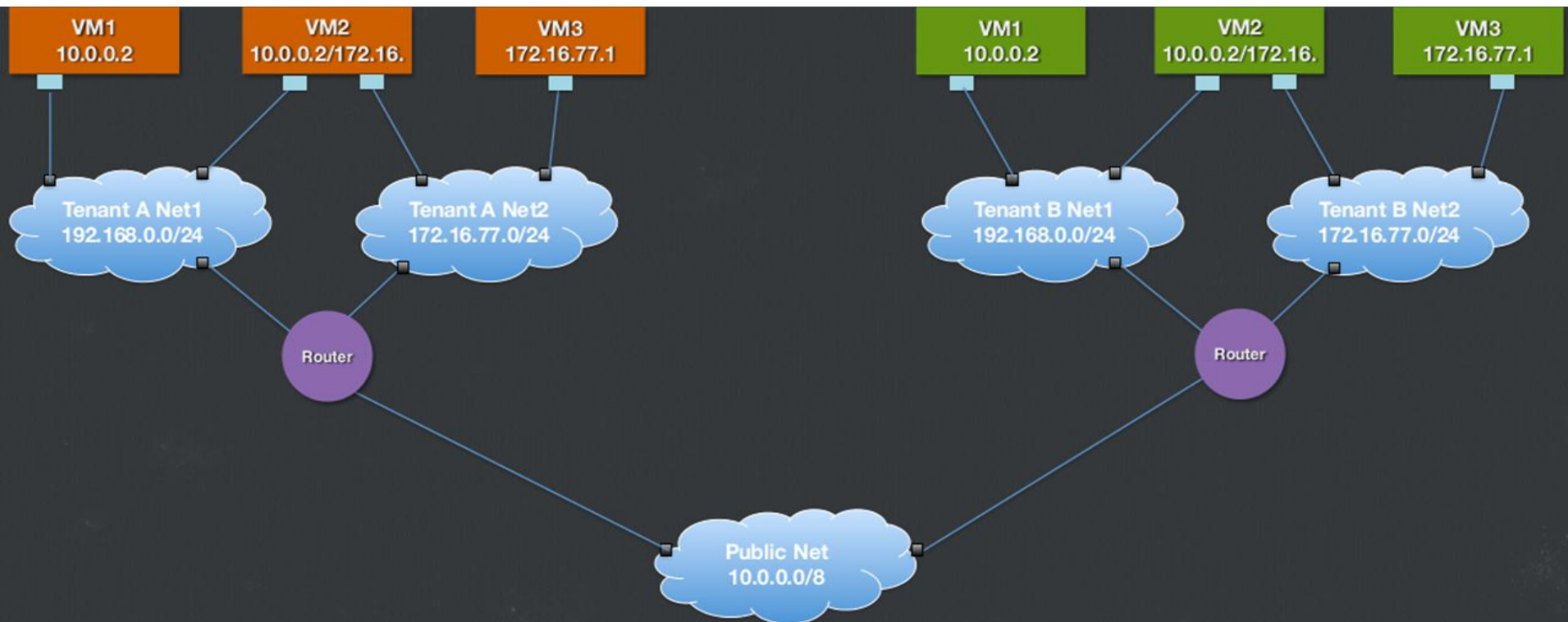
- Rich Topologies
- Technology Agnostic
- Extensibility
- Advanced Services

OpenStack Networking Design Goals

- High-density multi-tenancy
- On-demand provisioning
- Scheduling and moving workloads







Common Features

- Support for Overlapping IP space
- Configuration of guests
- Floating IPs
- Ingress/egress rules
- IPv6
- VMs with multiple virtual interfaces

neutron-server

```
graph LR; neutron-server[neutron-server] --- Database[(Database)]; neutron-server --- Message-Queue((Message Queue)); Message-Queue --- L2-Agent[L2 Agent]; Message-Queue --- L3-Agent[L3 Agent]; Message-Queue --- DHCP-Agent[DHCP Agent]; Message-Queue --- Adv-Services[Adv Services];
```

The diagram illustrates the Neutron architecture. On the left, the **neutron-server** (orange rectangle) is connected to a **Database** (green cylinder) and a central **Message Queue** (teal circle). The Message Queue is connected to four components on the right: **L2 Agent**, **L3 Agent**, **DHCP Agent**, and **Adv Services**. Each of these four components is represented by a stack of purple rectangles, indicating multiple instances. A vertical dashed line separates the neutron-server and Message Queue from the agents and services.

L2 Agent

L3 Agent

DHCP Agent

Adv Services

**Message
Queue**

Database

Plugins

- Used to implement resource control
- Either:
 - Proxy to a third party system (eg OpenContrail)
 - Directly controls switches, routers etc
- ML2 Plugin also separates
 - Type driver – managing transport type eg VXLAN, GRE
 - Mechanism driver – controls the interaction with the switch (hardware or software)

Plugins across OpenStack

OpenStack talks to:

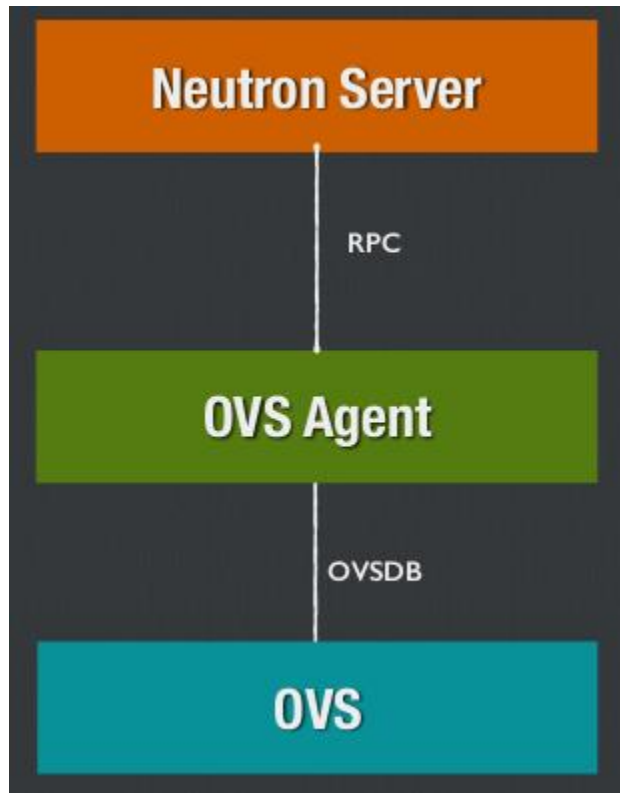
- your **hypervisor**: Hyper-V, PowerKVM, Xen Server, KVM, LXC, Docker, Vmware and bare metal.
- your **networking** hardware: A10 Networks, Arista, Big Switch, Brocade, Cisco, Embrane, Extreme Networks, Freescale, IBM, Juniper, Mellanox, MidoNet, NEC, NetScaler, Nuage Networks, One Convergence, Ryu, PLUMgrid, Radware, Tail-f, vArmour, VMWare NSX and more
- your **storage** hardware: Coraid, Datera, Dell, EMC, Fujitsu, FusionIO, Hitachi, HP, Huawei, IBM, NetApp, Nexenta, Nimble, ProphetStor, Scality, Solidfire, Zadara and more

Extensions

- Add logically to REST API
- Automatic discovery by server, queryable
- Some common features are implemented as extensions!
- Other extension example: Allowed addresses, Extra routes, Metering

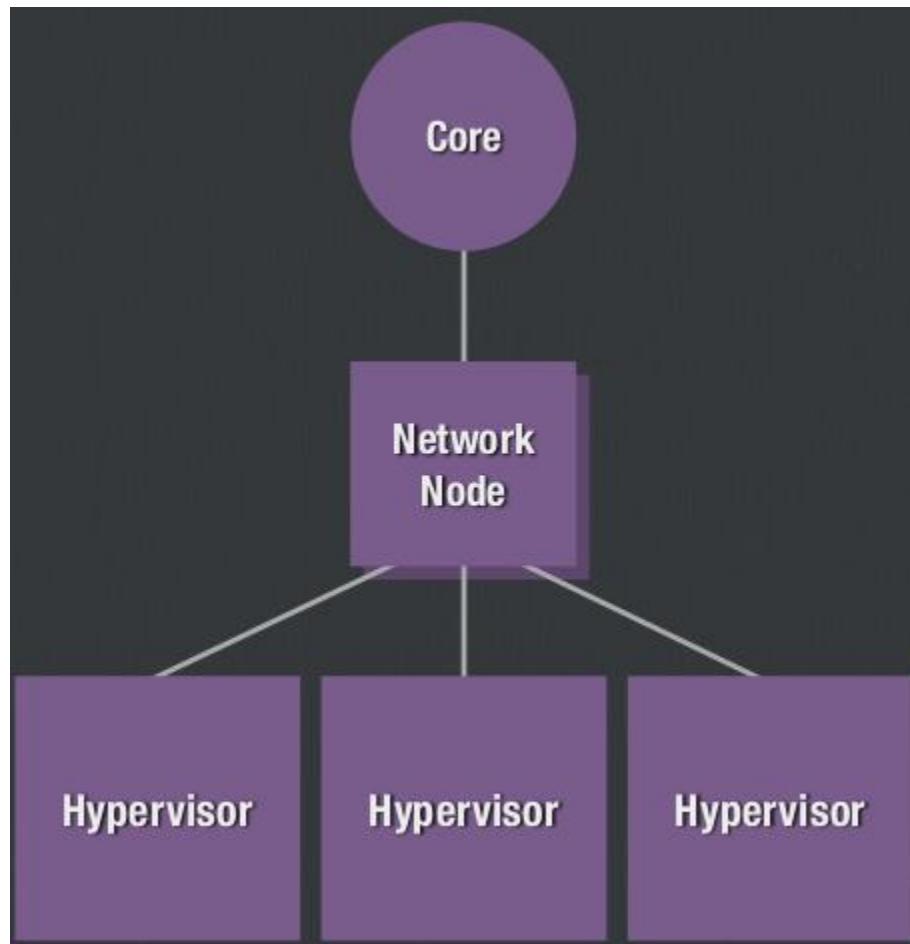
L2 Agent (OVS Example)

- Runs on Hypervisor
- Watch/notify device add/removal
- Wires up new devices
- Tenant Isolation
 - VLAN, GRE, VXLAN



L3 Agent

- Generally runs on network node
- Uses namespaces
- Isolated IP stacks
- Metadata agent







PS4™





ConoHa
by GMO



“[Developers] quickly spin up a new instance if they want to test a risky theory – something they may not have done before for fear of breaking their environment. It takes the risk out of being creative.”







TRAINING



DISTROS &
APPLIANCES



PUBLIC
CLOUDS



HOSTED
PRIVATE CLOUDS



CONSULTING &
INTEGRATORS



DRIVERS

The OpenStack Marketplace will help you make an informed decision, whether you're building a cloud, looking to use one by the hour, or pursuing a hybrid model.

BUILDING A CLOUD

- You'll want to understand which **Software Distributions** and **Converged Appliance** options there are.
- Many users start by hiring experts, which you can find in our **Consultants and System Integrators** section.
- Want to train your staff? Check out our **Training** section.
- Wondering if your compute, storage, and networking gear has compatible drivers? Check out the **Drivers** section to learn the status of ongoing testing.

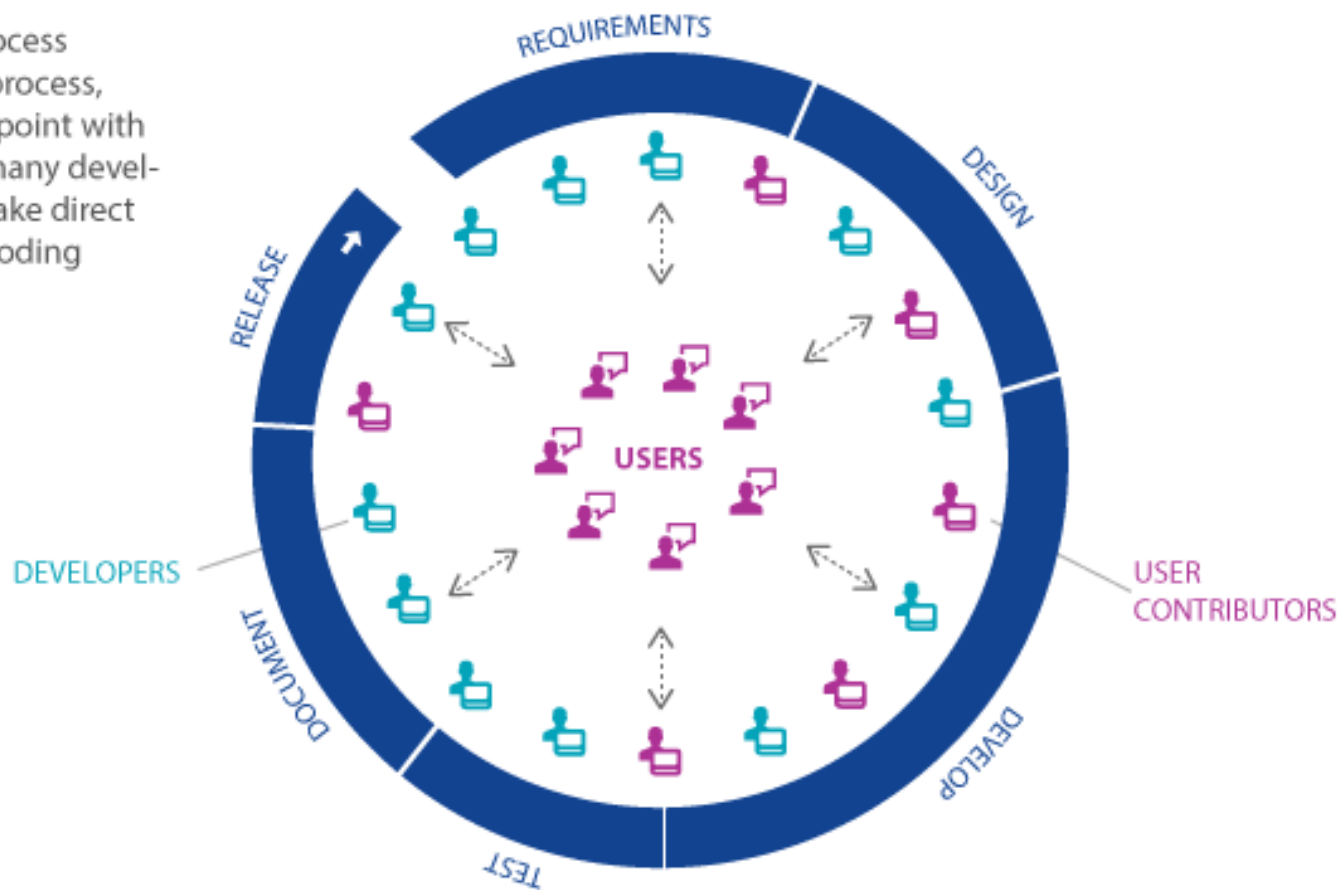
USING A CLOUD

There are OpenStack powered public clouds all over the world. Explore the possibilities.



OPENSTACK SOFTWARE

OpenStack's software development process makes room for users throughout the process, allowing for direct interaction at every point with the development community. In fact, many developers are also users, and users often make direct contributions, developing blueprints, coding features, or adding to documentation.





With its 10th release, OpenStack supports the widest set of technologies, enabling new use cases across finance, manufacturing, technology and many industries.

10th Release of OpenStack – Key Themes

<p>Enterprise Maturity</p>	<ul style="list-style-type: none"> • Most widely-supported cloud platform, expanded testing for plugins • Storage policies • Federated identity enhancements • Operational improvements
<p>Networking Advances</p>	<ul style="list-style-type: none"> • OpenStack infrastructure natural home for implementing NFV • NFV workgroup established, new features landing in Nova • Neutron parity with Nova Network
<p>New Data Processing & Container Support</p>	<ul style="list-style-type: none"> • New Data Processing capability part of integrated release. Supports Hadoop and Spark • Improved Docker support via Compute driver in StackForge

Kilo and Beyond

Kilo is expected to be released April 30, 2015. New capabilities integrated in the Kilo release:

- Bare Metal (Ironic); note that the Compute driver is available in the Juno release

Additional projects being incubated, expected to land in late 2015 and beyond:

- Manila (shared file system)
- Zaqar (queue service)
- Designate (DNS service)
- Barbican (key management)

Kilo and Beyond: Networking

- Paying down “Technical Debt”
- IPv6 – prefix delegation & metadata service
- IPAM
- Dynamic Routing
- Further NFV work
- Speed!
- Reliability!
- Flavour framework



SAVE THE DATE! THE NEXT OPENSTACK SUMMIT

VANCOUVER, BC

May 18 - 22, 2015

STAY TUNED FOR DETAILS





Thank you for supporting OpenStack

Ask Questions at ask.openstack.org

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[@TomFifield](https://twitter.com/TomFifield)



...and more.