OpenStack
企业就绪论坛
联合主办：
协办单位：

Win The Enterprise: OpenStack企业应用之道

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Agenda

- About Us
- OpenStack as an Open-Source Project
- OpenStack User Survey in 2014
- Win The Enterprise at OpenStack Foundation
- Win The Enterprise at Intel
- Summary

About US

Who are We?

- A Platinum member in OpenStack Foundation.
- A couple of teams in Intel who are working on or using OpenStack, including Data Center Group, Software and Services Group, Intel IT etc.
- Top 10 contributor since Grizzly (http://stackalytics.com/)
- A few cores in Ceilometer, Gantt, Horizon, oslo, Swift etc

Who are We?

- We are **dev** instead of **ops**

  (the biggest OpenStack engineering team in Intel)

  Datacenter and Cloud Software (DCS) Team

  Open Source Technology Center (OTC)

  Software and Services Group (SSG), Intel
- Teams at:
  - Shanghai (Zizhu) and Beijing (GTC) in China
  - Santa Clara and Portland in US

What are we doing in OpenStack?

- Nova, Neutron, Ceilometer, Ironic, TripleO, Congress, Horizon, Gantt, Cinder, Glance, Keystone etc. but Intel is doing more, including running OpenStack in Intel (which is called **iLab**)
- Meetup, summit, hackathon, corporation collaboration, tech support etc
- 《OpenStack设计与实现》

http://item.jd.com/11681557.html

Why does Intel do OpenStack?

- Make OpenStack a better choice for Enterprises
- Add Intel features to make OpenStack rich
- Optimize OpenStack on Intel platforms
- Build OpenStack ecosystem
- etc.

Stress on Datacenter Operations

Network

2-3 weeks to provision new services[1]

Storage

40% data growth, 90% unstructured[3]

Server

Average utilization <50% despite virtualization[4]

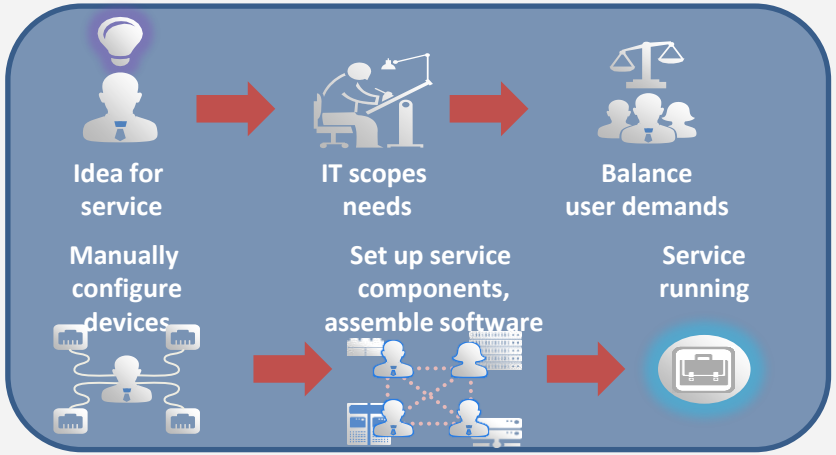
New Challenges are coming….

1: Source: Intel IT internal estimate;
2: 3: IDC's Digital Universe Study, sponsored by EMC, December 2012;
4: IDC Server Virtualization and The Cloud 2012

Intel Private Cloud Vision

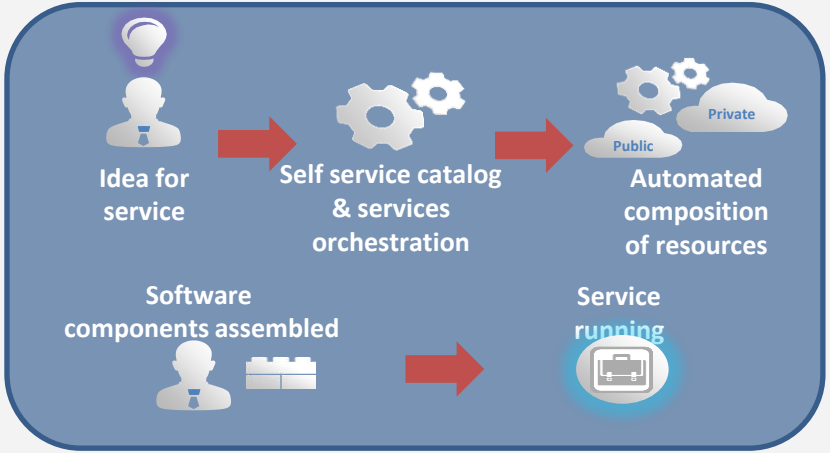
Self-provisioning, automated orchestration, composable resource pools

Datacenter Today



Time to Provision New Service: Months[1]

Software-Defined Infrastructure

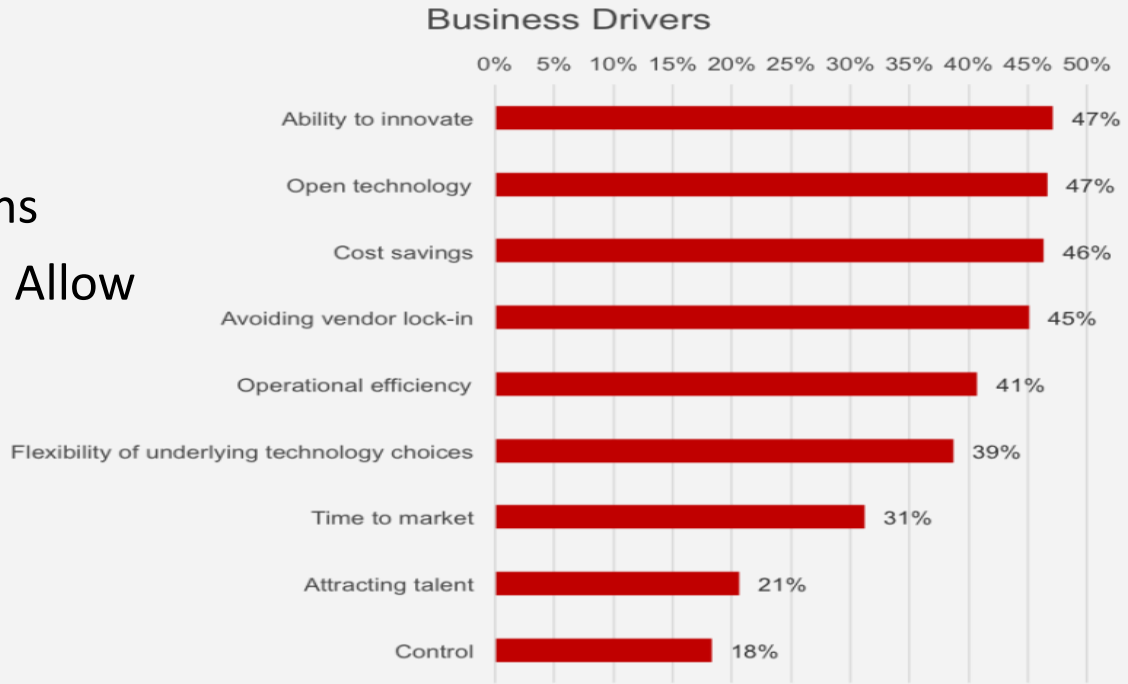


Time to Provision New Service: Minutes[1]

1: Source: Intel IT internal estimate

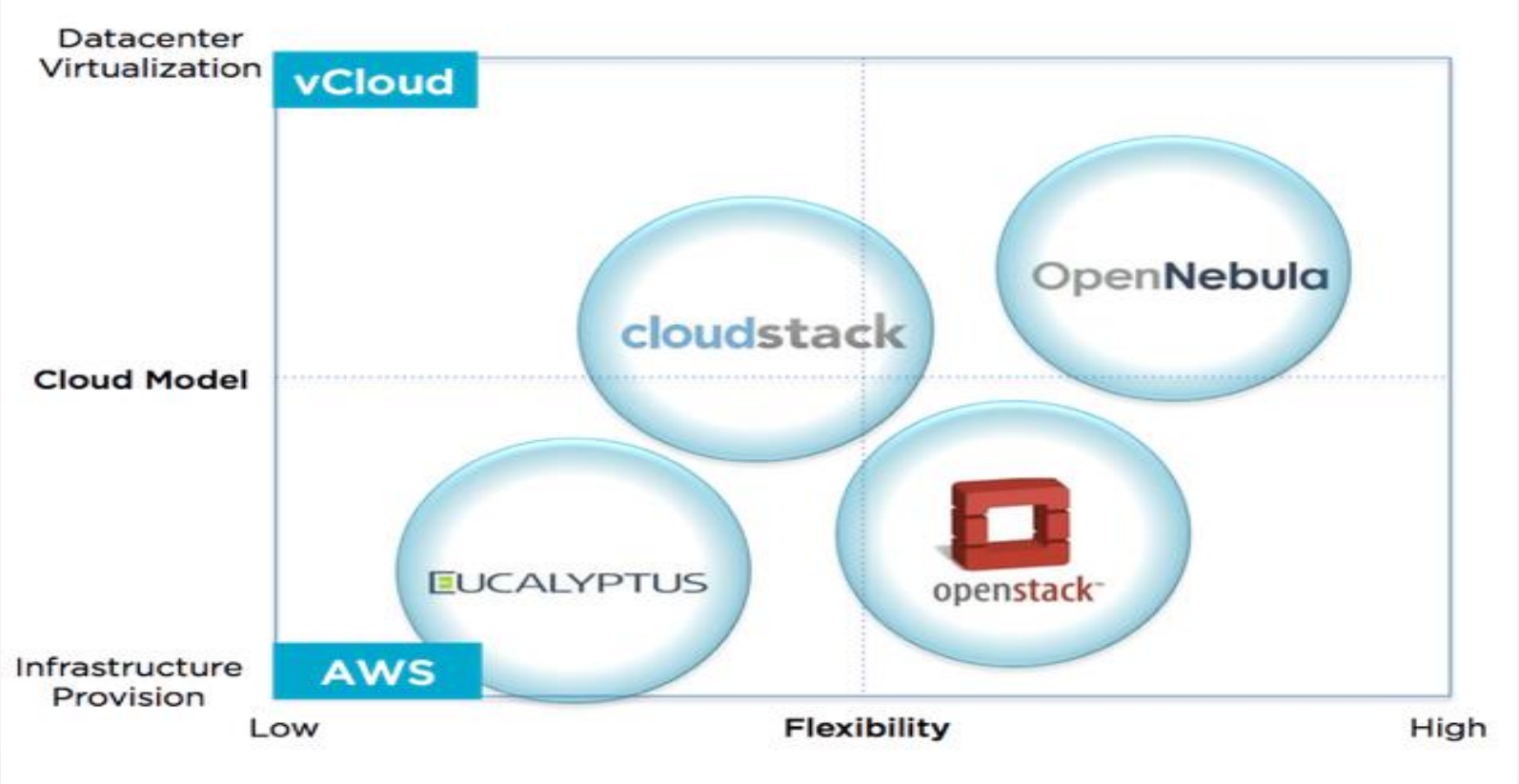
Why Open Source? Why OpenStack?

- Open and Free
- Relatively Mature
- Popular and Many adoptions
- Have Many Components to Allow Customization
- Avoid Vendor Locking
- Trend



Source: http://superuser.openstack.org/articles/openstack-user-survey-insights-november-2014

Cloud Comparison



Source: http://opennebula.org/

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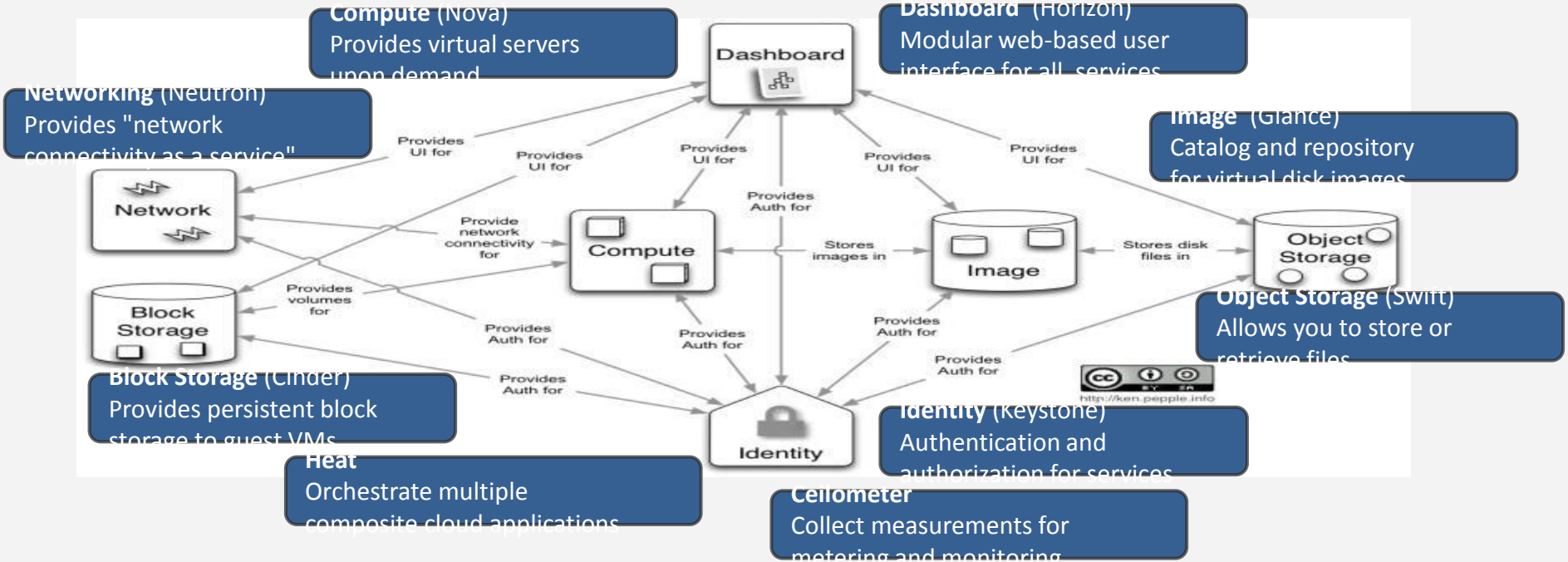
OpenStack As an Open-Source Project

OpenStack Services



Source: http://ken.pepple.info/

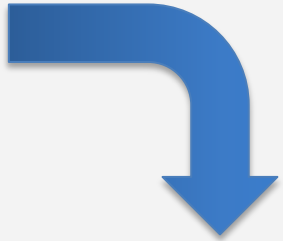
Other Bases

- Support
  - relies on the OpenStack community
- Documentation
- Message Queue
- Databases
- python
- Common libraries (oslo)

Enterprise Readiness Gaps

Different Companies have different needs

- Scale of hosts and VMs – 100-200 or 1K-2K?
- Real-time
- Cost and complexity
- Hardware purchasing consideration
- Security concerns
- Etc.



Open Source can’t afford sufficient services

- Stability management
- Too many options, too many contributors, too many configurations
- Knowledge needed for ops
- Projects evolve and change
- Free support but no commitment
- Etc.

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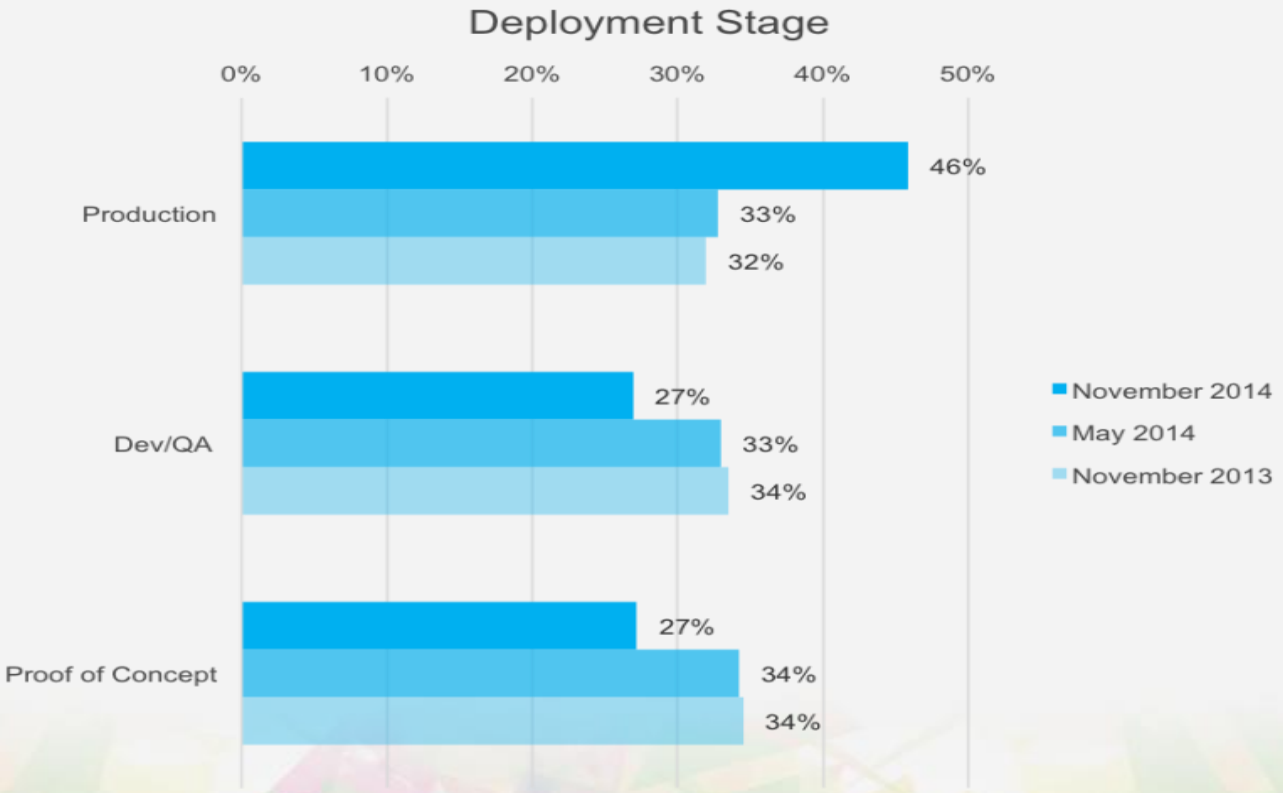
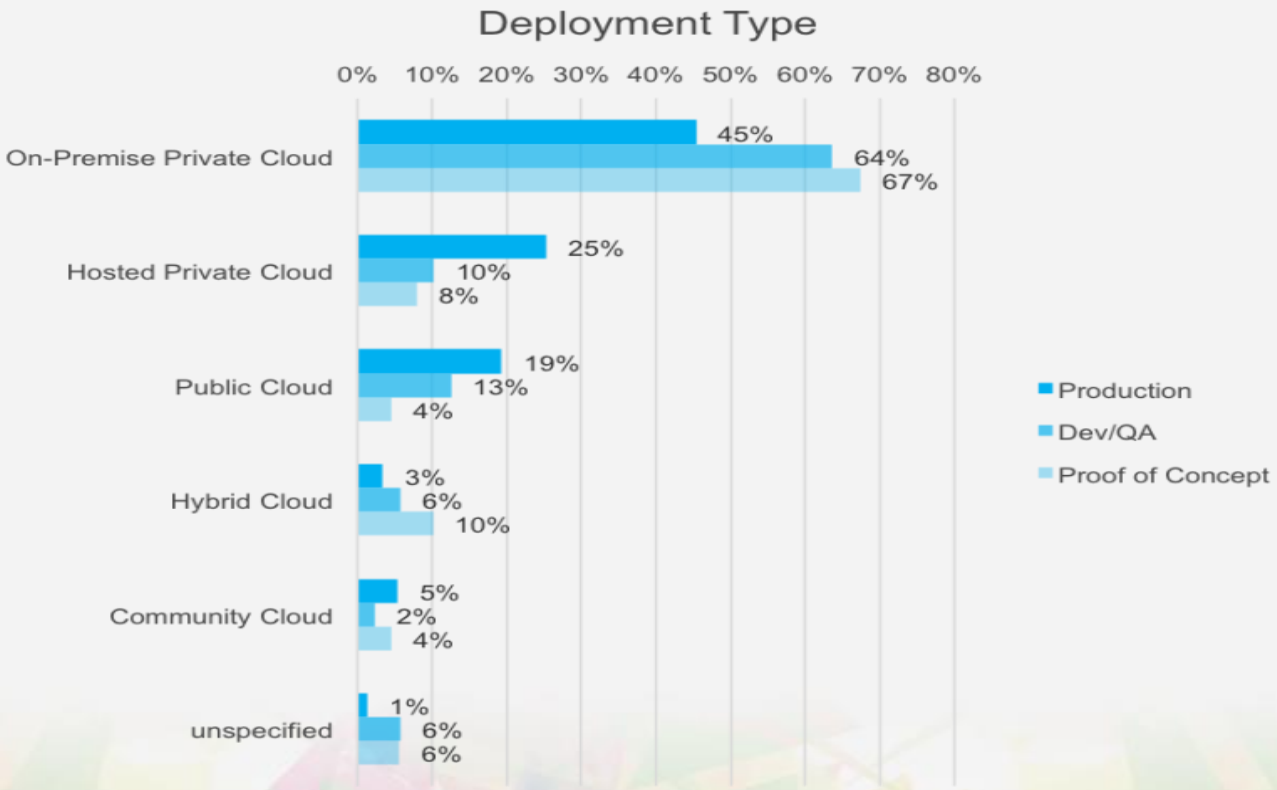
OpenStack User Survey 2014

Source: http://superuser.openstack.org/articles/openstack-user-survey-insights-november-2014

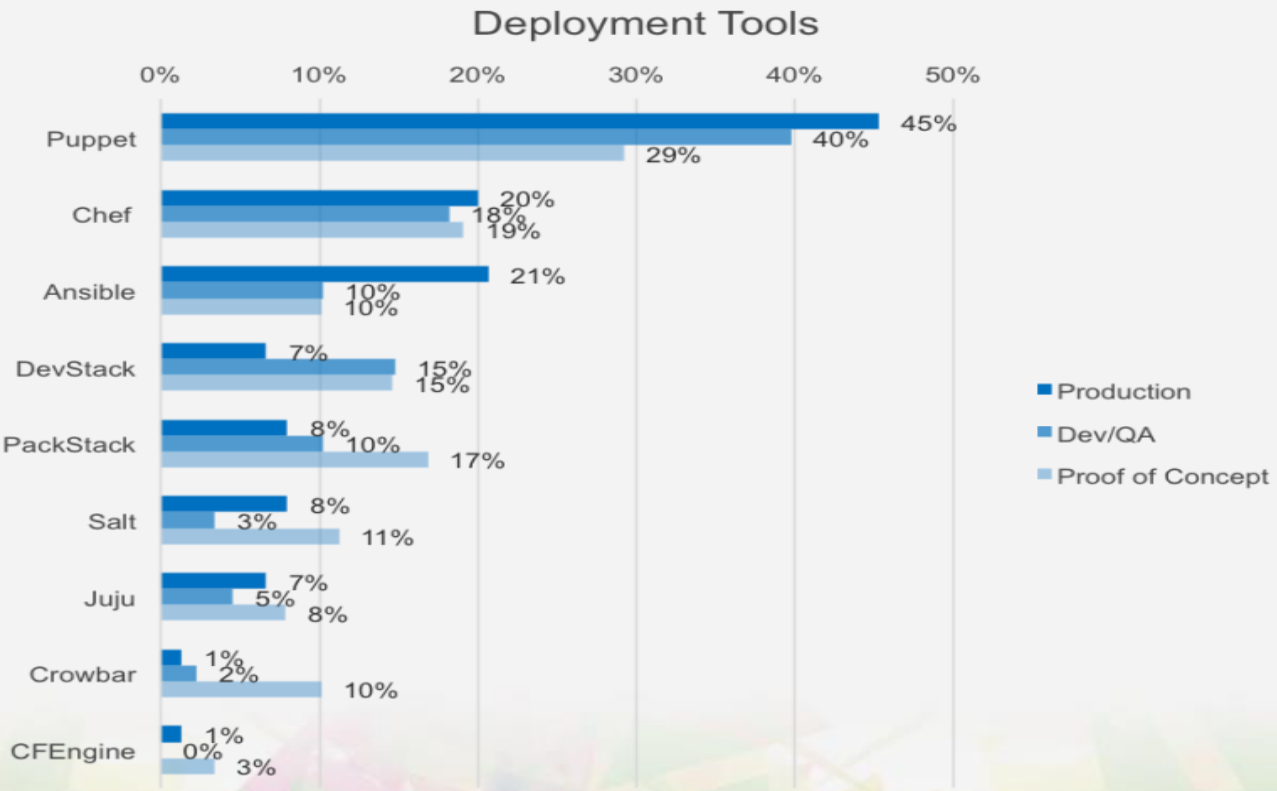
Deployment Stage



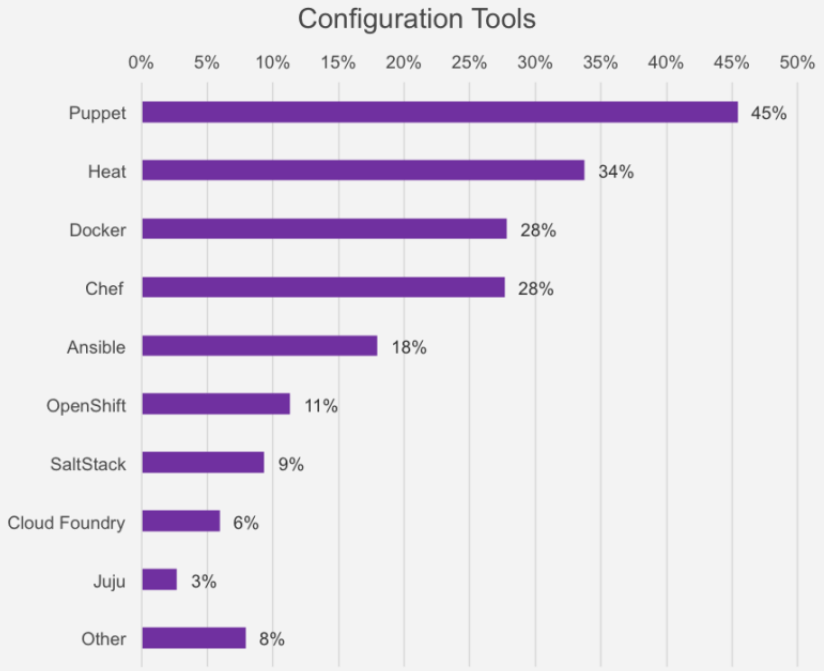
Deployment Type



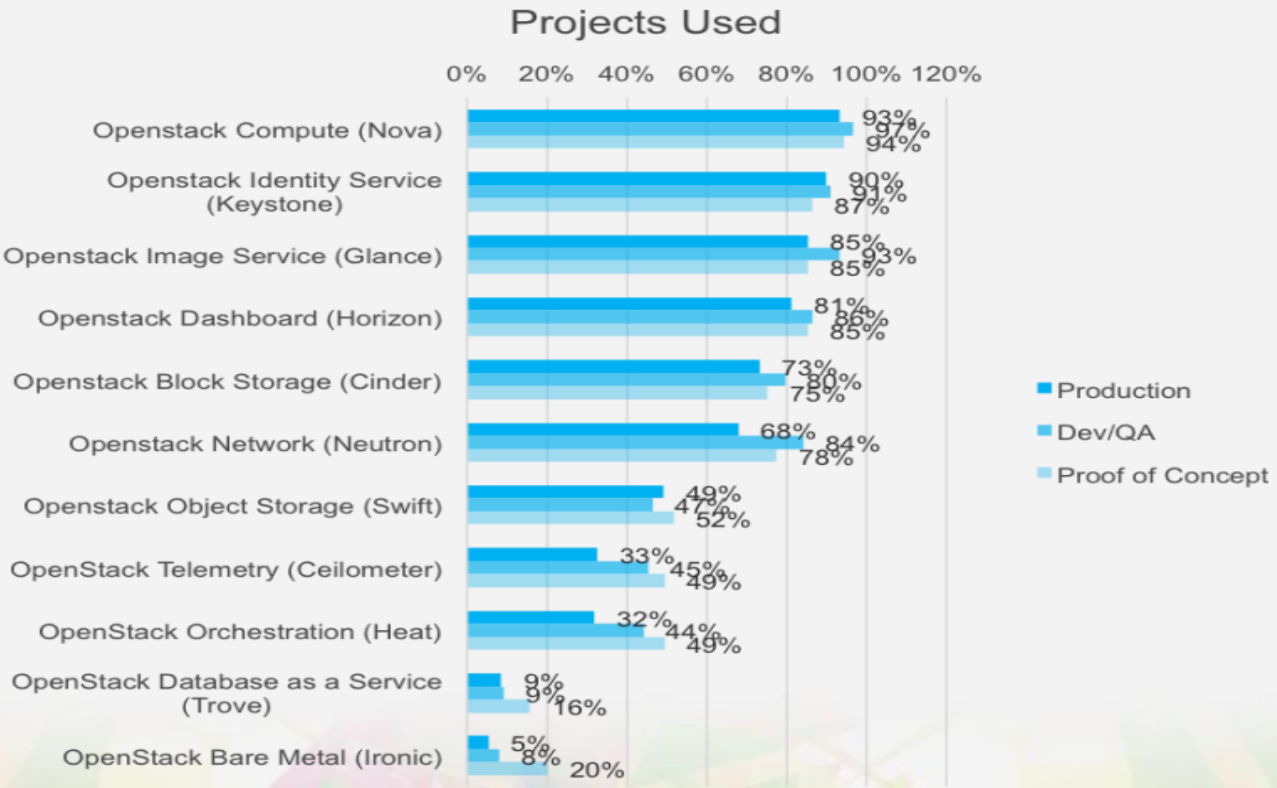
Deployment Tools



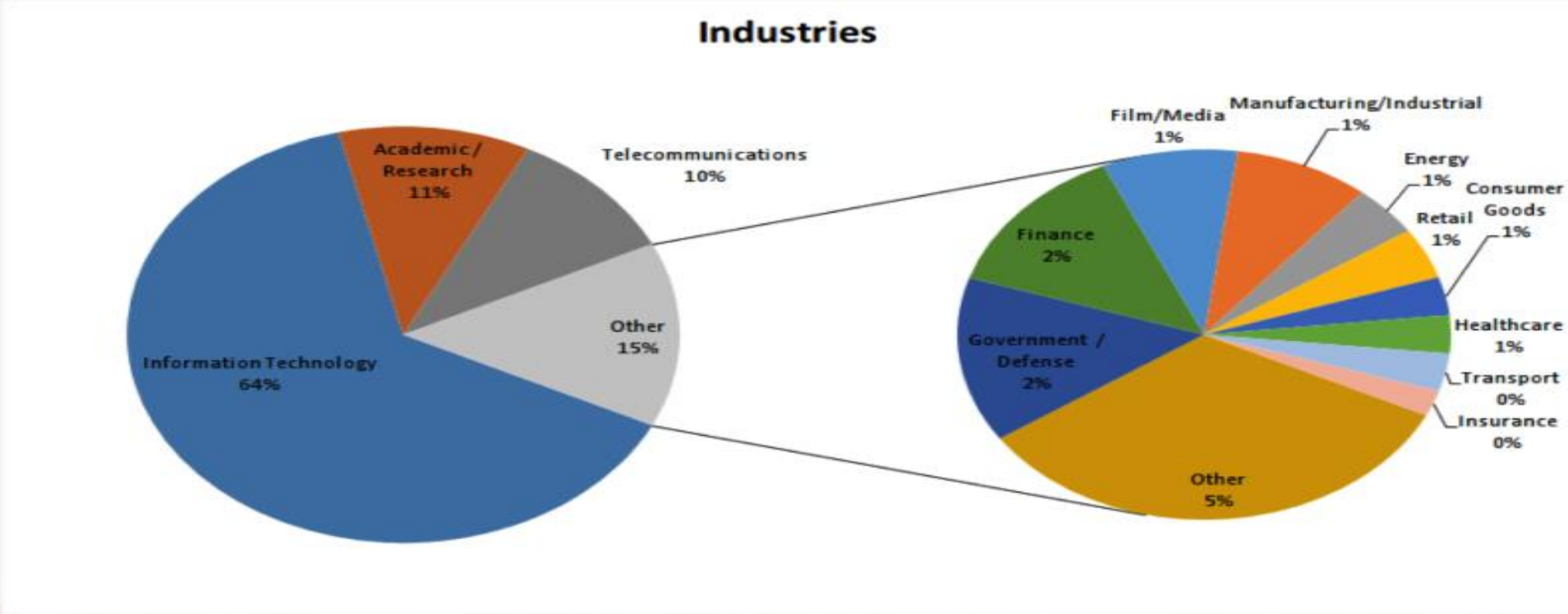
Configuration Tools



Projects Used

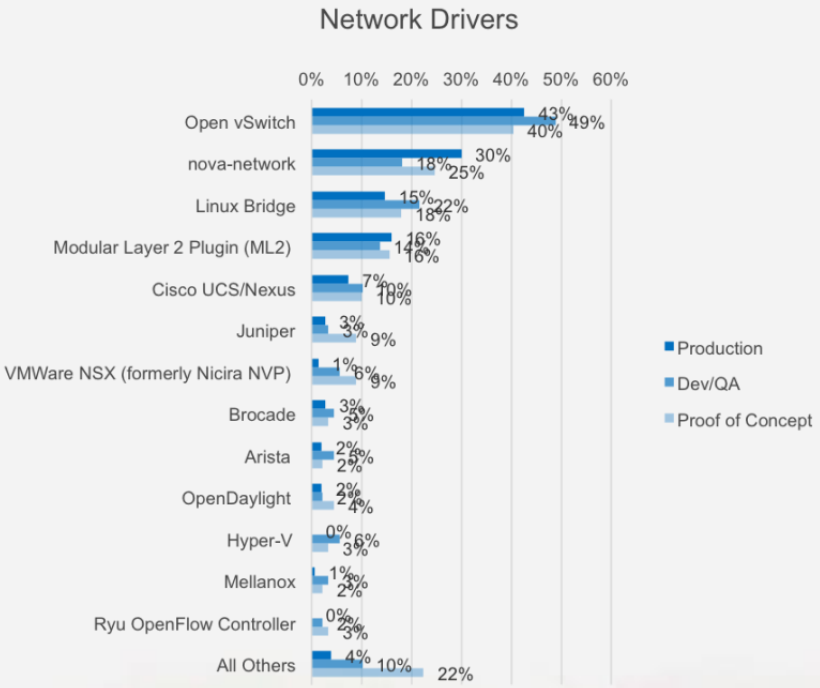


Industries

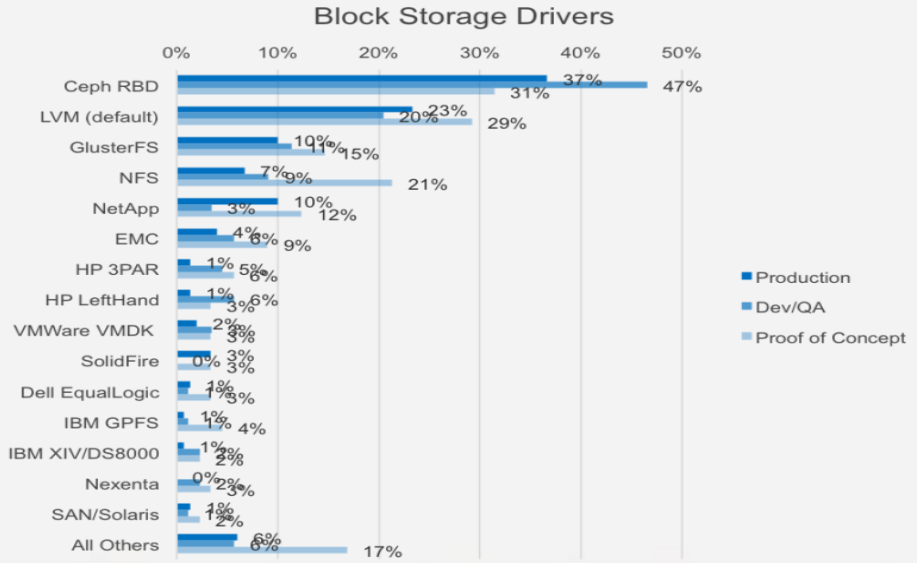

Industries
Academic / Research 11%
Telecommunications 10%
Other 15%
Information Technology 64%
Film/Media 1%
Manufacturing/Industrial 1%
Energy 1%
Consumer Goods 1%
Retail 1%
Finance 2%
Healthcare 1%
Government / Defense 2%
Transport 0%
Insurance 0%
Other 5%

Glance at others

Network

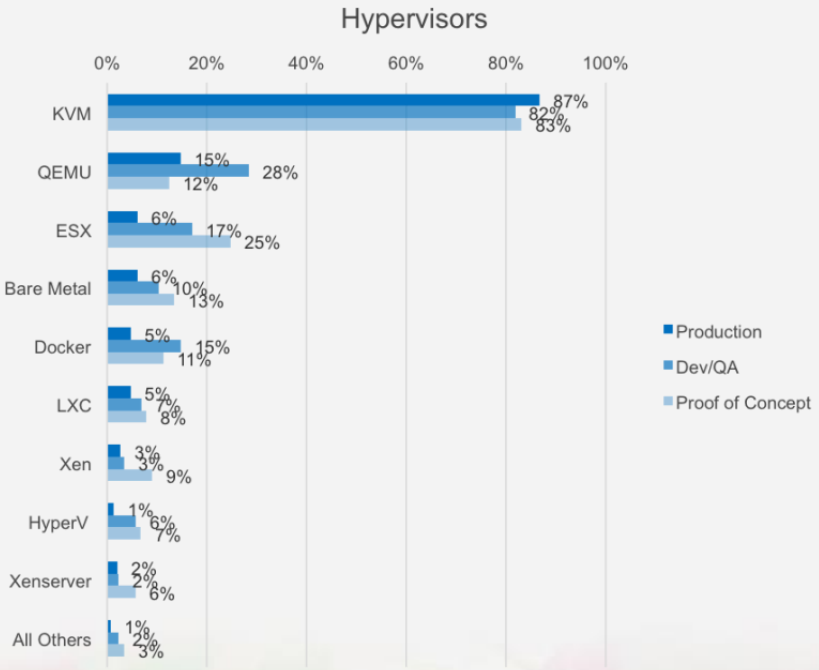


Block Storage

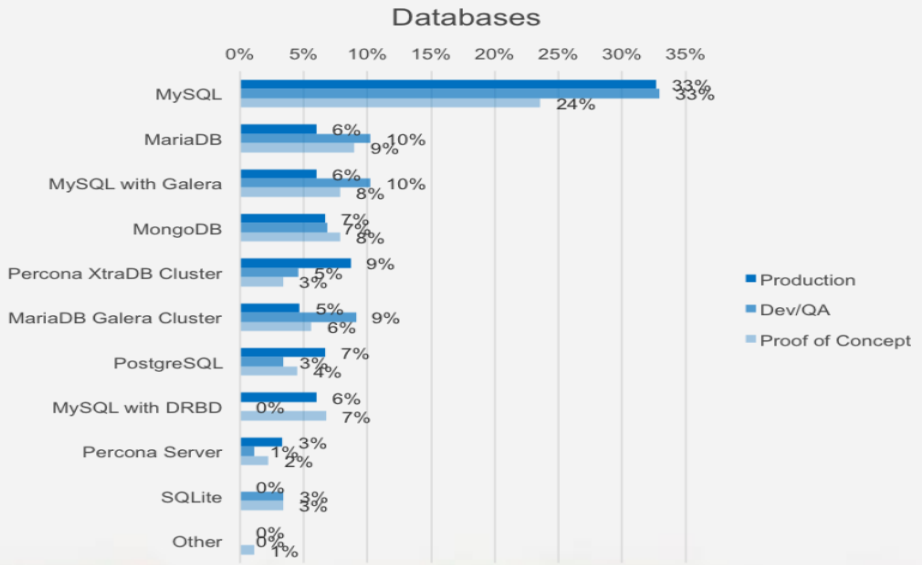


Glance at others

Hypervisors



Databases



Pain Points

- Neutron is the top area of pain
  - Performance, stability and ease of use
  - High Availability
  - SDN use cases and IPv6 requirements
  - Robustly migrating nova-network to Neutron
  - Security groups, NFV, LBaaS
- Documentation is the second – e.g. Localization
  - Feature completion, out of date and not accurate
- Upgrades and High Availability
- Request a stronger Dashboard – e.g. Localization
- Ceilometer and Heat have a ways to go
- Logging

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Win The Enterprise at OpenStack Foundation

Source: https://wiki.openstack.org/wiki/Win_the_Enterprise

Teams

- Business and Marketing
  - Identify market awareness and perception barriers to adoption
- Cattle and Pets
  - Identify today's barriers for on-boarding traditional enterprise IT workloads into OpenStack Cloud deployments
- Deployment
  - Understand enterprise IT requirements for OpenStack Cloud deployments and upgrades
- Monitoring
  - Work with OpenStack ops to understand the logging/monitoring requirements
- Operations
  - Address enterprise IT ops needs

Goals and Focuses

- Goals
  - Accelerate the deployment of OpenStack by Enterprise IT for Private or Hybrid Clouds
- Focuses
  - Deployment
  - Rolling Upgrades
  - Live Migration
  - Stability and Reliability
  - Legacy Infrastructure Integration/Migration

Win The Enterprises

- **Business and Marketing**
  - User reference architectures
  - Production Deployment Proof Points
  - Identify leading Cloud workloads and describe how the apps can be deployed on OpenStack
  - CIO whitepaper on considerations
- **Deployment**
  - Reference architecture and reference implementation of the home made deployment methods
  - Identify gaps of large scale deployment tools and small scale tools
- **Operational Best Practices**
  - OpenStack/Legacy infrastructure integration
  - Upgrades between major versions
  - OpenStack Infrastructure HA
  - Migration of HA applications into OpenStack
  - Gaps in OpenStack control plane HA capabilities
- **Cattle and Pets**
  - Identify and plan for changes needed in deploying OpenStack
  - Operational Best Practices
    - Legacy infrastructure integration and migration
    - HA database deployment in OpenStack
    - Centralized OpenStack/Legacy control plane
    - Rolling upgrades and Live Migration across all OpenStack services
- **Monitoring**
  - Publish APIs for the industry standard tools to consume, and work to integrate with OpenStack APIs
  - Share monitoring solutions and integrations with OpenStack at summits
- **Stability and Reliability**
  - API backward compatibility
  - Testing and Bug Fixing
  - User Docs, Reference Guides
  - Scaling

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Win The Enterprise at Intel Engineering

Source: https://wiki.openstack.org/wiki/Win_the_Enterprise

High Availability of Tenants

- VM Live Migration Hardening (speed & failure ratio)

  Nova Live Migration & Volume Migration
  - https://blueprints.launchpad.net/nova/+spec/migrate-non-active-instances
  - https://blueprints.launchpad.net/nova/+spec/manager-restart-during-migration
  - https://blueprints.launchpad.net/nova/+spec/refresh-abort-live-migration
  - https://blueprints.launchpad.net/cinder/+spec/generic-volume-migration
- Automatic Evacuation
  - http://blog.russellbryant.net/2014/10/15/openstack-instance-ha-proposal/
  - https://blueprints.launchpad.net/nova/+spec/host-health-monitoring
  - https://blueprints.launchpad.net/nova/+spec/pacemaker-servicegroup-driver
- Host Maintenance Mode
  - https://blueprints.launchpad.net/horizon/+spec/migrate-all-instances-from-hosts-in-maintenance-mode
  - https://blueprints.launchpad.net/nova?searchtext=maintenance

High Availability of Services

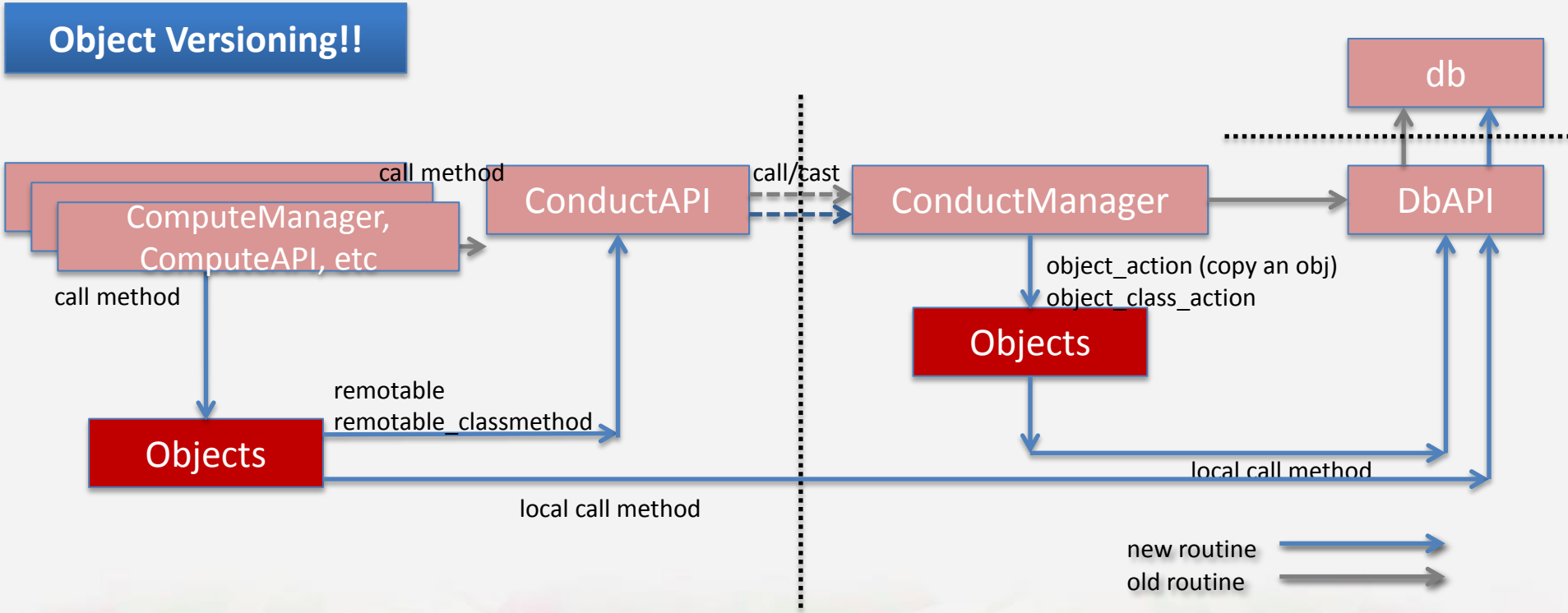
Always ON and respond during failure and massive stress

- HA guide is out of date
  - http://docs.openstack.org/high-availability-guide
- Requests are lost when Heat engine dies
  - https://blueprints.launchpad.net/heat/+spec/convergence
  - https://blueprints.launchpad.net/heat/+spec/convergence-observer
  - https://blueprints.launchpad.net/heat/+spec/convergence-engine
  - https://blueprints.launchpad.net/heat/+spec/convergence-continuous-observer
- No VLANs support in one of Neutron HA solutions
  - http://specs.openstack.org/openstack/neutron-specs/specs/kilo/neutron-ovs-dvr-vlan.html (**COMPLETED**)

High Availability of Services

- No retry in Glance
  - https://blueprints.launchpad.net/glance/+spec/taskflow-integration
- Unresolved state when Cinder service dies
  - https://blueprints.launchpad.net/cinder/+spec/create-volume-persistence-taskflow-support
  - https://blueprints.launchpad.net/cinder/+spec/create-volume-persistence-taskflow-support-api
  - https://blueprints.launchpad.net/cinder/+spec/create-volume-persistence-taskflow-support-scheduler
  - https://blueprints.launchpad.net/cinder/+spec/create-volume-persistence-taskflow-support-volume
- Cinder can’t run in an Active/Active mode (owned by RH)

Rolling Upgrades



Driving Monitoring Standards

- Collect dynamic runtime metrics in OpenStack Nova with monitor plugins on compute nodes
  - CPU utilization, memory usage, network bandwidth etc.
- Add physical host monitoring into OpenStack Ceilometer
  - Hardware pollsters, SNMP inspectors, and enhanced pipeline

OpenStack Service	Type	Metrics (e.g.)
Nova	Static capabilities	• CPU features • hypervisor version
	Dynamic Resources	• free memory/disk • vCPU # • PCI devices • # of NIC virtual functions
	Extensible runtime measurements	• CPU time
Ceilometer	Resources creation/deletion	• VM • network/subnet/port • image • ……
	Resources usage data	• CPU usage in VM • memory usage in VM • network usage in VM • storage usage stats • ……
	Hardware related	• CPU load • Memory usage • Network usage • Disk usage • Power consumption

Intelligent Workload Scheduling

- VM Placement

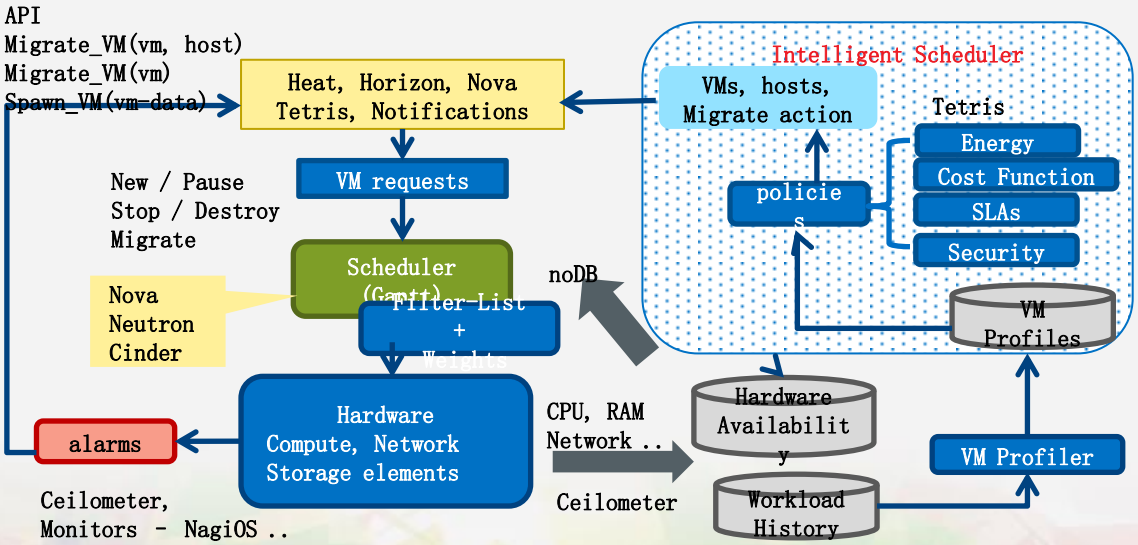
  Utilization Based Scheduling

  – Pluggable metric data collecting framework
  – New filters/weighers in OpenStack Nova
  – Monitor metrics
    - CPU load
    - Power & Themal via IPMI

- VM Runtime

  Dynamic Resource Reschduling

  – Reuse policy engine in OpenStack Congress
  – Step towards SLA



Intel Enables OpenStack Deployments

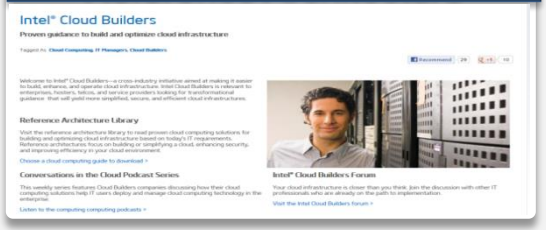
Contributions

- Contributions across OpenStack projects plus tools released to Open Source
- Active contributor in OpenStack community
- Performance optimizations, validation and patches

Intel® IT Open Cloud

- Intel IT Open Cloud with OpenStack
- Deliver Consumable Services
- Enable Automated Management of Cloud

Intel® Cloud Builders Reference Architecture



- Validate Intel IT customization of OpenStack
- Document best practices
- Share best practices with enterprises and services providers

Make Enterprises and cloud service providers deploy cloud solution successfully

Others

- Persistent connections for calls
- New filter, new scheduler considering rack
- Improve database throughput and performance
- Ceilometer tuning, time-series monitoring
- Real-time monitoring and alarming
- Speed up message Q handling, e.g. enable ZeroMQ
- Dashboard localization
- Deployment tool customization
- Storage optimization, e.g. fast boot
- Docker support
- Auto scaling
- Rollback support for rolling upgrades
- Mobile OpenStack Management
  - Authentication, Administration anywhere anytime, Alarming, …
- … … … … so many others

Summary

Is OpenStack Production Ready for Enterprise?

OpenStack Projects – Open Source

- Framework of a loosely coupled components
- A set of key components to run and satisfy minimum needs from enterprises
- Interests from different companies
- Open source community

Products – customized based on OpenStack

- Mature and stable enough
- Easy to deploy and use
- Customer needs satisfied
- Continuous technical support and service

Call for Actions

- Test OpenStack with your customers and collect feedbacks
- Report bugs as more as possible when you find them in the deployment
- Help to fix bugs as many as possible
- Bring WTE features to OpenStack upstream
- After fixing problems for your customers, try to contribute patches to WTE features in OpenStack

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