openstack™
CLOUD SOFTWARE

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Summary

What is OpenStack?

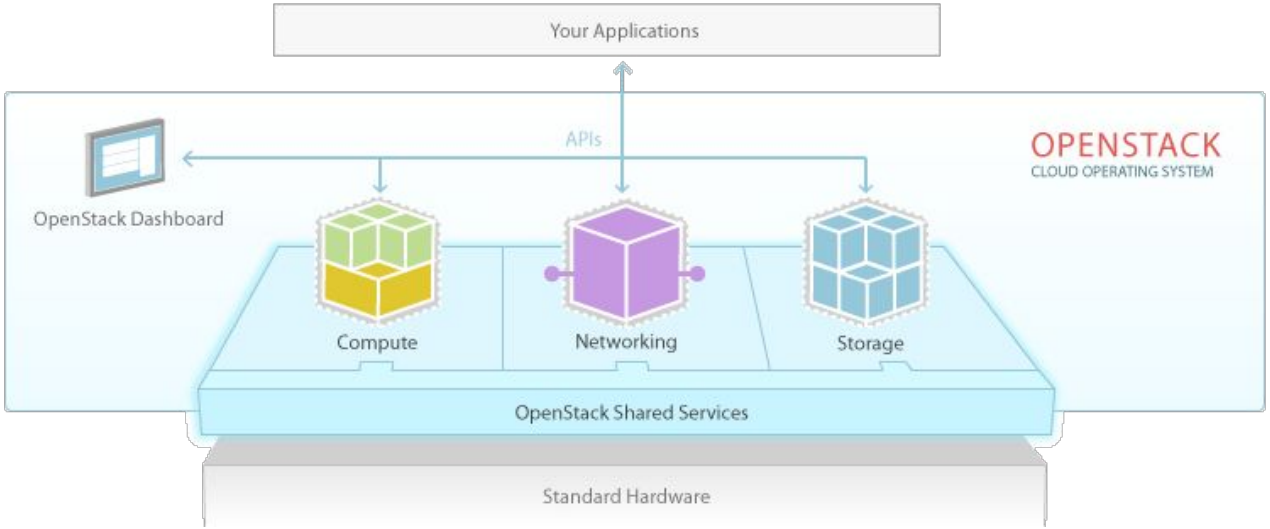
From a simple cooperation to a worldwide community

OpenStack components

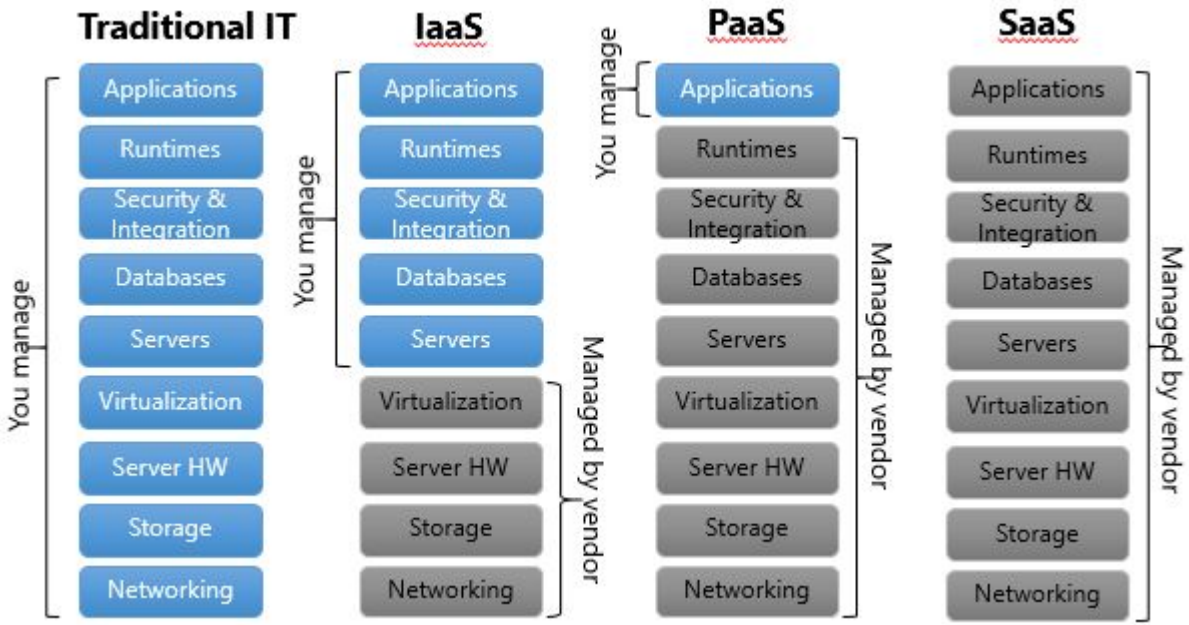
OpenStack architecture

What is OpenStack?

"OpenStack is a cloud operating system that controls large pools of compute, storage, and networking resources"

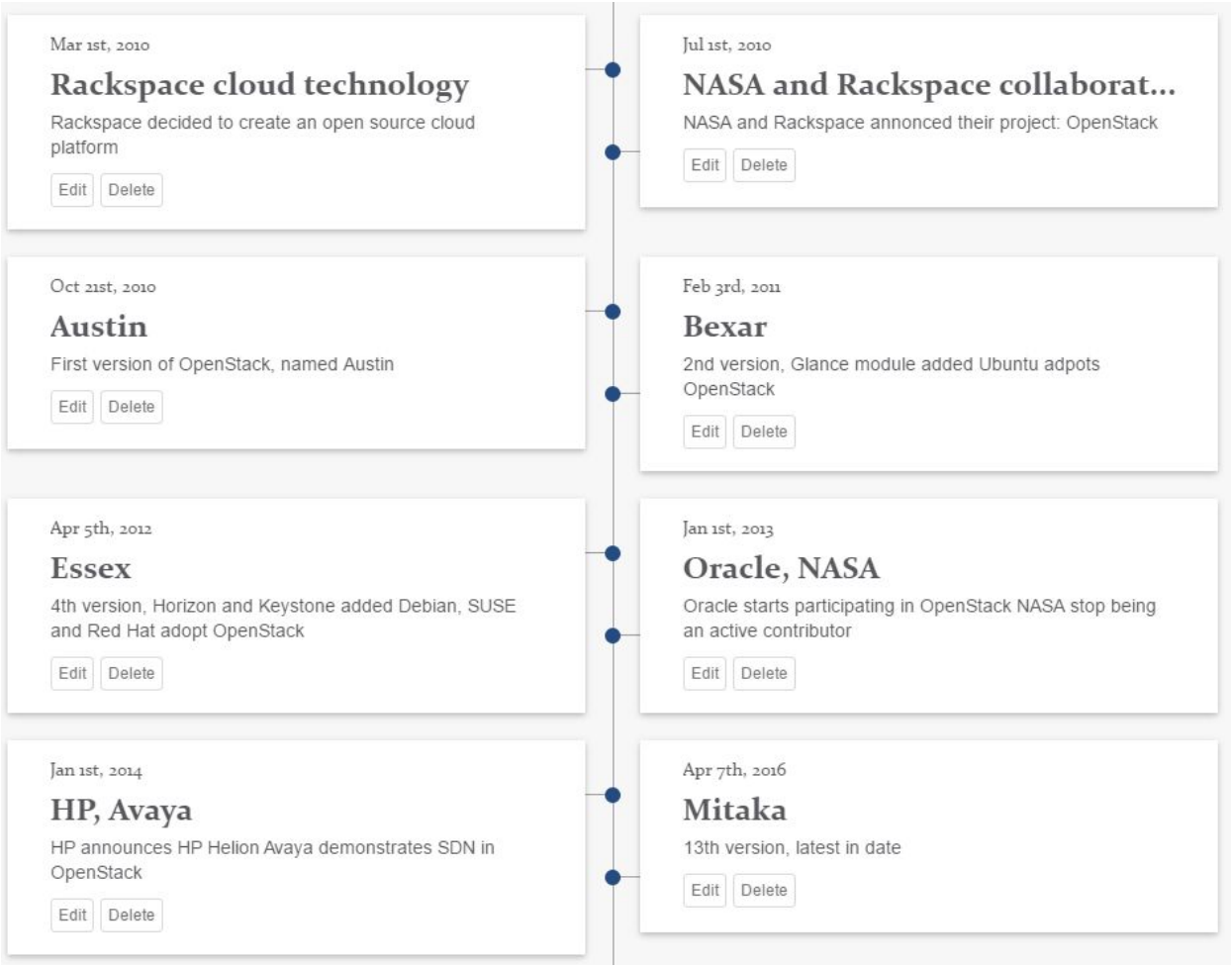


Infrastructure as a service (IaaS)



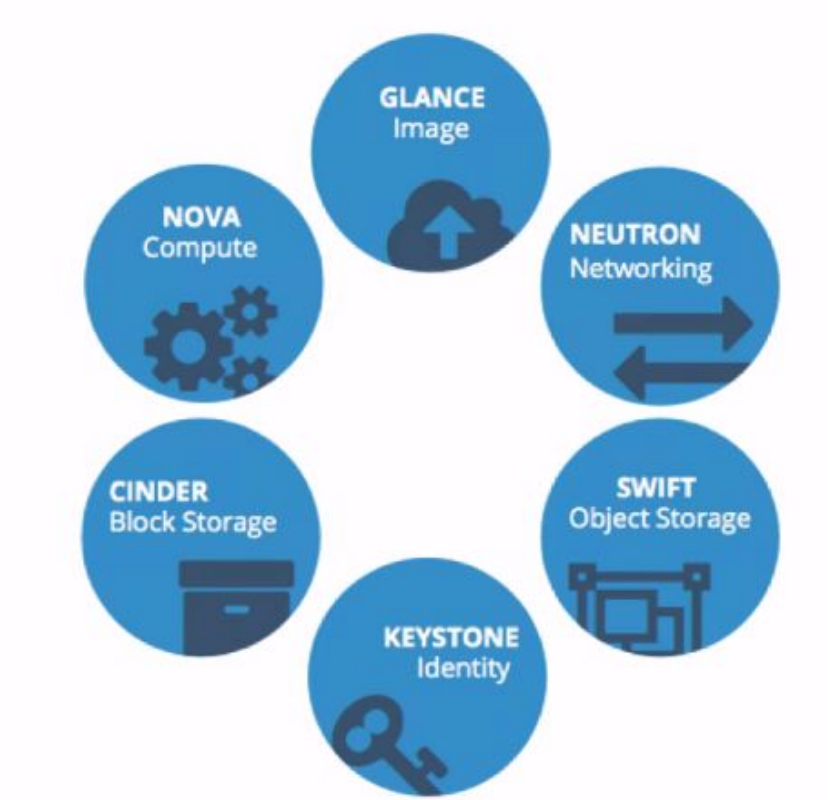
What is OpenStack?

- Aimed to make cloud easy and scalable
- For private, public or hybrid cloud
- Open Source
- Written in Python
- Can be controlled via command line or its RESTful API
- Modular architecture
- Works with multiple hypervisors (KMV, Hyper-V, VMware ESXi...)



The history of the project

OpenStack Components



Nova

- Manages pools of computer resources
- Communicates with hypervisors through API
- Scalable and on demand
- Provides access to the VM for the users

Swift & Cinder

- Cinder: Block Storage module
  - Used to store VM
  - Appears as a block using iSCSI
- Swift: Object storage system
  - Takes care of redundancy (data replication over multiple physical disks)
  - Manages storage clusters
  - data as binary objects

Glance, Neutron, Keystone & Horizon

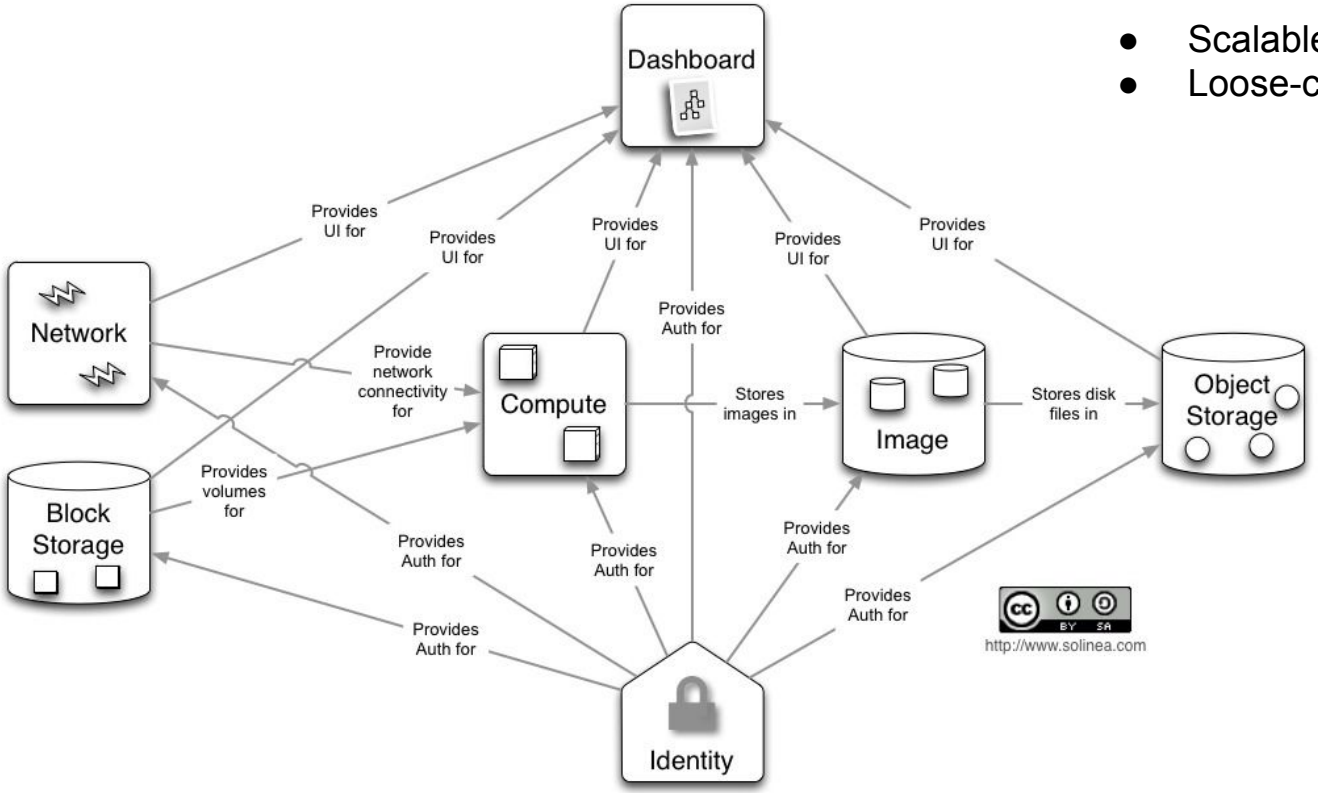
- Glance: manages images
  - Discovery, registration and management of disks and server images
  - Can be also used for back-up
- Neutron: manages the network
  - supports Software defined Network
  - manages IP addresses pool for static usage or DHCP
- Keystone: manages authentication
  - common authentication system for the entire cloud
  - supports LDAP
- Horizon: User Interface
  - Web UI for managing OpenStack

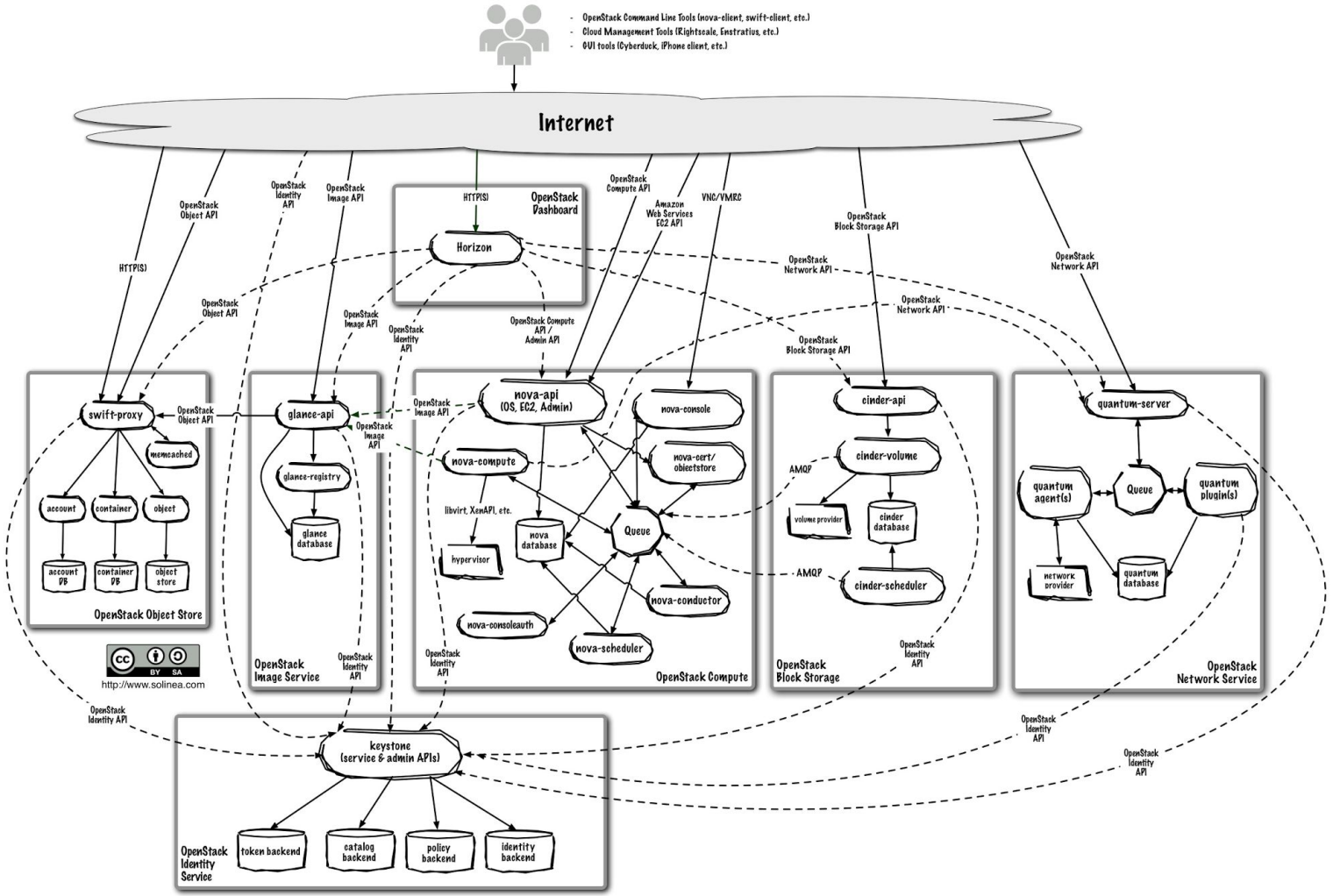
But there is more...

- Telemetry (Ceilometer)
- Governance (Congress)
- Application Catalog (Murano)
- Database (Trove)
- Shared Filesystems (Manila)
- Orchestration (Heat)
- etc...

OpenStack Architecture

- Scalable
- Loose-coupling




- OpenStack Command Line Tools (nova-client, swift-client, etc.)
- Cloud Management Tools (Rightscale, Enstratius, etc.)
- GUI tools (Cyberduck, iPhone client, etc.)
Internet
HTTP(S)
OpenStack Dashboard
Horizon
OpenStack Object API
OpenStack Identity API
OpenStack Image API
OpenStack Compute API
Amazon Web Services EC2 API
VNC/VMRC
OpenStack Block Storage API
OpenStack Network API
OpenStack Compute API / Admin API
swift-proxy
memcached
account
container
object
account DB
container DB
object store
OpenStack Object Store
glance-api
glance-registry
glance database
OpenStack Image Service
nova-api (OS, EC2, Admin)
nova-console
nova-compute
nova-cert/ objectstore
libvirt, XenAPI, etc.
hypervisor
nova database
Queue
nova-conductor
nova-consoleauth
nova-scheduler
OpenStack Compute
cinder-api
cinder-volume
AMQP
volume provider
cinder database
cinder-scheduler
OpenStack Block Storage
quantum-server
quantum agent(s)
Queue
quantum plugin(s)
network provider
quantum database
OpenStack Network Service
http://www.solinea.com
keystone (service & admin APIs)
token backend
catalog backend
policy backend
identity backend
OpenStack Identity Service

Conclusion - Why OpenStack?

- Compatible and Open source (no vendor lock-in)
- Industry involved in its creation (more than 100 companies (Cisco, Dell, HP, IBM, etc.) working on it)
- Migration between two OpenStack providers is easier than between two offers with different technologies

References

OpenStack, http://www.openstack.org

OpenStack presentation, Hitesh Wadekar, http://fr.slideshare.net/openstackindia/openstack-introduction-14761434

Nova Developer Documentation, http://docs.openstack.org/developer/nova/

Swift Developer Documentation, http://docs.openstack.org/developer/swift/