Understanding OpenStack

A quick look at OpenStack and its components

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Before we start

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- I encourage you to take photos or videos of today's session and share them online
- This presentation will be made available online after the event

Agenda

- What OpenStack is not
- So what is OpenStack?
- OpenStack's components
- Why does OpenStack matter?

What OpenStack Is Not

- It's not a single open source project (more on that in a moment)
- It's not a hypervisor
- It's not a storage platform (though it can provide storage)
- It's not network virtualization (or software-defined networking)

So What Is OpenStack?

- A group of open source projects aimed at providing comprehensive cloud services
  - There are currently seven core projects within OpenStack
  - All these projects communicate via public APIs
- Originally emerged from collaboration between Rackspace and NASA
- It's supported by the OpenStack Foundation, an independent legal entity

OpenStack's Components

- OpenStack Compute (code-named "Nova")
- OpenStack Object Store (code-named "Swift")
- OpenStack Image (code-named "Glance")
- OpenStack Identity (code-named "Keystone")
- OpenStack Block Storage (code-named "Cinder")
- OpenStack Network (code-named "Quantum")
- OpenStack Dashboard (code-named "Horizon")

OpenStack's Components

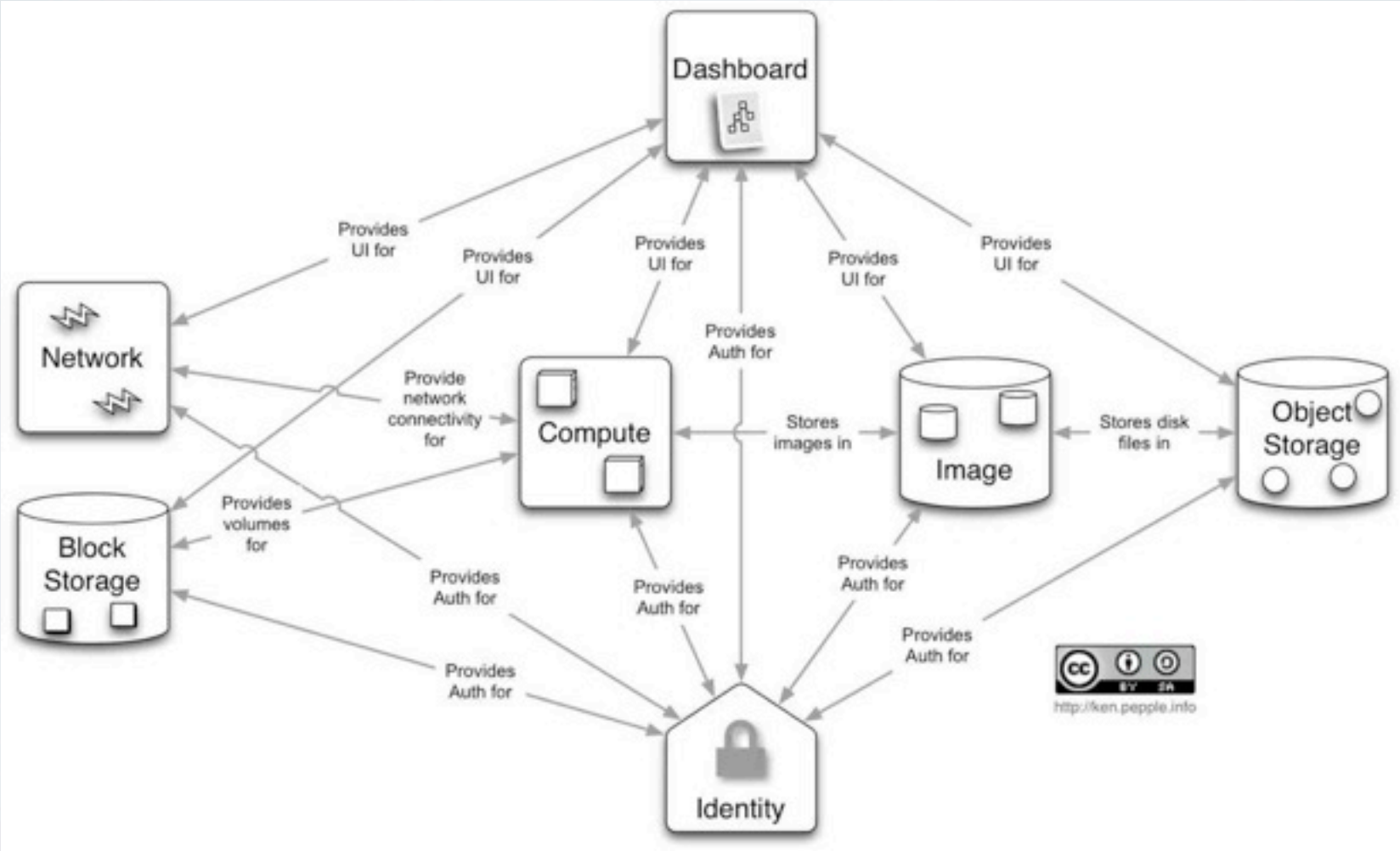

Image courtesy of Ken Pepple, http://ken.pepple.info/openstack/2012/09/25/openstack-folsom-architecture/

OpenStack's Components: Compute

- Conceptually similar to Amazon EC2
- Can leverage multiple hypervisors (Xen, KVM, ESXi, Hyper-V)
- Made up of several sub-components (`nova-api`, `nova-compute`, `nova-schedule`)
- Some sub-components are being broken out
  - `nova-network` will be replaced by Network ("Quantum")
  - `nova-volume` will be replaced by Block Storage ("Cinder")

OpenStack's Components: Object Store

- Think of it as similar to Amazon S3
- Provides distributed object storage
- Supports the OpenStack Object API as well as raw HTTP
- Authentication is handled via OpenStack Identity (typically)

OpenStack's Components: Image

- This can be compared to Amazon's AMI catalog
- Provides image storage, image retrieval, and image discovery services through `glance-api`
- Handles image metadata (size, type, etc.) via `glance-registry`
- Can leverage the Object Store ("Swift") or other storage platforms, including S3, filesystems, and HTTP

OpenStack's Components: Identity

- Provides policy and authentication services for other OpenStack services
- Leverages a pluggable architecture that can support LDAP, SQL, and other backend services

OpenStack's Components: Block Storage

- Can be compared in concept to Amazon EBS
- Provides block storage functionality to instances running on Compute
- Similar to Compute, it has several sub-components (`cinder-api`, `cinder-volume`, `cinder-scheduler`)
- `cinder-volume` leverages storage drivers to interact with underlying storage platforms
- Will eventually replace `nova-volume`

OpenStack's Components: Network

- Provides "network as a service" functionality
- Uses a plug-in architecture; plugins exist for:
  - Nicira NVP
  - OpenFlow
  - Open vSwitch
  - Linux bridging
- Will eventually replace `nova-network`

OpenStack's Components: Dashboard

- A web application that runs on Apache
- Provides a graphical user interface (GUI) for other OpenStack services
- Leverages the APIs of the other OpenStack services

Why Does OpenStack Matter?

- One of only a few significant open source projects attempting to provide a comprehensive cloud services framework
- Enjoys broad industry support
- Some significant providers are adopting OpenStack as their cloud services platform
- Like Linux, OpenStack could have a profound impact on your data center or cloud deployment

Questions & Answers

Thank you!

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