



OpenStack and Magnum

Kubernetes as a Service for everyone

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New challenges

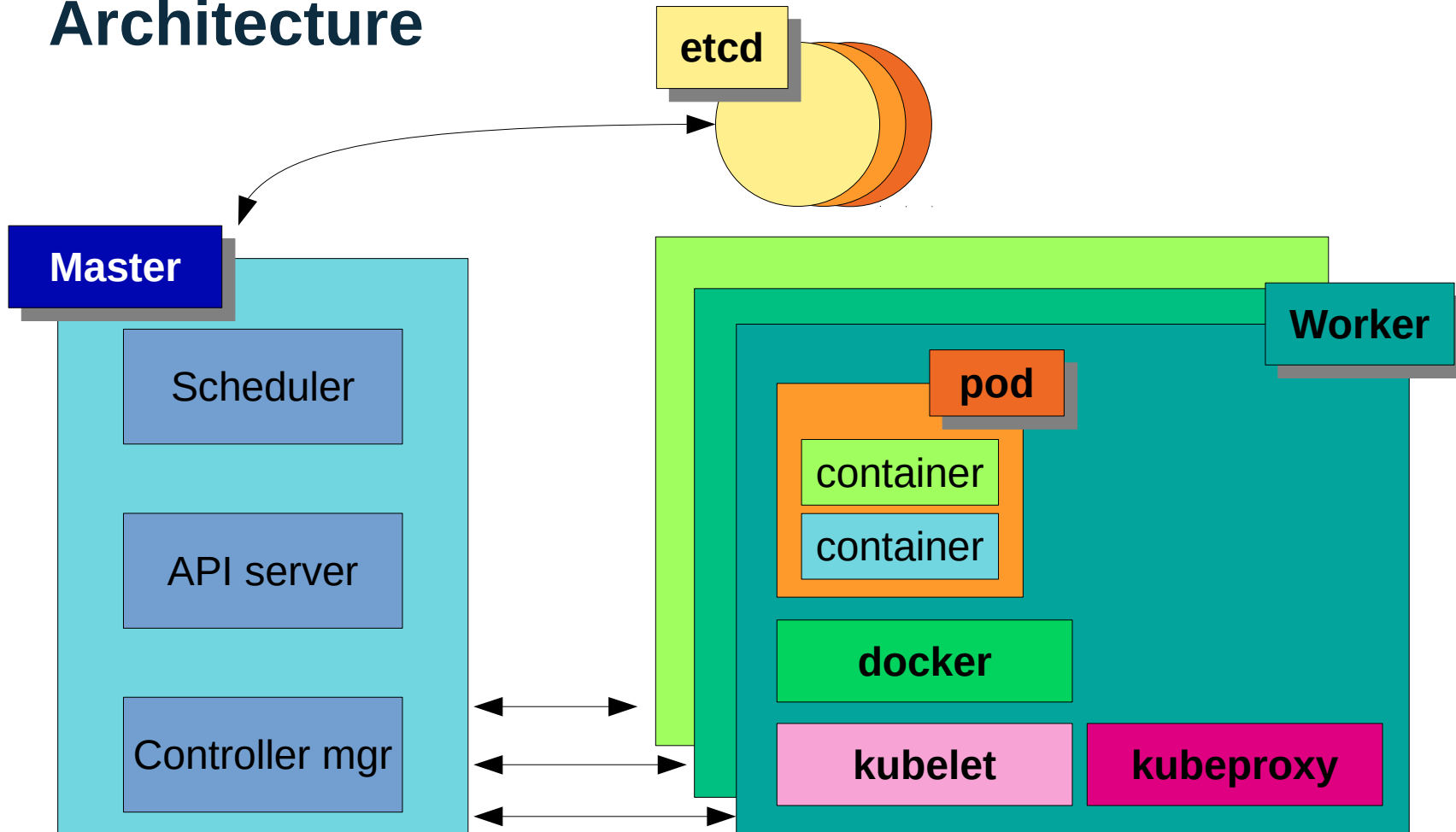
- New age of internet and mobile applications.
- Application super portability.
- Higher complexity of cloud environments.
- Different cloud providers.
- Adoption of micro services architectures.
- Stay agile in spirit of DevOps.

Manage applications,
not machines

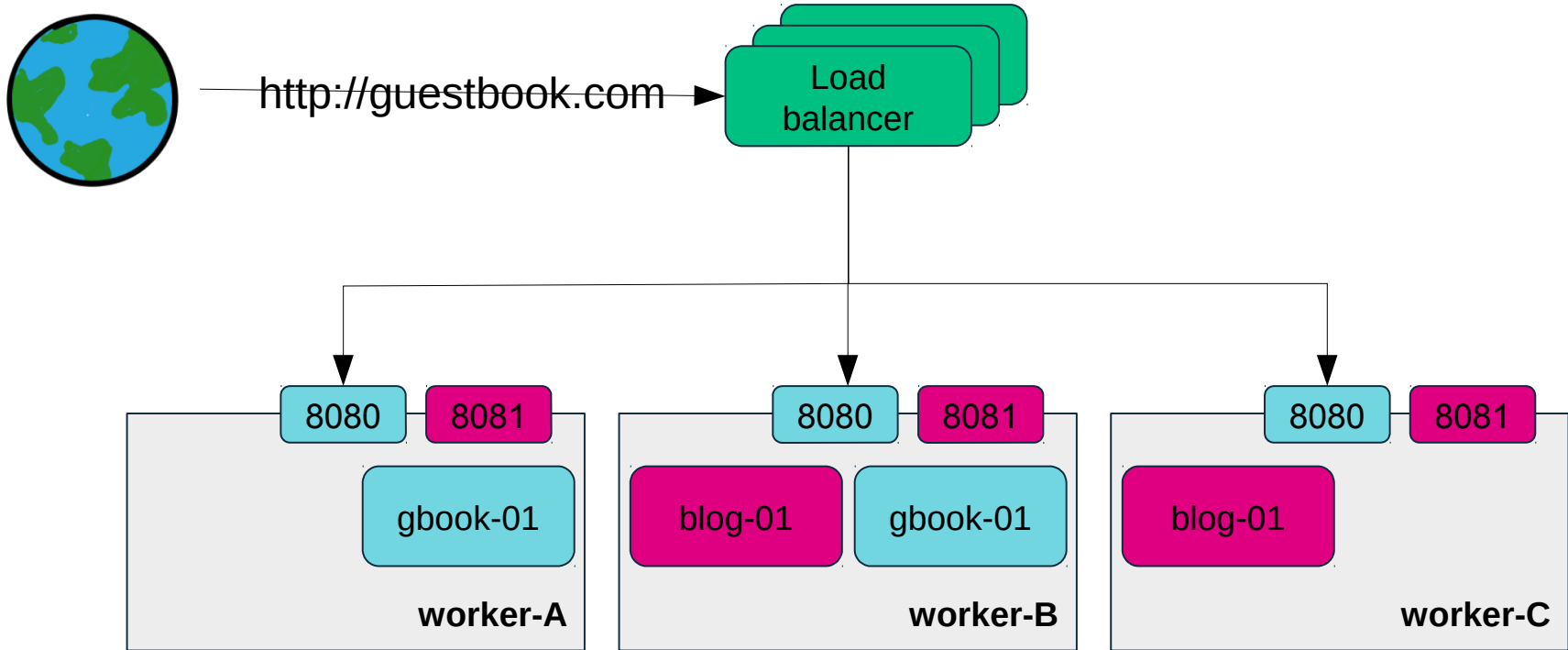
Kubernetes advantages

- Workload portability: doesn't enforce its directives to the application.
- Friendly with legacy applications: smooth migration path.
- Avoid vendor lock-in.
- Self healing.
- Auto-scaling.
- Has a solution for many problems:
 - Persistent storage.
 - Secrets management.
 - Blue-Green deployments.
- Flexible: plug-in architecture

Architecture



Architecture



Kubernetes deployment

- Requires an *etcd* cluster.
- Requires one or more *master* nodes.
- Requires one or more *worker* nodes.
- Requires a SDN network joining all the *worker* nodes.
- Requires a load balancer to expose internal applications.
- Lots of patience to link all these components together.

Kubernetes' status

- It's a pleasure to use as developer deploying your application.
- It's a pleasure to administer as an operator.
- It's a pain to deploy.

Things are changing

- **kubeadm**: upstream tool for kubernetes deployment.
- Kubernetes deployed with containers, by kubernetes itself.
- Introduced with the 1.4 release, still alpha.

How to combine OpenStack and Kubernetes worlds?

Solution for everyone

OpenStack and Kubernetes

Introduction to OpenStack Magnum

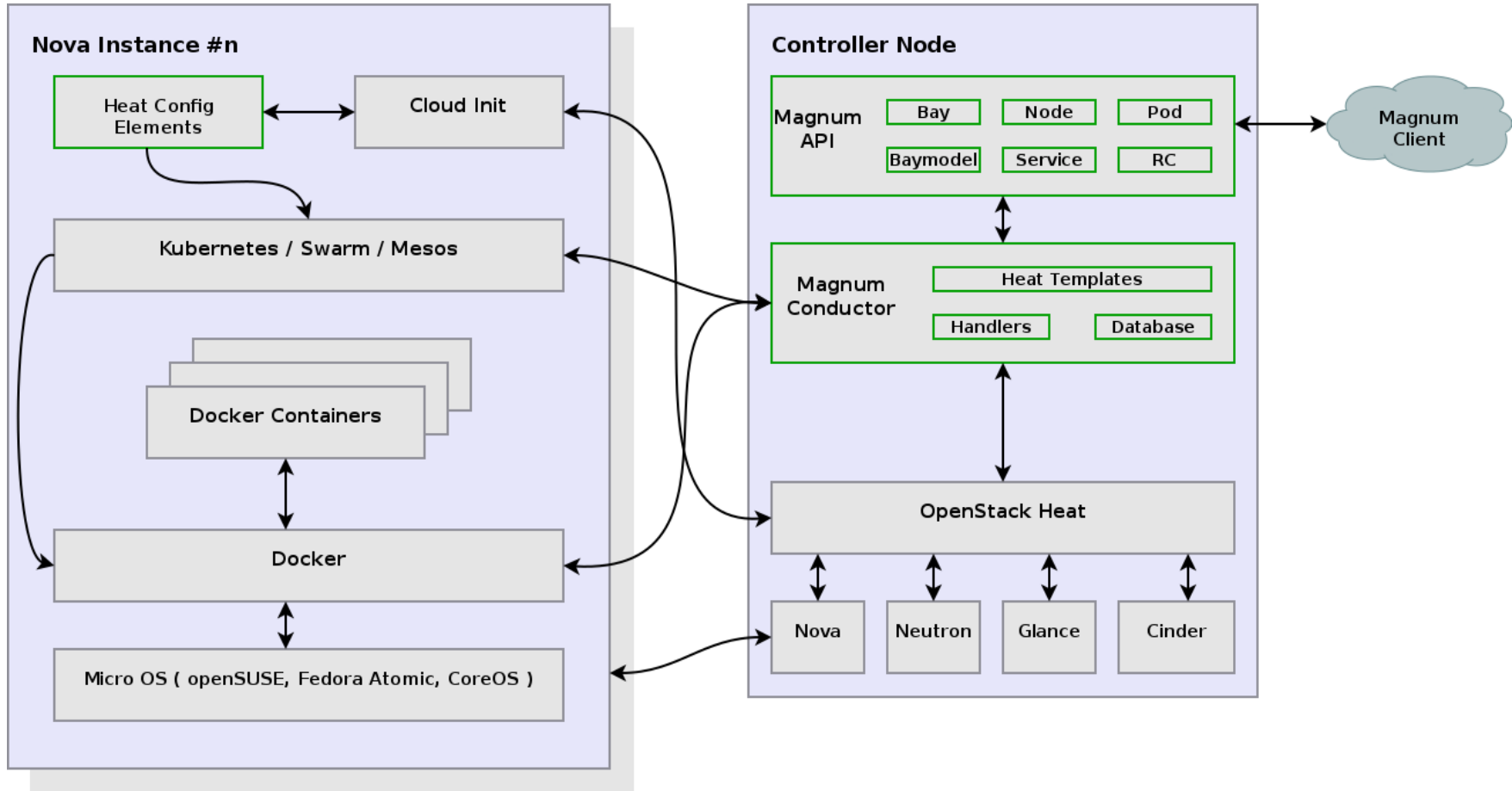
- A new service on OpenStack starting from Liberty release
- Provides CaaS (Containers as a Service)
- Supports different Linux images
- Integrates:
 - Kubernetes
 - Docker
 - Flannel (overlay network)
 - Heat, Keystone, Glance, Cinder, Neutron, Barbican etc.

OpenStack Magnum API

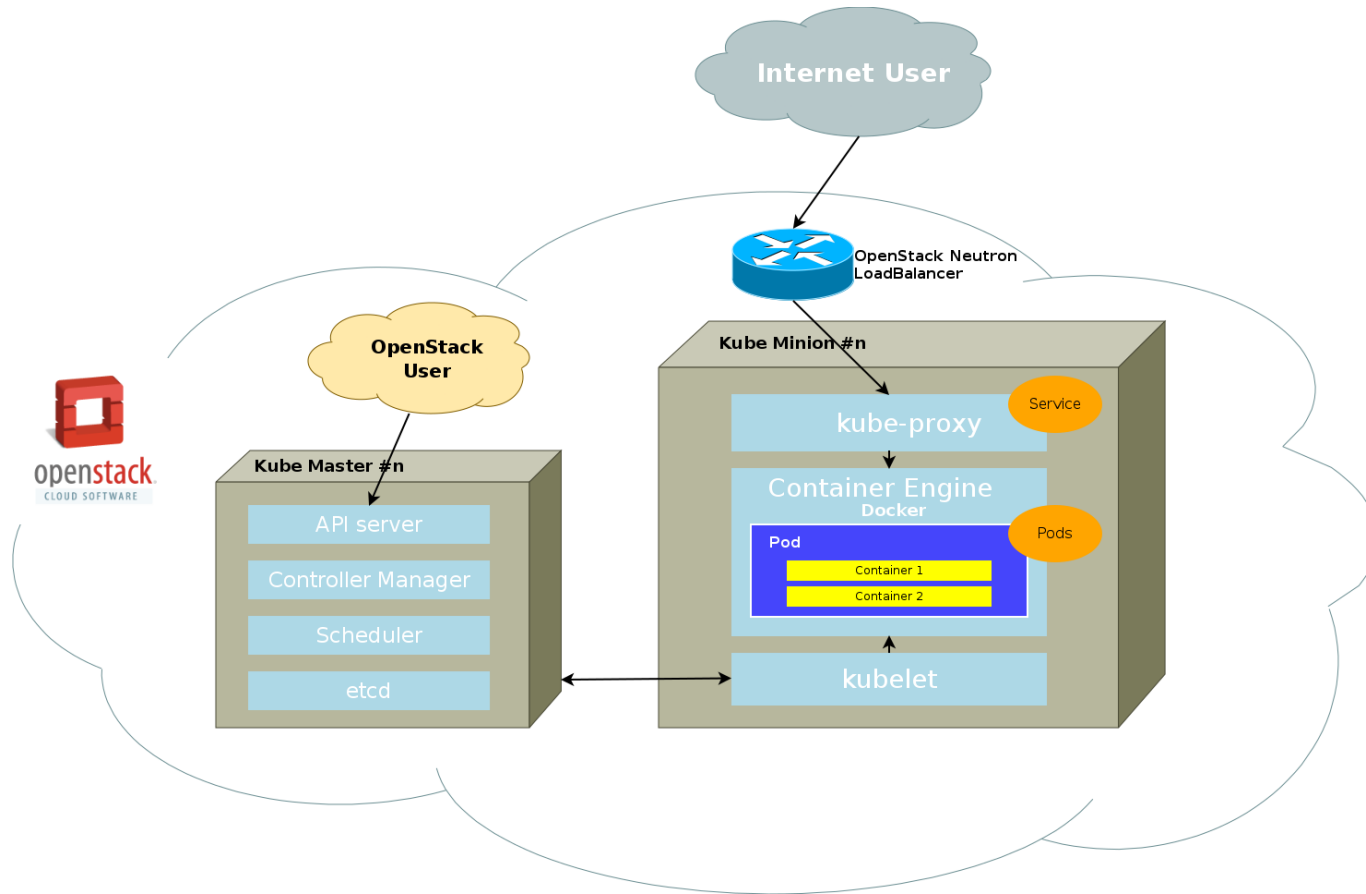
Magnum provides project isolation for container orchestration engines

- Management tool for containers within OpenStack
 - ✓ Orchestrate cloud resources and instances with Heat
 - ✓ Clone environments with similar network with Neutron
 - ✓ Implement separate clusters in many projects through Keystone
- Use different Container Orchestration Engines (COE)
 - × *Kubernetes*
 - × *Swarm*
 - × *Mesos*
- Access to native API's with dedicated clients.

OpenStack Magnum architecture



Magnum Kubernetes Cluster



Magnum awesomeness

- Each OpenStack user can have its own Kubernetes cluster.
- Kubernetes deployment will take a few minutes.
- Whole configuration will be done automatically.
- We can auto-scale Kubernetes cluster on request.
- Start containerized apps on ready environment.
- Expose service to the Internet using *LoadBalancer*.

Why pick up Magnum with Kubernetes

- Based on Google experience running containers in production
- Have this same deployment process for each application
- Take care about cloud application, fits especially for web and mobile apps
- Big cluster data readiness, fits perfectly with hundreds or thousands of hosts
- Choose between virtual machines and bare-metal servers

Magnum future

- Full support for bare metal deployments
- Support different CPU architectures ARM, s390
- Auto-scaling
- Auto-restarts
- Support other containers engines
- Rolling updates for Kubernetes engine
- Node groups feature

Magnum potentials

- Become a Magnum Opus
- Provide cloud ready apps and services
- Manage projects aware Container Topologies
- Use OpenStack as a first class citizen for container technology
- Help developers with their work

It is time for real demo example!!!



Questions ?

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