EVALUATING OPENSTACK CONTAINERS AS A SERVICE MAGNUM FOR PRODUCTION

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WHY CONTAINERS?

- Rapid application deployment
- Portability across machines
- Version control and component reuse
- Sharing
- Lightweight footprint and minimal overhead
- Simplified maintenance
BARE METAL OR VMS?

“...many containers can run together on a single host but they don't have enough defenses to shield themselves from active malware lurking in a neighboring container on the same host.”

“ So multi-tenant hosts will most likely assign a virtual machine to each customer then run multiple Docker containers inside the VM.”

–Craig McLuckie, product manager for Kubernetes and the Google Cloud Platform
MAGNUM

- The OpenStack container as a service (CaaS)
- Provides a very easy way to deploy a container cluster on top of OpenStack
- Resources started by Magnum can only be viewed and accessed by users of the tenant that created them
- Provides the same level of security isolation as Nova provides when running vms belonging to different tenants on the same compute nodes
- Pluggable container orchestration engine (COE), Kubernetes, Swarm and Mesos as of now
- Powered by Heat
ARCHITECTURE

- Very simple architecture
- Two services (Server Api, Conductor)
- The Magnum client talks with the Server Api
- Server Api and Conductor communicate using the messaging bus (RabbitMQ)
- The conductor is in charge of:
  - managing the clusters life-cycle through Heat
  - communicate with the clusters using the appropriate COE API
ARCHITECTURE
KUBERNETES-MAGNUM MATCHING

- First supported COE
- 1 to 1 match between K8s and Magnum resources (Pod, Service and Replication Controller)
- Introduces the concept of Bay
- Adds multi-tenancy
WHAT WE LIKE

• Managed vs Unmanaged
• SSL
• One truth of the state for K8s
• Heat powered
• Integration with Keystone for multi-tenant security
• Integration with Neutron for Kubernetes multi-tenancy network security
• Configurable etcd discovery service (default to discovery.etcd.io)
WHAT’S MISSING (WIP)

• Quota for magnum resources
• auto scaling
• Volume containers
• Horizon integration
magnum baymodel-create --name k8sbaymodel \
  --image-id fedora-21-atomic-5 \n  --keypair-id testkey \n  --external-network-id public \n  --flavor-id m1.small \n  --docker-volume-size 5 \n  --network-driver flannel \n  --coe kubernetes

magnum bay-create --name k8sbay \
  --baymodel k8sbaymodel \
  --node-count 1
CONCLUSIONS

- Is Magnum ready for production?