Nomad
An introduction to cluster schedulers

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Lessons learned

2006-2008 Law Offices - service availability
2009-2012 CSU San Bernardino - automation
2013-2014 DreamWorks Animation - schedulers
2015+ The Walt Disney Company - simplicity
Pets vs Cattle
Service discovery

- Easy to query
- Service information
- Consistent
Distributed key value

- configuration data
- triggers
- externalize environment from services/code
- sourced from a repo
Cluster schedulers

- Pool resources
- Service supervision
- Scaling functionality
- State information
Cluster schedulers
Docker Swarm

- Simple setup
- Native Docker API
- Can run on other schedulers (e.g. Mesos)
- Tooling compatibility
Amazon ECS

- Runs on AWS
- Docker only
- Open source agent, not server
- Simple to get started
Google Kubernetes

- kubelet, kube-proxy, etcd, api server, scheduler, repl-controller
- Borg successor
- Has the notion of "pods"
- Very active community
Apache **Mesos** + **Mesosphere Marathon**

- Zookeeper, Leader and Client, Marathon leader
- Multiple frameworks can be deployed on Mesos
- Two-level scheduling
Hashicorp **Nomad**

- Single binary for client *and* server
- More than just Docker
- Nomad is distributed, highly available and operationally simple
- Integrates well with Consul
Nomad Architecture [Region]
Nomad Architecture [Global]
Nomad Components

- Server
- Agent
- Job
- Task
Nomad + Consul

- Native support
- Nomad services -> Consul services (+ health checks)
- Simple
Using **Nomad**

- Deploying services
- Scaling services
- Rolling updates
- Integrating with Consul
- Load balancing deployed services
Job definition

```plaintext
job "microbot" {
  region = "global"
  datacenters = ["prod-east1", "prod-west1"]
  group "demo-stack" {
    task "microbot" {
      driver = "docker"
    },
    task "microbot-db" {
      driver = "docker"
    }
    ...
  }
}
```
Nomad is

- Operationally simple
- Distributed and highly available
- Open source
- Multi datacenter/region
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