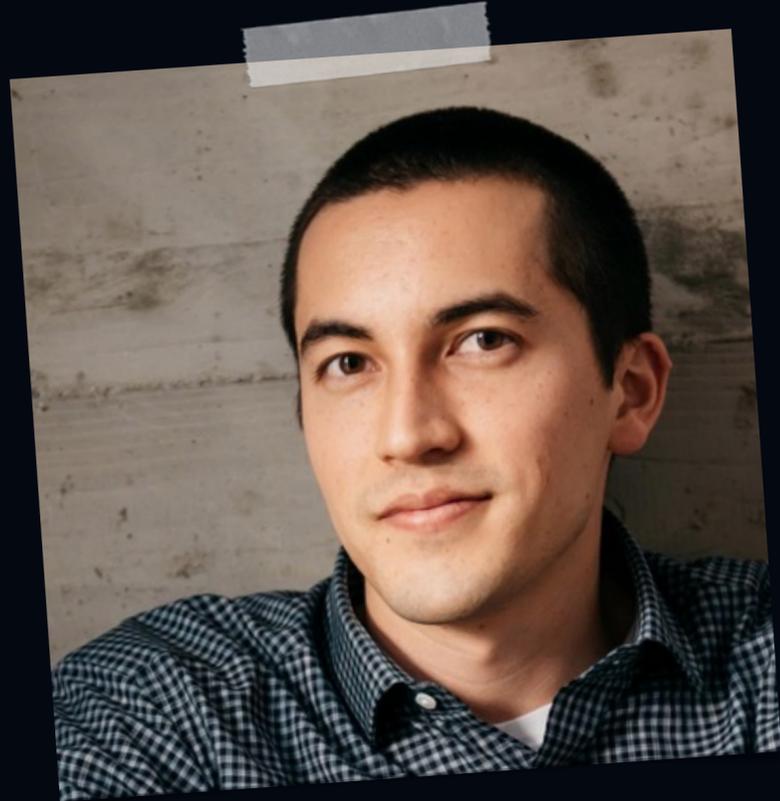
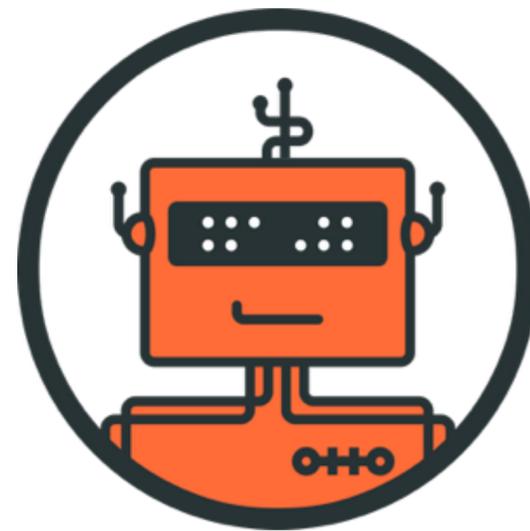
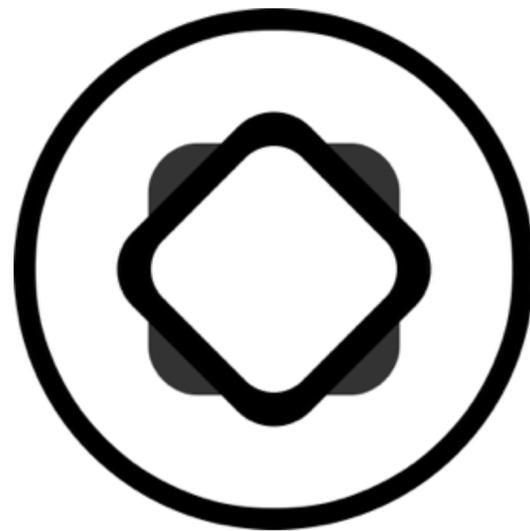
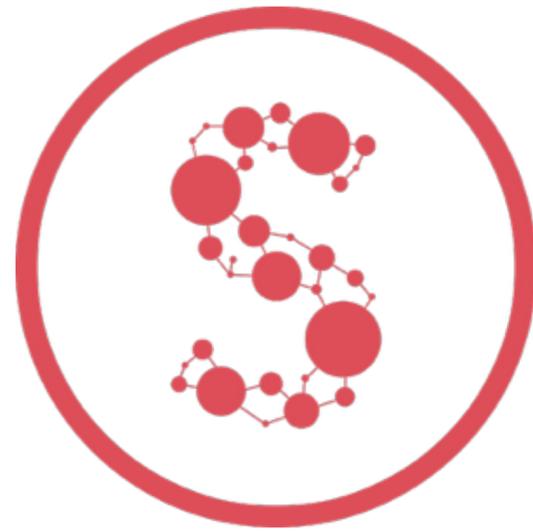
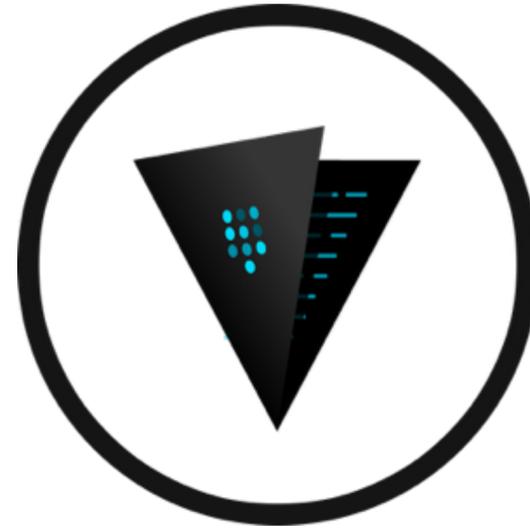
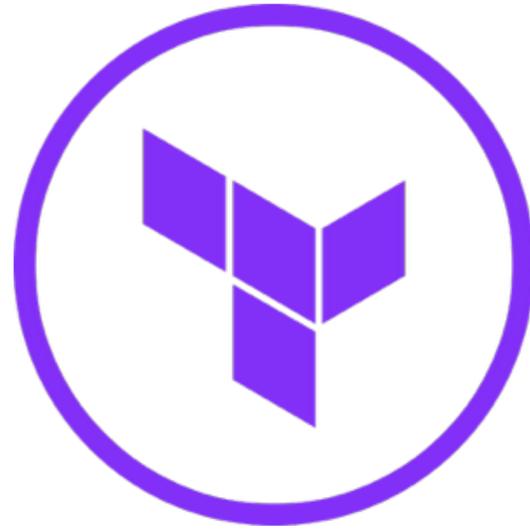
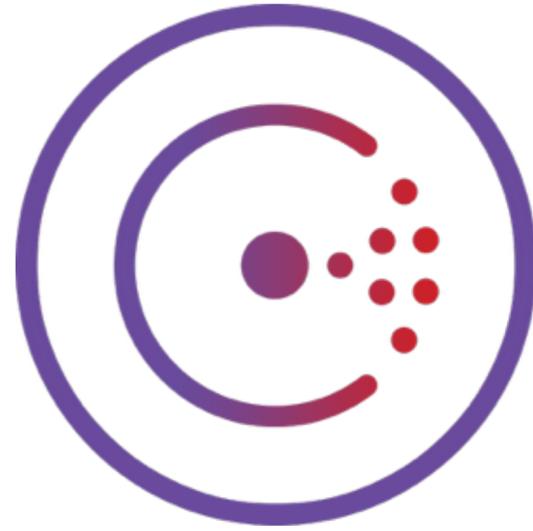


Observe, Enhance, Control: From VMs to Containers



Mitchell Hashimoto
@mitchellh







HashiConf 2016

June 13-15 Amsterdam

One day of training followed by two days of talks
in Amsterdam on all things [HashiCorp](#) 

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by [HashiCorp](#) 

Observe, Enhance, Control: From VMs to Containers

Welcome to the Age of Containers!

or... Age of Reinvention?

Monitoring

Nagios

Sensu

Configuration

Chef

Puppet

Deployment

Fabric

Chef, Puppet

Monitoring

Nagios

Sensu

Configuration

Chef

Puppet

Deployment

Fabric

Chef, Puppet

Monitoring

Nagios

Sensu

Still Widely Used!

Configuration

~~Chef~~

~~Puppet~~

Deployment

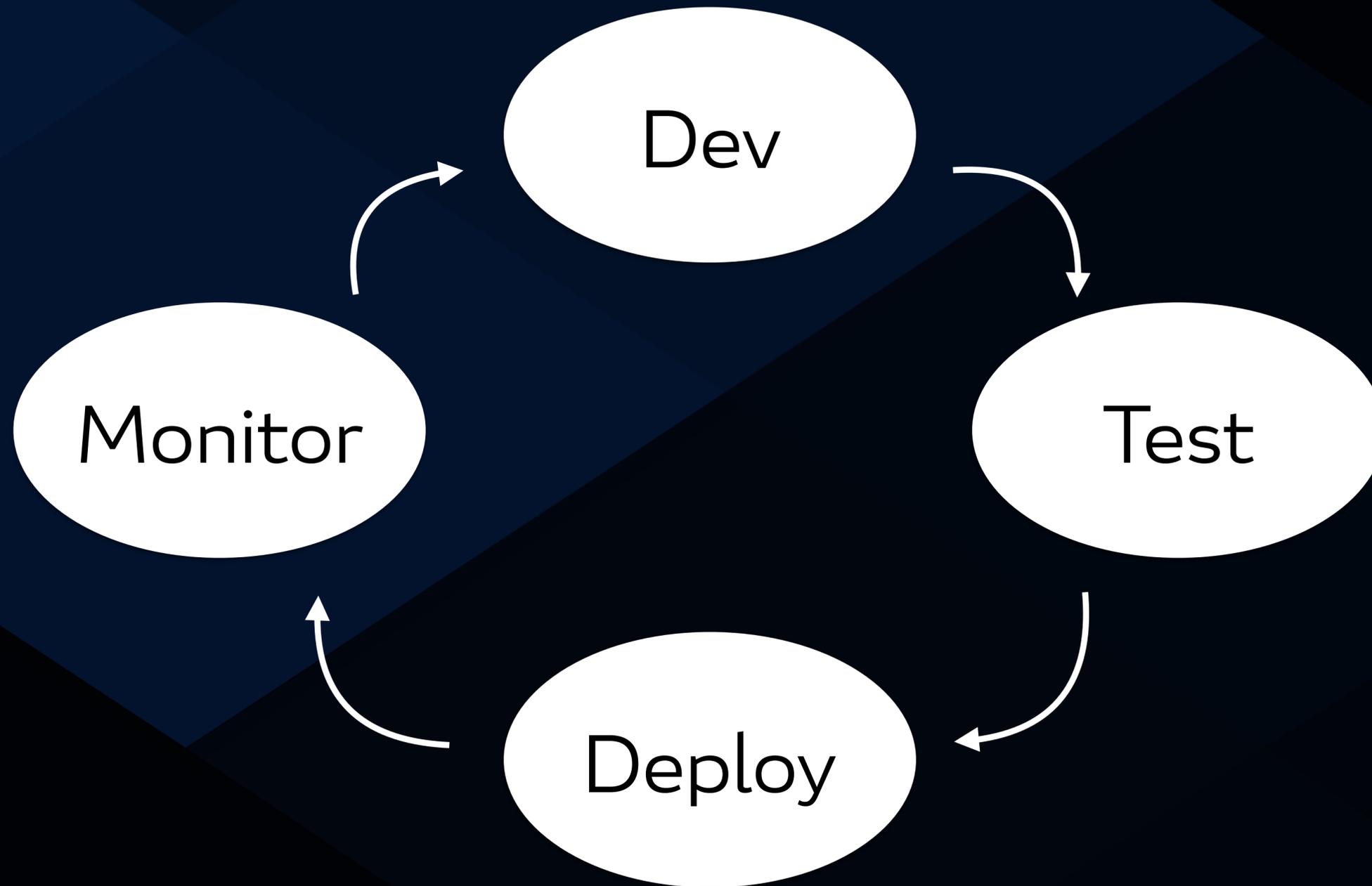
~~Fabric~~

~~Chef, Puppet~~

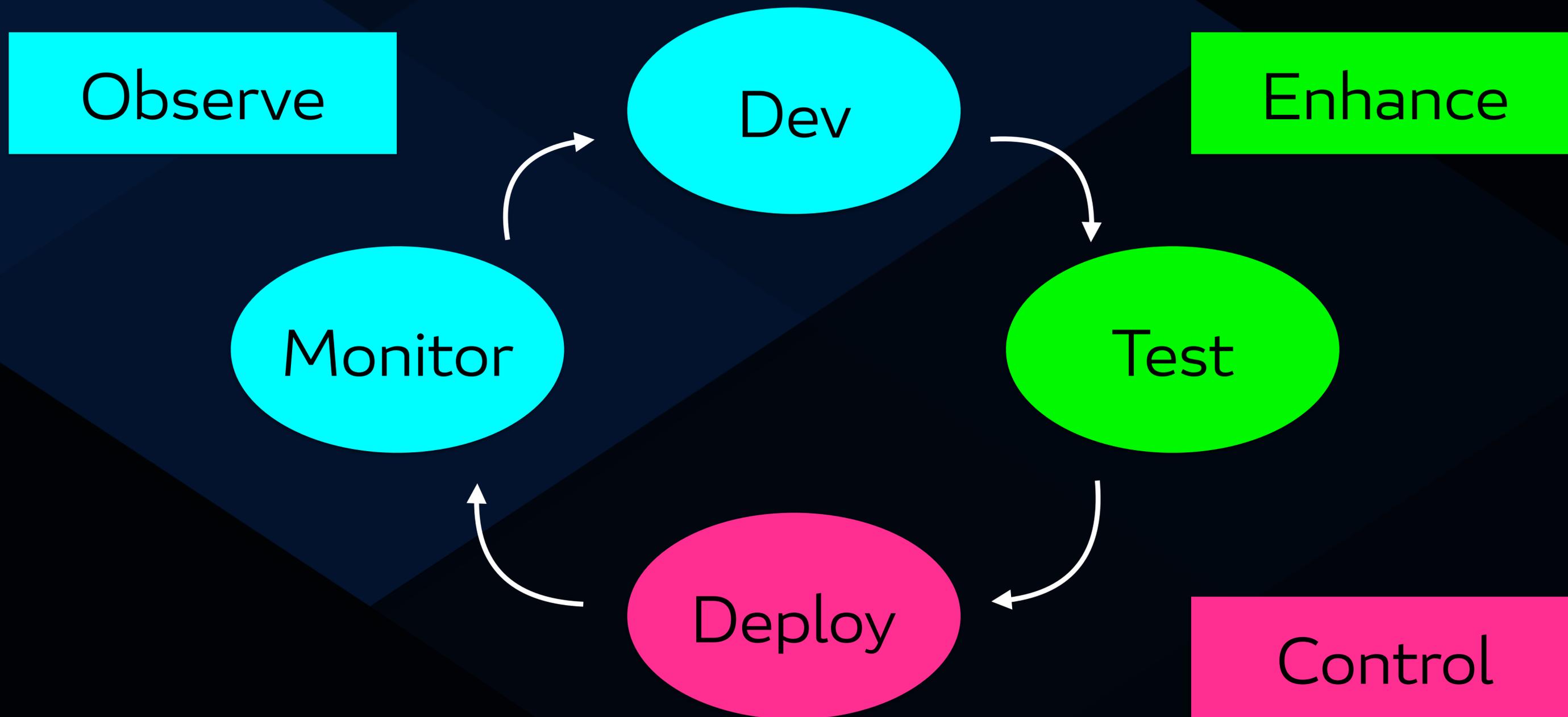
What is going on?

- Not a singular event
- Happening across a lot of categories
- The work of many well-accepted “smart” people
- Gathering real adoption! (Or, real abandonment)

App Lifecycle



App Lifecycle



Observe, Enhance, Control

Observe

Monitoring
Logging

Telemetry

Enhance

Debug
Improve

Package
Configure

Control

Deploy
Scale

Migrate

Age of the Virtual Machine (Circa 2006)

Circa 2006

Datacenter

- No APIs
- No elasticity
- Monolithic applications
- Young IaaS

Circa 2006

Datacenter	Problems
<ul style="list-style-type: none">• No APIs• No elasticity• Monolithic applications• Young IaaS	<ul style="list-style-type: none">• Uniformity of servers• Scalable change management• Auditing server state• Early service discovery

Circa 2006

Datacenter	Problems	Software
<ul style="list-style-type: none">• No APIs• No elasticity• Monolithic applications• Young IaaS	<ul style="list-style-type: none">• Uniformity of servers• Scalable change management• Auditing server state• Early service discovery	<ul style="list-style-type: none">• Manual node (de)registration• Single master servers• Check/correct divergence• Agent model• (Relevant: lots of Ruby)

Circa 2006

- Datacenters introduce constraints
- Applications fill constraints and cause problems
- Software written to help solve those problems in an architectural way that is comfortable for the time

Datacenter + Problems → Software

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Nagios
Sensu

Circa... ?

Configuration

Chef
Puppet

Deployment

Fabric
Chef, Puppet

Monitoring

Nagios
Sensu

Circa... ~2006

Configuration

Chef
Puppet

Deployment

Fabric
Chef, Puppet

Applying the Model

- What happens if we apply the same model to today?
- Will it fit?
- What would it tell us?

Age of the Container (Present Day, 2016)

Today: 2016

Datacenter

- API-driven
- Highly elastic
- Small, bin-packed servers
- Containers on VMs
- Fast

Today: 2016

Datacenter	Problems
<ul style="list-style-type: none">• API-driven• Highly elastic• Small, bin-packed servers• Containers on VMs• Fast	<ul style="list-style-type: none">• Infrastructure management• Service discovery• Configuration• Scale: speed and size

Today: 2016

Datacenter	Problems	Software
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Today: 2016

Datacenter	Problems	Software
<ul style="list-style-type: none">• API-driven• Highly elastic• Small, bin-packed servers• Containers on VMs• Fast	<ul style="list-style-type: none">• Infrastructure management• Service discovery• Configuration• Scale: speed and size	<ul style="list-style-type: none">• Distributed systems• Failure expectation• API-driven, Infra as Code• Low resource usage

Today: 2016

- Software designed for a 2006 architecture doesn't adapt well to the needs of software in 2016
- Rather than wait for existing vendors to catch up, new vendors are showing up and filling in gaps

Monitoring

Nagios
Sensu

What changed?

Configuration

Chef
Puppet

Deployment

Fabric
Chef, Puppet

Monitoring

Nagios

Sensu

Sysdig

Datadog

Configuration

Chef

Puppet

Consul

etcd

Deployment

Fabric

Chef, Puppet

Kubernetes

Nomad

Monitoring

Nagios

Sysdig

Sensu

Datadog

Configuration

Chef

Consul

Wow

Puppet

etcd

Deployment

Fabric

Kubernetes

Chef, Puppet

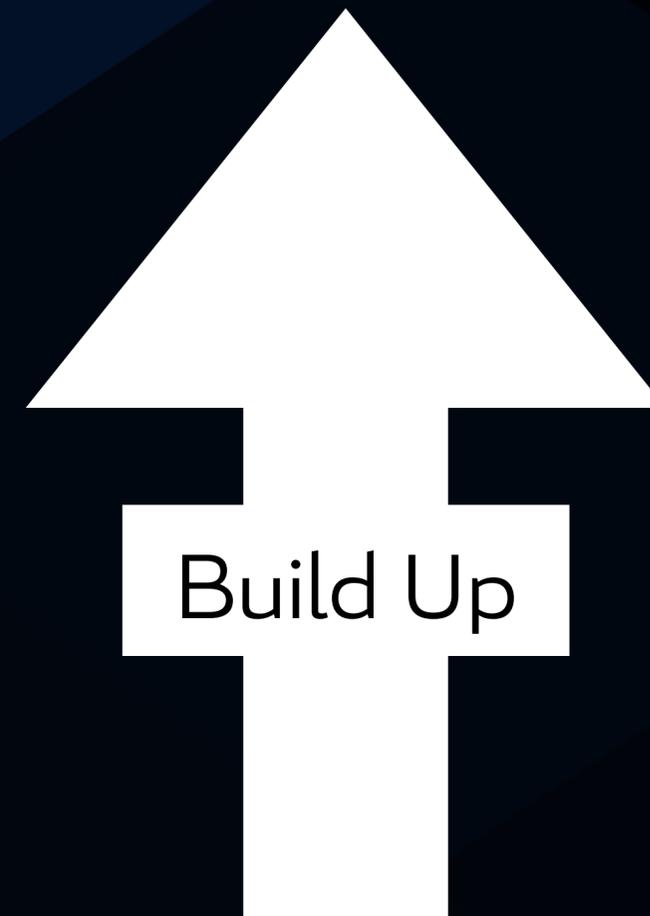
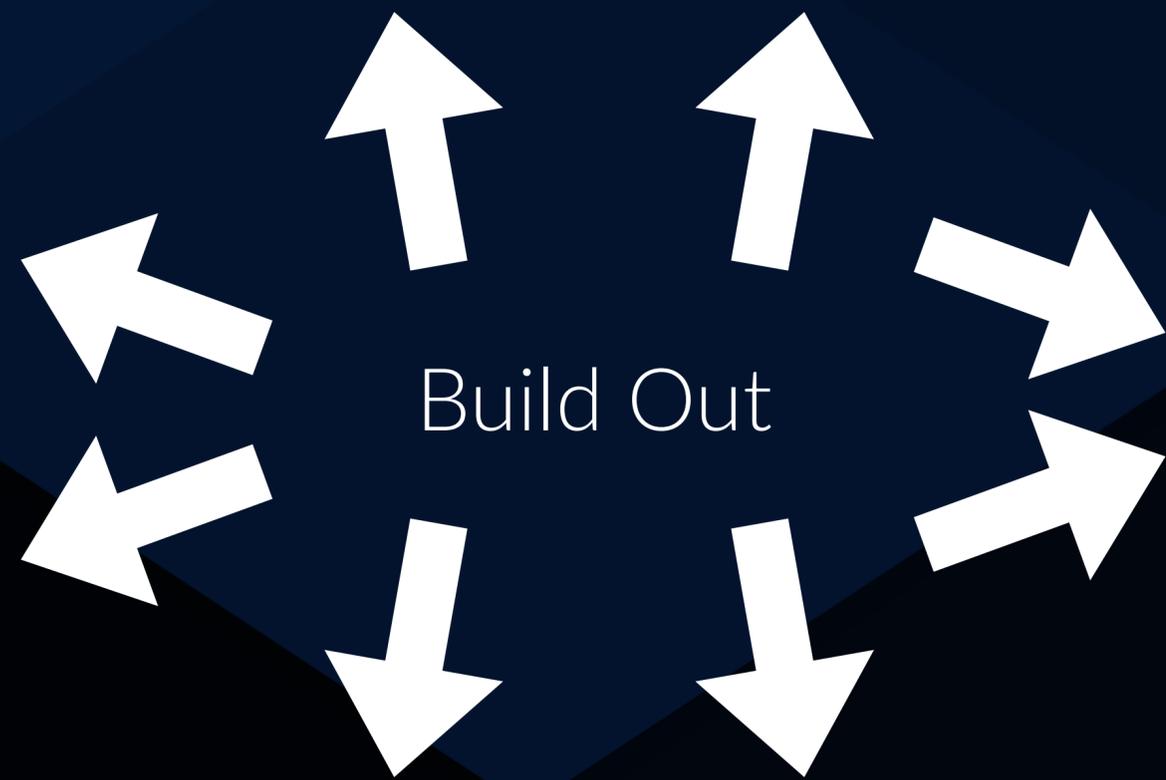
Nomad

2006 vs 2016

- My disclaimer: the examples used from 2006 are still highly deployed, highly successful, and highly relevant.
- But that shouldn't stop the community (and hasn't) from trying new designs and testing if they're better
- It is going to take years to reach the same level of maturity and production-hardening

From VMs to Containers: Molding Our Thinking

Out vs. Up



Build Out

- New tools
- Not abstracting anything new
- Solve existing problems
- Lay a new foundation

Build Up

- Assume lower layers are correct (or correct enough)
- Leverage existing solutions
- Create new abstractions

Out and Up

- I argue we had to build out for containers
- The build out will continue
- What will we build up? (Platforms?)

Age of Reinvention

- We aren't reinventing *anything*.
- We're building the same wheels, but instead of for a car they're for a fighter jet.

Thank You

@mitchellh
hashicorp.com