Continuous Delivery with Containers

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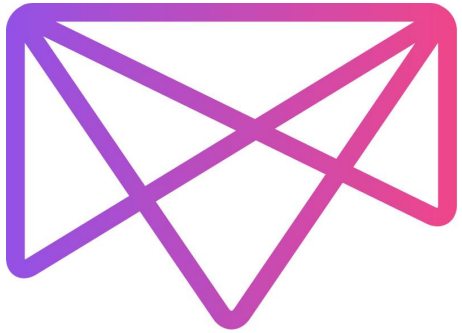
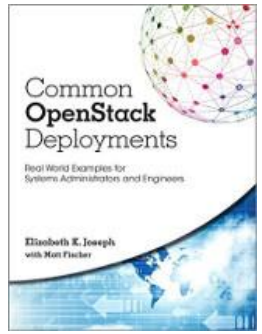
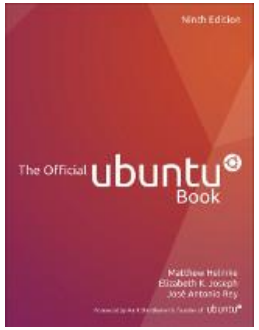






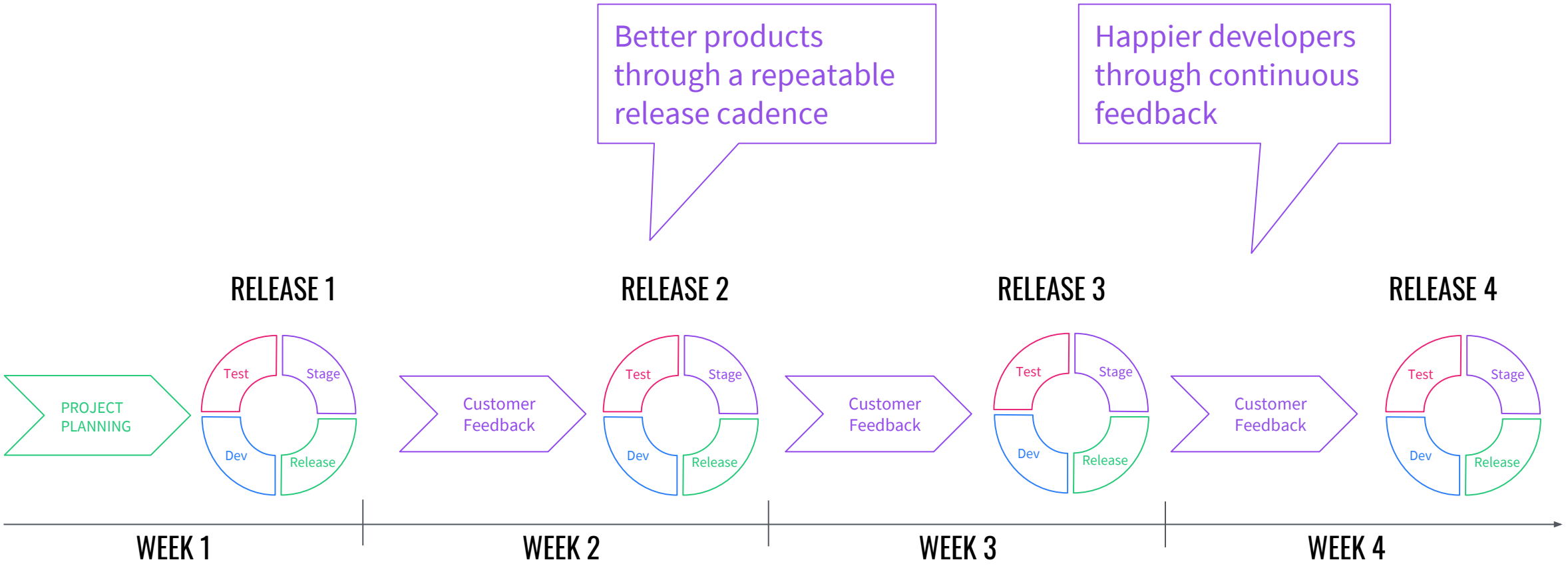
- Developer Advocate at Mesosphere
- 10+ years in Linux systems administration and engineering roles
- 4 years working on CI/CD for OpenStack
- Author of The Official Ubuntu Book and Common OpenStack Deployments

Definition: Continuous Delivery

Continuous Delivery (CD) is a software engineering approach in which teams produce software in short cycles, ensuring that the software can be reliably released at any time.

Via https://en.wikipedia.org/wiki/Continuous_delivery

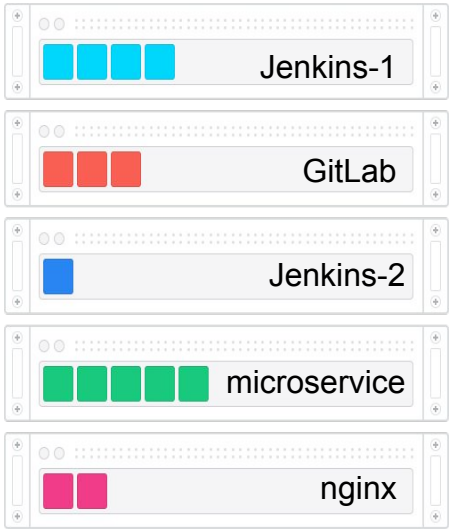
Goal: A Modern Release Process with CD



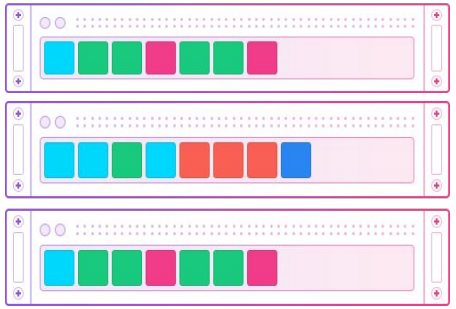
Run everything in containers!

Organize everything efficiently!

Utilization

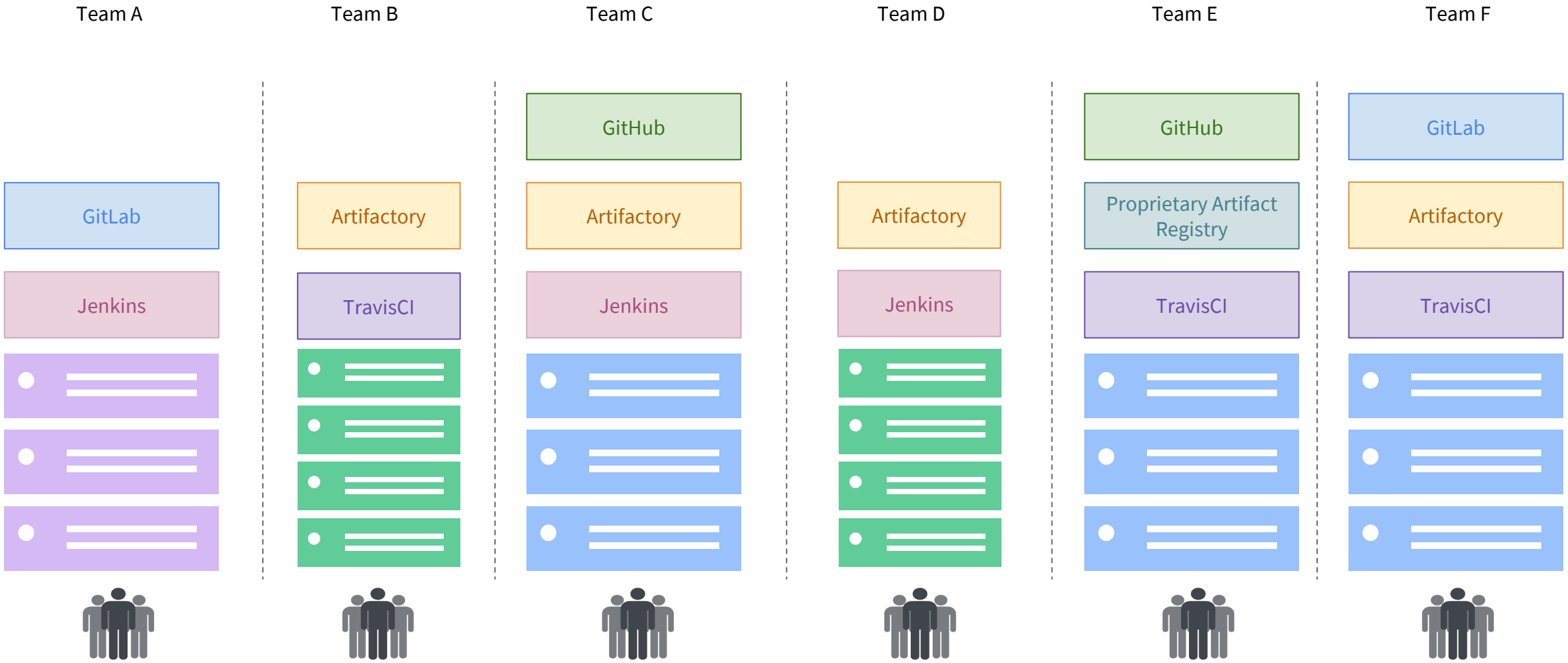


Typical Datacenter
siloed, over-provisioned servers,
low utilization (12-15% bare metal, 30% for VMs)



Containerization Platform
automated schedulers, workload multiplexing
onto the same machines

Supporting various pipelines



Services & Containers

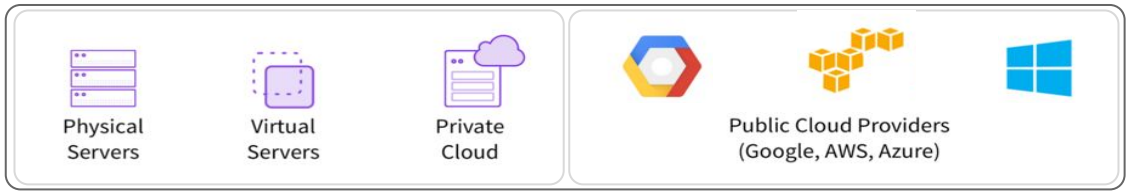
GitLab	Jenkins	Marathon	Cassandra	Flink
Spark	Artifactory	Kafka	MongoDB	Spinnaker

DC/OS

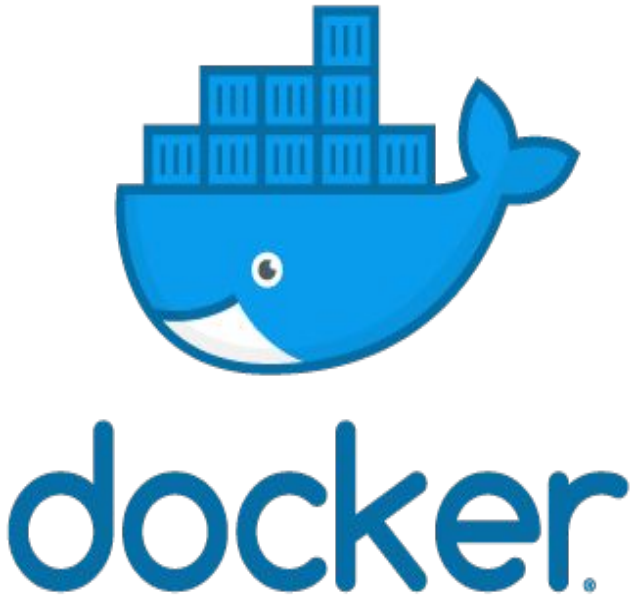
Container Orchestration	Security & Governance	Monitoring & Operations	User Interface & Command Line

MESOS

ANY INFRASTRUCTURE



Docker



Use: Container

Why Docker?

- De facto standard that developers are familiar with
- Portable Dockerfiles for sharing image build source
- Ease of use for building, storing, and deploying containers

Apache Mesos

Use: The primary resource manager and negotiator

Why Mesos?

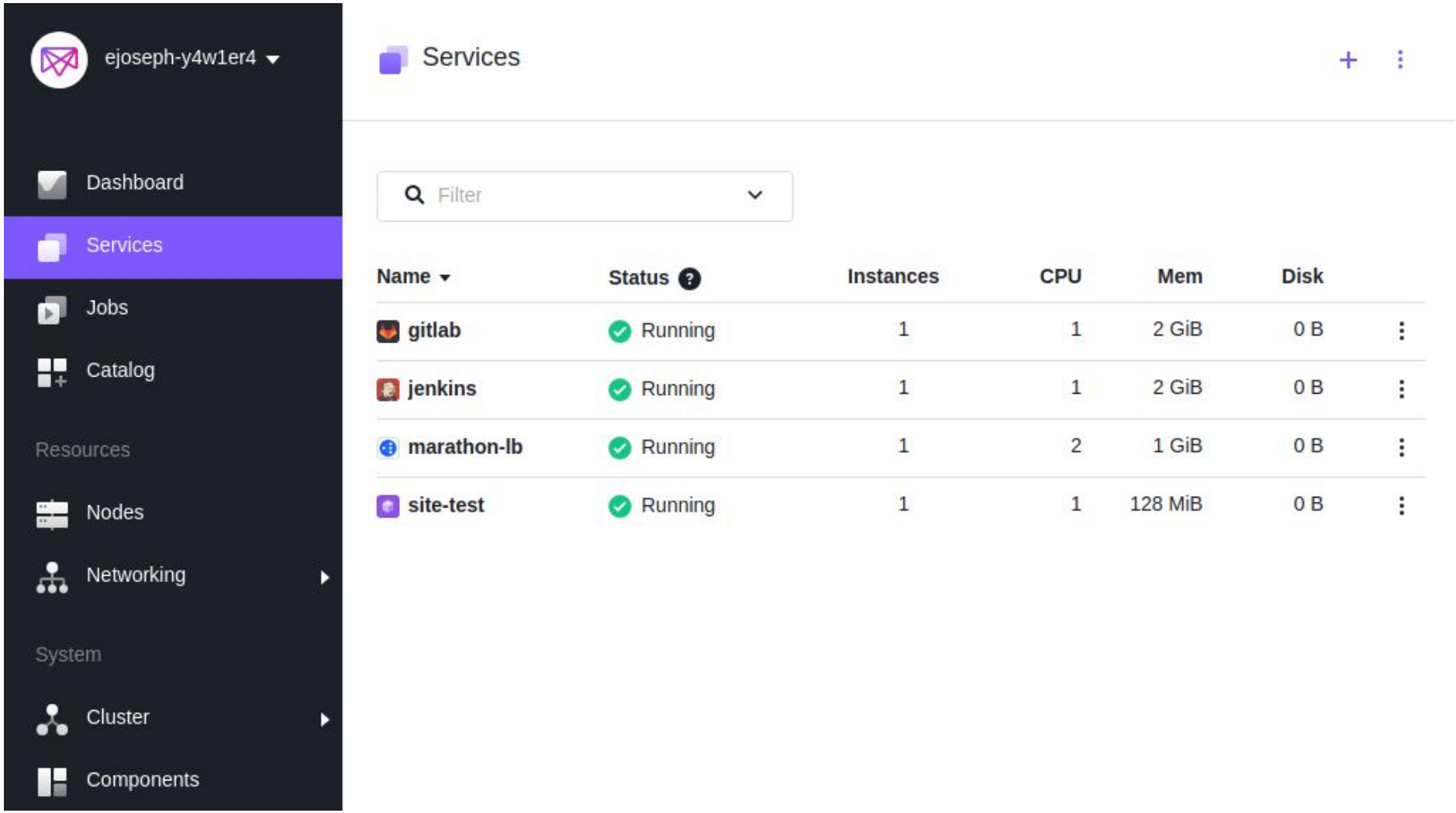
- 2-level scheduling
- Fault-tolerant, battle-tested
- Scalable to 10,000+ nodes
- Created by Mesosphere founder @ UC Berkeley; used in production by 100+ web-scale companies [1]

[1] http://mesos.apache.org/documentation/latest/powered-by-mesos/

DC/OS

- Resource management
- Task scheduling
- Container orchestration
- Logging and metrics
- Network management
- “Universe” catalog of pre-configured apps (including Jenkins, GitLab, Artifactory…), browse at https://mesosphere.com/service-catalog
- And much more https://dcos.io/

DC/OS Web-based UI



DC/OS CLI

$ dcos cluster list

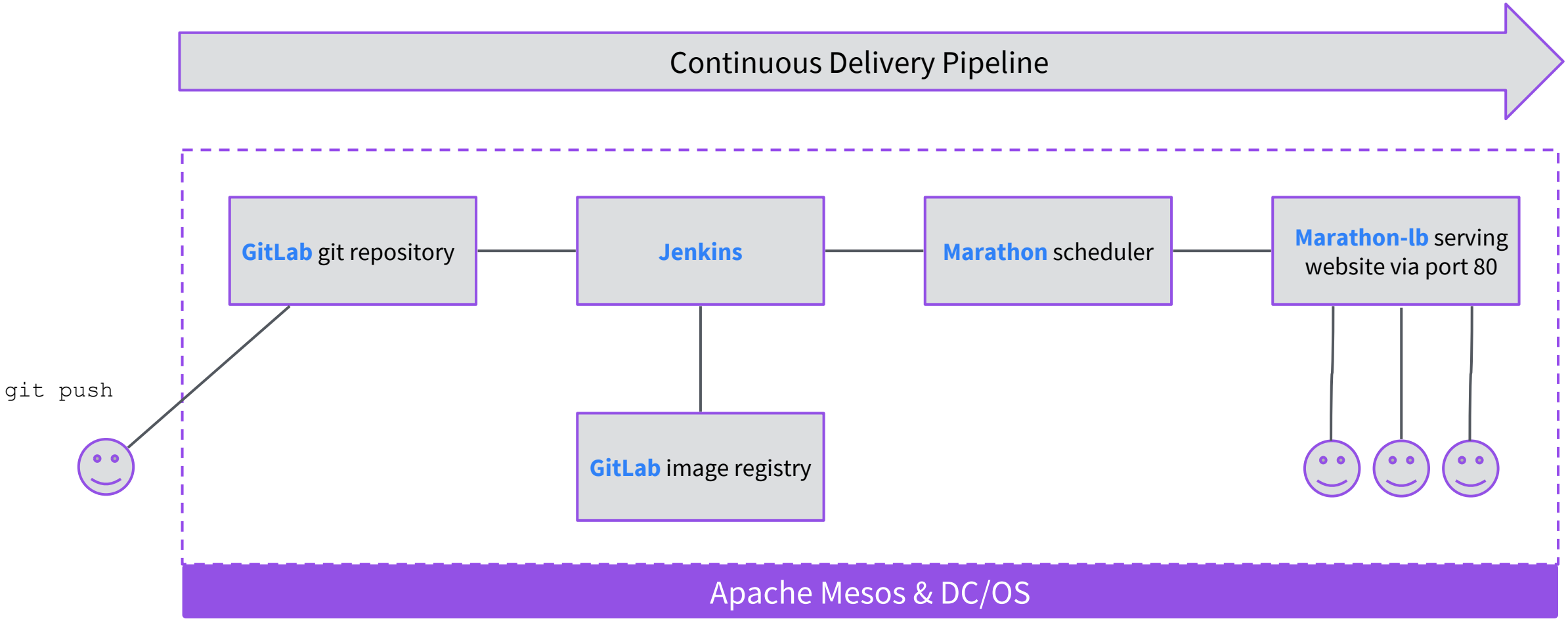
$ dcos node

$ dcos package install jenkins

$ dcos node ssh --master-proxy --leader

https://docs.mesosphere.com/latest/cli/

The Pipeline



CI/CD Demo

Using **Jenkins**, the **Jenkins+Mesos plugin**, and **GitLab** to test and deploy an **nginx**-based website.

https://github.com/dcos/demos/tree/master/cicd

Advanced Strategies!

Canary and Blue/Green Deployments

Canary

“Canary release is a technique to reduce the risk of introducing a new software version in production by slowly rolling out the change to a small subset of users before rolling it out to the entire infrastructure and making it available to everybody.” https://martinfowler.com/bliki/CanaryRelease.html

Blue/Green

“One of the challenges with automating deployment is the cut-over itself, taking software from the final stage of testing to live production. You usually need to do this quickly in order to minimize downtime. The blue-green deployment approach does this by ensuring you have two production environments, as identical as possible. At any time one of them, let's say blue for the example, is live. As you prepare a new release of your software you do your final stage of testing in the green environment. Once the software is working in the green environment, you switch the router so that all incoming requests go to the green environment - the blue one is now idle.” https://martinfowler.com/bliki/BlueGreenDeployment.html

Blue/Green, Canary: Marathon

Marathon

The Marathon scheduler in DC/OS has an API that can be called by Jenkins jobs to specify how a deployment is completed. Since it's a custom configuration, you can be as specific as you need, but it does make it a more complicated approach.

Get started at https://mesosphere.github.io/marathon/docs/blue-green-deploy.html

Blue/Green, Canary: Vamp

Vamp

This is can be simplified by using the open source Vamp tooling. Vamp easily hooks into DC/OS, leveraging your existing Marathon scheduler but with specific definitions around other types of deployments.

Vamp is available in the DC/OS Universe catalog.

Get started at https://vamp.io/documentation/how-vamp-works/v0.9.5/architecture-and-components/

Watch in action on DC/OS in “Doing Real DevOps with DC/OS” by Julien Stroheker of Microsoft at MesosCon EU back in October 2017: https://www.youtube.com/watch?v=hNAWHZhMNf8

Questions?

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Demo: https://github.com/dcos/demos/tree/master/cicd