Kubernetes

symflower
AUTOMATING QUALITY ASSURANCE

Motivation, Basics and Workshop

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Agenda

1. Why Kubernetes?
2. Kubernetes Basics
3. <Break>
4. Hands-On Workshop
   - Mail your Gmail account to: iaam.linz@gmail.com
   - Then have a look at: http://iaam.at/k8s-workshop.html
5. Q&A-Session

Symflower - Automating QA

Product to automatically
generate and execute unit tests.

Support and training for all
software testing needs.

Implementation of modern development
processes using the right tools.

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Why Kubernetes?

Intro and Use Cases

*Kubernetes (K8s) is an **open-source container-orchestration** system for automating deployment, scaling and management of containerized applications.*

wikipedia.org

Different Perspectives

Developer

The framework for deployment and infrastructure

Admin

The OS to manage the infrastructure

Manager

Let one person perform like ten.

Standardization + Knowledge of hundreds of experts

Fundamental Concepts of K8s

- Automate everything
  - Resources
  - Deployments (Rollouts and Rollbacks)
  - Monitoring/Scaling/Healing/...
- Declarative (generic) configuration
  - No explicit host usage
  - No SSH, no scripts -> see Ansible/Puppet/Salt
- Everything is disposable (best practice)
  - Pet vs Cattle

When to (not) use K8s

- Are you using some kind of service/server?
  - If not: Sorry, no Kubernetes for you…
- Kubernetes right from the start???
  - It depends:
    - Do you have K8s experience?
    - Kubernetes Administrator vs User?
    - Do you already have a K8s cluster?
    - Can you use a managed K8s cluster?
    - Time spent using traditional deployments << K8s?

Using Kubernetes with GitLab

- We @symflower use GitLab for CI and CD
- We have two kinds of CI pipelines:
  - Testing
  - Production
- Separate deployment per “feature branch”
- Two kinds of deployments
  - Testing deployments are disposable
  - Production deployments are migrated

Let’s Take a Look

- Marketing thinks red is the new black
  - Adapt the color of our website

- https://symflower.com/
- Let’s change the website color
- Do a pull request
- Product production pipeline

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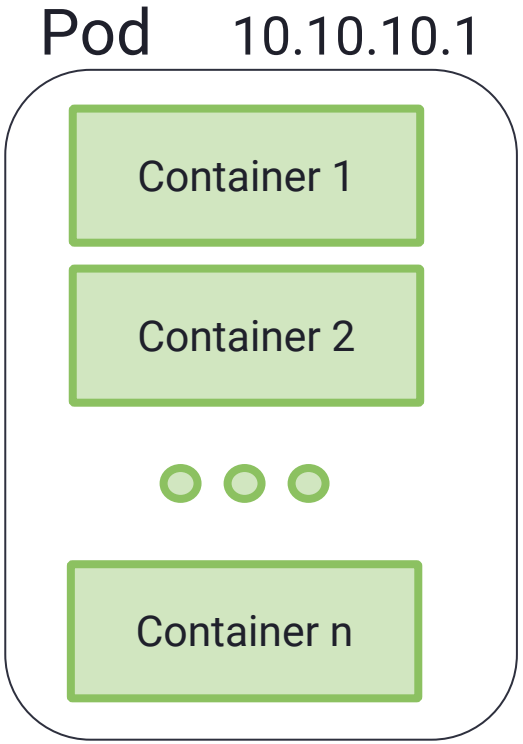
Kubernetes Basics

Basic Concepts
and Further Reading

K8s Installation

- **Where should K8s run?**
  https://kubernetes.io/docs/setup/pick-right-solution/
- Your notebook:
  https://github.com/kubernetes/minikube
- Managed: Google, AWS, Azure
- Self-Hosting?
  - WARNING: This is time-intense
  - https://kubernetes.io/docs/reference/setup-tools/kubeadm
  - https://kubernetes.io/docs/setup/custom-cloud/kubespray/

K8s Pods

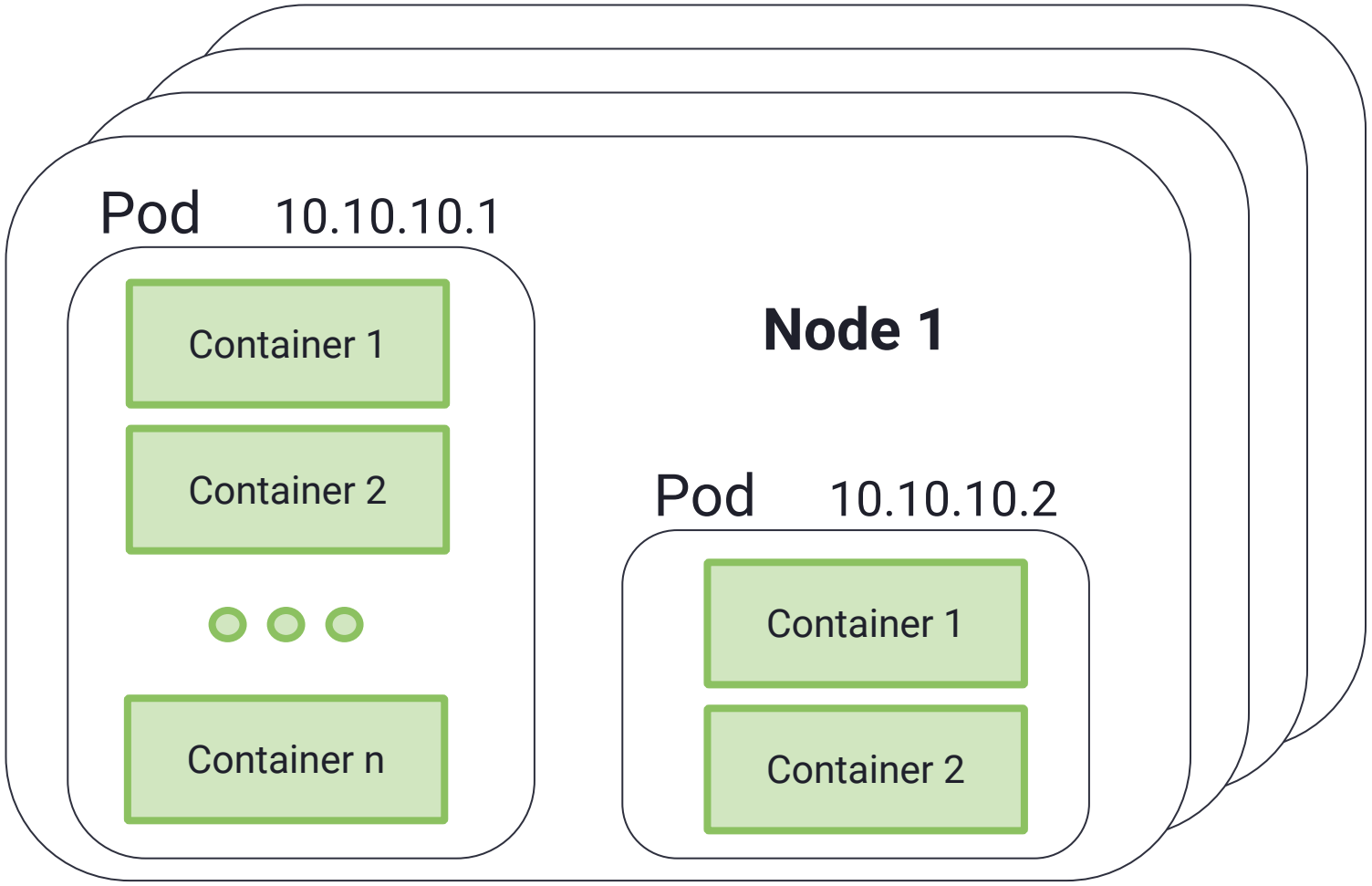


- Pods share resources
- A Pod needs all of its containers to live
- Why use different containers?
- Which containers should share a pod?

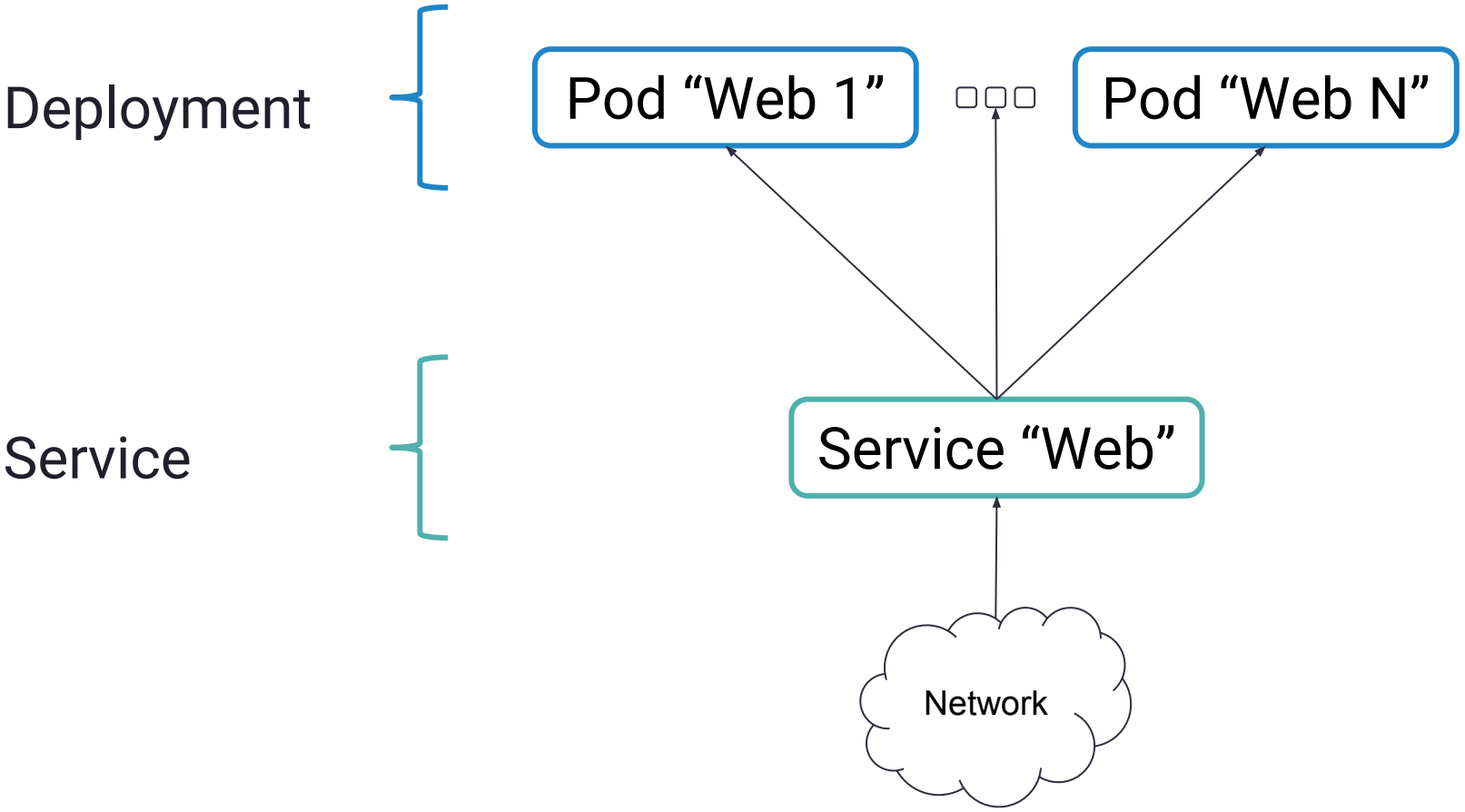
K8s Nodes

- Kubernetes cluster consists of one or more nodes
  - Also Single Node clusters make sense -> Symflower DE
- Nodes provide resources to pods
- A specific pod lives in exactly one node
- Assignment of Pods to Nodes and Livecycle Management is done by Kubernetes

K8s Pods


Pod
10.10.10.1
Container 1
Container 2
Container n
Node 1
Pod
10.10.10.2
Container 1
Container 2

K8s Deployments and Services



K8s *Your* Next Concepts

- Config Maps / Secrets
  - Inject configurations
- Persistent Volumes
  - *Persist* data to some storage device
- And then:
  - https://kubernetes.io/docs/home/
  - https://kubernetes.io/blog/

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Break

<PLEASE START YOUR K8S INSTANCE>

- Mail your Gmail account to: iaam.linz@gmail.com
- Then have a look at: http://iaam.at/k8s-workshop.html

Kubernetes Workshop

- You should have already every file you need
  - -> Look in the “iaam5” directory of the repository
- Or checkout https://github.com/symflower/sessions/tree/master/2018/iaam5
  - The README.md should explain everything we do

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