

# Effective Kubernetes Onboarding

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DigitalOcean  
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# Kubernetes in minutes

Managed Kubernetes designed for you and your small business. Start small at just \$10 per month, and scale up and save with our free master node and inexpensive bandwidth.

## Simple, Managed Kubernetes

- ✓ Free master node
- ✓ Release faster
- ✓ Scale automatically
- ✓ Increase availability
- ✓ Application portability

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# “Teach the world Kubernetes”

Community Team was tasked with this prior to May 2019  
launch



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COMMUNITY CURRICULUM

# Kubernetes for Full-Stack Developers



0 of 25 steps complete

Summary View ☐ Detailed View ☒

## By Topic

- ☒ Containers
- ☒ Application Development
- ☒ Monitoring
- ☒ Operations
- ☒ CI/CD

Table of Contents

Whether you're just curious, getting started with Kubernetes, or have experience with it, this curriculum will help you learn more about Kubernetes and running containerized applications. You'll learn about core Kubernetes concepts and use them to deploy and scale applications in practical tutorials. By the end of this curriculum you'll be able to create your own Kubernetes cluster from scratch and run your own applications on it. You will also learn how to set up monitoring, alerting, and automation for your applications on Kubernetes.

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# Effective Kubernetes onboarding?







# Effective Kubernetes onboarding?





# Effective Kubernetes onboarding?





# Effective Kubernetes onboarding:

- Know your audience and their objectives.



# Effective Kubernetes onboarding:

- Know your audience and their objectives.
- Determine the best approach to meet those objectives.



# Effective Kubernetes onboarding:

- Know your audience and their objectives.
- Determine the best approach to meet those objectives.
- Scope your approach appropriately.
- Plan for Day 2.



# MEANWHILE ... ON THE COMMUNITY PLATFORM





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# Effective Kubernetes onboarding:

- Know your audience and their objectives.
- Determine the best approach to meet those objectives.
- Scope your approach appropriately.
- Plan for Day 2.



# Part I: Audience



# Is your audience made up of

- Application Developers



# Is your audience made up of

- Application Developers

## Goals:

1. Develop with a distributed architecture in mind



# Is your audience made up of

- Application Developers

## Goals:

1. Develop with a distributed architecture in mind
2. Deploy successfully



# Is your audience made up of

- Operators



# Is your audience made up of

- Operators

## Goals:

1. Deploy successfully



# Is your audience made up of

- Operators

## Goals:

1. Deploy successfully
2. Automate deployments, pipelines & backups





# Is your audience made up of

- Operators

## Goals:

1. Deploy successfully
2. Automate deployments, pipelines & backups
3. Implement logging, monitoring & alerting



# Is your audience made up of

- Business Decision Makers



# Is your audience made up of

- Business Decision Makers

## Goals:

1. **Make responsible financial decisions**



# Is your audience made up of

- Business Decision Makers

## **Goals:**

- 1. Make responsible financial decisions**
- 2. Scope long-term goals for growth**



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1. Introductory Topics
2. Containers, Modernizing Applications and 12 Factor Development
3. Containers
4. Deployment Strategies
5. Operate a Kubernetes Cluster



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Contents

Abstract

Executive Summary:  
Scaling Cloud Native  
Apps

Kubernetes and  
DigitalOcean  
Kubernetes

# Running Cloud Native Applications on DigitalOcean Kubernetes

WHITE PAPER

## White Paper: Running Cloud Native Applications on DigitalOcean Kubernetes

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DigitalOcean eBook:  
Kubernetes for Full-Stack



## Part II: Approach



## Application Developers

### Goals:

1. Develop with a distributed architecture in mind.
2. Deploy successfully

Approach:





## Application Developers

### Goals:

1. Develop with a distributed architecture in mind.
2. Deploy successfully

Approach:



**12FA Application**



Application Developers

**Goals:**

- 1. Develop with a distributed architecture in mind.**
- 2. Deploy successfully**

Approach:

**12FA Application**



**Modernize**



## Application Developers

### Goals:

1. Develop with a distributed architecture in mind.
2. Deploy successfully

Approach:

**12FA Application**

**Modernize**



**Containerize**



## Application Developers

### Goals:

1. Develop with a distributed architecture in mind.
2. Deploy successfully

Approach:

**12FA Application**

**Modernize**

**Containerize**



**Deploy**



## Application Developers

### Goals:

1. Develop with a distributed architecture in mind.
2. Deploy successfully

## Approach:

### 12FA Application

**Blocker: Why is this necessary?**

### Modernize

**Blocker: What is a distributed architecture?**

### Containerize

**Blocker: How do containers differ from VMs?**

### Deploy

**Blocker: What will change from the tools/systems that I'm used to?**



## Application Developers

### Goals:

1. Develop with a distributed architecture in mind.
2. Deploy successfully

## Approach:

### Meta-Level Topics:

What is Kubernetes?

What are containers?

### Operational Topics:

12FA Application

Modernize

Containerize

Deploy



Summary View ☐ Detailed View

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## Developers on Community

### Goals:

1. Develop with a distributed architecture in mind.
2. Deploy successfully

## Approach:

Ensure understanding of:

**Where secrets are located**

**What's in the  
application/server base images**

**How to troubleshoot Concourse**

**How to kick off and roll back  
deployments**



## Developers on Community

### Goals:

1. Develop with a distributed architecture in mind.
2. Deploy successfully

## Approach:

Ensure understanding of:

**Where secrets are located**

**What's in the application base image**

**How to troubleshoot Concourse**

**How to kick off and roll back deployments**

**What does it mean to deploy in a distributed environment at the application level?**



## Developers on Community

### Goals:

1. Develop with a distributed architecture in mind.
2. Deploy successfully

## Approach:

### Key Takeaways:

Make time for meta-level discussions

Lay theoretical foundations before operational



## Part III: Scope



# Formats to Consider:

**Documentation**





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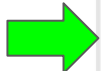

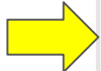
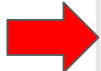
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# Kubernetes Documentation





We will use these files to create different types of objects: Services, which will ensure that the Pods running our containers remain accessible; Deployments, which will contain information about the desired state of our Pods; a PersistentVolumeClaim to provision storage for our database data; a ConfigMap for environment variables injected at runtime; and a Secret for our application's database user and password. Some of these definitions will be in the files kompose will create for us, and others we will need to create ourselves.



# Formats to Consider:

**Documentation**



**Talks or videos**





*"The capacity to learn is a gift, ability to learn is a skill and willingness to learn is a choice"- Brian Herbert*



# Formats to Consider:

**Documentation**



**Talks or videos**



**Meeting**



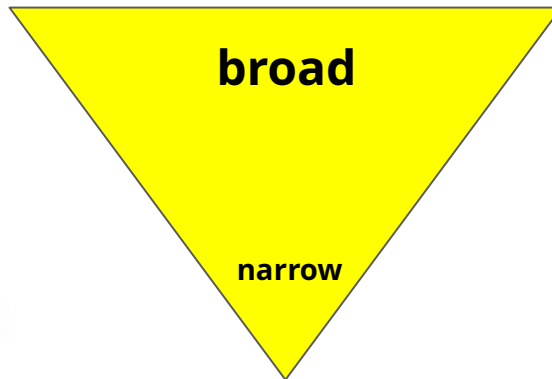


# Formats to Consider:

**Documentation**

**Talks or videos**

**Meeting**





## Developers on Community

### Scope:

1. Focused (meetings, docs)
2. Some shared resources (short videos)

Formats:

**Internal Documentation**

**Meetings**

**Videos**



## Part IV: Day 2



# Day 2: Changes

## **Audiences**

- Application Developers
- Operations
- Business Decision Makers





# Plan for Iterative Change

- Define audience and goals
- Determine best approach
- Scope appropriately
- Lather rinse repeat



Ops Team on a new k8s cluster

**Goals:**

1. Run an up to date cluster
2. Ensure no cluster downtime

## Approach:

### Meta-Level Topics:

What are Services and Ingress Controllers?

What are kube-apiserver & kubelet?

Why do pods get evicted?

### Operational Topics:

Draining nodes

kubeadm upgrade plan

Accessing private image registries



Ops Team on a new k8s cluster

Scope:

1. Focused planning meetings
2. Internal upgrade playbook
3. Kubernetes documentation

Formats:

Meetings

Documentation

Errata from dev/staging upgrades:

- Manual steps
- Failures encountered
- Troubleshooting



## Storage Architect

### Goals:

1. Deploy  ROOK
2. Ensure no data loss
3. Scale storage horizontally

## Approach:

### Meta-Level Topics:

What are Kubernetes CRDs?

How does Rook manage Ceph?

### Operational Topics:

How to check ceph mon servers?

Monitoring OSD health

What does managing PGs look like?

How are new disks added to a cluster?



## Storage Architect

### Scope:

1. Videos
2. Documentation
3. Documentation
4. Documentation
5. Meetings

## Formats:

### Videos:

- Learn meta-level quickly

### Documentation:

- Rook
- Ceph
- Kubernetes

### Meetings

- With developers & operations
- With Change Advisory

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