

Kubernetes Up And Running Ebook

Apply Kubernetes beyond the basics of Kubernetes clusters by implementing IAM using OIDC and Active Directory, Layer 4 load balancing using MetalLB, advanced service integration, security, auditing, and CI/CD Key Features Find out how to add enterprise features to a Kubernetes cluster with theory and exercises to guide you *Understand advanced topics including load balancing, externalDNS, IDP integration, security, auditing, backup, and CI/CD* Create development clusters for unique testing requirements, including running multiple clusters on a single server to simulate an enterprise environment *Book Description* Containerization has changed the DevOps game completely, with Docker and Kubernetes playing important roles in altering the flow of app creation and deployment. This book will help you acquire the knowledge and tools required to integrate Kubernetes clusters in an enterprise environment. The book begins by introducing you to Docker and Kubernetes fundamentals, including a review of basic Kubernetes objects. You'll then get to grips with containerization and understand its core functionalities, including how to create ephemeral multinode clusters using kind. As you make progress, you'll learn about cluster architecture, Kubernetes cluster deployment, and cluster management, and get started with application deployment. Moving on, you'll find out how to integrate your container to a cloud platform and integrate tools including MetalLB, externalDNS, OpenID connect (OIDC), pod security policies (PSPs), Open Policy Agent (OPA), Falco, and Veler0. Finally, you will discover how to deploy an entire platform to the cloud using continuous integration and continuous delivery (CI/CD). By the end of this Kubernetes book, you will have learned how to create development clusters for testing applications and Kubernetes components, and be able to secure and audit a cluster by implementing various open-source solutions including OpenUnison, OPA, Falco, Kibana, and Veler0. What you will learn *Create a multinode Kubernetes cluster using kind* Implement Ingress, MetalLB, and ExternalDNS *Configure a cluster* *OIDC using impersonation* Map enterprise authorization to Kubernetes *Secure clusters using PSPs and OPA* Enhance auditing using Falco and EFK *Back up your workload for disaster recovery and cluster migration* Deploy to a platform using Tekton, GitLab, and ArgoCD *Who this book is for* This book is for anyone interested in DevOps, containerization, and going beyond basic Kubernetes cluster deployments. DevOps engineers, developers, and system administrators looking to enhance their IT career paths will also find this book helpful. Although some prior experience with Docker and Kubernetes is recommended, this book includes a Kubernetes bootcamp that provides a description of Kubernetes objects to help you if you are new to the topic or need a refresher.

Quickly learn how to use Docker and containers in general to create packaged images for easy management, testing, and deployment of software. This practical guide lets you hit the ground running by demonstrating how Docker allows developers to package their application with all of its dependencies and to test and then ship the exact same bundle to production. You'll also learn how Docker enables operations engineers to help the development team quickly iterate on their software. Learn Docker's philosophy, design, and intent Use your own custom software to build Docker images *Launch Docker images as running containers* Explore advanced Docker concepts and topics *Get valuable references to related tools in the Docker ecosystem*

Building models is a small part of the story when it comes to deploying machine learning applications. The entire process involves developing, orchestrating, deploying, and running scalable and portable machine learning workloads--a process Kubeflow makes much easier. This practical book shows data scientists, data engineers, and platform architects how to plan and execute a Kubeflow project to make their Kubernetes workflows portable and scalable. Authors Josh Patterson, Michael Katzenellenbogen, and Austin Harris demonstrate how this open source platform orchestrates workflows by managing machine learning pipelines. You'll learn how to plan and execute a Kubeflow platform that can support workflows from on-premises to cloud providers including Google, Amazon, and Microsoft. Dive into Kubeflow architecture and learn best practices for using the platform Understand the process of planning your Kubeflow deployment *Install Kubeflow on an existing on-premises Kubernetes cluster* Deploy Kubeflow on Google Cloud Platform *step-by-step from the command line* Use the managed Amazon Elastic Kubernetes Service (EKS) to deploy Kubeflow on AWS *Deploy and manage Kubeflow across a network of Azure cloud data centers around the world* Use KFServing to develop and deploy machine learning models

A comprehensive introduction to automated application deployment on Kubernetes for beginners *Key Features* Effectively manage applications deployed in Kubernetes using Helm *Learn to install, upgrade, share, and manage applications deployed in Kubernetes* *Get up and running with a package manager for Kubernetes* *Book Description* Containerization is currently known to be one of the best ways to implement DevOps. While Docker introduced containers and changed the DevOps era, Google developed an extensive container orchestration system, Kubernetes, which is now considered the frontrunner in container orchestration. With the help of this book, you'll explore the efficiency of managing applications running on Kubernetes using Helm. Starting with a short introduction to Helm and how it can benefit the entire container environment, you'll then delve into the architectural aspects, in addition to learning about Helm charts and its use cases. You'll understand how to write Helm charts in order to automate application deployment on Kubernetes. Focused on providing enterprise-ready patterns relating to Helm and automation, the book covers best practices for application development, delivery, and lifecycle management with Helm. By the end of this Kubernetes book, you will have learned how to leverage Helm to develop an enterprise pattern for application delivery. What you will learn *Develop an enterprise automation strategy on Kubernetes using Helm* *Create easily consumable and configurable Helm charts* Use Helm in orchestration tooling and Kubernetes operators *Explore best practices for application delivery and life cycle management* Leverage Helm in a secure and stable manner that is fit for your enterprise *Discover the ins and outs of automation with Helm* *Who this book is for* This book is for Kubernetes developers or administrators who are interested in learning Helm to provide automation for application development on Kubernetes. Although no prior knowledge of Helm is required, basic knowledge of Kubernetes application development will be useful.

Kubernetes in Action

Shipping Reliable Containers in Production

Docker and Kubernetes for Java Developers

The Docker Book

Dive into the Future of Infrastructure

Who This Book Is For

If you're looking to develop native applications in Kubernetes, this is your guide. Developers and AppOps administrators will learn how to build Kubernetes-native applications that interact directly with the API server to query or update the state of resources. AWS developer advocate Michael Hausenblas and Red Hat principal software engineer Stefan Schimanski explain the characteristics of these apps and show you how to program Kubernetes to build them. You'll explore the basic building blocks of Kubernetes, including the client-go API library and custom resources. All you need to get started is a rudimentary understanding of development and system administration tools and practices, such as package management, the Go programming language, and Git. Walk through Kubernetes API basics and dive into the server's inner structure *Explore Kubernetes's programming interface in Go, including Kubernetes API objects* Learn about custom resources—the central extension tools used in the Kubernetes ecosystem *Use tags to control Kubernetes code generators for custom resources* Write custom controllers and operators and make them production ready *Extend the Kubernetes API surface by implementing a custom API server*

Kubernetes is the operating system of the cloud native world, providing a reliable and scalable platform for running containerized workloads. In this friendly, pragmatic book, cloud experts John Arundel and Justin Domingus show you what Kubernetes can do—and what you can do with it. You'll learn all about the Kubernetes ecosystem, and use battle-tested solutions to everyday problems. You'll build, step by step, an example cloud native application and its supporting infrastructure, along with a development environment and continuous deployment pipeline that you can use for your own applications. Understand containers and Kubernetes from first principles; no experience necessary *Run your own clusters or choose a managed Kubernetes service from Amazon, Google, and others* Use Kubernetes to manage resource usage and the container lifecycle *Optimize clusters for cost, performance, resilience, capacity, and scalability* Learn the best tools for developing, testing, and deploying your applications *Apply the latest industry practices for security, observability, and monitoring* Adopt DevOps principles to help make your development teams lean, fast, and effective *Get a comprehensive understanding of gRPC fundamentals through real-world examples. With this practical guide, you'll learn how this high-performance interprocess communication protocol is capable of connecting polyglot services in microservices architecture, while providing a rich framework for defining service contracts and data types. Complete with hands-on examples written in Go, Java, Node, and Python, this book also covers the essential techniques and best practices to use gRPC in production systems. Authors Kasun Indrasiri and Danesh Kuruppu discuss the importance of gRPC in the context of microservices development.*

Kubernetes has become the dominant container orchestrator, but many organizations that have recently adopted this system are still struggling to run actual production workloads. In this practical book, four software engineers from VMware bring their shared experiences running Kubernetes in production and provide insight on key challenges and best practices. The brilliance of Kubernetes is how

configurable and extensible the system is, from pluggable runtimes to storage integrations. For platform engineers, software developers, infosec, network engineers, storage engineers, and others, this book examines how the path to success with Kubernetes involves a variety of technology, pattern, and abstraction considerations. With this book, you will: Understand what the path to production looks like when using Kubernetes *Examine where gaps exist in your current Kubernetes strategy* Learn Kubernetes's essential building blocks—and their trade-offs *Understand what's involved in making Kubernetes a viable location for applications* Learn better ways to navigate the cloud native landscape

Kubernetes for Developers

Deploy and manage production-ready Kubernetes clusters on AWS

Terraform: Up & Running

Prometheus: Up & Running

Docker: Up & Running

Kubernetes Best Practices

In this practical guide, four Kubernetes professionals with deep experience in distributed systems, enterprise application development, and open source will guide you through the process of building applications with this container orchestration system. Based on the experiences of companies that are running Kubernetes in production successfully, many of the methods are also backed by concrete code examples. This book is ideal for those already familiar with basic Kubernetes concepts who want to learn common best practices. You'll learn exactly what you need to know to build your best app with Kubernetes the first time. Set up and develop applications in Kubernetes Learn patterns for monitoring, securing your systems, and managing upgrades, rollouts, and rollbacks *Understand Kubernetes networking policies and where service mesh fits in* *Integrate services and legacy applications and develop higher-level platforms on top of Kubernetes* *Run machine learning workloads in Kubernetes*

Learn how to automate and manage your Linux containers and improve the overall performance of your system *About This Book-* Are you using containers in your organization and want to better manage, scale, and orchestrate apps on the container? *Use the recipes in the book to find a reliable solution from experts-* This is the first and only book on the market on Kubernetes, and it will show how to manage your containers in production using Kubernetes- *Buy this book, simply follow the recipes, and you will be the master of your Linux containers* *Who This Book Is For* The book is aimed at system administrators who have intermediate level of knowledge with Kubernetes and want to better manage their applications deployed over containers. Also, it will help those administrators who want to maintain and scale applications on these containers. *What You Will Learn-* Get to know how to build your own container cluster- *Deploy and manage highly scalable applications using Kubernetes-* Discover how to build high availability Kubernetes clusters- *Find out how to build a continuous delivery pipeline for your application-* Track metrics and logs for every container running in your cluster- *Streamline the way you deploy and manage your applications with large-scale container orchestration* *In Detail* Kubernetes is Google's solution to managing a cluster of containers. Kubernetes provides a declarative API to manage clusters while giving us a lot of flexibility. This book will provide you with recipes to better manage containers in different scenarios in production using Kubernetes. *We will start by giving you a quick brush up on how Kubernetes works with containers along with an overview of the main Kubernetes features such as Pods, Replication Controllers, and more. Next, we will teach you how to create Kubernetes cluster and how to run programs on Kubernetes. We'll explain features such as High Availability* Kubernetes master setup, using Kubernetes with Docker, and orchestration with Kubernetes using AWS. Later, will show you how to use Kubernetes-UI, and how to set up and manage Kubernetes clusters on the cloud and bare metal. Upon completion of this book, you will be able use Kubernetes in production and will have a better understanding of how to manage your containers using Kubernetes. *Style and approach* This recipe-based book precisely teaches you how to use Kubernetes in production and how to better manage your containers using Kubernetes.

Get up to speed with Prometheus, the metrics-based monitoring system used by tens of thousands of organizations in production. This practical guide provides application developers, sysadmins, and DevOps practitioners with a hands-on introduction to the most important aspects of Prometheus, including dashboarding and alerting, direct code instrumentation, and metric collection from third-party systems with exporters. This open source system has gained popularity over the past few years for good reason. With its simple yet powerful data model and query language, Prometheus does one thing, and it does it well. Author and Prometheus developer Brian Brazil guides you through Prometheus setup, the Node exporter, and the Alertmanager, then demonstrates how to use them for application and infrastructure monitoring. Know where and how much to apply instrumentation to your application code Identify metrics with labels using unique key-value pairs *Get an introduction to Grafana, a popular tool for building dashboards* Learn how to use the Node Exporter to monitor your infrastructure *Use service discovery to provide different views of your machines and services* Use Prometheus with Kubernetes and examine exporters you can use with containers *Convert data from other monitoring systems into the Prometheus format*

Leverage the lethal combination of Docker and Kubernetes to automate deployment and management of Java applications *About This Book* Master using Docker and Kubernetes to build, deploy and manage Java applications in a jiff *Learn how to create your own Docker image and customize your own cluster using Kubernetes*

Empower the journey from development to production using this practical guide. Who This Book Is For The book is aimed at Java developers who are eager to build, deploy, and manage applications very quickly using container technology. They need have no knowledge of Docker and Kubernetes. *What You Will Learn* Package Java applications into Docker images *Understand the running of containers locally* Explore development and deployment options with Docker *Integrate Docker into Maven builds* Manage and monitor Java applications running on Kubernetes clusters *Create Continuous Delivery pipelines for Java applications deployed to Kubernetes*

In Detail Imagine creating and testing Java EE applications on Apache Tomcat Server or Wildfly Application server in minutes along with deploying and managing Java applications swiftly. Sounds too good to be true? But you have a reason to cheer as such scenarios are only possible by leveraging Docker and Kubernetes. *This book will start by introducing Docker and delve deep into its networking and persistent storage concepts. You will then proceed to learn how to refactor monolith application into separate services by building an application and then packaging it into Docker containers. Next, you will create an image containing Java Enterprise Application and later run it using Docker. Moving on, the book will focus on Kubernetes and its features and you will learn to deploy a Java application to Kubernetes using Maven and monitor a Java application in production. By the end of the book, you will get hands-on with some more*

advanced topics to further extend your knowledge about Docker and Kubernetes. Style and approach An easy-to-follow, practical guide that will help Java developers develop, deploy, and manage Java applications efficiently. *Effortless Application Deployment and Scaling*

Building Cloud Native Applications

The Site Reliability Workbook

Developing Cloud-Native Applications

Heroku: Up and Running

Kubernetes

While Kubernetes has greatly simplified the task of deploying containerized applications, managing this orchestration framework on a daily basis can still be a complex undertaking. With this practical book, site reliability and DevOps engineers will learn how to build, operate, manage, and upgrade a Kubernetes cluster—whether it resides on cloud infrastructure or on-premises. Brendan Burns, cofounder of Kubernetes, and Craig Tracey, staff field engineer at Heptio, dissect how Kubernetes works internally and demonstrate ways to maintain, adjust, and improve the cluster to suit your particular use case. You'll learn how to make architectural choices for designing a cluster, managing access control, monitoring and alerting, and upgrading Kubernetes. Dive in and discover how to take full advantage of this orchestration framework's capabilities. Learn how your cluster operates, how developers use it to deploy applications, and how Kubernetes can facilitate a developer's job *Adjust, secure, and tune your cluster by understanding Kubernetes APIs and configuration options* Detect cluster-level problems early and learn the steps necessary to respond and recover quickly *Determine how and when to add libraries, tools, and platforms that build on, extend, or otherwise improve a Kubernetes cluster*

In 2016, Google's Site Reliability Engineering book ignited an industry discussion on what it means to run production services today—and why reliability considerations are fundamental to service design. Now, Google engineers who worked on that bestseller introduce The Site Reliability Workbook, a hands-on companion that uses concrete examples to show you how to put SRE principles and practices to work in your environment. This new workbook not only combines practical examples from Google's experiences, but also provides case studies from Google's Cloud Platform customers who underwent this journey. Evernote, The Home Depot, The New York Times, and other companies outline hard-won experiences of what worked for them and what didn't. Dive into this workbook and learn how to flesh out your own SRE practice, no matter what size your company is. You'll learn: How to run reliable services in environments you don't completely control—like cloud

Practical applications of how to create, monitor, and run your services via Service Level Objectives *How to convert existing ops teams to SRE—including how to dig out of operational overload* *Methods for starting SRE from either greenfield or brownfield*

You did it. You successfully transformed your application into a microservices architecture. But now that you're running services across different environments—public to public, private to public, virtual machine to container—your cloud native software is beginning to encounter reliability issues. How do you stay on top of this ever-increasing complexity? With the Istio service mesh, you'll be able to manage traffic, control access, monitor, report, get telemetry data, manage quota, trace, and more with resilience across your microservice. In this book, Lee Calcote and Zack Butcher explain why your services need a service mesh and demonstrate step-by-step how Istio fits into the life cycle of a distributed application. You'll learn about the tools and APIs for enabling and managing many of the features found in Istio. Explore the observability challenges Istio addresses *Use request routing, traffic shifting, fault injection, and other features essential to running a solid service mesh* Generate and collect telemetry information *Try different deployment patterns, including A/B, blue/green, and canary* Get examples of how to develop and deploy real-world applications with Istio support

Kubernetes: Up and Running *Dive Into the Future of Infrastructure* O'Reilly Media

Quick Start Kubernetes

Kubernetes Operators

The Kubernetes Book

Improve productivity, reduce complexity, and speed up cloud-native adoption with Helm for Kubernetes

Cloud Native DevOps with Kubernetes

Kubernetes: Up and Running

Securing, observing, and troubleshooting containerized workloads on Kubernetes can be daunting. It requires a range of considerations, from infrastructure choices and cluster configuration to deployment controls and runtime and network security. With this practical book, you'll learn how to adopt a holistic security and observability strategy for building and securing cloud native applications running on Kubernetes. Whether you're already working on cloud native applications or are in the process of migrating to its architecture, this guide introduces key security and observability concepts and best practices to help you unleash the power of cloud native applications. Authors Brendan Creane and Amit Gupta from Tigera take you through the full breadth of new cloud native approaches for establishing security and observability for applications running on Kubernetes. Learn why you need a security and observability strategy for cloud native applications and determine your scope of coverage *Understand key concepts behind the book's security and observability approach* Explore the technology choices available to support this strategy *Discover how to share security responsibilities across multiple teams or roles* Learn how to architect Kubernetes security and observability for

multicloud and hybrid environments

Terraform has become a key player in the DevOps world for defining, launching, and managing infrastructure as code (IaC) across a variety of cloud and virtualization platforms, including AWS, Google Cloud, Azure, and more. This hands-on second edition, expanded and thoroughly updated for Terraform version 0.12 and beyond, shows you the fastest way to get up and running. Gruntwork cofounder Yevgeniy (Jim) Brikmank works you through code examples that demonstrate Terraform's simple, declarative programming language for deploying and managing infrastructure with a few commands. Veteran sysadmins, DevOps engineers, and novice developers will quickly go from Terraform basics to running a full stack that can support a massive amount of traffic and a large team of developers. Explore changes from Terraform 0.9 through 0.12, including backends, workspaces, and first-class expressions Learn how to write production-grade Terraform modules Dive into manual and automated testing for Terraform code Compare Terraform to Chef, Puppet, Ansible, CloudFormation, and Salt Stack Deploy server clusters, load balancers, and databases Use Terraform to manage the state of your infrastructure Create reusable infrastructure with Terraform modules Use advanced Terraform syntax to achieve zero-downtime deployment

In just five years, Kubernetes has radically changed the way developers and ops personnel build, deploy, and maintain applications in the cloud. With this book's updated third edition, you'll learn how this popular container orchestrator can help your company achieve new levels of velocity, agility, reliability, and efficiency--whether you're new to distributed systems or have been deploying cloud native apps for some time. Brendan Burns, Joe Beda, Kelsey Hightower, and Lachlan Evenson—who have worked on Kubernetes at Google and beyond—explain how this system fits into the life cycle of a distributed application. Software developers, engineers, and architects will learn ways to use tools and APIs to automate scalable distributed systems for online services, machine learning applications, or even a cluster of Raspberry Pi computers. This guide shows you how to: Create a simple cluster to learn how Kubernetes works Dive into the details of deploying an application using Kubernetes Learn specialized objects in Kubernetes, such as DaemonSets, jobs, ConfigMaps, and secrets Explore deployments that tie together the lifecycle of a complete application Get practical examples of how to develop and deploy real-world applications in Kubernetes Introduction -- Creating and running containers -- Deploying a Kubernetes cluster -- Common kubectll commands -- Pods -- Labels and annotations -- Service discovery -- ReplicaSets -- DaemonSets -- Jobs -- ConfigMaps and secrets -- Deployments -- Integrating storage solutions and Kubernetes -- Deploying real-world applications -- Building a Raspberry Pi Kubernetes cluster

Programming Kubernetes

Level up your container orchestration skills with Kubernetes to build, run, secure, and observe large-scale distributed apps, 3rd Edition

Operating Kubernetes Clusters in the Real World

Kubeflow Operations Guide

Effectively containerize applications, integrate enterprise systems, and scale applications in your enterprise

Docker: Up and Running

Kubernetes radically changes the way applications are built and deployed in the cloud. Since its introduction in 2014, this container orchestrator has become one of the largest and most popular open source projects in the world. The updated edition of this practical book shows developers and ops personnel how Kubernetes and container technology can help you achieve new levels of velocity, agility, reliability, and efficiency. Kelsey Hightower, Brendan Burns, and Joe Beda—who've worked on Kubernetes at Google and beyond—explain how this system fits into the lifecycle of a distributed application. You'll learn how to use tools and APIs to automate scalable distributed systems, whether it's for online services, machine learning applications, or a cluster of Raspberry Pi computers. Create a simple cluster to learn how Kubernetes works Dive into the details of deploying an application using Kubernetes Learn specialized objects in Kubernetes, such as DaemonSets, jobs, ConfigMaps, and secrets Explore deployments that tie together the lifecycle of a complete application Get practical examples of how to develop and deploy real-world applications in Kubernetes.

Get up to speed with Helm, the preeminent package manager for the Kubernetes container orchestration system. This practical guide shows you how to efficiently create, install, and manage the applications running inside your containers. Helm maintainers Matt Butcher, Matt Farina, and Josh Dolitsky explain how this package manager fits into the Kubernetes ecosystem and provide an inside look at Helm's design and best practices. More than 70% of the organizations that work with Kubernetes use Helm today. While the Helm community provides thousands of packages, or charts, to help you get started, this book walks developers and DevOps engineers through the process of creating custom charts to package applications. If you have a working understanding of Kubernetes, you're ready to go. Explore primary features including frequently used Helm commands Learn how to build and deploy Helm charts from scratch Use Helm to manage complexity and achieve repeatable deployments Package an application and its dependencies for easy installation Manage the entire lifecycle of applications on Kubernetes Explore ways to extend Helm to add features and functionality Learn features for testing, handling dependencies, and providing security

Legend has it that Google deploys over two billion application containers a week. How's that possible? Google revealed the secret through a project called Kubernetes, an open source cluster orchestrator (based on its internal Borg system) that radically simplifies the task of building, deploying, and maintaining scalable distributed systems in the cloud. This practical guide shows you how Kubernetes and container technology can help you achieve new levels of velocity, agility, reliability, and efficiency. Authors Kelsey Hightower, Brendan Burns, and Joe Beda—who've worked on Kubernetes at Google and other organizations—explain how this system fits into the lifecycle of a distributed application. You will learn how to use tools and APIs to automate scalable distributed systems, whether it is for online services, machine-learning applications, or a cluster of Raspberry Pi computers. Explore the distributed system challenges that Kubernetes addresses Dive into containerized application development, using containers such as Docker Create and run containers on Kubernetes, using the docker image format and container runtime Explore specialized objects essential for running applications in production Reliably roll out new software versions without downtime or errors Get examples of how to develop and deploy real-world applications in Kubernetes

Go beyond simply learning Kubernetes fundamentals and its deployment, and explore more advanced concepts, including serverless computing and service meshes with the latest updates Key Features Master Kubernetes architecture and design to build and deploy secure distributed applications Learn advanced concepts like autoscaling, cluster federation, serverless computing, and service mesh integration for observability Explore Kubernetes 1.18 features and its rich ecosystem of tools like Kubectll, Knative, and Helm Book Description The third edition of Mastering Kubernetes is updated with the latest tools and code enabling you to learn Kubernetes 1.18's latest features. This book primarily concentrates on diving deeply into complex concepts and Kubernetes best practices to help you master the skills of designing and deploying large clusters on various cloud platforms. The book trains you to run complex stateful microservices on Kubernetes including advanced features such as horizontal pod autoscaling, rolling updates, resource quotas, and persistent storage backend. With the two new chapters, you will gain expertise in serverless computing and utilizing service meshes. As you proceed through the chapters, you will explore different options for network configuration and learn to set up, operate, and troubleshoot Kubernetes networking plugins through real-world use cases. Furthermore, you will understand the mechanisms of custom resource development and its utilization in automation and maintenance workflows. By the end of this Kubernetes book, you will graduate from an intermediate to advanced Kubernetes professional. What you will learn Master the fundamentals of Kubernetes architecture and design Build and run stateful applications and complex microservices on Kubernetes Use tools like Kubectll, secrets, and Helm to manage resources and storage Master Kubernetes Networking with load balancing options like Ingress Achieve high-availability Kubernetes clusters Improve Kubernetes observability with tools like Prometheus, Grafana, and Jaeger Extend Kubernetes working with Kubernetes API, plugins, and webhooks Who this book is for If you are a system administrator or a cloud developer with working knowledge of Kubernetes and are keen to master its advanced features, along with learning everything from building microservices to utilizing service meshes, Mastering Kubernetes is for you. Basic familiarity with networking concepts will be helpful.

Kubernetes for Full-Stack Developers

Kubernetes on AWS

Kubernetes and Docker - An Enterprise Guide

Reusable Elements for Designing Cloud-Native Applications

Blueprints for Building Successful Applications on Kubernetes

Kubernetes Patterns

April 2021 edition. Brought to you by best-selling author and video trainer, Nigel Poulton. Every page and every example has been checked and updated against the latest versions of Kubernetes (1.20+) and the latest trends in the cloud-native ecosystem. Containers have revolutionized the way we package and run applications. However, like most things, containers come with a bunch of challenges. This is where Kubernetes comes into play. Kubernetes helps you deploy and manage containerized applications at scale. It also abstracts the underlying infrastructure so that you don't need to care if you're deploying applications to Amazon Web Services, Microsoft Azure, or your own on-premises datacenter. With Kubernetes, you can develop applications on your laptop, deploy to your favourite cloud platform, migrate to a different cloud platform, and even migrate to your on-premises datacenters. The Kubernetes Book starts from the beginning, explains all concepts in a clear and friendly way, and covers everything you need to become proficient at Kubernetes. You'll learn: - Kubernetes architecture - How to build Kubernetes - How to deploy, self-heal, scale, and perform rolling updates on applications - What the Kubernetes API is and how it works - How to secure Kubernetes - The meaning of terms such as: cloud-native, microservices, desired state, containerized, and more... Finally, Kubernetes and cloud technologies are developing fast! That's why this book will be updated every year, meaning it's always up-to-date with the latest versions of Kubernetes and the latest trends in the cloud-native ecosystem.

A developer's field-guide to designing scalable services using Kubernetes Key Features Develop and run your software using containers within a Kubernetes environment Get hands-on experience of using Kubernetes with DevOps concepts such as continuous integration, benchmark testing, monitoring, and so on Pragmatic example-based approach showing how to use Kubernetes in the development process Book Description Kubernetes is documented and typically approached from the perspective of someone running software that has already been built. Kubernetes may also be used to enhance the development process, enabling more consistent testing and analysis of code to help developers verify not only its correctness, but also its efficiency. This book introduces key Kubernetes concepts, coupled with examples of how to deploy and use them with a bit of Node.js and Python example code, so that you can quickly replicate and use that knowledge. You will begin by setting up Kubernetes to help you develop and package your code. We walk you through the setup and installation process before working with Kubernetes in the development environment. We then delve into concepts such as automating your build process, autonomic computing, debugging, and integration testing. This book covers all the concepts required for a developer to work with Kubernetes. By the end of this book, you will be in a position to use Kubernetes in development ecosystems. What you will learn Build your software into containers Deploy and debug software running in containers within Kubernetes Declare and add configuration through Kubernetes Define how your application fits together, using internal and external services Add feedback to your code to help Kubernetes manage your services Monitor and measure your services through integration testing and in production deployments Who this book is for If you are a full-stack or back-end software developers interested, curious, or being asked to test as well as run the code you're creating, you can leverage Kubernetes to make that process simpler and consistent regardless of where you deploy. If you're looking for developer focused examples in NodeJS and Python for how to build, test, deploy, and run your code with Kubernetes, this is perfect for you.

Kubernetes is becoming the de-facto standard for container orchestration and distributed applications management across a microservices framework. With this practical cookbook, you'll learn hands-on recipes for automating the deployment, scaling, and operations of application containers across clusters of hosts. The book's easy-lookup problem-solution-discussion format helps you find the detailed answers you need-quickly. Kubernetes lets you deploy your applications quickly and predictably, so you can efficiently respond to customer demand. This cookbook, ideal for developers and system administrators alike, provides the essential knowledge you need to get there. You'll find recipes for: Kubernetes installation Kubernetes API, API groups Application primitives Monitoring Troubleshooting

This book is designed to help newcomers and experienced users alike learn about Kubernetes. Its chapters are designed to introduce core Kubernetes concepts and to build on them to a level where running an application on a production cluster is a familiar, repeatable, and automated process. From there, more advanced topics are introduced, like how to manage a Kubernetes cluster itself.

Kubernetes Cookbook

Building Cloud Native Applications with Go and Java for Docker and Kubernetes

Writing Infrastructure as Code

Using a Service Mesh to Connect, Secure, Control, and Observe

Automating the Container Orchestration Platform

Building, Deploying, and Scaling Modern Applications in the Cloud

Master the art of container management utilizing the power of Kubernetes. About This Book This practical guide demystifies Kubernetes and ensures that your clusters are always available, scalable, and up to date Discover new features such as autoscaling, rolling updates, resource quotas, and cluster size Master the skills of designing and deploying large clusters on various cloud platforms Who This Book Is For The book is for system administrators and developers who have intermediate level of knowledge with Kubernetes and are now waiting to master its advanced features. You should also have basic networking knowledge. This advanced-level book provides a pathway to master Kubernetes. What You Will Learn Architect a robust Kubernetes cluster for long-time operation Discover the advantages of running Kubernetes on GCE, AWS, Azure, and bare metal See the identity model of Kubernetes and options for cluster federation Monitor and troubleshoot Kubernetes clusters and run a highly available Kubernetes Create and configure custom Kubernetes resources and use third-party resources in your automation workflows Discover the art of running complex stateful applications in your container environment Deliver applications as standard packages In Detail Kubernetes is an open source system to automate the deployment, scaling, and management of containerized applications. If you are running more than just a few containers or want automated management of your containers, you need Kubernetes. This book mainly focuses on the advanced management of Kubernetes clusters. It covers problems that arise when you start using container orchestration in production. We start by giving you an overview of the guiding principles in Kubernetes design and show you the best practises in the fields of security, high availability, and cluster federation. You will discover how to run complex stateful microservices on Kubernetes including advanced features as horizontal pod autoscaling, rolling updates, resource quotas, and persistent storage back ends. Using real-world use cases, we explain the options for network configuration and provides guidelines on how to set up, operate, and troubleshoot various Kubernetes networking plugins. Finally, we cover custom resource development and utilization in automation and maintenance workflows. By the end of this book, you'll know everything you need to know to go from intermediate to advanced level. Style and approach Delving into the design of the Kubernetes platform, the reader will be exposed to the advanced features and best practices of Kubernetes. This book will be an advanced level book which will provide a pathway to master Kubernetes

Take full advantage of Heroku's cloud-based hosting services. This guide takes you through the inner workings of this PaaS platform and delivers practical advice for architecting your application to work as efficiently as possible. You'll learn best practices for improving speed and throughput, solving latency issues, locating and fixing problems if your application goes down, and ensuring your deployments go smoothly. By covering everything from basic concepts and primary components to add-on services and advanced topics such as buildpacks, this book helps you effectively deploy and manage your application with Heroku. Learn your way around Heroku with the command line interface Discover several methods for scaling your application to increase throughput Speed up response time through performance optimizations Solve latency issues by deploying your Heroku instance in new regions Choose the right plan for using Heroku's PostgreSQL database-as-a-service Get a checklist of items to consider when deploying your application Find and fix problems during deployment, at runtime, and when your application goes down Understand how Heroku buildpacks work, and learn how customize your own

Summary Kubernetes in Action is a comprehensive guide to effectively developing and running applications in a Kubernetes environment. Before diving into Kubernetes, the book gives an overview of container technologies like Docker, including how to build containers, so that even readers who haven't used these technologies before can get up and running. Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About the Technology Kubernetes is Greek for "helmsman," your guide through unknown waters. The Kubernetes container orchestration system safely manages the structure and flow of a distributed application, organizing containers and services for maximum efficiency. Kubernetes serves as an operating system for your clusters, eliminating the need to factor the underlying network and server infrastructure into your designs. About the Book Kubernetes in Action teaches you to use Kubernetes to deploy container-based distributed applications. You'll start with an overview of Docker and Kubernetes before building your first Kubernetes cluster. You'll gradually expand your initial application, adding features and deepening your knowledge of Kubernetes architecture and operation. As you navigate this comprehensive guide, you'll explore high-value topics like monitoring, tuning, and scaling. What's Inside Kubernetes' internals Deploying containers across a cluster Securing clusters Updating applications with zero downtime About the Reader Written for intermediate software developers with little or no familiarity with Docker or container orchestration systems. About the Author Marko Luksa is an engineer at Red Hat working on Kubernetes and OpenShift. Table of Contents PART 1 - OVERVIEW Introducing Kubernetes First steps with Docker and Kubernetes PART 2 - CORE CONCEPTS Pods: running containers in Kubernetes Replication and other controllers: deploying managed pods Services: enabling clients to discover and talk to pods Volumes: attaching disk storage to containers ConfigMaps and Secrets: configuring applications Accessing pod metadata and other resources from applications Deployments: updating applications declaratively StatefulSets: deploying replicated stateful applications PART 3 - BEYOND THE BASICS Understanding Kubernetes internals Securing the Kubernetes API server Securing cluster nodes and the network Managing pods' computational resources Automatic scaling of pods and cluster nodes Advanced scheduling Best practices for developing apps Extending Kubernetes

The way developers design, build, and run software has changed significantly with the evolution of microservices and containers. These modern architectures use new primitives that require a different set of practices than most developers, tech leads, and architects are accustomed to. With this focused guide, Bilgin Ibryam and Roland Huß from Red Hat provide common reusable elements, patterns, principles, and practices for designing and implementing cloud-native applications on Kubernetes. Each pattern includes a description of the problem and a proposed solution with Kubernetes specifics. Many patterns are also backed by concrete code examples. This book is ideal for developers already familiar with basic Kubernetes concepts who want to learn common cloud native patterns. You'll learn about the following pattern categories: Foundational patterns cover the core principles and practices for building container-based cloud-native applications. Behavioral patterns explore finer-grained concepts for managing various types of container and platform interactions. Structural patterns help you organize containers within a pod, the atom of the Kubernetes platform. Configuration patterns provide insight into how application configurations can be handled in Kubernetes. Advanced patterns covers more advanced topics such as extending the platform with operators.

Patterns and Paradigms for Scalable, Reliable Services

Infrastructure and Application Performance Monitoring

Getting Started with Kubernetes

Istio: Up and Running

Managing Kubernetes

Containerization Is the New Virtualization

Do you need to figure out what Kubernetes is all about? Do you like learning through hands-on? If yes, this is the book for you... Quick Start Kubernetes, brought to you by best-selling author Nigel Poulton, assumes zero prior experience and gets you to the point you can hold deploy and manage a simple app. And it does it in less than 100 pages! You'll learn: - Why we have Kubernetes - What Kubernetes is - Where Kubernetes is going - The fundamentals of Kubernetes architecture You'll also perform the following hands-on tasks: - Build a cluster - containerize an app - Deploy the app to Kubernetes - Break the app and watch it self-heal - Scale the app - Perform a rolling update Along the way, Nigel explains everything as clearly as possible and busts every piece of jargon. When you're done, you'll be in love with Kubernetes and ready to use your skills in the real world.

In the race to compete in today's fast-moving markets, large enterprises are busy adopting new technologies for creating new products, processes, and business models. But one obstacle on the road to digital transformation is placing too much emphasis on technology, and not enough on the types of processes technology enables. What if different lines of business could build their own services and applications—and decision-making was distributed rather than centralized? This report explores the concept of a digital business platform as a way of empowering individual business sectors to act on data in real time. Much innovation in a digital enterprise will increasingly happen at the edge, whether it involves business users (from marketers to data scientists) or IoT devices. To facilitate the process, your core IT team can provide these sectors with the digital tools they need to innovate quickly. This report explores: Key cultural and organizational changes for developing business capabilities through cross-functional product teams A platform for integrating applications, data sources, business partners, clients, mobile apps, social networks, and IoT devices Creating internal API programs for building innovative edge services in low-code or no-code environments Tools including Integration Platform as a Service, Application Platform as a Service, and Integration Software as a Service The challenge of integrating microservices and serverless architectures Event-driven architectures for processing and reacting to events in real time You'll also learn about a complete pervasive integration solution as a core component of a digital business platform to serve every audience in your organization.

Operators are a way of packaging, deploying, and managing Kubernetes applications. A Kubernetes application doesn't just run on Kubernetes; it's composed and managed in Kubernetes terms. Operators add application-specific operational knowledge to a Kubernetes cluster, making it easier to automate complex, stateful applications and to augment the platform. Operators can coordinate application upgrades seamlessly, react to failures automatically, and streamline repetitive maintenance like backups. Think of Operators as site reliability engineers in software. They work by extending the Kubernetes control plane and API, helping systems integrators, cluster administrators, and application developers reliably deploy and manage key services and components. Using real-world examples, authors Jason Dobies and Joshua Wood demonstrate how to use Operators today and how to create Operators for your applications with the Operator Framework and SDK.

Learn how to establish a Kubernetes cluster and deploy an Operator Examine a range of Operators from usage to implementation Explore the three pillars of the Operator Framework: the Operator SDK, the Operator Lifecycle Manager, and Operator Metering Build Operators from the ground up using the Operator SDK Build, package, and run an Operator in development, testing, and production phases Learn how to distribute your Operator for installation on Kubernetes clusters

Docker is rapidly changing the way organizations deploy software at scale. However, understanding how Linux containers fit into your workflow—and getting the integration details right—is not a trivial task. With the updated edition of this practical guide, you'll learn how to use Docker to package your applications with all of their dependencies and then test, ship, scale, and support your containers in production. This edition includes significant updates to the examples and explanations that reflect the substantial changes that have occurred over the past couple of years. Sean Kane and Karl Matthias have added a complete chapter on Docker Compose, deeper coverage of Docker Swarm mode, introductions to both Kubernetes and AWS Fargate, examples on how to optimize your Docker images, and much more. Learn how Docker simplifies dependency management and deployment workflow for your applications Start working with Docker images, containers, and command line tools Use practical techniques to deploy and test Docker containers in production Debug containers by understanding their composition and internal processes Deploy production containers at scale inside your data center or cloud environment Explore advanced Docker topics, including deployment tools, networking, orchestration, security, and configuration

Learn Helm

Practical Ways to Implement SRE

Designing Distributed Systems

Use Kubernetes to develop, test, and deploy your applications with the help of containers

Production Kubernetes

Learning Helm

Learn to implement container orchestration on AWS with ease *Key Features* *Leverage the power of Kubernetes on AWS to deploy highly scalable applications* *Provision Kubernetes clusters on Amazon EC2 environments* *Implement best practices to improve efficiency and security of Kubernetes on the cloud* *Book Description* *Docker containers promise to radicalize the way developers and operations build, deploy, and manage applications running on the cloud. Kubernetes provides the orchestration tools you need to realize that promise in production. Kubernetes on AWS guides you in deploying a production-ready Kubernetes cluster on the AWS platform. You will then discover how to utilize the power of Kubernetes, which is one of the fastest growing platforms for production-based container orchestration, to manage and update your applications. Kubernetes is becoming the go-to choice for production-grade deployments of cloud-native applications. This book covers Kubernetes from first principles. You will start by learning about Kubernetes' powerful abstractions - Pods and Services - that make managing container deployments easy. This will be followed by a guided tour through setting up a production-ready Kubernetes cluster on AWS, while learning the techniques you need to successfully deploy and manage your own applications. By the end of the book, you will have gained plenty of hands-on experience with Kubernetes on Amazon Web Services. You will also have picked up some tips on deploying and managing applications, keeping your cluster and applications secure, and ensuring that your whole system is reliable and resilient to failure. What you will learn* *Learn how to provision a production-ready Kubernetes cluster on AWS* *Deploy your own applications to Kubernetes with Helm* *Discover strategies for troubleshooting your cluster and know where to find help with issues* *Explore the best ways to monitor your cluster and the applications running on it* *Supercharge your cluster by integrating it with the tools provided by the AWS platform* *Architect your cluster for high availability* *Who this book is for* *If you're a cloud engineer, cloud solution provider, sysadmin, site reliability engineer, or developer with an interest in DevOps and are looking for an extensive guide to running Kubernetes in the AWS environment, this book is for you. Though any previous knowledge of Kubernetes is not expected, some experience with Linux and Docker containers would be a bonus.*

Learn how to schedule and run application containers using Kubernetes. About This Book *Get well-versed with the fundamentals of Kubernetes and get it production-ready for deployments* *Confidently manage your container clusters and networks using Kubernetes* *This practical guide will show you container application examples throughout to illustrate the concepts and features of Kubernetes* *Who This Book Is For* *This book is for developers, sys admins, and DevOps engineers who want to automate the deployment process and scale their applications. You do not need any knowledge about Kubernetes. What You Will Learn* *Download, install, and configure the Kubernetes codebase* *Understand the core concepts of a Kubernetes cluster* *Be able to set up and access monitoring and logging for Kubernetes clusters* *Set up external access to applications running in the cluster* *Understand how CoreOS and Kubernetes can help you achieve greater performance and container implementation agility* *Run multiple clusters and manage from a single control plane* *Explore container security as well as securing Kubernetes clusters* *Work with third-party extensions and tools* *In Detail* *Kubernetes has continued to grow and achieve broad adoption across various industries, helping you to orchestrate and automate container deployments on a massive scale. This book will give you a complete understanding of Kubernetes and how to get a cluster up and running. You will develop an understanding of the installation and configuration process. The book will then focus on the core Kubernetes constructs such as pods, services, replica sets, replication controllers, and labels. You will also understand how cluster-level networking is done in Kubernetes. The book will also show you how to manage deployments and perform updates with minimal downtime. Additionally, you will learn about operational aspects of Kubernetes such as monitoring and logging. Advanced concepts such as container security and cluster federation will also be covered. Finally, you will learn about the wider Kubernetes ecosystem with OCP, CoreOS, and Tectonic and explore the third-party extensions and tools that can be used with Kubernetes. By the end of the book, you will have a complete understanding of the Kubernetes platform and will start deploying applications on it. Style and approach* *This straightforward guide will help you understand how to move your container applications into production through best practices and a step-by-step walkthrough tied to real-world operational strategies.*

Updated for Docker Community Edition v18.09! *Docker book designed for SysAdmins, SREs, Operations staff, Developers and DevOps who are interested in deploying the open source container service Docker. In this book, we'll walk you through installing, deploying, managing, and extending Docker. We're going to do that by first introducing you to the basics of Docker and its components. Then we'll start to use Docker to build containers and services to perform a variety of tasks. We're going to take you through the development lifecycle, from testing to production, and see where Docker fits in and how it can make your life easier. We'll make use of Docker to build test environments for new projects, demonstrate how to integrate Docker with continuous integration workflow, and then how to build application services and platforms. Finally, we'll show you how to use Docker's API and how to extend Docker yourself. We'll teach you how to:* ** Install Docker. * Take your first steps with a Docker container. * Build Docker images. * Manage and share Docker images. * Run and manage more complex Docker containers. * Deploy Docker containers as part of your testing pipeline. * Build multi-container applications and environments. * Learn about orchestration using Compose and Swarm for the orchestration of Docker containers and Consul for service discovery. * Explore the Docker API. * Getting Help and Extending Docker.*

Dive Into the Future of Infrastructure

Up and Running, 2nd Edition

gRPC: Up and Running

Kubernetes Security and Observability

Mastering Kubernetes