

The Kubernetes Book

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Keras to Kubernetes

Kubernetes is one of the most popular, sophisticated, and fast-evolving container

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orchestrators. In this book, you'll learn the essentials and find out about the advanced administration and orchestration techniques in Kubernetes. Readers will also learn to manage containers using the latest version of Kubernetes with a recipe-based approach.

Introducing Azure Kubernetes Service

Summary Go from zero to production readiness with Docker in 22 bite-sized lessons! Learn Docker in a Month of Lunches is an accessible task-focused guide to Docker on Linux, Windows, or Mac systems. In it, you'll learn practical Docker skills to help you tackle the challenges of modern IT, from cloud migration and microservices to handling legacy systems. There's no excessive theory or niche-use cases—just a quick-and-easy guide to the essentials of Docker you'll use every day. Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About the technology The idea behind Docker is simple: package applications in lightweight virtual containers that can be easily installed. The results of this simple idea are huge! Docker makes it possible to manage applications without creating custom infrastructures. Free, open source, and battle-tested, Docker has quickly become must-know technology for developers and administrators. About the book Learn Docker in a Month of Lunches introduces Docker concepts through a series of brief hands-on lessons. Following a learning path perfected by author Elton Stoneman, you'll run containers by chapter

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2 and package applications by chapter 3. Each lesson teaches a practical skill you can practice on Windows, macOS, and Linux systems. By the end of the month you'll know how to containerize and run any kind of application with Docker.

What's inside Package applications to run in containers Put containers into production Build optimized Docker images Run containerized apps at scale About the reader For IT professionals. No previous Docker experience required. About the author Elton Stoneman is a consultant, a former architect at Docker, a Microsoft MVP, and a Pluralsight author. Table of Contents

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Kubernetes Best Practices

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

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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.

Kubernetes: Up and Running

"This book shares how to instrument a company and most importantly, build an

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internal culture that values and uses data to maximum effect"--

Kubernetes

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

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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.

DevOps with Kubernetes

Schedule and run application containers using Kubernetes Key Features Get to grips with a wide range of tools to monitor and secure your deployments Manage your container clusters and networks using Kubernetes Get well-versed with the fundamentals of Kubernetes Book Description Kubernetes has continued to grow and achieve broad adoption across various industries, helping you to orchestrate and automate container deployments on a massive scale. Based on the recent release of Kubernetes 1.12, Getting Started with Kubernetes gives you a complete understanding of how to install a Kubernetes cluster. The book focuses on core Kubernetes constructs, such as pods, services, replica sets, replication controllers, and labels. You will understand cluster-level networking in Kubernetes, and learn to

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set up external access to applications running in the cluster. As you make your way through the book, you'll understand how to manage deployments and perform updates with minimal downtime. In addition to this, you will explore operational aspects of Kubernetes , such as monitoring and logging, later moving on to advanced concepts such as container security and cluster federation. You'll get to grips with integrating your build pipeline and deployments within a Kubernetes cluster, and be able to understand and interact with open source projects. In the concluding chapters, you'll orchestrate updates behind the scenes, avoid downtime on your cluster, and deal with underlying cloud provider instability within your cluster. By the end of this book, you'll have a complete understanding of the Kubernetes platform and will start deploying applications on it. What you will learn

Download, install, and configure the Kubernetes code base
Set up and access monitoring and logging for Kubernetes clusters
Set up external access to applications running in the cluster
Learn how to manage and scale kubernetes with hosted platforms on AWS, Azure, and GCP
Run multiple clusters and manage them from a single control plane
Discover top tools for deploying and managing a Kubernetes cluster
Learn how to get production ready and harden Kubernetes operations, networking, and storage
Who this book is for
Getting Started with Kubernetes is for developers, system administrators, and DevOps engineers who want to automate the deployment process and scale their applications. No prior knowledge of Kubernetes is required.

Docker and Kubernetes for Java Developers

Every day, companies struggle to scale critical applications. As traffic volume and data demands increase, these applications become more complicated and brittle, exposing risks and compromising availability. This practical guide shows IT, devops, and system reliability managers how to prevent an application from becoming slow, inconsistent, or downright unavailable as it grows. Scaling isn't just about handling more users; it's also about managing risk and ensuring availability. Author Lee Atchison provides basic techniques for building applications that can handle huge quantities of traffic, data, and demand without affecting the quality your customers expect. In five parts, this book explores: Availability: learn techniques for building highly available applications, and for tracking and improving availability going forward Risk management: identify, mitigate, and manage risks in your application, test your recovery/disaster plans, and build out systems that contain fewer risks Services and microservices: understand the value of services for building complicated applications that need to operate at higher scale Scaling applications: assign services to specific teams, label the criticalness of each service, and devise failure scenarios and recovery plans Cloud services: understand the structure of cloud-based services, resource allocation, and service distribution

Learn Docker in a Month of Lunches

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.

The Complete Kubernetes Guide

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Start using Kubernetes in complex big data and enterprise applications, including Docker containers. Starting with installing Kubernetes on a single node, the book introduces Kubernetes with a simple Hello example and discusses using environment variables in Kubernetes. Next, Kubernetes Microservices with Docker discusses using Kubernetes with all major groups of technologies such as relational databases, NoSQL databases, and in the Apache Hadoop ecosystem. The book concludes with using multi container pods and installing Kubernetes on a multi node cluster. /div "a concise but clear introduction to containers, Docker and Kubernetes, using simple real-world examples to pass on the core concepts, via repetition, and is a very useful enabler." 10/10 Dave Hay MBCS CITP: review for BCS, The Chartered Institute for IT (<http://www.bcs.org/content/conWebDoc/58512>) What You Will Learn Install Kubernetes on a single node Set environment variables Create multi-container pods using Docker Use volumes Use Kubernetes with the Apache Hadoop ecosystem, NoSQL databases, and RDBMSs Install Kubernetes on a multi-node cluster Who This Book Is For Application developers including Apache Hadoop developers, database developers and NoSQL developers.

Terraform: Up & Running

Learn how to automate and manage your containers and reduce the overall operation burden on your system. Key Features Use containers to manage, scale and orchestrate apps in your organization Transform the latest concept of

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Kubernetes 1.10 into examples Expert techniques for orchestrating containers effectively Book Description Kubernetes is an open source orchestration platform to manage containers in a cluster environment. With Kubernetes, you can configure and deploy containerized applications easily. This book gives you a quick brush up on how Kubernetes works with containers, and an overview of main Kubernetes concepts, such as Pods, Deployments, Services and etc. This book explains how to create Kubernetes clusters and run applications with proper authentication and authorization configurations. With real-world recipes, you'll learn how to create high availability Kubernetes clusters on AWS, GCP and in on-premise datacenters with proper logging and monitoring setup. You'll also learn some useful tips about how to build a continuous delivery pipeline for your application. Upon completion of this book, you will be able to use Kubernetes in production and will have a better understanding of how to manage containers using Kubernetes. What you will learn Build your own container cluster Deploy and manage highly scalable, containerized applications with Kubernetes Build high-availability Kubernetes clusters 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 Who this book is for This book is for system administrators, developers, DevOps engineers, or any stakeholder who wants to understand how Kubernetes works using a recipe-based approach. Basic knowledge of Kubernetes and Containers is required.

Kubernetes Cookbook

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

OpenShift for Developers

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-

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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) Brikman walks 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

Kubernetes on AWS

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

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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

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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

Kubernetes for Developers

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

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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

Kubernetes Patterns

Take container cluster management to the next level; learn how to administer and configure Kubernetes on CoreOS; and apply suitable management design patterns such as Configmaps, Autoscaling, elastic resource usage, and high availability. Some of the other features discussed are logging, scheduling, rolling updates, volumes, service types, and multiple cloud provider zones. The atomic unit of modular container service in Kubernetes is a Pod, which is a group of containers with a common filesystem and networking. The Kubernetes Pod abstraction enables design patterns for containerized applications similar to object-oriented design patterns. Containers provide some of the same benefits as software objects such as modularity or packaging, abstraction, and reuse. CoreOS Linux is used in the majority of the chapters and other platforms discussed are CentOS with OpenShift, Debian 8 (jessie) on AWS, and Debian 7 for Google Container Engine. CoreOS is the main focus because Docker is pre-installed on CoreOS out-of-the-box. CoreOS: Supports most cloud providers (including Amazon AWS EC2 and Google Cloud Platform) and virtualization platforms (such as VMWare and VirtualBox) Provides Cloud-Config for declaratively configuring for OS items such as

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network configuration (flannel), storage (etcd), and user accounts Provides a production-level infrastructure for containerized applications including automation, security, and scalability Leads the drive for container industry standards and founded appc Provides the most advanced container registry, Quay Docker was made available as open source in March 2013 and has become the most commonly used containerization platform. Kubernetes was open-sourced in June 2014 and has become the most widely used container cluster manager. The first stable version of CoreOS Linux was made available in July 2014 and since has become one of the most commonly used operating system for containers. What You'll Learn Use Kubernetes with Docker Create a Kubernetes cluster on CoreOS on AWS Apply cluster management design patterns Use multiple cloud provider zones Work with Kubernetes and tools like Ansible Discover the Kubernetes-based PaaS platform OpenShift Create a high availability website Build a high availability Kubernetes master cluster Use volumes, configmaps, services, autoscaling, and rolling updates Manage compute resources Configure logging and scheduling Who This Book Is For Linux admins, CoreOS admins, application developers, and container as a service (CAAS) developers. Some pre-requisite knowledge of Linux and Docker is required. Introductory knowledge of Kubernetes is required such as creating a cluster, creating a Pod, creating a service, and creating and scaling a replication controller. For introductory Docker and Kubernetes information, refer to Pro Docker (Apress) and Kubernetes Microservices with Docker (Apress). Some pre-requisite knowledge about using Amazon Web Services (AWS) EC2, CloudFormation, and VPC is also

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required.

The Kubernetes Book

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.

Kubernetes Cookbook

Start deploying, managing, and scaling containerized applications into AWS container infrastructure using Docker on Amazon EC2, Amazon Elastic Container Service (ECS), and AWS Elastic Kubernetes Service (EKS). This step by step practical book will cover all the available container services on AWS and review the usage of each one based on your required scale and cost. Further, you will see how to set up each environment and finally deploy, manage, and scale containerized applications on each one. In the chapter about Elastic Kubernetes Service (EKS), you will learn the process of building and managing Kubernetes clusters on AWS and see how to provision hosts in a matter of minutes, while deploying containers in seconds and making them available globally. Deploy Containers on AWS shows you how to get started with AWS container offerings and manage production or test environments of containerized applications using a hands-on approach with step-by-step instructions. What You Will Learn Deploy and manage containers with Docker on Amazon EC2 Store and retrieve container images using the Amazon EC2 container registry Orchestrate containers with Amazon Elastic Container Service (ECS) Run Kubernetes-managed infrastructure on AWS (EKS) Monitor, manage, back up, and restore containers on AWS Who This Book Is For Developers, cloud and systems administrators, and architects

Getting Started with Kubernetes

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

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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.

Monolith to Microservices

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

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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

Managing Kubernetes

Use this beginner's guide to understand and work with Kubernetes on the Google Cloud Platform and go from single monolithic Pods (the smallest unit deployed and managed by Kubernetes) all the way up to distributed, fault-tolerant stateful backing stores. You need only a familiarity with Linux, Bash, and Python to successfully use this book. Proficiency in Docker or cloud technology is not required. You will follow a learn-by-doing approach, running small experiments and

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observing the effects. Google open sourced Kubernetes in 2015 and now it is the industry standard in container orchestration. It has been adopted by all leading vendors of cloud, on-prem, and hybrid infrastructure services: Microsoft (Azure AKS), Amazon (AWS EKS), IBM (IBM Cloud Kubernetes Services), Alibaba Cloud (ACK), RedHat (OpenShift), and Pivotal (PKS). Even though Kubernetes is offered by all of the market-leading cloud providers, the Google Cloud Platform (GCP) offers an integrated shell (Google Cloud Shell) and a \$300 credit to get started, which makes it the ideal platform to not only learn Kubernetes but also to implement final production workloads.

What You Will Learn

- Set up a Kubernetes cluster in GCP
- Deploy simple Docker images using monolithic Pods
- Arrange highly available and highly scalable applications using Deployments
- Achieve zero-downtime deployments using the Service controller
- Externalize configuration using ConfigMaps and Secrets
- Set up batch processes and recurrent tasks using Jobs and CronJobs
- Install horizontal (sidecar pattern) services using DaemonSets
- Implement distributed, stateful backing stores using StatefulSets

Who This Book Is For

Beginners with basic Linux admin and scripting skills (Bash and Python). Proficiency with Docker is not required as all examples in the book use off-the-shelf public images from Docker Hub.

Kubernetes for Full-Stack Developers

Exploit design, deployment, and management of large-scale containers Key

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Features Explore the latest features available in Kubernetes 1.10 Ensure that your clusters are always available, scalable, and up to date Master the skills of designing and deploying large clusters on various cloud platforms Book Description Kubernetes is an open source system that is used to automate the deployment, scaling, and management of containerized applications. If you are running more containers or want automated management of your containers, you need Kubernetes at your disposal. To put things into perspective, Mastering Kubernetes walks you through the advanced management of Kubernetes clusters. To start with, you will learn the fundamentals of both Kubernetes architecture and Kubernetes design in detail. You will discover how to run complex stateful microservices on Kubernetes including advanced features such as horizontal pod autoscaling, rolling updates, resource quotas, and persistent storage backend. Using real-world use cases, you will explore the options for network configuration, and understand how to set up, operate, and troubleshoot various Kubernetes networking plugins. In addition to this, you will get to grips with custom resource development and utilization in automation and maintenance workflows. To scale up your knowledge of Kubernetes, you will encounter some additional concepts based on the Kubernetes 1.10 release, such as Prometheus, Role-based access control, API aggregation, and more. By the end of this book, you'll know everything you need to graduate from intermediate to advanced level of understanding Kubernetes. What you will learn Architect a robust Kubernetes cluster for long-time operation Discover the advantages of running Kubernetes on GCE, AWS, Azure,

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and bare metal Understand the identity model of Kubernetes, along with the 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 Enjoy the art of running complex stateful applications in your container environment Deliver applications as standard packages Who this book is for Mastering Kubernetes is for you if you are a system administrator or a developer who has an intermediate understanding of Kubernetes and wish to master its advanced features. Basic knowledge of networking would also be helpful. In all, this advanced-level book provides a smooth pathway to mastering Kubernetes.

Getting Started with Kubernetes

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.

Mastering Kubernetes

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How do you detangle a monolithic system and migrate it to a microservice architecture? How do you do it while maintaining business-as-usual? As a companion to Sam Newman's extremely popular Building Microservices, this new book details a proven method for transitioning an existing monolithic system to a microservice architecture. With many illustrative examples, insightful migration patterns, and a bevy of practical advice to transition your monolith enterprise into a microservice operation, this practical guide covers multiple scenarios and strategies for a successful migration, from initial planning all the way through application and database decomposition. You'll learn several tried and tested patterns and techniques that you can use as you migrate your existing architecture. Ideal for organizations looking to transition to microservices, rather than rebuild Helps companies determine whether to migrate, when to migrate, and where to begin Addresses communication, integration, and the migration of legacy systems Discusses multiple migration patterns and where they apply Provides database migration examples, along with synchronization strategies Explores application decomposition, including several architectural refactoring patterns Delves into details of database decomposition, including the impact of breaking referential and transactional integrity, new failure modes, and more

Docker Deep Dive

Kubernetes is the operating system of the cloud-native world, providing a reliable

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and scalable platform for running containerized workloads. This book shows developers and operations staff how to apply industry-standard DevOps practices to Kubernetes in a cloud-native context. You'll learn all about the Kubernetes ecosystem and discover battle-tested solutions to everyday problems. 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 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 Design your own cloud-native services and infrastructure 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 observability and monitoring Secure your containers and clusters in production Adopt DevOps principles to help make your development teams lean, fast, and effective

Kubernetes - A Complete DevOps Cookbook

To facilitate scalability and resilience, many organizations now run applications in cloud native environments using containers and orchestration. But how do you

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know if the deployment is secure? This practical book examines key underlying technologies to help developers, operators, and security professionals assess security risks and determine appropriate solutions. Author Liz Rice, VP of open source engineering at Aqua Security, looks at how the building blocks commonly used in container-based systems are constructed in Linux. You'll understand what's happening when you deploy containers and learn how to assess potential security risks that could affect your deployments. If you run container applications with kubectl or docker and use Linux command-line tools such as ps and grep, you're ready to get started. Explore attack vectors that affect container deployments Dive into the Linux constructs that underpin containers Examine measures for hardening containers Understand how misconfigurations can compromise container isolation Learn best practices for building container images Identify container images that have known software vulnerabilities Leverage secure connections between containers Use security tooling to prevent attacks on your deployment

Container Security

Design, deploy, and manage large-scale containers using Kubernetes Key Features Gain insight into the latest features of Kubernetes, including Prometheus and API aggregation Discover ways to keep your clusters always available, scalable, and up-to-date Master the skills of designing and deploying large clusters on various cloud

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platforms Book Description If you are running a number of containers and want to be able to automate the way they're managed, it can be helpful to have Kubernetes at your disposal. This Learning Path guides you through core Kubernetes constructs, such as pods, services, replica sets, replication controllers, and labels. You'll get started by learning how to integrate your build pipeline and deployments in a Kubernetes cluster. As you cover more chapters in the Learning Path, you'll get up to speed with orchestrating updates behind the scenes, avoiding downtime on your cluster, and dealing with underlying cloud provider instability in your cluster. With the help of real-world use cases, you'll also explore options for network configuration, and understand how to set up, operate, and troubleshoot various Kubernetes networking plugins. In addition to this, you'll gain insights into custom resource development and utilization in automation and maintenance workflows. By the end of this Learning Path, you'll have the expertise you need to progress from an intermediate to an advanced level of understanding Kubernetes. This Learning Path includes content from the following Packt products: Getting Started with Kubernetes - Third Edition by Jonathan Baier and Jesse White Mastering Kubernetes - Second Edition by Gigi Sayfan What you will learn Download, install, and configure the Kubernetes code base Create and configure custom Kubernetes resources Use third-party resources in your automation workflows Deliver applications as standard packages Set up and access monitoring and logging for Kubernetes clusters Set up external access to applications running in the cluster Manage and scale Kubernetes with hosted platforms on Amazon Web

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Services (AWS), Azure, and Google Cloud Platform (GCP) Run multiple clusters and manage them from a single control plane Who this book is for If you are a developer or a system administrator with an intermediate understanding of Kubernetes and want to master its advanced features, then this book is for you. Basic knowledge of networking is required to easily understand the concepts explained.

Designing Data-Intensive Applications

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

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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 Microservices with Docker

A hands-on and introductory guide to the art of modern application and infrastructure monitoring and metrics. We start small and then build on what you

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learn to scale out to multi-site, multi-tier applications. The book is written for both developers and sysadmins. We focus on building monitored and measurable applications. We also use tools that are designed to handle the challenges of managing Cloud, containerised and distributed applications and infrastructure. In the book we'll deliver:

- * An introduction to monitoring, metrics and measurement.
- * A scalable framework for monitoring hosts (including Docker and containers), services and applications built on top of the Riemann event stream processor.
- * Graphing and metric storage using Graphite and Grafana.
- * Logging with Logstash.
- * A framework for high quality and useful notifications
- * Techniques for developing and building monitorable applications
- * A capstone that puts all the pieces together to monitor a multi-tier application.

Kubernetes in Action

Keen to build web applications for the cloud? Get a quick hands-on introduction to OpenShift, the open source Platform as a Service (PaaS) offering from Red Hat. With this practical guide, you'll learn the steps necessary to build, deploy, and host a complete real-world application on OpenShift without having to slog through long, detailed explanations of the technologies involved. OpenShift enables you to use Docker application containers and the Kubernetes cluster manager to automate the way you create, ship, and run applications. Through the course of the book, you'll learn how to use OpenShift and the Wildfly application server to

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build and then immediately deploy a Java application online. Learn about OpenShift's core technology, including Docker-based containers and Kubernetes Use a virtual machine with OpenShift installed and configured on your local environment Create and deploy your first application on the OpenShift platform Add language runtime dependencies and connect to a database Trigger an automatic rebuild and redeployment when you push changes to the repository Get a working environment up in minutes with application templates Use commands to check and debug your application Create and build Docker-based images for your application

Kubernetes Operators

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

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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 Management Design Patterns

Build a Keras model to scale and deploy on a Kubernetes cluster We have seen an exponential growth in the use of Artificial Intelligence (AI) over last few years. AI is becoming the new electricity and is touching every industry from retail to manufacturing to healthcare to entertainment. Within AI, we're seeing a particular growth in Machine Learning (ML) and Deep Learning (DL) applications. ML is all about learning relationships from labeled (Supervised) or unlabeled data (Unsupervised). DL has many layers of learning and can extract patterns from unstructured data like images, video, audio, etc. em style="box-sizing: border-box;"Keras to Kubernetes: The Journey of a Machine Learning Model to Production takes you through real-world examples of building DL models in Keras for recognizing product logos in images and extracting sentiment from text. You will then take that trained model and package it as a web application container before learning how to deploy this model at scale on a Kubernetes cluster. You will

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understand the different practical steps involved in real-world ML implementations which go beyond the algorithms. • Find hands-on learning examples • Learn to uses Keras and Kubernetes to deploy Machine Learning models • Discover new ways to collect and manage your image and text data with Machine Learning • Reuse examples as-is to deploy your models • Understand the ML model development lifecycle and deployment to production If you're ready to learn about one of the most popular DL frameworks and build production applications with it, you've come to the right place!

Architecting for Scale

Feb 2018.This is the ultimate book for learning Docker, brought to you by Docker Captain and leading educator in the container ecosystem Nigel Poulton.

Cloud Native DevOps with Kubernetes

Data is at the center of many challenges in system design today. Difficult issues need to be figured out, such as scalability, consistency, reliability, efficiency, and maintainability. In addition, we have an overwhelming variety of tools, including relational databases, NoSQL datastores, stream or batch processors, and message brokers. What are the right choices for your application? How do you make sense

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of all these buzzwords? In this practical and comprehensive guide, author Martin Kleppmann helps you navigate this diverse landscape by examining the pros and cons of various technologies for processing and storing data. Software keeps changing, but the fundamental principles remain the same. With this book, software engineers and architects will learn how to apply those ideas in practice, and how to make full use of data in modern applications. Peer under the hood of the systems you already use, and learn how to use and operate them more effectively Make informed decisions by identifying the strengths and weaknesses of different tools Navigate the trade-offs around consistency, scalability, fault tolerance, and complexity Understand the distributed systems research upon which modern databases are built Peek behind the scenes of major online services, and learn from their architectures

Winning with Data

This book is designed to introduce you to using containers and Kubernetes for full-stack development. You'll learn how to develop a full-stack application using Node.js and MongoDB and how to and manage them using Docker, then Docker Compose, and finally Kubernetes.

From Containers to Kubernetes with Node.js

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Go from zero to sixty deploying and running a Kubernetes cluster on Microsoft Azure! This hands-on practical guide to Microsoft's Azure Kubernetes Service (AKS), a managed container orchestration platform, arms you with the tools and knowledge you need to easily deploy and operate on this complex platform. Take a journey inside Docker containers, container registries, Kubernetes architecture, Kubernetes components, and core Kubectl commands. Drawing on hard-earned experience in the field, the authors provide just enough theory to help you grasp important concepts, teaching the practical straightforward knowledge you need to start running your own AKS cluster. You will dive into topics related to the deployment and operation of AKS, including Rancher for management, security, networking, storage, monitoring, backup, scaling, identity, package management with HELM, and AKS in CI/CD. What You Will Learn Develop core knowledge of Docker containers, registries, and Kubernetes Gain AKS skills for Microsoft's fastest growing services in the cloud Understand the pros and cons of deploying and operating AKS Deploy and manage applications on the AKS platform Use AKS within a DevOps CI/CD process Who This Book Is For IT professionals who work with DevOps, the cloud, Docker, networking, storage, Linux, or Windows. Experience with cloud, DevOps, Docker, or application development is helpful.

Beginning Kubernetes on the Google Cloud Platform

Learn to implement DevOps using Docker & Kubernetes. About This Book Learning

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DevOps, container, and Kubernetes within one book. Leverage Kubernetes as a platform to deploy, scale, and run containers efficiently. A practical guide towards container management and orchestration Who This Book Is For This book is targeted for anyone, who wants to learn containerization and clustering in a practical way using Kubernetes. No prerequisite skills required, however, essential DevOps skill and public/private Cloud knowledge will accelerate the reading speed. If you're advanced readers, you can also get a deeper understanding of all the tools and technique described in the book. What You Will Learn Learn fundamental and advanced DevOps skills and tools Get a comprehensive understanding for container Learn how to move your application to container world Learn how to manipulate your application by Kubernetes Learn how to work with Kubernetes in popular public cloud Improve time to market with Kubernetes and Continuous Delivery Learn how to monitor, log, and troubleshoot your application with Kubernetes In Detail Containerization is said to be the best way to implement DevOps. Google developed Kubernetes, which orchestrates containers efficiently and is considered the frontrunner in container orchestration. Kubernetes is an orchestrator that creates and manages your containers on clusters of servers. This book will guide you from simply deploying a container to administrate a Kubernetes cluster, and then you will learn how to do monitoring, logging, and continuous deployment in DevOps. The initial stages of the book will introduce the fundamental DevOps and the concept of containers. It will move on to how to containerize applications and deploy them into. The book will then introduce

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networks in Kubernetes. We then move on to advanced DevOps skills such as monitoring, logging, and continuous deployment in Kubernetes. It will proceed to introduce permission control for Kubernetes resources via attribute-based access control and role-based access control. The final stage of the book will cover deploying and managing your container clusters on the popular public cloud Amazon Web Services and Google Cloud Platform. At the end of the book, other orchestration frameworks, such as Docker Swarm mode, Amazon ECS, and Apache Mesos will be discussed. Style and approach Readers will be taken through fundamental DevOps skills and Kubernetes concept and administration with detailed examples. It introduces comprehensive DevOps topics, including microservices, automation tools, containers, monitoring, logging, continuous delivery, and popular public cloud environments. At each step readers will learn how to leverage Kubernetes in their everyday lives and transform their original delivery pipeline for fast and efficient delivery.

The Art of Monitoring

Understand the Kubernetes ecosystem and learn techniques to run fault-tolerant, scalable applications
Key Features* Gain insight into the inner workings of Kubernetes* Learn how to deploy and manage applications on Kubernetes* Explore ways to build and secure Kubernetes clusters
Book Description Kubernetes is the leading orchestrator of cloud-native apps. With knowledge of how to work with

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Kubernetes, you can easily deploy and manage applications on the cloud or in your on-premises data center. The book begins by introducing you to Kubernetes and showing you how to install it. You'll learn how to use Kubernetes Services and bring stable and reliable networking to apps that are deployed on Kubernetes. You'll delve deep into the powerful storage subsystem of Kubernetes and learn how to leverage the variety of external storage backends in your applications. As the book progresses, it shows you how to use features such as DaemonSets, Helm, and RBAC to enhance your Kubernetes applications. You'll explore the six categories of identifying vulnerabilities and look at a few ways to prevent and mitigate them. You'll also look at ways to secure the software delivery pipeline by discussing some image-related best practices. The book ends by sharing with you some resources that'll help take your Kubernetes knowledge to the next level. By the end of the book, you'll have the confidence and skills to leverage all the features of Kubernetes to develop scalable applications.

What you will learn*

- Explore cluster-level and node-level isolation and runtime isolation options*
- Use Kubernetes Deployments for self-healing, scaling, and updating apps*
- Manage Kubernetes clusters with kubectl*
- Write a Container Storage Interface (CSI) plugin to work across multiple orchestrators*
- Use Kubernetes features such as Jobs and CronJobs in your apps*
- Identify vulnerabilities and learn measures to prevent and mitigate them

Who this book is for

If you want to be more comfortable using Kubernetes to orchestrate your containerized applications, this is the ideal book for you. To easily grasp the concepts explained in this book, you must be familiar with Docker and

containers.

Istio: Up and Running

Have you been looking for the most efficient way to develop and deploy applications fast with Kubernetes and make your software development process (and test process) simpler but don't know how to get started? If you've answered YES, keep reading You Are 1-Click Away From Discovering How To Leverage The Power Of Kubernetes To Streamline And Fasten The Process Of Developing, Deploying And Testing Applications! Truth is, deploying containers is simple, and many software companies don't have a problem with it -at that level. However, when it comes to doing the actual running of containers in production, it becomes a huge problem because then you can end up with countless (sometimes even millions) containers -if you're using micro-services- over time. There is need to deploy, manage and connect them to the outside world- which includes scheduling and distribution, and I bet you wouldn't dare think of going about this process manually because of the size of dev or ops army you'd require to achieve that. Which is where Kubernetes, the best container orchestration system comes in. But you already know that, don't you? Perhaps you're here because you've been wondering: What is Kubernetes, and how does it work? How is Kubernetes different from other container management systems? What can Kubernetes do? How would it help me? How do I get Kubernetes on my computer system and get started? If

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you've been asking yourself these or similar questions, this book is about to become the best thing that has happened to your life and business recently (or ever). From the basics of this platform, its main features and pros, to how you can benefit from it and get started with it like a professional, this book offers to you everything you've been looking for! Here's a snapshot of what you'll learn from it: What Kubernetes is and how it works What containers are, and why they're important Why Google Kubernetes is stands out from many of other similar platforms out there The basic features of Kubernetes Details about the Kubernetes master, Node Components and Network How to set up Kubernetes in simple steps on Mac, Windows, Linux, Google Cloud, Microsoft Azure and AWS How to run containers on Kubernetes What you need to learn in advanced Kubernetes concepts including Kubectl, pods, ReplicaSet and Deployments How to work with services, load balancing and networks And much more! Are you ready to simplify your daily container workflow to make the (promised) potential of container technology a reality through automation? Are you ready to be able to handle storage, networking, alerting, logs and other tasks for all your containers automatically and join the countless enterprises that are enjoying increased efficiency and high returns following their adoption of this amazing technology? If you are, Scroll up and click Buy Now With 1-Click or Buy Now to get started!

The Docker Book

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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.

Deploy Containers on AWS

Learn to implement container orchestration on AWS with ease Key Features

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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

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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.

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