

The Kubernetes Book By Nigel Poulton Leanpub Ipad Kindle

Kubernetes has become an essential part of the daily work for most system, network, and cluster administrators today. But to work effectively together on a production-scale Kubernetes system, they must be able to speak the same language. This book provides a clear guide to the layers of complexity and abstraction that come with running a Kubernetes network. Authors James Strong and Vallery Lancey bring you up to speed on the intricacies that Kubernetes has to offer for large container deployments. If you're to be effective in troubleshooting and maintaining a production cluster, you need to be well versed in the abstraction provided at each layer. This practical book shows you how. Learn the Kubernetes networking model Choose the best interface for your clusters from the CNCF Container Network Interface project Explore the networking and Linux primitives that power Kubernetes Quickly troubleshoot networking issues and prevent downtime Examine cloud networking and Kubernetes using the three major providers: Amazon Web Services, Google Cloud, and Microsoft Azure Learn the pros and cons of various network tools--and how to select the best ones for your stack

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 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.

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

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

This book is a clear and informative introduction to cryptography and data protection - subjects of considerable social and political importance. It explains what algorithms do, how they are used, the risks associated with using them, and why governments should be concerned. Important areas are highlighted, such as Stream Ciphers, block ciphers, public key algorithms, digital signatures, and applications such as e-commerce. This book highlights the explosive impact of cryptography on modern society, with, for example, the evolution of the internet and the introduction of more sophisticated banking methods. ABOUT THE SERIES: The Very Short Introductions series from Oxford University Press contains hundreds of titles in almost every subject area. These pocket-sized books are the perfect way to get ahead in a new subject quickly. Our expert authors combine facts, analysis, perspective, new ideas, and enthusiasm to make interesting and challenging topics highly readable.

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

What "Kubernetes" does and how? After working in the technology and consulting ecosystem for the last 10 years, I am a huge supporter of simplification. While I understood the whole concept of Containerization and automating the deployment, I wanted to explain the bunch of newly recruited Technology Consultants in our team that how actually it's used and deployed. So, the logical topics to be explained with examples were: The Background of it? Why we needed this system in first place? How Kubernetes Operates? The Nuts and Bolts of the system. How it is deployed? Best Practices If these things are clear with examples then we can operate with confidence and manage the project well. So, here it is. All our discussions are formulated in a book to help you people to take your respective agenda ahead in your current role with conviction. The book has been written in a simple, easy to comprehend language and can be used by Non-Programmers, Project Managers, Business Consultants or any other persons with an interest in Kubernetes. So, move ahead with your Continuous Development journey with this new book and as I mentioned earlier: let's simplify the discussions around!

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.

Design, build, and operate scalable and reliable Kubernetes infrastructure for production Key Features Implement industry best practices to build and manage production-grade Kubernetes infrastructure Learn how to architect scalable Kubernetes clusters, harden container security, and fine-tune resource management Understand, manage, and operate complex business workloads confidently Book Description Although out-of-the-box solutions can help you to get a cluster up and running quickly, running a Kubernetes cluster that is optimized for production workloads is a challenge, especially for users with basic or intermediate knowledge. With detailed coverage of cloud industry standards and best practices for achieving scalability, availability, operational excellence, and cost optimization, this Kubernetes book is a blueprint for managing applications and services in production. You'll discover the most common way to deploy and operate Kubernetes clusters, which is to use a public cloud-managed service from AWS, Azure, or Google Cloud Platform (GCP). This book explores Amazon Elastic Kubernetes Service (Amazon EKS), the AWS-managed version of Kubernetes, for working through practical exercises. As you get to grips with implementation details specific to AWS and EKS, you'll understand the design concepts, implementation best practices, and configuration applicable to other cloud-managed services. Throughout the book, you'll also discover standard and cloud-agnostic tools, such as Terraform and Ansible, for provisioning and configuring infrastructure. By the end of this book, you'll be able to leverage Kubernetes to operate and manage your production environments confidently. What you will learn Explore different infrastructure architectures for Kubernetes deployment Implement optimal open source and commercial storage management solutions Apply best practices for provisioning and configuring Kubernetes clusters, including infrastructure as code (IaC) and configuration as code (CAC) Configure the cluster networking plugin and core networking components to get the best out of them Secure your Kubernetes environment using the latest tools and best practices Deploy core observability stacks, such as monitoring and logging, to fine-tune your infrastructure Who this book is for This book is for cloud infrastructure experts, DevOps engineers, site reliability engineers, and engineering managers looking to design and operate Kubernetes infrastructure for production. Basic knowledge of Kubernetes, Terraform, Ansible, Linux, and AWS is needed to get the most out of this book.

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

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 Velero. 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 Velero. 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.

Master PostgreSQL 12 features such as advanced indexing, high availability, monitoring, and much more to efficiently manage and maintain your database Key Features Grasp advanced PostgreSQL 12 concepts with real-world examples and sample datasets Explore query parallelism, data replication, database administration, and more Extend PostgreSQL functionalities to suit your organization's needs with minimal effort Book Description Thanks to its reliability, robustness, and high performance, PostgreSQL has become the most advanced open source database on the market. This third edition of Mastering PostgreSQL helps you build dynamic database solutions for enterprise applications using the latest release of PostgreSQL, which enables database analysts to design both physical and technical aspects of system architecture with ease. Starting with an introduction to the newly released features in PostgreSQL 12, this book will help you build efficient and fault-tolerant PostgreSQL applications. You'll thoroughly examine the advanced features of PostgreSQL, including logical replication, database clusters, performance tuning, monitoring, and user management. You'll also work with the PostgreSQL optimizer, configure PostgreSQL for high speed, and understand how to move from Oracle to PostgreSQL. As you progress through the chapters, you'll cover transactions, locking, indexes, and how to optimize queries for improved performance. Additionally, you'll learn how to manage network security and explore backups and replications while understanding useful PostgreSQL extensions to help you in optimizing the performance of large databases. By the end of this PostgreSQL book, you'll be able to get the most out of your database by implementing advanced administrative tasks effortlessly. What you will learn Understand the advanced SQL functions in PostgreSQL 12 Use indexing features in PostgreSQL to fine-tune the performance of queries Work with stored procedures and manage backup and recovery Master replication and failover techniques to reduce data loss Replicate PostgreSQL database systems to create backups and to scale your database Manage and improve the security of your server to protect your data Troubleshoot your PostgreSQL instance for solutions to common and not-so-common problems Who this book is for This book is for PostgreSQL developers and administrators and database professionals who want to implement advanced functionalities and master complex administrative tasks with PostgreSQL 12. Prior exposure to PostgreSQL as well as familiarity with the basics of database administration is expected.

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

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

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

Provides information on analyzing, designing, and writing object-oriented software.

Introductory book designed for SysAdmins, Operations staff, Developers and DevOps who are interested in building images using the open source tool Packer.

Giving you the confidence you need to take on Docker in the real world, this guide is the ultimate book for learning Docker, brought to you by Docker Captain and leading educator in the container ecosystem. --

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.

Apply microservices patterns to build resilient and scalable distributed systems Key Features Understand the challenges of building large-scale microservice landscapes Build cloud-native production-ready microservices with this comprehensive guide Discover how to get the best out of Spring Cloud, Kubernetes, and Istio when used together Book Description Microservices architecture allows developers to build and maintain applications with ease, and enterprises are rapidly adopting it to build software using Spring Boot as their default framework. With this book, you'll learn how to efficiently build and deploy microservices using Spring Boot. This microservices book will take you through tried and tested approaches to building distributed systems and implementing microservices architecture in your organization. Starting with a set of simple cooperating microservices developed using Spring Boot, you'll learn how you can add functionalities such as persistence, make your microservices reactive, and describe their APIs using Swagger/OpenAPI. As you advance, you'll understand how to add different services from Spring Cloud to your microservice system. The book also demonstrates how to deploy your microservices using Kubernetes and manage them with Istio for improved security and traffic management. Finally, you'll explore centralized log management using the EFK stack and monitor microservices using Prometheus and Grafana. By the end of this book, you'll be able to build microservices that are scalable and robust using Spring Boot and Spring Cloud. What you will learn Build reactive microservices using Spring Boot Develop resilient and scalable microservices using Spring Cloud Use OAuth 2.0/OIDC and Spring Security to protect public APIs Implement Docker to bridge the gap between development, testing, and production Deploy and manage microservices using Kubernetes Apply Istio for improved security, observability, and traffic management Who this book is for This book is for Java and Spring developers and architects who want to learn how to break up their existing monoliths into microservices and deploy them either on-premises or in the cloud using Kubernetes as a container orchestrator and Istio as a service Mesh. No familiarity with microservices architecture is required to get started with this book.

GitOps and Kubernetes is half reference, half practical tutorial for operating Kubernetes the GitOps way. Through fast-paced chapters, you'll unlock the benefits of GitOps for flexible configuration management, monitoring, robustness, multi-environment support, and discover tricks and tips for managing secrets in the unique GitOps fashion. GitOps and Kubernetes introduces a radical idea--managing your infrastructure with the same Git pull requests you use to manage your codebase. In this in-depth

tutorial, you'll learn to operate infrastructures based on powerful-but-complex technologies with the same Git version control tools most developers use daily. GitOps and Kubernetes is half reference, half practical tutorial for operating Kubernetes the GitOps way. Through fast-paced chapters, you'll unlock the benefits of GitOps for flexible configuration management, monitoring, robustness, multi-environment support, and discover tricks and tips for managing secrets in the unique GitOps fashion. Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications.

Start from scratch and develop the essential skills needed to create, deploy, and manage cloud-native applications using Docker
Key Features Get a solid understanding of Docker and containers Overcome common problems while containerizing an application Master Docker commands needed for creating, deploying, and running applications Book Description Most applications, even the funky cloud-native microservices ones, need high-performance, production-grade infrastructure to run on. Having impeccable knowledge of Docker will help you to thrive in the modern cloud-first world. With this book, you'll gain the skills you need to work with Docker and its containers. The book begins with an introduction to containers and explains its functionality and application in the real world. You'll then get an overview of VMware, Kubernetes, and Docker and learn to install Docker on Windows, Mac, and Linux. Once you've understood the Ops and Dev perspective of Docker, you'll be able to see the big picture and understand what Docker exactly does. The book then turns its attention to the more technical aspects, guiding your through practical exercises covering Docker engine, Docker images, and Docker containers. You'll learn techniques for containerizing an app, deploying apps with Docker Compose, and managing cloud-native applications with Swarm. You'll also build Docker networks and Docker overlay networks and handle applications that write persistent data. Finally, you'll deploy apps with Docker stacks and secure your Docker environment. By the end of this book, you'll be well-versed in Docker and containers and have developed the skills to create, deploy, and run applications on the cloud. What you will learn Become familiar with the applications of Docker and containers Discover how to pull images into Docker host's local registry Find out how to containerize an app Build and test a Docker overlay network in the swarm mode Use Docker compose to deploy and manage multi-container applications Securely share sensitive data with containers and Swarm services Who this book is for Whether you are a beginner or an experienced developer looking to utilize Docker to develop and operate cloud-native microservices apps, this book is for you. Anyone who wants to learn Docker orchestration, networking, imaging, and security will also find it useful. No prior knowledge of Docker is necessary.

Whether you're deploying applications on-premise or in the cloud, this cookbook is for developers, operators, and IT professionals who need practical solutions for using Docker. The recipes in this book will help developers go from zero knowledge to distributed applications packaged and deployed within a couple of chapters. IT professionals will be able to use this cookbook to solve everyday problems, as well as create, run, share, and deploy Docker images quickly. Operators will learn and understand what developers are excited about and start to adopt the tools that will change the way they work.--

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) 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

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.

Get hands-on recipes to automate and manage Linux containers with the Docker 1.6 environment and jump-start your Puppet development About This Book Successfully deploy DevOps with proven solutions and recipes Automate your infrastructure with Puppet and combine powerful DevOps methods Deploy and manage highly scalable applications using Kubernetes streamline the way you manage your applications Who This Book Is For This Learning Path is for developers, system administrators, and DevOps engineers who want to use Puppet, Docker, and Kubernetes in their development, QA, or production environments. This Learning Path assumes experience with Linux administration and requires some experience with command-line usage and basic text file editing. What You Will Learn Discover how to build high availability Kubernetes clusters Deal with inherent issues with container virtualization and container concepts Create services with Docker to enable the swift development and deployment of applications Make optimum use of Docker in a testing environment Create efficient manifests to streamline your deployments Automate Puppet master deployment using Git hooks, r10k, and PuppetDB In Detail With so many IT management and DevOps tools on the market, both open source and commercial, it's difficult to know where to start. DevOps is incredibly powerful when implemented correctly, and here's how to get it done. This Learning Path covers three broad areas: Puppet, Docker, and Kubernetes. This Learning Path is a large resource of recipes to ease your daily DevOps tasks. We begin with recipes that help you develop a complete and expert understanding of Puppet's latest and most advanced features. Then we provide recipes that help you efficiently work with the Docker environment. Finally, we show you how to better manage containers in different scenarios in production using Kubernetes. This course is based on these books: Puppet Cookbook, Third Edition Docker Cookbook Kubernetes Cookbook Style and approach This easy-to-follow tutorial-style guide teaches you precisely how to configure complex systems in Puppet and manage your containers using Kubernetes.

Build robust and secure applications using the building blocks of Docker
Key Features
a- Understand the fundamentals of Containers.
a- Understand the working of the entire Docker ecosystem.
a- Learn how to utilize Docker Networking capabilities to its fullest.
a- Learn how to secure Docker Containers.
a- Get familiar and work with Docker Enterprise Edition.
Description
The book

starts by introducing Containers and explains how they are different from virtual machines, and why they are the preferred tool for developing applications. You will understand the working of Images, Containers, and their associated Storage and will see how all the moving parts bind together to work synchronously. The book will then focus on Docker Swarm, the mechanism for orchestrating several running Docker containers. It then delves deeper into Docker Networking. Towards the end, you will learn how to secure your applications, especially by leveraging the native features of Docker Enterprise Edition. What will you learn? - Learn how to use Docker Images. - Get to know more about Docker Storage. - Learn how to use Volume plugins in Docker services. - Learn how to deploy a service to the Swarm. - Learn how to manage, scale, and maintain containerized applications. Who this book is for This book is for anyone who is looking to learn Docker. It is also useful for professionals who are looking to build and deploy web apps using Docker. Table of Contents 1. Introduction to Containerization and Docker 2. Containers and Images 3. Storage Drivers and Volumes 4. The Container Network Model and the Docker Bridge 5. Docker Swarm 6. Docker Networking 7. Docker Security - I 8. Docker Security - II About the Authors Saibal Ghosh has spent a substantial part of his career working with databases. However, in the last few years, he gravitated towards the cloud, cloud security, and newer technologies like Docker and Kubernetes. He has developed a deep understanding of these concepts and technologies bolstered by the insight gained from many years of experience working with applications, databases, storage and infrastructure, and the understanding of how data is stored, moved, and secured. He currently works as a Principal Architect in Ericsson India Ltd. and spends a substantial amount of time playing around with Docker and Kubernetes. He holds numerous certifications around applications, databases, cloud, and cloud security and is also a member of Leader's Excellence, Harvard Square. Your LinkedIn Profile: <https://www.linkedin.com/in/saibal-ghosh-mle%E2%84%A0-ccsk-prince2-%C2%AE-469b0a7/>

Klingon Edition - September 2020. This is a special Klingon tribute edition of The Kubernetes Book. The front cover has the title of the book and the YAML code in Klingon script, however, the rest of the book is written in English. Every page and every example has been checked against the latest versions of Kubernetes (1.18) 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 their own set of challenges. This is where Kubernetes enters the scene. 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 private cloud at your on-premises datacenter. The Kubernetes Book starts from the beginning, explains all concepts in a clear and friendly manner, and covers everything needed for you to become proficient at Kubernetes. It even includes two chapters dedicated to threat-modeling Kubernetes and real-world security. You'll learn: - Kubernetes architecture - How to build Kubernetes - How to deploy, self-heal, scale, and perform rolling updates on applications - 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 at least once per year, meaning it's always up-to-date with the latest versions of Kubernetes and the latest trends in the cloud-native ecosystem.

To facilitate scalability and resilience, many organizations now run applications in cloud native environments using containers and orchestration. But how do you 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, Chief Open Source Officer at Isovalent, 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

A hands-on, introductory book about managing infrastructure with Terraform. Start small and then build on what you learn to scale up to complex infrastructure. Written for both developers and sysadmins. Focuses on how to build infrastructure and applications with Terraform. The book contains: Chapter 1: An Introduction to Terraform Chapter 2: Installing Terraform Chapter 3: Building our first application Chapter 4: Provisioning and Terraform Chapter 5: Collaborating with Terraform Chapter 6: Building a multi-environment architecture Chapter 7: Infrastructure testing Updated for Terraform 0.12!

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. 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 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 Kubernetes Book

Enhance your skills in building scalable infrastructure for your cloud-based applications Key Features Learn to design a scalable architecture by building continuous integration (CI) pipelines with Kubernetes Get an in-depth understanding of role-based access control (RBAC), continuous deployment (CD), and observability Monitor a Kubernetes cluster with Prometheus and Grafana Book Description Kubernetes is among the most popular open-source platforms for automating the deployment, scaling, and operations of application containers across clusters of hosts, providing a container-centric infrastructure. Hands-On Microservices with Kubernetes starts by providing you with in-depth insights into the synergy between Kubernetes and microservices. You will learn how to use Delinkcious, which will serve as a live lab throughout the book to help you understand microservices and Kubernetes concepts in the context of a real-world application. Next, you will get up to speed with setting up a CI/CD pipeline and configuring microservices using Kubernetes ConfigMaps. As you cover later chapters, you will gain hands-on experience in securing microservices, and implementing REST, gRPC APIs, and a Delinkcious data store. In addition to this, you'll explore the Nuclio project, run a serverless task on Kubernetes, and manage and implement data-intensive tests. Toward the concluding chapters, you'll deploy microservices on Kubernetes and learn to maintain a well-monitored system. Finally, you'll discover the importance of service meshes and how to incorporate Istio into the Delinkcious cluster. By the end of this book, you'll have gained the skills you need to implement microservices on Kubernetes with the help of effective tools and best practices. What you will learn Understand the synergy between Kubernetes and microservices Create a complete CI/CD pipeline for your microservices on Kubernetes Develop microservices on Kubernetes with the Go kit framework using best practices Manage and monitor your system using Kubernetes and open-source tools Expose your services through REST and gRPC APIs Implement and deploy serverless functions as a service Externalize authentication, authorization and traffic shaping using a service mesh Run a Kubernetes cluster in the cloud on Google Kubernetes Engine Who this book is for This book is for developers, DevOps engineers, or anyone who wants to develop large-scale microservice-based systems on top of Kubernetes. If you are looking to use Kubernetes on live production projects or want to migrate existing systems to a modern containerized microservices system, then this book is for you. Coding skills, together with some knowledge of Docker, Kubernetes, and cloud concepts will be useful.

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 Kubectl, 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 Kubectl, 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.

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.

Containers are here and resistance is futile! Now that we're getting our heads around Docker, we need an orchestration platform to help us manage our containerized apps. Kubernetes has emerged as the hottest and most important container orchestration platform in the world. This book gets you up to speed fast, and it's constantly kept up-to-date! Master all the concepts and tools necessary to start administering a Kubernetes cluster and deploying applications to production. You will cover the entire curricula of the two Kubernetes certifications (for application developers and administrators). The initial chapters guide you through deployment of a Kubernetes cluster on virtual machines and explore the different components of the control plane. Next, you will work with the kubectl command-line tool; namespaces, labels, selectors, and annotations—common resources used through the Kubernetes API. The following chapters describe the principle of controllers and detail how workload controllers work as well as the possibilities for configuring deployed applications. You will also learn how to deploy a scalable and self-healing application, how pods are scheduled to nodes, how parts of the application can communicate, and how the application is discoverable from the outside. Next, you will cover security concerns describing the different authentication methods, the RBAC authorization mode, security contexts, network policies, and how to secure container images. You will also cover using persistent volumes for your containers to store long-term data, monitoring your clusters and applications and implementing design patterns for multi-container pods. The concluding chapters guide you through the upgrade of your deployed cluster. After reading this book, you will have enough knowledge to deploy a complex application using a Kubernetes cluster and be ready for the certification exams. What You Will Learn Deploy a Kubernetes cluster with kubeadm and learn how the control plane works Discover how the Kubernetes API is structured Deploy secure, auto-scaled, and self-healing applications Master the kubectl command-line tool Who This Book Is For Administrators and application developers with good knowledge of micro-services development and deployment.

Harness Kubernetes' extensibility to deploy modern patterns and learn to effectively handle production issues Key Features Build and run efficient cloud-native applications on Kubernetes using industry best practices Operate Kubernetes in a production environment, troubleshoot clusters, and address security concerns Deploy cutting-edge Kubernetes patterns such as service mesh and serverless to your cluster Book Description Kubernetes is a modern cloud native container orchestration tool and one of the most popular open source projects worldwide. In addition to the technology being powerful and highly flexible, Kubernetes engineers are in high demand across the industry. This book is a comprehensive guide to deploying, securing, and operating modern cloud native applications on Kubernetes. From the fundamentals to Kubernetes best practices, the book covers essential aspects of configuring applications. You'll even explore real-world techniques for running clusters in production, tips for setting up observability for cluster resources, and valuable troubleshooting techniques. Finally, you'll learn how to extend and customize Kubernetes, as well as gaining tips for deploying service meshes, serverless tooling, and more on your cluster. By the end of this Kubernetes book, you'll be equipped with the tools you need to confidently run and extend modern applications on Kubernetes. What you will learn Set up Kubernetes and configure its authentication Deploy your applications to Kubernetes Configure and provide storage to Kubernetes applications Expose Kubernetes applications outside the cluster Control where and how applications are run on Kubernetes Set up observability for Kubernetes Build a continuous integration and continuous deployment (CI/CD) pipeline for Kubernetes Extend Kubernetes with service meshes, serverless, and more Who this

book is for This book is for developers, architects, DevOps engineers, or anyone interested in developing and managing cloud-native applications. Those already running cloud applications and looking for a better way to manage their platform or others interested in a career change given the recent popularity of Kubernetes will also find this book helpful. Some familiarity with cloud computing, containers and DevOps is required, but no prior knowledge of building production applications using Kubernetes is needed to get started with this book.

This workshop takes you through a Kubernetes-oriented application delivery pipeline in a practical way. You'll learn how to manage containers efficiently and scale and stabilize cloud-native applications using Kubernetes.

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.

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