

# Red Hat Ceph Storage

Over 100 effective recipes to help you design, implement, and troubleshoot manage the software-defined and massively scalable Ceph storage system. About This Book Implement a Ceph cluster successfully and learn to manage it. Recipe based approach in learning the most efficient software defined storage system Implement best practices on improving efficiency and security of your storage cluster Learn to troubleshoot common issues experienced in a Ceph cluster Who This Book Is For This book is targeted at storage and cloud engineers, system administrators, or anyone who is interested in building software defined storage, to power your cloud or virtual infrastructure. If you have basic knowledge of GNU/Linux and storage systems, with no experience of software defined storage solutions and Ceph, but eager to learn then this book is for you What You Will Learn Understand, install, configure, and manage the Ceph storage system Get to grips with performance tuning and benchmarking, and learn practical tips to help run Ceph in production Integrate Ceph with OpenStack Cinder, Glance, and Nova components Deep dive into Ceph object storage, including S3, Swift, and Keystone integration Configure a disaster recovery solution with a Ceph Multi-Site V2 gateway setup and RADOS Block Device mirroring Gain hands-on experience with Ceph Metrics and VSM for cluster monitoring Familiarize yourself with Ceph operations such as maintenance, monitoring, and troubleshooting Understand

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advanced topics including erasure-coding, CRUSH map, cache pool, and general Ceph cluster maintenance In Detail Ceph is a unified distributed storage system designed for reliability and scalability. This technology has been transforming the software-defined storage industry and is evolving rapidly as a leader with its wide range of support for popular cloud platforms such as OpenStack, and CloudStack, and also for virtualized platforms. Ceph is backed by Red Hat and has been developed by community of developers which has gained immense traction in recent years. This book will guide you right from the basics of Ceph , such as creating blocks, object storage, and filesystem access, to advanced concepts such as cloud integration solutions. The book will also cover practical and easy to implement recipes on CephFS, RGW, and RBD with respect to the major stable release of Ceph Jewel. Towards the end of the book, recipes based on troubleshooting and best practices will help you get to grips with managing Ceph storage in a production environment. By the end of this book, you will have practical, hands-on experience of using Ceph efficiently for your storage requirements. Style and approach This step-by-step guide is filled with practical tutorials, making complex scenarios easy to understand.

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

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augment the platform. Operators can coordinate application upgrades seamlessly, react to failures automatically, and streamline repetitive maintenance like backups. Think of Operators as site reliability engineers in software. They work by extending the Kubernetes control plane and API, helping systems integrators, cluster administrators, and application developers reliably deploy and manage key services and components. Using real-world examples, authors Jason Dobies and Joshua Wood demonstrate how to use Operators today and how to create Operators for your applications with the Operator Framework and SDK. Learn how to establish a Kubernetes cluster and deploy an Operator Examine a range of Operators from usage to implementation Explore the three pillars of the Operator Framework: the Operator SDK, the Operator Lifecycle Manager, and Operator Metering Build Operators from the ground up using the Operator SDK Build, package, and run an Operator in development, testing, and production phases Learn how to distribute your Operator for installation on Kubernetes clusters

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

This IBM® Redbooks® publication provides advice and technical information about

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optimizing and tuning application code to run on systems that are based on the IBM POWER7® and POWER7+™ processors. This advice is drawn from application optimization efforts across many different types of code that runs under the IBM AIX® and Linux operating systems, focusing on the more pervasive performance opportunities that are identified, and how to capitalize on them. The technical information was developed by a set of domain experts at IBM. The focus of this book is to gather the right technical information, and lay out simple guidance for optimizing code performance on the IBM POWER7 and POWER7+ systems that run the AIX or Linux operating systems. This book contains a large amount of straightforward performance optimization that can be performed with minimal effort and without previous experience or in-depth knowledge. This optimization work can: Improve the performance of the application that is being optimized for the POWER7 system Carry over improvements to systems that are based on related processor chips Improve performance on other platforms The audience of this book is those personnel who are responsible for performing migration and implementation activities on IBM POWER7-based servers, which includes system administrators, system architects, network administrators, information architects, and database administrators (DBAs). Are you measuring, monitoring and predicting Red Hat Ceph Storage activities to optimize operations and profitability, and enhancing outcomes? How do you improve Red Hat Ceph Storage service perception, and satisfaction? How do you accomplish

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your long range Red Hat Ceph Storage goals? Who will be responsible for making the decisions to include or exclude requested changes once Red Hat Ceph Storage is underway? Are accountability and ownership for Red Hat Ceph Storage clearly defined? This powerful Red Hat Ceph Storage self-assessment will make you the entrusted Red Hat Ceph Storage domain standout by revealing just what you need to know to be fluent and ready for any Red Hat Ceph Storage challenge. How do I reduce the effort in the Red Hat Ceph Storage work to be done to get problems solved? How can I ensure that plans of action include every Red Hat Ceph Storage task and that every Red Hat Ceph Storage outcome is in place? How will I save time investigating strategic and tactical options and ensuring Red Hat Ceph Storage costs are low? How can I deliver tailored Red Hat Ceph Storage advice instantly with structured going-forward plans? There's no better guide through these mind-expanding questions than acclaimed best-selling author Gerard Blokdyk. Blokdyk ensures all Red Hat Ceph Storage essentials are covered, from every angle: the Red Hat Ceph Storage self-assessment shows succinctly and clearly that what needs to be clarified to organize the required activities and processes so that Red Hat Ceph Storage outcomes are achieved. Contains extensive criteria grounded in past and current successful projects and activities by experienced Red Hat Ceph Storage practitioners. Their mastery, combined with the easy elegance of the self-assessment, provides its superior value to you in knowing how to ensure the outcome of any efforts in Red Hat Ceph Storage are

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maximized with professional results. Your purchase includes access details to the Red Hat Ceph Storage self-assessment dashboard download which gives you your dynamically prioritized projects-ready tool and shows you exactly what to do next. Your exclusive instant access details can be found in your book. You will receive the following contents with New and Updated specific criteria: - The latest quick edition of the book in PDF - The latest complete edition of the book in PDF, which criteria correspond to the criteria in... - The Self-Assessment Excel Dashboard, and... - Example pre-filled Self-Assessment Excel Dashboard to get familiar with results generation ...plus an extra, special, resource that helps you with project managing. INCLUDES LIFETIME SELF ASSESSMENT UPDATES Every self assessment comes with Lifetime Updates and Lifetime Free Updated Books. Lifetime Updates is an industry-first feature which allows you to receive verified self assessment updates, ensuring you always have the most accurate information at your fingertips. This is the eBook version of the print title. Learn, prepare, and practice for Red Hat RHCSA 8 (EX200) exam success with this Cert Guide from Pearson IT Certification, a leader in IT Certification learning. Master Red Hat RHCSA 8 EX200 exam topics Assess your knowledge with chapter-ending quizzes Review key concepts with exam-preparation tasks Practice with four unique practice tests Learn from two full hours of video training from the author's Red Hat Certified System Administrator (RHCSA) Complete Video Course, 3rd Edition. Red Hat RHCSA 8 Cert Guide is a best-of-breed

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exam study guide. Leading Linux consultant, author, and instructor Sander van Vugt shares preparation hints and test-taking tips, helping you identify areas of weakness and improve both your conceptual knowledge and hands-on skills. Material is presented in a concise manner, focusing on increasing your understanding and retention of exam topics. The book presents you with an organized test-preparation routine through the use of proven series elements and techniques. Exam topic lists make referencing easy. Chapter-ending Exam Preparation Tasks help you drill on key concepts you must know thoroughly. Review questions help you assess your knowledge, and a final preparation chapter guides you through tools and resources to help you craft your final study plan. Well regarded for its level of detail, assessment features, and challenging review questions and exercises, this study guide helps you master the concepts and techniques that will enable you to succeed on the exam the first time, including Basic system management: Installation, tools, file management, text files, RHEL8 connections, user/group management, permissions, and network configuration Operating running systems: Managing software, processes, storage, and advanced storage; working with systemd; scheduling tasks; and configuring logging Advanced system administration: Managing the kernel and boot procedures, essential troubleshooting, bash shell scripting Managing network services: Configuring SSH, firewalls, and time services; managing Apache HTTP services and SE Linux; and accessing network storage

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Over 100 effective recipes to help you design, implement, and manage the software-defined and massively scalable Ceph storage system

About This Book Implement a Ceph cluster successfully and gain deep insights into its best practices Harness the abilities of experienced storage administrators and architects, and run your own software-defined storage system This comprehensive, step-by-step guide will show you how to build and manage Ceph storage in production environment

Who This Book Is For This book is aimed at storage and cloud system engineers, system administrators, and technical architects who are interested in building software-defined storage solutions to power their cloud and virtual infrastructure. If you have basic knowledge of GNU/Linux and storage systems, with no experience of software defined storage solutions and Ceph, but eager to learn this book is for you.

What You Will Learn Understand, install, configure, and manage the Ceph storage system Get to grips with performance tuning and benchmarking, and gain practical tips to run Ceph in production Integrate Ceph with OpenStack Cinder, Glance, and nova components Deep dive into Ceph object storage, including s3, swift, and keystone integration Build a Dropbox-like file sync and share service and Ceph federated gateway setup Gain hands-on experience with Calamari and VSM for cluster monitoring Familiarize yourself with Ceph operations such as maintenance, monitoring, and troubleshooting Understand advanced topics including erasure coding, CRUSH map, cache pool, and system maintenance

In Detail Ceph is a unified, distributed storage system designed

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for excellent performance, reliability, and scalability. This cutting-edge technology has been transforming the storage industry, and is evolving rapidly as a leader in software-defined storage space, extending full support to cloud platforms such as Openstack and Cloudstack, including virtualization platforms. It is the most popular storage backend for Openstack, public, and private clouds, so is the first choice for a storage solution. Ceph is backed by RedHat and is developed by a thriving open source community of individual developers as well as several companies across the globe. This book takes you from a basic knowledge of Ceph to an expert understanding of the most advanced features, walking you through building up a production-grade Ceph storage cluster and helping you develop all the skills you need to plan, deploy, and effectively manage your Ceph cluster. Beginning with the basics, you'll create a Ceph cluster, followed by block, object, and file storage provisioning. Next, you'll get a step-by-step tutorial on integrating it with OpenStack and building a Dropbox-like object storage solution. We'll also take a look at federated architecture and CephFS, and you'll dive into Calamari and VSM for monitoring the Ceph environment. You'll develop expert knowledge on troubleshooting and benchmarking your Ceph storage cluster. Finally, you'll get to grips with the best practices to operate Ceph in a production environment. Style and approach This step-by-step guide is filled with practical tutorials, making complex scenarios easy to understand.

Use Red Hat's security tools to establish a set of security strategies that work together

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to help protect your digital data. You will begin with the basic concepts of IT security and DevOps with topics such as CIA triage, security standards, network and system security controls and configuration, hybrid cloud infrastructure security, and the CI/CD process. Next, you will integrate and automate security into the DevOps cycle, infrastructure, and security as code. You will also learn how to automate with Red Hat Ansible Automation Platform and about hybrid cloud infrastructure. The later chapters will cover hyper-converged infrastructure and its security, Red Hat Smart Management, predictive analytics with Red Hat Insights, and Red Hat security auditing to ensure best security practices. Lastly, you will see the different types of case studies with real-world examples. Red Hat and IT Security will help you get a better understanding of IT security concepts from a network and system administration perspective. It will help you to understand how the IT infrastructure landscape can change by implementing specific security best practices and integrating Red Hat products and solutions to counter against modern cybersecurity threats. What You Will Learn ? Understand IT infrastructure security and its best practices ? Implement hybrid cloud infrastructure ? Realign DevOps process into DevSecOps, emphasizing security ? Implement automation in IT infrastructure services using Red Hat Ansible ? Explore Red Hat Smart Management, predictive analytics, and auditing Who This Book Is For IT professionals handling network/system administration or the IT infrastructure of an organization. DevOps professionals and cybersecurity analysts would find the book useful.

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Arguably one of the most highly regarded and widely used enterprise level operating systems available today is the Red Hat Enterprise Linux 8 distribution. Not only is it considered to be among the most stable and reliable operating systems, it is also backed by the considerable resources and technical skills of Red Hat, Inc. Red Hat Enterprise Linux 8 Essentials is designed to provide detailed information on the installation, use and administration of the Red Hat Enterprise Linux 8 distribution. For beginners, the book covers topics such as operating system installation, the basics of the GNOME desktop environment, configuring email and web servers and installing packages and system updates using App Streams. Additional installation topics such as dual booting with Microsoft Windows are also covered, together with all important security topics such as configuring a firewall and user and group administration. For the experienced user, topics such as remote desktop access, the Cockpit web interface, logical volume management (LVM), disk partitioning, swap management, KVM virtualization, Secure Shell (SSH), Linux Containers and file sharing using both Samba and NFS are covered in detail to provide a thorough overview of this enterprise class operating system.

Study the material in this book to prepare for the RHCE exam EX294 and to learn how using Ansible within your own environment improves system administration

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productivity. This book covers all of the objectives of the exam and extends further, ensuring that you know how to use Ansible to manage Linux. The book uses CentOS, a Red Hat-based distribution, and Ubuntu instead of using a single Red Hat distribution. By using the two distributions, you will understand the power of Ansible and how easily you can deal with multiple platforms, which is crucial for your understanding of Ansible in the real world. The book assumes no previous knowledge of Ansible but some knowledge of Linux system administration from the command line. You will learn how to manage Linux systems that are installed with different distributions, including CentOS Enterprise Linux 8 and Ubuntu 18.04. You will be able to manage these systems using ad hoc commands from the command line as well as creating Ansible playbooks that can be replayed reliably many times. To save on the code that you have to create, you will learn how to use Ansible Galaxy to search for and download roles and collections that are pre-written to manage elements of your Linux installations. By the end of this book, you will be able to write efficient and effective YAML playbooks to manage your entire estate. What You Will Learn Prepare systems so that password-less access can be used with Ansible remotely Use ad hoc commands to quickly configure systems Use and format YAML files correctly Create playbooks that grow in their complexity as your

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experience develops Ensure that services are restarted on configuration changes  
Who This Book Is For Those who want to prepare for the RHCE exam EX294  
and readers who want to learn how to use Ansible to improve the productivity of  
their system administration. This book will help you prepare yourself for the exam  
as well as your real-life administration needs.

This is a story of reinvention. Jim Whitehurst, celebrated president and CEO of one of the world's most revolutionary software companies, tells first-hand his journey from traditional manager (Delta Air Lines, Boston Consulting Group) and “chief” problem solver to CEO of one of the most open organizational environments he'd ever encountered. This challenging transition, and what Whitehurst learned in the interim, has paved the way for a new way of managing—one this modern leader sees as the only way companies will successfully function in the future. Whitehurst says beyond embracing the technology that has so far disrupted entire industries, companies must now adapt their management and organizational design to better fit the Information Age. His mantra? “Adapt or die.” Indeed, the successful company Whitehurst leads—the open source giant Red Hat—has become the organizational poster child for how to reboot, redesign, and reinvent an organization for a decentralized, digital age. Based on open source principles of transparency, participation, and

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collaboration, “open management” challenges conventional business ideas about what companies are, how they run, and how they make money. This book provides the blueprint for putting it into practice in your own firm. He covers challenges that have been missing from the conversation to date, among them: how to scale engagement; how to have healthy debates that net progress; and how to attract and keep the “Social Generation” of workers. Through a mix of vibrant stories, candid lessons, and tested processes, Whitehurst shows how Red Hat has blown the traditional operating model to pieces by emerging out of a pure bottom up culture and learning how to execute it at scale. And he explains what other companies are, and need to be doing to bring this open style into all facets of the organization. By showing how to apply open source methods to everything from structure, management, and strategy to a firm's customer and partner relationships, leaders and teams will now have the tools needed to reach a new level of work. And with that new level of work comes unparalleled success. The Open Organization is your new resource for doing business differently. Get ready to make traditional management thinking obsolete.

Perform fast interactive analytics against different data sources using the Trino high-performance distributed SQL query engine. With this practical guide, you'll learn how to conduct analytics on data where it lives, whether it's Hive,

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Cassandra, a relational database, or a proprietary data store. Analysts, software engineers, and production engineers will learn how to manage, use, and even develop with Trino. Initially developed by Facebook, open source Trino is now used by Netflix, Airbnb, LinkedIn, Twitter, Uber, and many other companies. Matt Fuller, Manfred Moser, and Martin Traverso show you how a single Trino query can combine data from multiple sources to allow for analytics across your entire organization. Get started: Explore Trino's use cases and learn about tools that will help you connect to Trino and query data Go deeper: Learn Trino's internal workings, including how to connect to and query data sources with support for SQL statements, operators, functions, and more Put Trino in production: Secure Trino, monitor workloads, tune queries, and connect more applications; learn how other organizations apply Trino

Improve Manageability, Flexibility, Scalability, and Control with Hyperconverged Infrastructure Hyperconverged infrastructure (HCI) combines storage, compute, and networking in one unified system, managed locally or from the cloud. With HCI, you can leverage the cloud's simplicity, flexibility, and scalability without losing control or compromising your ability to scale. In Hyperconverged Infrastructure Data Centers, best-selling author Sam Halabi demystifies HCI technology, outlines its use cases, and compares solutions from a vendor-neutral

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perspective. He guides you through evaluation, planning, implementation, and management, helping you decide where HCI makes sense, and how to migrate legacy data centers without disrupting production systems. The author brings together all the HCI knowledge technical professionals and IT managers need, whether their background is in storage, compute, virtualization, switching/routing, automation, or public cloud platforms. He explores leading solutions including the Cisco HyperFlex platform, VMware vSAN, Nutanix Enterprise Cloud, Cisco Application-Centric Infrastructure (ACI), VMware's NSX, the open source OpenStack and Open vSwitch (OVS) / Open Virtual Network (OVN), and Cisco CloudCenter for multicloud management. As you explore discussions of automation, policy management, and other key HCI capabilities, you'll discover powerful new opportunities to improve control, security, agility, and performance. Understand and overcome key limits of traditional data center designs Discover improvements made possible by advances in compute, bus interconnect, virtualization, and software-defined storage Simplify rollouts, management, and integration with converged infrastructure (CI) based on the Cisco Unified Computing System (UCS) Explore HCI functionality, advanced capabilities, and benefits Evaluate key HCI applications, including DevOps, virtual desktops, ROBO, edge computing, Tier 1 enterprise applications, backup, and disaster

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recovery Simplify application deployment and policy setting by implementing a new model for provisioning, deployment, and management Plan, integrate, deploy, provision, manage, and optimize the Cisco HyperFlex hyperconverged infrastructure platform Assess alternatives such as VMware vSAN, Nutanix, open source OpenStack, and OVS/OVN, and compare architectural differences with HyperFlex Compare Cisco ACI (Application- Centric Infrastructure) and VMware NSX approaches to network automation, policies, and security This book is part of the Networking Technology Series from Cisco Press, which offers networking professionals valuable information for constructing efficient networks, understanding new technologies, and building successful careers.

OpenStack was created with the audacious goal of being the ubiquitous software choice for building public and private cloud infrastructures. In just over a year, it's become the most talked-about project in open source. This concise book introduces OpenStack's general design and primary software components in detail, and shows you how to start using it to build cloud infrastructures. If you're a developer, technologist, or system administrator familiar with cloud offerings such as Rackspace Cloud or Amazon Web Services, *Deploying OpenStack* shows you how to obtain and deploy OpenStack software in a few controlled scenarios. Learn about OpenStack Compute (known as "Nova"), OpenStack

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Object Store ("Swift"), and OpenStack Image Service ("Glance") Understand common pitfalls in architecting, deploying, and implementing your cloud infrastructure with OpenStack Determine which version of the OpenStack code base best suits your deployment needs Define your deployment scenario and finalize key design choices Install Nova on a single node with either the StackOps distro or an Ubuntu package Be familiar with important configuration options and important administrative commands

Covering marriage, children, grandparents, careers, retirement, and more, this is the official book of The Red Hat Society, a craze that is sweeping the nation. Two-color text & illustrations throughout.

The organization pursuing digital transformation must embrace new ways to use and deploy integration technologies, so they can move quickly in a manner appropriate to the goals of multicloud, decentralization, and microservices. The integration layer must transform to allow organizations to move boldly in building new customer experiences, rather than forcing models for architecture and development that pull away from maximizing the organization's productivity. Many organizations have started embracing agile application techniques, such as microservice architecture, and are now seeing the benefits of that shift. This approach complements and accelerates an enterprise's API strategy. Businesses

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should also seek to use this approach to modernize their existing integration and messaging infrastructure to achieve more effective ways to manage and operate their integration services in their private or public cloud. This IBM® Redbooks® publication explores the merits of what we refer to as agile integration; a container-based, decentralized, and microservice-aligned approach for integration solutions that meets the demands of agility, scalability, and resilience required by digital transformation. It also discusses how the IBM Cloud Pak for Integration marks a significant leap forward in integration technology by embracing both a cloud-native approach and container technology to achieve the goals of agile integration. The target audiences for this book are cloud integration architects, IT specialists, and application developers.

This IBM® Redbooks® publication delivers a Site Reliability Engineering (SRE) solution for cloud workloads that uses Red Hat OpenStack for Infrastructure as a Service (IaaS), Red Hat OpenShift for Platform as a Service (PaaS), and IT operations management that uses open source tools. Today, customers are no longer living in a world of licensed software. Curiosity increased the demand for investigating the Open Source world for Community Open Source and Enterprise grade applications. IBM as one of the contributors to the Open Source community is interested in helping the software be maintained and supported. Having companies, such as IBM, support the evolution of

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Open Source software helps to keep the Open Source community striving for enterprise grade open source solutions. Lately, companies are working on deciphering how to take advantage of Enterprise and Community Open Source to implement in their enterprises. The business case for open source software is no longer a mystery and no surprise that most of the new positions in IT enterprises are related to open source projects. The ability of a large enterprise to manage this sort of implementations is to engage in a hypertrophied cooperation, where the ability to not only cooperate with teams and people outside your organization, but also to find new ways of working together and devise new ways to improve the software and its code. A goal for this publication is to help the client's journey into the open source space and implement a private Cloud Container-based architecture with the ability to manage the entire IT Service Management processes from the open source framework. This publication describes the architecture and implementation details of the solution. Although not every piece of this solution is documented here, this book does provide instructions for what was achieved incorporating open source technologies. Moreover, with this publication, the team shares their collaboration experiences working in a team of technologists, open source developers, Red Hat, and the open source community. This publication is for designers, developers, managers, and anyone who is considering starting a Cloud open source project, or users who started that journey. This book also can be a manual to guide the implementation of a technical viable architecture and help

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those enterprises participate in an open source project but have not done so before.

The reader must be familiar with principles in programming and basic software engineering concepts, such as source code, compilers, and patches.

Not everything about computers and software these days is related to packaging, but a lot is. How can users acquire software faster and run it more easily? How should software be packaged up so that we can run it wherever we like? How do we resolve the tensions between the siren song of public cloud convenience and open source freedom and flexibility? In this book, Red Hat's Gordon Haff and William Henry take you on a journey through the history of packaging, pointing out along the way the clear parallels to how software packaging has evolved and continues to evolve. The retail industry and other packaging pioneers have had many lessons to teach and much to say about how we should think about software packaging. Today, open source software innovations in automation, container platforms, and assured software supply chains increasingly support the user directly, rather than just serving as a way to box up some bits. They simplify, integrate, and improve the overall software experience in the way that consumers accustomed to smartphones and on-demand content expect.

Implement and manage your software-defined, massively scalable storage system  
About This Book\* Explore Ceph's architecture in order to achieve scalability and high availability\* Learn to utilize Ceph efficiently with the help of practical examples\* Successfully implement Ceph clusters to scale-out storage solutions along with

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outstanding data protection Who This Book Is For A basic knowledge of GNU/Linux, and storage systems, and server components is assumed. If you have no experience of software-defined storage solutions and Ceph, but are eager to learn about them, this is the book for you. What You Will Learn\* The limitations of existing systems and why you should use Ceph as a storage solution\* Familiarity with Ceph's architecture, components, and services\* Instant deployment and testing of Ceph within a Vagrant and VirtualBox environment\* Ceph operations including maintenance, monitoring, and troubleshooting\* Storage provisioning of Ceph's block, object, and filesystem services\* Integrate Ceph with OpenStack\* Advanced topics including erasure coding, CRUSH maps, and performance tuning\* Best practices for your Ceph clusters

In Detail Learning Ceph, Second Edition will give you all the skills you need to plan, deploy, and effectively manage your Ceph cluster. You will begin with the first module, where you will be introduced to Ceph use cases, its architecture, and core projects. In the next module, you will learn to set up a test cluster, using Ceph clusters and hardware selection. After you have learned to use Ceph clusters, the next module will teach you how to monitor cluster health, improve performance, and troubleshoot any issues that arise. In the last module, you will learn to integrate Ceph with other tools such as OpenStack, Glance, Manila, Swift, and Cinder. By the end of the book you will have learned to use Ceph effectively for your data storage requirements. Style and approach This step-by-step guide, including use cases and examples, not only helps

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you to easily use Ceph but also demonstrates how you can use it to solve any of your server or drive storage issues.

With platforms designed for rapid adaptation and failure recovery such as Amazon Web Services, cloud computing is more like programming than traditional system administration. Tools for automatic scaling and instance replacement allow even small DevOps teams to manage massively scalable application infrastructures—if team members drop their old views of development and operations and start mastering automation. This comprehensive guide shows developers and system administrators how to configure and manage AWS services including EC2, CloudFormation, Elastic Load Balancing, S3, and Route 53. Sysadms will learn will learn to automate their favorite tools and processes; developers will pick up enough ops knowledge to build a robust and resilient AWS application infrastructure. Launch instances with EC2 or CloudFormation Securely deploy and manage your applications with AWS tools Learn to automate AWS configuration management with Python and Puppet Deploy applications with Auto Scaling and Elastic Load Balancing Explore approaches for deploying application and infrastructure updates Save time on development and operations with reusable components Learn strategies for managing log files in AWS environments Configure a cloud-aware DNS service with Route 53 Use AWS CloudWatch to monitor your infrastructure and applications

If you already have basic knowledge of GNU/Linux and storage systems, but have no

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experience of software-defined storage solutions and Ceph, and are eager to learn about it, this is the book for you. If you are looking for your next career jump as a Ceph administrator, this book is also ideal for you.

Understand the fundamental factors of data storage system performance and master an essential analytical skill using block trace via applications such as MATLAB and Python tools. You will increase your productivity and learn the best techniques for doing specific tasks (such as analyzing the IO pattern in a quantitative way, identifying the storage system bottleneck, and designing the cache policy). In the new era of IoT, big data, and cloud systems, better performance and higher density of storage systems has become crucial. To increase data storage density, new techniques have evolved and hybrid and parallel access techniques—together with specially designed IO scheduling and data migration algorithms—are being deployed to develop high-performance data storage solutions. Among the various storage system performance analysis techniques, IO event trace analysis (block-level trace analysis particularly) is one of the most common approaches for system optimization and design. However, the task of completing a systematic survey is challenging and very few works on this topic exist. *Block Trace Analysis and Storage System Optimization* brings together theoretical analysis (such as IO qualitative properties and quantitative metrics) and practical tools (such as trace parsing, analysis, and results reporting perspectives). The book provides content on block-level trace analysis techniques, and includes case studies to illustrate

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how these techniques and tools can be applied in real applications (such as SSHD, RAID, Hadoop, and Ceph systems). What You'll Learn Understand the fundamental factors of data storage system performance Master an essential analytical skill using block trace via various applications Distinguish how the IO pattern differs in the block level from the file level Know how the sequential HDFS request becomes "fragmented" in final storage devices Perform trace analysis tasks with a tool based on the MATLAB and Python platforms Who This Book Is For IT professionals interested in storage system performance optimization: network administrators, data storage managers, data storage engineers, storage network engineers, systems engineers

Get to grips with the unified, highly scalable distributed storage system and learn how to design and implement it. Key Features Explore Ceph's architecture in detail Implement a Ceph cluster successfully and gain deep insights into its best practices Leverage the advanced features of Ceph, including erasure coding, tiering, and BlueStore Book Description This Learning Path takes you through the basics of Ceph all the way to gaining in-depth understanding of its advanced features. You'll gather skills to plan, deploy, and manage your Ceph cluster. After an introduction to the Ceph architecture and its core projects, you'll be able to set up a Ceph cluster and learn how to monitor its health, improve its performance, and troubleshoot any issues. By following the step-by-step approach of this Learning Path, you'll learn how Ceph integrates with OpenStack, Glance, Manila, Swift, and Cinder. With knowledge of

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federated architecture and CephFS, you'll use Calamari and VSM to monitor the Ceph environment. In the upcoming chapters, you'll study the key areas of Ceph, including BlueStore, erasure coding, and cache tiering. More specifically, you'll discover what they can do for your storage system. In the concluding chapters, you will develop applications that use Librados and distributed computations with shared object classes, and see how Ceph and its supporting infrastructure can be optimized. By the end of this Learning Path, you'll have the practical knowledge of operating Ceph in a production environment. This Learning Path includes content from the following Packt products: Ceph Cookbook by Michael Hackett, Vikhyat Umrao and Karan Singh Mastering Ceph by Nick Fisk Learning Ceph, Second Edition by Anthony D'Atri, Vaibhav Bhembre and Karan Singh What you will learn Understand the benefits of using Ceph as a storage solution Combine Ceph with OpenStack, Cinder, Glance, and Nova components Set up a test cluster with Ansible and virtual machine with VirtualBox Develop solutions with Librados and shared object classes Configure BlueStore and see its interaction with other configurations Tune, monitor, and recover storage systems effectively Build an erasure-coded pool by selecting intelligent parameters Who this book is for If you are a developer, system administrator, storage professional, or cloud engineer who wants to understand how to deploy a Ceph cluster, this Learning Path is ideal for you. It will help you discover ways in which Ceph features can solve your data storage problems. Basic knowledge of storage systems and GNU/Linux will be beneficial.

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This small book shows you how to get up and running with Red Hat Satellite 6 software.

Get an in-depth tour of OpenShift, the container-based software deployment and management platform from Red Hat that provides a secure multi-tenant environment for the enterprise. This practical guide describes in detail how OpenShift, building on Kubernetes, enables you to automate the way you create, ship, and run applications in a containerized environment. Author Graham Dumpleton provides the knowledge you need to make the best use of the OpenShift container platform to deploy not only your cloud-native applications, but also more traditional stateful applications. Developers and administrators will learn how to run, access, and manage containers in OpenShift, including how to orchestrate them at scale. Build application container images from source and deploy them Implement and extend application image builders Use incremental and chained builds to accelerate build times Automate builds by using a webhook to link OpenShift to a Git repository Add configuration and secrets to the container as project resources Make an application visible outside the OpenShift cluster Manage persistent storage inside an OpenShift container Monitor application health and manage the application lifecycle This book is a perfect follow-up to OpenShift for Developers: A Guide for Impatient Beginners (O'Reilly).

IBM® Cloud Private is an application platform for developing and managing containerized applications across hybrid cloud environments, on-premises and public

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clouds. It is an integrated environment for managing containers that includes the container orchestrator Kubernetes, a private image registry, a management console, and monitoring frameworks. This IBM Redbooks covers tasks performed by IBM Cloud Private system administrators such as installation for high availability, configuration, backup and restore, using persistent volumes, networking, security, logging and monitoring. Istio integration, troubleshooting and so on. As part of this project we also developed several code examples and you can download those from the IBM Redbooks GitHub location: <https://github.com/IBMRedbooks>. The authors team has many years of experience in implementing IBM Cloud Private and other cloud solutions in production environments, so throughout this document we took the approach of providing you the recommended practices in those areas. If you are an IBM Cloud Private system administrator, this book is for you. If you are developing applications on IBM Cloud Private, you can see the IBM Redbooks publication IBM Cloud Private Application Developer's Guide, SG24-8441.

Learning CephPackt Publishing Ltd

This is not an instructional guide, but a practical, scenario-based book which guides you through everything you need to know in a practical manner by letting you build your own cluster. By the end of the book, you will have a fully functional Proxmox cluster setup at your disposal and have the knowledge to replicate virtualization solutions. If you already know what the word "virtualization" means and you are ready to stand out

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from the crowd equipped with the unique ability to design and implement a rock-solid virtualized network environment using Proxmox, then you have just picked up the only book you will need. Linux system administration experience together with knowledge of networking and virtualization concepts is assumed. This book is also useful if you are already using Proxmox and simply want to master its advanced features.

Praise for the first edition of Building Storage Networks: "This book is the Bible of storage networking" --Dave Hill, Senior Storage Analyst, the Aberdeen Group Now more than ever, especially in the age of e-commerce, data must be available and accessible 24x7 on a network. This easy-to-understand book clearly explains all the latest methods of storing data on a network, including updated coverage of Internet storage service providers.

Learn how to work with the Automate feature of CloudForms, the powerful Red Hat cloud management platform that lets you administer your virtual infrastructure, including hybrid public and private clouds. This practical hands-on introduction shows you how to increase your operational efficiency by automating day-to-day tasks that now require manual input. Throughout the book, author Peter McGowan provides a combination of theoretical information and practical coding examples to help you learn the Automate object model. With this CloudForms feature, you can create auto-scalable cloud applications, eliminate manual decisions and operations when provisioning virtual machines and cloud instances, and manage your complete virtual machine lifecycle. In

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six parts, this book helps you: Learn the objects and concepts for developing automation scripts with CloudForms Automate Customize the steps and workflows involved in provisioning virtual machines Create and use service catalogs, items, dialogs, objects, bundles, and hierarchies Use CloudForm's updated workflow to retire and delete virtual machines and services Orchestrate and coordinate with external services as part of a workflow Explore distributed automation processing as well as argument passing and handling

Design and implement successful private clouds with OpenStack About This Book Explore the various design choices available for cloud architects within an OpenStack deployment Craft an OpenStack architecture and deployment pipeline to meet the unique needs of your organization Create a product roadmap for Infrastructure as a Service in your organization using this hands-on guide Who This Book Is For This book is written especially for those who will design OpenStack clouds and lead their implementation. These people are typically cloud architects, but may also be in product management, systems engineering, or enterprise architecture. What You Will Learn Familiarize yourself with the components of OpenStack Build an increasingly complex OpenStack lab deployment Write compelling documentation for the architecture teams within your organization Apply Agile configuration management techniques to deploy OpenStack Integrate OpenStack with your organization's identity management, provisioning, and billing systems Configure a robust virtual environment for users to

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interact with Use enterprise security guidelines for your OpenStack deployment Create a product roadmap that delivers functionality quickly to the users of your platform In Detail Over the last five years, hundreds of organizations have successfully implemented Infrastructure as a Service (IaaS) platforms based on OpenStack. The huge amount of investment from these organizations, industry giants such as IBM and HP, as well as open source leaders such as Red Hat have led analysts to label OpenStack as the most important open source technology since the Linux operating system. Because of its ambitious scope, OpenStack is a complex and fast-evolving open source project that requires a diverse skill-set to design and implement it. This guide leads you through each of the major decision points that you'll face while architecting an OpenStack private cloud for your organization. At each point, we offer you advice based on the experience we've gained from designing and leading successful OpenStack projects in a wide range of industries. Each chapter also includes lab material that gives you a chance to install and configure the technologies used to build production-quality OpenStack clouds. Most importantly, we focus on ensuring that your OpenStack project meets the needs of your organization, which will guarantee a successful rollout. Style and approach This is practical, hands-on guide to implementing OpenStack clouds, where each topic is illustrated with real-world examples and then the technical points are proven in the lab.

For many organizations, a big part of DevOps' appeal is software automation using

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infrastructure-as-code techniques. This book presents developers, architects, and infra-ops engineers with a more practical option. You'll learn how a container-centric approach from OpenShift, Red Hat's cloud-based PaaS, can help your team deliver quality software through a self-service view of IT infrastructure. Three OpenShift experts at Red Hat explain how to configure Docker application containers and the Kubernetes cluster manager with OpenShift's developer- and operational-centric tools. Discover how this infrastructure-agnostic container management platform can help companies navigate the murky area where infrastructure-as-code ends and application automation begins. Get an application-centric view of automation—and understand why it's important Learn patterns and practical examples for managing continuous deployments such as rolling, A/B, blue-green, and canary Implement continuous integration pipelines with OpenShift's Jenkins capability Explore mechanisms for separating and managing configuration from static runtime software Learn how to use and customize OpenShift's source-to-image capability Delve into management and operational considerations when working with OpenShift-based application workloads Install a self-contained local version of the OpenShift environment on your computer Migrating Linux to Microsoft Azure enables your organization to maximize the existing investments on Linux and become sustainable with efficient migration of existing Linux workloads to Azure.

IBM® Spectrum Scale is a proven, scalable, high-performance data and file

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management solution. It provides world-class storage management with extreme scalability, flash accelerated performance, automatic policy-based storage that has tiers of flash through disk to tape. It also provides support for various protocols, such as NFS, SMB, Object, HDFS, and iSCSI. Containers can leverage the performance, information lifecycle management (ILM), scalability, and multisite data management to give the full flexibility on storage as they experience on the runtime. Container adoption is increasing in all industries, and they sprawl across multiple nodes on a cluster. The effective management of containers is necessary because their number will probably reach a far greater number than virtual machines today. Kubernetes is the standard container management platform currently being used. Data management is of ultimate importance, and often is forgotten because the first workloads containerized are ephemeral. For data management, many drivers with different specifications were available. A specification named Container Storage Interface (CSI) was created and is now adopted by all major Container Orchestrator Systems available. Although other container orchestration systems exist, Kubernetes became the standard framework for container management. It is a very flexible open source platform used as the base for most cloud providers and software companies' container orchestration systems. Red Hat OpenShift is one of the most reliable enterprise-grade container orchestration systems based on Kubernetes, designed and optimized to easily deploy web applications and services. OpenShift enables developers to focus on the code, while

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the platform takes care of all of the complex IT operations and processes. This IBM Redbooks® publication describes how the CSI Driver for IBM file storage enables IBM Spectrum® Scale to be used as persistent storage for stateful applications running in Kubernetes clusters. Through the Container Storage Interface Driver for IBM file storage, Kubernetes persistent volumes (PVs) can be provisioned from IBM Spectrum Scale. Therefore, the containers can be used with stateful microservices, such as database applications (MongoDB, PostgreSQL, and so on).

Dive in to the cutting edge techniques of Linux KVM virtualization, and build the virtualization solutions your datacentre demands About This Book Become an expert in Linux virtualization Migrate your virtualized datacenter to the cloud Find out how to build a large scale virtualization solution that will transform your organization Who This Book Is For Linux administrators – if you want to build incredible, yet manageable virtualization solutions with KVM this is the book to get you there. It will help you apply what you already know to some tricky virtualization tasks. What You Will Learn Explore the ecosystem of tools that support Linux virtualization Find out why KVM offers you a smarter way to unlock the potential of virtualization Implement KVM virtualization using oVirt Explore the KVM architecture – so you can manage, scale and optimize it with ease Migrate your virtualized datacenter to the cloud for truly resource-efficient computing Find out how to integrate OpenStack with KVM to take full control of the cloud In Detail A robust datacenter is essential for any organization – but you don't want

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to waste resources. With KVM you can virtualize your datacenter, transforming a Linux operating system into a powerful hypervisor that allows you to manage multiple OS with minimal fuss. This book doesn't just show you how to virtualize with KVM – it shows you how to do it well. Written to make you an expert on KVM, you'll learn to manage the three essential pillars of scalability, performance and security – as well as some useful integrations with cloud services such as OpenStack. From the fundamentals of setting up a standalone KVM virtualization platform, and the best tools to harness it effectively, including virt-manager, and kimchi-project, everything you do is built around making KVM work for you in the real-world, helping you to interact and customize it as you need it. With further guidance on performance optimization for Microsoft Windows and RHEL virtual machines, as well as proven strategies for backup and disaster recovery, you'll can be confident that your virtualized data center is working for your organization – not hampering it. Finally, the book will empower you to unlock the full potential of cloud through KVM. Migrating your physical machines to the cloud can be challenging, but once you've mastered KVM, it's a little easie. Style and approach Combining advanced insights with practical solutions, Mastering KVM Virtualization is a vital resource for anyone that believes in the power of virtualization to help a business use resources more effectively.

This document provides the step-by-step instructions for installing OpenShift OKD 3.10 on LinuxONE. The intended audience is Systems Architects and Specialists who

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design, size, and implement solutions on IBM® infrastructures.

Leverage Kubernetes for the rapid adoption of emerging technologies. Kubernetes is the future of enterprise platform development and has become the most popular, and often considered the most robust, container orchestration system available today. This book focuses on platforming technologies that power the Internet of Things, Blockchain, Machine Learning, and the many layers of data and application management supporting them. *Advanced Platform Development with Kubernetes* takes you through the process of building platforms with these in-demand capabilities. You'll progress through the development of Serverless, CI/CD integration, data processing pipelines, event queues, distributed query engines, modern data warehouses, data lakes, distributed object storage, indexing and analytics, data routing and transformation, query engines, and data science/machine learning environments. You'll also see how to implement and tie together numerous essential and trending technologies including: Kafka, NiFi, Airflow, Hive, Keycloak, Cassandra, MySQL, Zookeeper, Mosquitto, Elasticsearch, Logstash, Kibana, Presto, Mino, OpenFaaS, and Ethereum. The book uses Golang and Python to demonstrate the development integration of custom container and Serverless functions, including interaction with the Kubernetes API. The exercises throughout teach Kubernetes through the lens of platform development, expressing the power and flexibility of Kubernetes with clear and pragmatic examples. Discover why Kubernetes is an excellent choice for any individual or organization

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looking to embark on developing a successful data and application platform. What You'll Learn Configure and install Kubernetes and k3s on vendor-neutral platforms, including generic virtual machines and bare metal Implement an integrated development toolchain for continuous integration and deployment Use data pipelines with MQTT, NiFi, Logstash, Kafka and Elasticsearch Install a serverless platform with OpenFaaS Explore blockchain network capabilities with Ethereum Support a multi-tenant data science platform and web IDE with JupyterHub, MLflow and Seldon Core Build a hybrid cluster, securely bridging on-premise and cloud-based Kubernetes nodes Who This Book Is For System and software architects, full-stack developers, programmers, and DevOps engineers with some experience building and using containers. This book also targets readers who have started with Kubernetes and need to progress from a basic understanding of the technology and "Hello World" example to more productive, career-building projects.

Design, deploy, and maintain your own private or public Infrastructure as a Service (IaaS), using the open source OpenStack platform. In this practical guide, experienced developers and OpenStack contributors show you how to build clouds based on reference architectures, as well as how to perform daily administration tasks. Designed for horizontal scalability, OpenStack lets you build a cloud by integrating several technologies. This approach provides flexibility, but knowing which options to use can be bewildering. Once you complete this book, you'll know the right questions to ask

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while you organize compute, storage, and networking resources. If you already know how to manage multiple Ubuntu machines and maintain MySQL, you're ready to: Set up automated deployment and configuration Design a single-node cloud controller Use metrics to improve scalability Explore compute nodes, network design, and storage Install OpenStack packages Use an example architecture to help simplify decision-making Build a working environment to explore an IaaS cloud Manage users, projects, and quotas Tackle maintenance, debugging, and network troubleshooting Monitor, log, backup, and restore

Red Hat RHCE(TM) 8 Cert Guide is designed to help you pass the newest version of the Hat Certified Engineer exam for Red Hat Enterprise Linux 8, and master the skills you need to automate Linux and execute common system administration tasks with Red Hat(R) Ansible(R) Engine. The most comprehensive and time-efficient RHCE 8 prep guide available, it's also an extraordinarily cost-effective complement to other training, including the author's own RHCE Complete Video Course. Authored by a leading Red Hat trainer, consultant, and speaker, it presents focused, straight-to-the-point coverage of every exam topic, including: Performing Core Red Hat system administration tasks Understanding Ansible core components Installing and configuring Ansible control nodes Configuring Ansible managed nodes Administering scripts Performing system administration tasks with Ansible modules Working with roles Using advanced Ansible features such as templates and Ansible Vault From start to finish,

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this guide is organized to help you focus your study time where you need the most help, so you can retain more, and earn higher scores. It offers: Step-by-step chapter labs to help you practice what you've just learned Pre-exam theoretical exam to help you decide if you're ready for the real exam Two realistic RHCE sample exams delivered through Pearson's state-of-the-art test engine Pre-chapter "Do I Know This Already" (DIKTA) quizzes to assess your knowledge of each chapter's content, so you can decide how much time to spend on each section Foundation Topics sections thoroughly explaining concepts and theory, and linking them to real-world configurations and commands Key Topics icons flagging every figure, table, or list you absolutely must understand and remember End of chapter Glossary terms Chapter-ending Exam Preparation sections delivering even more exercises and troubleshooting scenarios UNIX, UNIX LINUX & UNIX TCL/TK. Write software that makes the most effective use of the Linux system, including the kernel and core system libraries. The majority of both Unix and Linux code is still written at the system level, and this book helps you focus on everything above the kernel, where applications such as Apache, bash, cp, vim, Emacs, gcc, gdb, glibc, ls, mv, and X exist. Written primarily for engineers looking to program at the low level, this updated edition of Linux System Programming gives you an understanding of core internals that makes for better code, no matter where it appears in the stack. -- Provided by publisher.

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