

Brocade Fabric Os Troubleshooting And Diagnostics Guide

This IBM® Redpaper™ publication helps network and storage administrators understand how to implement the IBM SAN42B-R Extension Switch and the IBM b-type Gen 6 Extension Blade for distance replication. It provides an overview of the IBM System Storage® SAN42B-R extension switch hardware and software features, describes the extension architecture, shows example implementations, and explains how to troubleshoot your extension products. IBM b-type extension products provide long-distance replication of your data for business continuity by using disaster recovery (BC/DR). This paper provides an overview of extension, detailed information about IBM b-type extension technologies and products, preferred topologies, example implementations with FCIP and TS7760/7700 Grid IP Extension, monitoring, and troubleshooting.

As we all know, large ocean going ships never collide with icebergs. However, occasionally life deals out some unexpected pleasures for us to cope with. Surviving any disaster in life is usually a lot easier if you have prepared adequately by taking into account the likely problems, solutions, and their

implementation. In this IBM Redbooks publication, we limit ourselves to those situations in which it is likely that a SAN will be deployed. We present the IBM SAN portfolio of products, going a little under the surface to show the fault tolerant features that they utilize, and then describe solutions with all these features taken into account. Each of these solutions was built on practical experience, in some cases with cost in mind, in some cases with no cost in mind. Any well-thought-out SAN design will have taken every single one of these concerns into account, and either formulated a solution for it, or ignored it, but nonetheless understanding the potential exposure. With these points in mind, in this book we have two objectives: to position the IBM SAN products that are currently in our portfolio; and to show how those products can be configured together to build a SAN that not only allows you to survive most forms of disaster, but also provides performance benefits. So, make sure that you know what to do if you hit an iceberg!

This IBM® Redbooks® product guide describes the IBM Storage Networking SAN512B-6 (8961-F08) and SAN256B-6 (8961-F04) directors and the IBM b-type Gen 6 Extension Blade (FC 3892, 3893). Digital transformation is pushing mission-critical storage environments to the limit, with users expecting data to be accessible from anywhere, at any time, on any device. Faced with exponential

data growth, the network must evolve to enable businesses to thrive in this new era. A new approach to storage networking is needed to enable databases, virtual servers, desktops, and critical applications, and to unlock the full capabilities of flash. By treating the network as a strategic part of a storage environment, organizations can maximize their productivity and efficiency even as they rapidly scale their environments. IBM Storage Networking SAN512B-6 and SAN256B-6 directors with Fabric Vision technology are modular building blocks that combine innovative hardware, software, and built-in instrumentation to ensure high levels of operational stability and redefine application performance. Fabric Vision technology enhances visibility into the health of storage environments, delivering greater control and insight to quickly identify problems and achieve critical service level agreements (SLAs). Breakthrough 32 Gbps performance shatters application performance barriers and provides support for more than 1 billion input/output operations per second (IOPS) for flash-based storage workloads while 128 Gbps UltraScale inter-chassis links enable simplified, high-bandwidth scalability between directors. Summary OpenStack in Action offers the real world use cases and step-by-step instructions you can take to develop your own cloud platform from from inception to deployment. This book guides you through the design of both the physical

hardware cluster and the infrastructure services you'll need to create a custom cloud platform. Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About the Technology OpenStack is an open source framework that lets you create a private or public cloud platform on your own physical servers. You build custom infrastructure, platform, and software services without the expense and vendor lock-in associated with proprietary cloud platforms like Amazon Web Services and Microsoft Azure. With an OpenStack private cloud, you can get increased security, more control, improved reliability, and lower costs. About the Book OpenStack in Action offers real-world use cases and step-by-step instructions on how to develop your own cloud platform. This book guides you through the design of both the physical hardware cluster and the infrastructure services you'll need. You'll learn how to select and set up virtual and physical servers, how to implement software-defined networking, and technical details of designing, deploying, and operating an OpenStack cloud in your enterprise. You'll also discover how to best tailor your OpenStack deployment for your environment. Finally, you'll learn how your cloud can offer user-facing software and infrastructure services. What's Inside Develop and deploy an enterprise private cloud Private cloud technologies from an IT perspective Organizational impact of self-service cloud computing About the

Reader No prior knowledge of OpenStack or cloud development is assumed. About the Author Cody Bumgardner is the Chief Technology Architect at a large university where he is responsible for the architecture, deployment, and long-term strategy of OpenStack private clouds and other cloud computing initiatives. Table of Contents PART 1 GETTING STARTED Introducing OpenStack Taking an OpenStack test-drive Learning basic OpenStack operations Understanding private cloud building blocks PART 2 WALKING THROUGH A MANUAL DEPLOYMENT Walking through a Controller deployment Walking through a Networking deployment Walking through a Block Storage deployment Walking through a Compute deployment PART 3 BUILDING A PRODUCTION ENVIRONMENT Architecting your OpenStack Deploying Ceph Automated HA OpenStack deployment with Fuel Cloud orchestration using OpenStack This IBM Redbooks publication supersedes both: IBM TotalStorage: Introduction to SAN Routing, SG24-7119-00 Implementing the IBM TotalStorage Multiprotocol Routers, SG24-7246-00 The rapid spread and adoption of production storage area networks (SANs) has fuelled the need for multiprotocol routers. The routers provide improved scalability, security, and manageability by enabling devices in separate SAN fabrics to communicate without merging fabrics into a single, large SAN fabric. This capability enables clients to initially deploy separate SAN

solutions at the departmental and data center levels. Then, clients can consolidate these separate solutions into large enterprise SAN solutions as their experience and requirements grow and change. Alternatively, multiprotocol routers can help to connect existing enterprise SANs for a variety of reasons. For instance, the introduction of Small Computer System Interface over IP (iSCSI) provides for the connection of low-end, low-cost hosts to enterprise SANs. The use of an Internet Protocol (IP) in the Fibre Channel (FC) environment provides for resource consolidation and disaster recovery planning over long distances. And the use of FC-FC routing services provides connectivity between two or more fabrics without having to merge them into a single SAN. This book targets storage network administrators, system designers, architects, and IT professionals who sell, design, or administer SANs. It introduces you to the products, concepts, and technology in the IBM System Storage SAN Routing portfolio. This book shows the features of each product and examples of how you can deploy and use them.

In today's infrastructure, it is common to build networks based on 10 Gb Ethernet technology. The IBM® portfolio of 10 Gb systems networking products includes Top-of-Rack switches, and the embedded switches in the IBM BladeCenter® family. In 2010, IBM formed the IBM System Networking business (by acquiring

BLADE Network Technologies), which is now focused on driving data center networking by using the latest Ethernet technologies. The main focus of this IBM Redbooks® publication is on the IBM System Networking 10Gb Switch Modules, which include both embedded and Top-of-Rack (TOR) models. After reading this book, you can perform basic to advanced configurations of IBM System Networking 10Gb Switch Modules. In this publication, we introduce the various 10 Gb switch models that are available today and then describe in detail the features that are applicable to these switches. We then present two architectures that use these 10 Gb switches, which are used throughout this book. These designs are based on preferred practices and the experience of authors of this book. Our intention is to show the configuration of the different features that are available with IBM System Networking 10Gb Switch Modules. We follow the three-tier Data Center design, focusing on the Access and Aggregation Layers, because those layers are the layers that IBM System Networking Switches use. First Published in 1997, this book offers a full, comprehensive investigation into the relationship between our Immune System and Disease. Carefully compiled and filled with a vast repertoire of notes, diagrams, and references this book serves as a useful reference for students of medicine, and other practitioners in their respective fields.

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This IBM® Redbooks product guide describes Fabric Vision technology. The use of virtualization, flash storage, and automation tools has allowed applications and services to be deployed faster while shattering performance barriers. The unprecedented number of application and service interactions has also increased the complexity, risk, and instability of mission-critical operations. As a result, IT organizations need flexible storage networks that can adapt to dynamic environments and performance requirements for high-density virtualization, flash storage, and cloud infrastructures. To achieve Service Level Agreement (SLA) objectives, IT administrators also need new tools that can help ensure non-stop operations, quickly identify potential points of congestion, and maximize application performance, while simplifying administration. Fabric Vision technology with IO Insight, an extension of Gen 6 Fibre Channel, provides outstanding insight and visibility across the storage network with powerful, integrated monitoring, management, and diagnostic tools that help organizations to simplify monitoring, increase operational stability, and dramatically reduce costs.

Bridging the fields of conservation, art history, and museum curating, this volume contains the principal papers from an international symposium titled "Historical Painting Techniques, Materials, and Studio Practice" at the University of Leiden in Amsterdam, Netherlands, from

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June 26 to 29, 1995. The symposium—designed for art historians, conservators, conservation scientists, and museum curators worldwide—was organized by the Department of Art History at the University of Leiden and the Art History Department of the Central Research Laboratory for Objects of Art and Science in Amsterdam. Twenty-five contributors representing museums and conservation institutions throughout the world provide recent research on historical painting techniques, including wall painting and polychrome sculpture. Topics cover the latest art historical research and scientific analyses of original techniques and materials, as well as historical sources, such as medieval treatises and descriptions of painting techniques in historical literature. Chapters include the painting methods of Rembrandt and Vermeer, Dutch 17th-century landscape painting, wall paintings in English churches, Chinese paintings on paper and canvas, and Tibetan thangkas. Color plates and black-and-white photographs illustrate works from the Middle Ages to the 20th century.

This IBM® Redbooks® publication provides information for attaching the IBM XIV® Storage System to various host operating system platforms, including IBM i. The book provides information and references for combining the XIV Storage System with other storage platforms, host servers, or gateways, including IBM N Series, and IBM ProtecTIER®. It is intended for administrators and architects of enterprise storage systems. The book also addresses using the XIV storage with databases and other storage-oriented application software that include: IBM DB2® VMware ESX Microsoft HyperV SAP The goal is to give an overview of the versatility and compatibility of the XIV Storage System with various platforms and environments. The information that is presented here is not meant as a replacement or substitute for the Host Attachment kit publications. It is meant as a complement and to provide

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readers with usage guidance and practical illustrations.

Storage Area Networks provide highly reliable, high-performance connectivity between hosts and storage devices. This allows storage resource sharing, improving asset utilization, and enabling solutions such as high availability, disaster recovery, information lifecycle management, and utility computing. These solutions provide a high return on investment, resulting in an accelerating SAN adoption rate in all IT markets. This book provides an overview of SAN protocols and technologies, and practical guidance on SAN design, implementation, and management topics. Some future SAN trends and technologies are discussed, but the focus is on designing SANs with current, real-world products such as Fibre Channel switches and routers. Principles of SAN Design offers a "one stop shop" for SAN design knowledge. Why wait? Read the definitive work on SAN design today!

Over 40 practical recipes to get your hands dirty with the powerful Cisco UCS and overcome various challenges About This Book Master the skills of minimizing cost, enabling your business to work faster by reducing cycle times for reporting and improving overall revenue Work through hands-on recipes for efficient deployment approaches, see computing techniques, and explore new operational models with UCS Render a better work-flow management, ensure effective monitoring, and learn new deployment paradigms for the operational infrastructure with the help of this book Who This Book Is For This book is for competent system/network or storage administrators who are working with Cisco UCS, but now want to learn new ways to compute UCS. What You Will Learn Familiarize yourself with information on the latest information on memory management practices, virtualization architectures, and the specific technical advantages of UCS Get a concrete understanding of

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integrating processes and techniques to ensure effective convergence of LAN/SAN Get to know the best practices of Cisco UCS, EMC Storage, and VMware vSphere Master migrating data from other band servers or Blade to Cisco UCS Comprehend how to replicate and back up UCS to remote sites UCS Assimilate innovative techniques to deploy UCS to leverage its full potential Gather information on installing and configuring automatic and manual Pinning Discover ways to integrate a system in Cisco UCS In Detail Cisco Unified Computing System (UCS) is a data center server platform that is used for computing, deploying, and storing resources in data center environments. This cookbook aims to teach you about various tasks you can implement to improve your existing method of configuring and deploying UCS. You will start by learning how to upgrade your firmware on Brocade and Cisco Fibre Channel Switch and will move on to enhance your knowledge of LAN connectivity. We will then discuss how to configure Windows 2008 and 2012 local boot in Cisco UCS. Next, you will learn how to install the operating system on Cisco UCS and use Cisco UCS Power Calculator to calculate the UCS consumption. Finally, we'll take a look at backup solutions. By the end of the book, you will know several ways to build and compute in data center environment using Cisco UCS. Style and approach This guide explains every task in a conversational and easy-to-follow style. You can open this book up to the task you want to learn and will be able to perform that task by the end of the recipe.

Cloud Networking: Understanding Cloud-Based Data Center Networks explains the evolution of established networking technologies into distributed, cloud-based networks. Starting with an overview of cloud technologies, the book explains how cloud data center networks leverage distributed systems for network virtualization, storage networking, and software-defined

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networking. The author offers insider perspective to key components that make a cloud network possible such as switch fabric technology and data center networking standards. The final chapters look ahead to developments in architectures, fabric technology, interconnections, and more. By the end of the book, readers will understand core networking technologies and how they're used in a cloud data center. Understand existing and emerging networking technologies that combine to form cloud data center networks Explains the evolution of data centers from enterprise to private and public cloud networks Reviews network virtualization standards for multi-tenant data center environments Includes cutting-edge detail on the latest switch fabric technologies from the networking team in Intel

This book is a concise one-stop desk reference and synopsis of basic knowledge and skills for Cisco certification prep. For beginning and experienced network engineers tasked with building LAN, WAN, and data center connections, this book lays out clear directions for installing, configuring, and troubleshooting networks with Cisco devices. The full range of certification topics is covered, including all aspects of IOS, NX-OS, and ASA software. The emphasis throughout is on solving the real-world challenges engineers face in configuring network devices, rather than on exhaustive descriptions of hardware features. This practical desk companion doubles as a comprehensive overview of the basic knowledge and skills needed by CCENT, CCNA, and CCNP exam takers. It distills a comprehensive library of cheat sheets, lab configurations, and advanced commands that the authors assembled as senior network engineers for the benefit of junior engineers they train, mentor on the job, and prepare for Cisco certification exams. Prior familiarity with Cisco routing and switching is desirable but not necessary, as Chris Carthern, Dr. Will Wilson, Noel Rivera, and Richard Bedwell start their

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book with a review of the basics of configuring routers and switches. All the more advanced chapters have labs and exercises to reinforce the concepts learned. This book differentiates itself from other Cisco books on the market by approaching network security from a hacker's perspective. Not only does it provide network security recommendations but it teaches you how to use black-hat tools such as oclHashcat, Loki, Burp Suite, Scapy, Metasploit, and Kali to actually test the security concepts learned. Readers of Cisco Networks will learn How to configure Cisco switches, routers, and data center devices in typical corporate network architectures The skills and knowledge needed to pass Cisco CCENT, CCNA, and CCNP certification exams How to set up and configure at-home labs using virtual machines and lab exercises in the book to practice advanced Cisco commands How to implement networks of Cisco devices supporting WAN, LAN, and data center configurations How to implement secure network configurations and configure the Cisco ASA firewall How to use black-hat tools and network penetration techniques to test the security of your network

Organizations of all sizes are faced with the challenge of managing massive volumes of increasingly valuable data. However, storing this data can be costly, and extracting value from the data is becoming more and more difficult. IT organizations have limited resources, but must stay responsive to dynamic environments and act quickly to consolidate, simplify, and optimize their IT infrastructures. The IBM® Storwize® V3700 system provides a solution that is affordable, easy to use, and self-optimizing, which enables organizations to overcome these storage challenges. Storwize V3700 delivers efficient, entry-level configurations that are specifically designed to meet the needs of small and midsize businesses. Designed to provide organizations with the ability to consolidate and share data at an affordable price, Storwize

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V3700 offers advanced software capabilities that are usually found in more expensive systems. Built on innovative IBM technology, Storwize V3700 addresses the block storage requirements of small and midsize organizations, Storwize V3700 is designed to accommodate the most common storage network technologies. This design enables easy implementation and management. Storwize V3700 includes the following features: Web-based GUI provides point-and-click management capabilities. Internal disk storage virtualization enables rapid, flexible provisioning and simple configuration changes. Thin provisioning enables applications to grow dynamically, but only use space they actually need. Enables simple data migration from external storage to Storwize V3700 storage (one-way from another storage device). Remote Mirror creates copies of data at remote locations for disaster recovery. IBM FlashCopy® creates instant application copies for backup or application testing. This IBM Redbooks® publication is intended for pre-sales and post-sales technical support professionals and storage administrators. The concepts in this book also relate to the IBM Storwize V3500. This book was written at a software level of version 7 release 4.

"A killer resume gets more job interviews."

Using TRILL, FabricPath, and VXLAN Designing Massively Scalable Data Centers with Overlays TRILL, FabricPath, and VXLAN overlays help you distribute data traffic far more effectively, dramatically improving utilization in even the largest data center networks. Using TRILL, FabricPath, and VXLAN is the first practical and comprehensive guide to planning and establishing these high-efficiency overlay networks. The authors begin by reviewing today's fast-

growing data center requirements, and making a strong case for overlays in the Massive Scale Data Center (MSDC). Next, they introduce each leading technology option, including FabricPath, TRILL, LISP, VXLAN, NVGRE, OTV, and Shortest Path Bridging (SPB). They also present a chapter-length introduction to IS-IS, focusing on details relevant to the control of FabricPath and TRILL networks. Building on this foundation, they offer in-depth coverage of FabricPath: its advantages, architecture, forwarding, configuration, verification, and benefits in Layer-2 networks. Through examples, they explain TRILL's architecture, functionality, and forwarding behavior, focusing especially on data flow. They also fully address VXLAN as a solution for realizing IP-based data center fabrics, including multi-tenant cloud applications. Using TRILL, FabricPath, and VXLAN provides detailed strategies and methodologies for FabricPath, TRILL, and VXLAN deployment and migration, as well as best practices for management and troubleshooting. It also presents three detailed implementation scenarios, each reflecting realistic data center challenges. In particular, the authors show how to integrate multiple overlay technologies into a single end-to-end solution that offers exceptional flexibility, agility, and availability. Sanjay K. Hooda is principal engineer in Catalyst switching software engineering at Cisco. He has more than 15 years of network design and implementation experience in

large enterprise environments, and has participated in IETF standards activities. His interests include wireless, multicast, TRILL, FabricPath, High Availability, ISSU, and IPv6. He is co-author of IPv6 for Enterprise Networks. Shyam Kapadia, Technical Leader at Cisco's Data Center Group (DCG), was an integral part of the team that delivered the next-generation Catalyst 6500 Sup 2T (2 Terabyte) platform. Since then, he has focused on developing new solutions for data center environments. He holds a Ph.D. in computer science from USC, where his research encompassed wired, wireless, ad hoc, vehicular, and sensor networks. Padmanabhan Krishnan has more than 12 years of experience in networking and telecommunications, including 7 at Cisco. His recent experience has included providing data path solutions for TRILL in the Catalyst 6500 Sup 2T Platform using FPGA, as well as design and development of platform core infrastructure and L2 features.

- Discover how overlays can address data center network problems ranging from scalability to rapid provisioning
- Examine popular data center overlay examples
- Learn about extensions to IS-IS for TRILL and FabricPath
- Use FabricPath, TRILL, and VXLAN to simplify configuration, improve performance and availability, optimize efficiency, and limit table size
- Learn about FabricPath control and data plane architecture details
- Review example FabricPath configurations on Cisco Nexus 7000/6000/5000

switches n Understand TRILL concepts and architecture, including overlay header, control and data plane, and MAC address learning n Learn about VXLAN architecture details and packet forwarding n Review example VXLAN configurations on a Cisco Nexus 1000V distributed virtual switch n Implement TRILL/FabricPath networks with VXLAN to virtualized servers in an intra-data center environment n Connect multiple traditional data centers using an OTV overlay as a Layer 2 extension n Use OTV overlays to connect sites running FabricPath, TRILL, or both

* The emphasis of this book will be on detailed practicality. Most of the SAN books provide a theoretical treatment of the technology from a top-down perspective. This book will be written from the perspective of "from the ground up". * Relates specific technology offerings to particular application areas. Email stores, Image stores, Video Production and RDBMS disk are used as specific case studies to show how the hardware, firmware, and interconnects are set up and used. * SAN technology is ready to move out of the glass house and large scale storage is becoming applicable to even dedicated purposes. This represents an increase in the potential audience for a book on SANs and, of course, remains highly useful for the administrators and centralized technical staff responsible for backups, recoverability, and availability.

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If you create, manage, operate, or configure systems running in the cloud, you're a cloud engineer--even if you work as a system administrator, software developer, data scientist, or site reliability engineer. With this book, professionals from around the world provide valuable insight into today's cloud engineering role. These concise articles explore the entire cloud computing experience, including fundamentals, architecture, and migration. You'll delve into security and compliance, operations and reliability, and software development. And examine networking, organizational culture, and more. You're sure to find 1, 2, or 97 things that inspire you to dig deeper and expand your own career. "Three Keys to Making the Right Multicloud Decisions," Brendan O'Leary "Serverless Bad Practices," Manases Jesus Galindo Bello "Failing a Cloud Migration," Lee Atchison "Treat Your Cloud Environment as If It Were On Premises," Iyana Garry "What Is Toil, and Why Are SREs Obsessed with It?", Zachary Nickens "Lean QA: The QA Evolving in the DevOps World," Theresa Neate "How Economies of Scale Work in the Cloud," Jon Moore "The Cloud Is Not About the Cloud," Ken Corless "Data Gravity: The Importance of Data Management in the Cloud," Geoff Hughes "Even in the Cloud, the Network Is the Foundation," David Murray "Cloud Engineering Is About Culture, Not Containers," Holly Cummins

This book is written in a friendly manner written by an expert with numerous

years of practical experience utilizing SolarWinds Orion NPM as a network monitoring solution. This book is for systems administrators, system analysts, and systems engineers who are tasked with installing and implementing a network performance monitor. Knowledge of basic network concepts is required.

This practical guide to techniques necessary to integrate fibre-based switches to an IP-based network is designed for advanced-level administrators. Beginning with a detailed analysis of the benefits of implementing a SAN and an examination of the hardware and bandwidth requirements, this book proceeds to a discussion of the Brocade SilkWorm series of fibre channel switches and how the various switches are configured to connect a SAN with existing LANs.

This IBM® Redbooks® document introduces the IBM Converged Switch B32. This switch supports Fibre Channel over Ethernet (FCoE), Fibre Channel, Converged Enhanced Ethernet (CEE), and traditional Ethernet protocol connectivity for servers and storage. FCoE is a new protocol that can expand Fibre Channel into the Ethernet environment, and it helps to combine and leverage the advantages of two technologies, Fibre Channel protocol and Ethernet. Features of the IBM Converged Switch B32 include: A 32-port multiprotocol switch for server I/O consolidation Enterprise-class availability for business continuance Improved return on investment and investment protection

Fabric security for mission-critical information In the related publication An Introduction to Fibre Channel over Ethernet, and Fibre Channel over Convergence Enhanced Ethernet, REDP-4493 we introduce FCoE and CEE concepts.

This bestselling book serves as the go-to study guide for Juniper Networks enterprise routing certification exams. The second edition has been updated with all the services available to the Junos administrator, including the new set of flow-based security services as well as design guidelines incorporating new services and features of MX, SRX, and EX network devices.

The IBM® b-type Gen 5 Fibre Channel directors and switches provide reliable, scalable, and secure high-performance foundations for high-density server virtualization, cloud architectures, and next generation flash and SSD storage. They are designed to meet the demands of highly virtualized private cloud storage and data center environments. This IBM Redbooks® publication helps administrators learn how to implement or migrate to an IBM Gen 5 b-type SAN. It provides an overview of the key hardware and software products and explains how to install, monitor, tune, and troubleshoot your storage area network (SAN). Read this publication to learn about fabric design, managing and monitoring your network, key tools such as IBM Network Advisor and Fabric Vision, and

troubleshooting.

Learn efficient ways to harness and manage your data storage networks Whether you're preparing for the CompTIA Storage+ exam or simply seeking a deeper understanding of data storage networks, this Sybex guide will help you get there. This book covers data storage from the basics to advanced topics, and provides practical examples to show you ways to deliver world-class solutions. In addition, it covers all the objectives of the CompTIA Storage+ exam (SG0-001), including storage components, connectivity, storage management, data protection, and storage performance. Focuses on designing, implementing, and administering storage for today's evolving organizations, getting under the hood of the technologies that enable performance, resiliency, availability, recoverability, and simplicity Covers virtualization, big data, cloud storage, security, and scalability as well as how storage fits in to the wider technology environments prevalent in today's cloud era Provides advice and real-world examples that storage administrators in the trenches can actually use An excellent study aid for the CompTIA Storage+ exam (SG0-001), covering all the exam objectives Data Storage Networking: Real World Skills for the CompTIA Storage+ Certification and Beyond provides a solid foundation for data storage administrators and a reference that can be consulted again and again.

The Cloud Computing Bible is a complete reference to cloud computing that presents the technologies, protocols, platforms and infrastructure that make cloud computing possible and desirable. Many of the cloud computing books on the market today are small books of 300 pages or less and the larger books tend to be programming books or security titles. A longer format book such as Cloud Computing Bible allows a complete definition of the topic as well as

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in-depth introductions to essential technologies and platforms. Additionally it allows significant technologies to be presented in a form that provides enough detail for the reader to determine if it is something that they are interested in learning more about. It is important to stress platform and technologies as the main subject and intersperse that with products in order to provide an extended life span, but have current appeal. The book will be divided into five parts: The Value Proposition, Platforms, Infrastructure, Services and Applications, and The Mobile Cloud.

This IBM® Redbooks® product guide describes the IBM Storage Networking SAN24B-6 switch. Explosive data growth, coupled with user expectations of unlimited access from anywhere, at any time, is pushing storage environments to the limit. To meet these dynamic business demands, the network must evolve to improve speed, increase efficiency, and reduce costs. Legacy infrastructures were not designed to support the performance requirements of flash-based storage technology. A new approach to storage networking is required to unlock the full capabilities of all-flash arrays. By treating the network as a strategic part of a storage environment, organizations can maximize their productivity and efficiency, even as they rapidly grow their environments. The IBM Storage Networking SAN24B-6 switch provides exceptional value in an entry-level switch, combining high-performance capabilities of 4, 8, 16, and 32 Gbps, point-and-click simplicity, and enterprise-class functionality. The port speed capability is dependent on the transceiver installed. SAN24B-6 provides small to midsized data centers with low-cost access to industry-leading Gen 5 and Gen 6 Fibre Channel technology and the ability to start small and grow on demand from 8 to 24 ports to support an evolving storage environment. In addition, SAN24B-6 is easy to use and install, with a point-and-click user

interface that simplifies deployment and saves time.

"Do everything that is necessary and absolutely nothing that is not." This IBM® Redbooks® publication, written at a Data Center Fabric Manager v10.1.4 and Fabric Operating System v6.4 level, consolidates critical information while also covering procedures and tasks that you are likely to encounter on a daily basis when implementing an IBM b-type SAN. The products that we describe in this book have more functionality than we can possibly cover in a single book. A storage area network (SAN) is a powerful infrastructure for consolidation, distance solutions, and data sharing. The quality applications that the IBM SAN portfolio provides can help you take full advantage of the benefits of the SAN. In this book, we cover the latest additions to the IBM b-type SAN family and show how you can implement them in an open systems environment. In particular, we focus on the Fibre Channel Protocol (FCP) environment. We address the key concepts that these products bring to the market and, in each case, we provide an overview of the functions that are essential to building a robust SAN environment.

IBM® System Storage® Gen 5 fabric backbones are among the industry's most powerful Fibre Channel switching infrastructure offerings. They provide reliable, scalable, and high-performance foundations for mission-critical storage. These fabric backbones also deliver enterprise connectivity options to add support for IBM FICON® connectivity, offering a high-performing and reliable FICON infrastructure with fast and scalable IBM System z® servers. Designed to increase business agility while providing nonstop access to information and reducing infrastructure and administrative costs, Gen 5 Fibre Channel fabric backbones deliver a new level of scalability and advanced capabilities to this robust, reliable, and high-

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performance technology. Although every network type has unique management requirements, most organizations face similar challenges managing their network environments. These challenges can include minimizing network downtime, reducing operational expenses, managing application service level agreements (SLAs), and providing robust security. Until now, no single tool could address these needs across different network types. To address this issue, the IBM Network Advisor management tool provides comprehensive management for data, storage, and converged networks. This single application can deliver end-to-end visibility and insight across different network types by integrating with Fabric Vision technology; it supports Fibre Channel SANs, including Gen 5 Fibre Channel platforms, IBM FICON, and IBM b-type SAN FCoE networks. In addition, this tool supports comprehensive lifecycle management capabilities across different networks through a simple, seamless user experience. This IBM Redbooks® publication introduces the concepts, architecture, and basic implementation of Gen 5 and IBM Network Advisor. It is aimed at system administrators, and pre- and post-sales support staff.

This IBM® Redbooks® product guide describes the IBM Storage Networking SAN64B-6 switch. cloud infrastructures and growing flash-based storage environments by delivering market-leading Gen 6 Fibre Channel technology and capabilities. SAN64B-6 delivers unmatched 32/128 gigabits per second (Gbps) performance, industry-leading port density, and built-in instrumentation to accelerates data access, drive always-on business, and support data center consolidation in small to large-scale enterprise infrastructures.

The superabundance of data that is created by today's businesses is making storage a strategic investment priority for companies of all sizes. As storage takes precedence, the

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following major initiatives emerge: Flatten and converge your network: IBM® takes an open, standards-based approach to implement the latest advances in the flat, converged data center network designs of today. IBM Storage solutions enable clients to deploy a high-speed, low-latency Unified Fabric Architecture. Optimize and automate virtualization: Advanced virtualization awareness reduces the cost and complexity of deploying physical and virtual data center infrastructure. Simplify management: IBM data center networks are easy to deploy, maintain, scale, and virtualize, delivering the foundation of consolidated operations for dynamic infrastructure management. Storage is no longer an afterthought. Too much is at stake. Companies are searching for more ways to efficiently manage expanding volumes of data, and to make that data accessible throughout the enterprise. This demand is propelling the move of storage into the network. Also, the increasing complexity of managing large numbers of storage devices and vast amounts of data is driving greater business value into software and services. With current estimates of the amount of data to be managed and made available increasing at 60% each year, this outlook is where a storage area network (SAN) enters the arena. SANs are the leading storage infrastructure for the global economy of today. SANs offer simplified storage management, scalability, flexibility, and availability; and improved data access, movement, and backup. Welcome to the cognitive era. The smarter data center with the improved economics of IT can be achieved by connecting servers and storage with a high-speed and intelligent network fabric. A smarter data center that hosts IBM Storage solutions can provide an environment that is smarter, faster, greener, open, and easy to manage. This IBM® Redbooks® publication provides an introduction to SAN and Ethernet networking, and how these networks help to achieve a smarter data center. This book is intended for people

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who are not very familiar with IT, or who are just starting out in the IT world.

Multiprotocol routers have been used in data networks for decades, but routers built specifically for Storage Area Networks (SANs) are a recent innovation. This book covers multiprotocol SAN routing in general and the Brocade SilkWorm Multiprotocol Router platform in particular. Multiprotocol SAN routers today usually provide three services: Fibre Channel to Fibre Channel routing, iSCSI to Fibre Channel bridging, and FCIP tunneling for distance extension. The subjects covered for each service include theory, usage cases, and advice on designing, implementing, and managing routed SANs. "Multiprotocol Routing for SANs" offers the first comprehensive look at this cutting-edge technology.

A practical guide to building programmable networks using OpenDaylight About This Book Learn and understand how SDN controllers operate and integrate with networks; this book's step-by-step tutorials will give you a strong foundation in SDN, NVF, and OpenDayLight. Learn how to map legacy Layer 2/3 networking technologies in the SDN world Add new services and capabilities to your infrastructure and quickly adopt SDN and NFV within your organization with OpenDayLight. Integrate and manage software-defined networks efficiently in your organization. Build innovative network applications with OpenDayLight and save time and resources. Who This Book Is For This book targets network engineers, network programmers and developers, administrators, and anyone with some level of networking experience who'd like to deploy OpenDayLight effectively. Familiarity with the day-to-day operations of computer networks is expected What You Will Learn Transition from legacy networking to software-defined networking

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Learn how SDN controllers work and manage a network using southbound and northbound APIs Learn how to deploy the OpenDayLight SDN controller and integrate it with virtual switches Understand the basic design and operation of the OpenDaylight platform Build simple MD-SAL OpenDaylight applications Build applications on top of OpenDayLight to trigger network changes based on different events Integrate OpenStack with OpenDayLight to build a fully managed network Learn how to build a software-defined datacenter using NFV and service-chaining technologies In Detail OpenDaylight is an open source, software-defined network controller based on standard protocols. It aims to accelerate the adoption of Software-Defined Networking (SDN) and create a solid foundation for Network Functions Virtualization (NFV). SDN is a vast subject; many network engineers find it difficult to get started with using and operating different SDN platforms. This book will give you a practical bridge from SDN theory to the practical, real-world use of SDN in datacenters and by cloud providers. The book will help you understand the features and use cases for SDN, NFV, and OpenDaylight. NFV uses virtualization concepts and techniques to create virtual classes for node functions. Used together, SDN and NFV can elevate the standards of your network architecture; generic hardware-saving costs and the advanced and abstracted software will give you the freedom to evolve your network in the future without having to invest more in costly equipment. By the end of this book, you will have learned how to design and deploy OpenDaylight networks and integrate them with

physical network switches. You will also have mastered basic network programming over the SDN fabric. Style and approach This is a step-by-step tutorial aimed at getting you up-to-speed with OpenDayLight and ready to adopt it for your SDN (Software-Defined Networking) and NFV (Network Functions Virtualization) ecosystem.

Updated March 2019 - See Appendix B: IBM FlashSystem V9000 FlashCore Forever

The success or failure of businesses often depends on how well organizations use their data assets for competitive advantage. Deeper insights from data require better information technology. As organizations modernize their IT infrastructure to boost innovation rather than limit it, they need a data storage system that can keep pace with several areas that affect your business: Highly virtualized environments Cloud computing Mobile and social systems of engagement In-depth, real-time analytics Making the correct decision on storage investment is critical. Organizations must have enough storage performance and agility to innovate when they need to implement cloud-based IT services, deploy virtual desktop infrastructure, enhance fraud detection, and use new analytics capabilities. At the same time, future storage investments must lower IT infrastructure costs while helping organizations to derive the greatest possible value from their data assets. The IBM® FlashSystem V9000 is the premier, fully integrated, Tier 1, all-flash offering from IBM. It has changed the economics of today's data center by eliminating storage bottlenecks. Its software-defined storage features simplify data management, improve data security, and preserve your investments in storage. The

IBM FlashSystem® V9000 SAS expansion enclosures provide new tiering options with read-intensive SSDs or nearline SAS HDDs. IBM FlashSystem V9000 includes IBM FlashCore® technology and advanced software-defined storage available in one solution in a compact 6U form factor. IBM FlashSystem V9000 improves business application availability. It delivers greater resource utilization so you can get the most from your storage resources, and achieve a simpler, more scalable, and cost-efficient IT Infrastructure. This IBM Redbooks® publication provides information about IBM FlashSystem V9000 Software V8.1. It describes the core product architecture, software, hardware, and implementation, and provides hints and tips. The underlying basic hardware and software architecture and features of the IBM FlashSystem V9000 AC3 control enclosure and on IBM Spectrum Virtualize 8.1 software are described in these publications: Implementing IBM FlashSystem 900 Model AE3, SG24-8414 Implementing the IBM System Storage SAN Volume Controller V7.4, SG24-7933 Using IBM FlashSystem V9000 software functions, management tools, and interoperability combines the performance of IBM FlashSystem architecture with the advanced functions of software-defined storage to deliver performance, efficiency, and functions that meet the needs of enterprise workloads that demand IBM MicroLatency® response time. This book offers IBM FlashSystem V9000 scalability concepts and guidelines for planning, installing, and configuring, which can help environments scale up and out to add more flash capacity and expand virtualized systems. Port utilization methodologies

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are provided to help you maximize the full potential of IBM FlashSystem V9000 performance and low latency in your scalable environment. This book is intended for pre-sales and post-sales technical support professionals, storage administrators, and anyone who wants to understand how to implement this exciting technology.

Offers techniques, tips, and insights into squeezing maximum performance out of a virtualized database.

The Fibre Channel Association is a group of companies involved in developing devices and technologies used with Fibre Channel, a very high-speed bus technology capable of bi-directional data transfer at rates in excess of one gigabit per second. Describes how to use Fibre Channel technology to connect between storage devices and network servers for maximum data transfer

Authoring association is a group of companies involved in developing devices and technologies used with Fibre Channel

Discusses cutting edge technology capable of bi-directional data transfer at rates in excess of one gigabit per second

The rapid spread and adoption of production storage area networks (SANs) has fueled the need for multiprotocol routers. The routers provide improved scalability, security, and manageability by enabling devices in separate SAN fabrics to communicate without merging fabrics into a single, large SAN fabric. This capability enables clients to initially deploy separate SAN solutions at the departmental and data center levels. Then, clients can consolidate these separate solutions into large enterprise SAN solutions as

their experience and requirements grow and change. Alternatively, multiprotocol routers can help to connect existing enterprise SANs for a variety of reasons. For instance, the introduction of Small Computer System Interface over IP (iSCSI) provides for the connection of low-end, low-cost hosts to enterprise SANs. The use of an Internet Protocol (IP) in the Fibre Channel (FC) environment provides for resource consolidation and disaster recovery planning over long distances. And the use of FC-FC routing services provides connectivity between two or more fabrics without having to merge them into a single SAN. This IBM® Redbooks® publication targets storage network administrators, system designers, architects, and IT professionals who sell, design, or administer SANs. It introduces you to products, concepts, and technology in the IBM System Storage™ SAN Routing portfolio, which is based on Brocade products and technology. This book shows the features of these products and examples of how you can deploy and use them.

This IBM® Redbooks® publication will help you design and manage an end-to-end, extended distance connectivity architecture for IBM System z®. This solution addresses your requirements now, and positions you to make effective use of new technologies in the future. Many enterprises implement extended distance connectivity in a silo manner. However, effective extended distance solutions require the involvement of different teams within an organization. Typically there is a network group, a storage group, a systems group, and possibly other teams. The intent of this publication is to

help you design and manage a solution that will provide for all of your System z extended distance needs in the most effective and flexible way possible. This book introduces an approach to help plan, optimize, and maintain all of the moving parts of the solution together.

Along with servers and networking infrastructure, networked storage is one of the fundamental components of a modern data center. Because storage networking has evolved over the past two decades, the industry has settled on the basic storage networking technologies. These technologies are Fibre Channel (FC) storage area networks (SANs), Internet Small Computer System Interface (iSCSI)-based Ethernet attachment, and Ethernet-based network-attached storage (NAS). Today, lossless, low-latency, high-speed FC SANs are viewed as the high-performance option for networked storage. iSCSI and NAS are viewed as lower cost, lower performance technologies. The advent of the 100 Gbps Ethernet and Data Center Bridging (DCB) standards for lossless Ethernet give Ethernet technology many of the desirable characteristics that make FC the preferred storage networking technology. These characteristics include comparable speed, low latency, and lossless behavior. Coupled with an ongoing industry drive toward better asset utilization and lower total cost of ownership, these advances open the door for organizations to consider consolidating and converging their networked storage infrastructures with their Ethernet data networks. Fibre Channel over Ethernet (FCoE) is one approach to this convergence, but 10-Gbps-enabled iSCSI

