

## Cisco Software Defined Access Services Solution Overview

Designing Networks and Services for the Cloud Delivering business-grade cloud applications and services A rapid, easy-to-understand approach to delivering a secure, resilient, easy-to-manage, SLA-driven cloud experience Designing Networks and Services for the Cloud helps you understand the design and architecture of networks and network services that enable the delivery of business-grade cloud services. Drawing on more than 40 years of experience in network and cloud design, validation, and deployment, the authors demonstrate how networks spanning from the Enterprise branch/HQ and the service provider Next-Generation Networks (NGN) to the data center fabric play a key role in addressing the primary inhibitors to cloud adoption—security, performance, and management complexity. The authors first review how virtualized infrastructure lays the foundation for the delivery of cloud services before delving into a primer on clouds, including the management of cloud services. Next, they explore key factors that inhibit enterprises from moving their core workloads to the cloud, and how advanced networks and network services can help businesses migrate to the cloud with confidence. You'll find an in-depth look at data center networks, including virtualization-aware networks, virtual network services, and service overlays. The elements of security in this virtual, fluid environment are discussed, along with techniques for optimizing and accelerating the service delivery. The book dives deeply into cloud-aware service provider NGNs and their role in flexibly connecting distributed cloud resources, ensuring the security of provider and tenant resources, and enabling the optimal placement of cloud services. The role of Enterprise networks as a critical control point for securely and cost-effectively connecting to high-performance cloud services is explored in detail before various parts of the network finally come together in the definition and delivery of end-to-end cloud SLAs. At the end of the journey, you preview the exciting future of clouds and network services, along with the major upcoming trends. If you are a technical professional or manager who must design, implement, or operate cloud or NGN solutions in enterprise or service-provider environments, this guide will be an indispensable resource.

- \* Understand how virtualized data-center infrastructure lays the groundwork for cloud-based services
- \* Move from distributed virtualization to "IT-as-a-service" via automated self-service portals
- \* Classify cloud services and deployment models, and understand the actors in the cloud ecosystem
- \* Review the elements, requirements, challenges, and opportunities associated with network services in the cloud
- \* Optimize data centers via network segmentation, virtualization-aware networks, virtual network services, and service overlays
- \* Systematically secure cloud services
- \* Optimize service and application performance
- \* Plan and implement NGN infrastructure to support and accelerate cloud services
- \* Successfully connect enterprises to the cloud
- \* Define and deliver on end-to-end cloud SLAs
- \* Preview the future of cloud and network services

Practical Cisco Unified Communications Security guides you through securing modern Cisco UC environments that support voice, video, IM, and presence, and integrate real-time collaboration based on mobile/remote access and BYOD. Leading Cisco collaboration experts Nik Smith and Brett Hall bring together knowledge and insights previously scattered through multiple sources, helping you understand both the "why" and the "how" of effective collaboration security in both new ("greenfield") and existing ("brownfield") deployments. Using the proven "Explain, Demonstrate, and Verify" methodology, they explain each security threat, walk through remediation, and show how to confirm correct implementation. Smith and Hall present a reference network design based on the Standard Cisco Preferred UC Architecture, and walk through securing each attack surface in a logical progression, across each Cisco UC application domain. Chapter summaries provide quick reference checklists, and the authors offer links to even more detail wherever needed.

While several publishers (including O'Reilly) supply excellent documentation of router features, the trick is knowing when, why, and how to use these features There are often many different ways to solve any given networking problem using Cisco devices, and some solutions are clearly more effective than others. The pressing question for a network engineer is which of the many potential solutions is the most appropriate for a particular situation. Once you have decided to use a particular feature, how should you implement it? Unfortunately, the documentation describing a particular command or feature frequently does very little to answer either of these questions. Everybody who has worked with Cisco routers for any length of time has had to ask their friends and co-workers for example router configuration files that show how to solve a common problem. A good working configuration example can often save huge amounts of time and frustration when implementing a feature that you've never used before. The Cisco Cookbook gathers hundreds of example router configurations all in one place. As the name suggests, Cisco Cookbook is organized as a series of recipes. Each recipe begins with a problem statement that describes a common situation that you might face. After each problem statement is a brief solution that shows a sample router configuration or script that you can use to resolve this particular problem. A discussion section then describes the solution, how it works, and when you should or should not use it. The chapters are organized by the feature or protocol discussed. If you are looking for information on a particular feature such as NAT, NTP or SNMP, you can turn to that chapter and find a variety of related recipes. Most chapters list basic problems first, and any unusual or complicated situations last. The Cisco Cookbook will quickly become your "go to" resource for researching and solving complex router configuration issues, saving you time and making your network more efficient. It covers: Router Configuration and File Management Router Management User Access and Privilege Levels TACACS+ IP Routing RIP EIGRP OSPF BGP Frame Relay Queueing and Congestion Tunnels and VPNs Dial Backup NTP and Time DLSw Router Interfaces and Media Simple Network Management Protocol Logging Access Lists DHCP NAT Hot Standby Router Protocol IP Multicast

A Visual Guide to Understanding Software Defined Networks and Network Function Virtualization The simple, visual, at-a-glance guide to SDN and NFV: Core concepts, business drivers, key technologies, and more! SDN (Software Defined Networks) and NFV (Network Function Virtualization) are today's hottest areas of networking. Many executives, investors, sales professionals, and marketers need a solid working understanding of these technologies, but most books on the subject are written specifically for network engineers and other technical experts. SDN and NFV Simplified fills that gap, offering highly visual, "at-a-glance" explanations of SDN, NFV, and their underlying virtualizations. Built around an illustrated, story-telling approach, this answers the questions: Why does this technology matter? How does it work? Where is it used? What problems does it solve? Through easy, whiteboard-style infographics, you'll learn: how virtualization enables SDN and NFV; how datacenters are virtualized through clouds; how networks can also be virtualized; and how to maximize security, visibility, and Quality of Experience in tomorrow's fully-virtualized environments. Step by step, you'll discover why SDN and NFV technologies are completely redefining both enterprise and carrier networks, and driving the most dramatic technology migration since IP networking. That's not all: You'll learn all you need to help lead this transformation. Learn how virtualization establishes

the foundation for SDN and NFV Review the benefits of VMs, the role of hypervisors, and the management of virtual resources Discover how cloud technologies enable datacenter virtualization Understand the roles of networking gear in virtualized datacenters See VMWare VMotion and VXLAN at work in the virtualized datacenter Understand multitenancy and the challenges of “communal living” Learn how core network functions and appliances can be virtualized Ensure performance and scalability in virtualized networks Compare modern approaches to network virtualization, including OpenFlow, VMWare Nicera, Cisco Insieme, and OpenStack Walk through the business case for SDN, NFV, and the Cloud Discover how the Software Defined Network (SDN) solves problems previously left unaddressed Understand SDN controllers—and who’s fighting to control your network Use SDN and NFV to improve integration and say goodbye to “truck rolls” Enforce security, avoid data leakage, and protect assets through encryption Provide for effective monitoring and consistent Quality of Experience (QoE) Learn how SDN and NFV will affect you—and what’s next

Software-Defined Networks (SDN) are transforming the Internet by replacing bundled, proprietary hardware and control software. SDN is being embraced by cloud providers, telcos, and enterprises, as it enables a new era of innovation in networking. This book provides a comprehensive introduction to SDN from the perspective of those who are developing and leveraging the technology. Book Features: Describes a complete SDN stack, illustrated with example open source software. Emphasizes underlying concepts, abstractions, and design rationale. Describes both fixed-function and programmable switching chips. Describes the P4-based toolchain for programming and controlling switches. Describes a range of SDN use cases: enterprises, datacenters, access networks. Includes hands-on programming exercises, downloadable from GitHub.

Trust the best-selling Official Cert Guide series from Cisco Press to help you learn, prepare, and practice for exam success. They are built with the objective of providing assessment, review, and practice to help ensure you are fully prepared for your certification exam. This book, combined with CCNA 200-301 Official Cert Guide, Volume 1, covers all the exam topics on the CCNA 200-301 exam. · Master Cisco CCNA 200-301 exam topics · Assess your knowledge with chapter-opening quizzes · Review key concepts with exam preparation tasks This is the eBook edition of CCNA 200-301 Official Cert Guide, Volume 2. This eBook does not include access to the Pearson Test Prep practice exams that comes with the print edition. CCNA 200-301 Official Cert Guide, Volume 2 presents you with an organized test preparation routine through the use of proven series elements and techniques. “Do I Know This Already?” quizzes open each chapter and enable you to decide how much time you need to spend on each section. Exam topic lists make referencing easy. Chapter-ending Exam Preparation Tasks help you drill on key concepts you must know thoroughly. CCNA 200-301 Official Cert Guide, Volume 2 from Cisco Press enables you to succeed on the exam the first time and is the only self-study resource approved by Cisco. Best-selling author Wendell Odom shares preparation hints and test-taking tips, helping you identify areas of weakness and improve both your conceptual knowledge and hands-on skills. This complete study package includes · A test-preparation routine proven to help you pass the exams · Do I Know This Already? quizzes, which enable you to decide how much time you need to spend on each section · Chapter-ending Key Topic tables, which help you drill on key concepts you must know thoroughly · The powerful Pearson Test Prep Practice Test software, complete with hundreds of well-reviewed, exam-realistic questions, customization options, and detailed performance reports · A free copy of the CCNA 200-301 Network Simulator, Volume 2 Lite software, complete with meaningful lab exercises that help you hone your hands-on skills with the command-line interface for routers and switches · Links to a series of hands-on config labs developed by the author · Online interactive practice exercises that help you enhance your knowledge · More than 50 minutes of video mentoring from the author · An online interactive Flash Cards application to help you drill on Key Terms by chapter · A final preparation chapter, which guides you through tools and resources to help you craft your review and test-taking strategies · Study plan suggestions and templates to help you organize and optimize your study time Well regarded for its level of detail, study plans, assessment features, hands-on labs, and challenging review questions and exercises, this official study guide helps you master the concepts and techniques that ensure your exam success. CCNA 200-301 Official Cert Guide, Volume 2, combined with CCNA 200-301 Official Cert Guide, Volume 1, walk you through all the exam topics found in the Cisco 200-301 exam. Topics covered in Volume 2 include · IP access control lists · Security services · IP services · Network architecture · Network automation Companion Website: Companion Website: The companion website contains CCNA Network Simulator Lite software, practice exercises, 50 minutes of video training, and other study resources. See the Where Are the Companion Files on the last page of your eBook file for instructions on how to access. In addition to the wealth of content, this new edition includes a series of free hands-on exercises to help you master several real-world configuration activities. These exercises can be performed on the CCNA 200-301 Network Simulator Lite, Volume 2 software included for free on the companion website that accompanies this book.

The advancement of technology is a standard of modern daily life, whether it be the release of a new cellphone, computer, or a self-driving car. Due to this constant advancement, the networks on which these technologies operate must advance as well. Innovations in Software-Defined Networking and Network Functions Virtualization is a critical scholarly publication that observes the advances made in network infrastructure through achieving cost efficacy while maintaining maximum flexibility for the formation and operation of these networks. Featuring coverage on a broad selection of topics, such as software-defined storage, openflow controller, and storage virtualization, this publication is geared toward professionals, computer engineers, academicians, students, and researchers seeking current and relevant research on the advancements made to network infrastructures.

This primer on NSX-T helps you understand the capabilities and features of NSX-T, how to configure and manage NSX-T, and integrate NSX-T with other software. The book is the first in a series that will teach you the basics of NSX-T, which is an update of VMware's original software-defined networking (SDN) architecture aimed at making networks agile and flexible. You will become familiar with VMware's software-defined data center (SDDC) ecosystem and how NSX-T fits in. You will understand NSX-T components such as NSX-T Manager, NSX-T Edge Transport Nodes, and NSX-T Host Transport Nodes. And you will learn how to install and configure network services such as East/West and North/South routing capabilities, layer two switching, VRF, EVPN, multicast, and layer two bridging. The book provides best practices on how to configure routing and switching features, and teaches you how to get the required visibility of not only your NSX-T platform but also your NSX-T-enabled network infrastructure. The book explains security, advanced network features, and multi-site capabilities and demonstrates how network and security services can be offered across multiple on-premise locations with a single pane of glass for networking and security policy management. The interface with public cloud services is discussed and the book explains NSX-T operation in an on-premise private cloud and positioning and integrating NSX-T on a public cloud (off premises). What

You Will Learn Understand how NSX-T fits in the VMware SDDC ecosystem Know what NSX-T is, its components, and the terminology used Install NSX-T Configure NSX-T network services Manage the NSX-T network Who This Book Is For Virtualization administrators, system integrators, and network administrators

End-to-End QoS Network Design Quality of Service for Rich-Media & Cloud Networks Second Edition New best practices, technical strategies, and proven designs for maximizing QoS in complex networks This authoritative guide to deploying, managing, and optimizing QoS with Cisco technologies has been thoroughly revamped to reflect the newest applications, best practices, hardware, software, and tools for modern networks. This new edition focuses on complex traffic mixes with increased usage of mobile devices, wireless network access, advanced communications, and video. It reflects the growing heterogeneity of video traffic, including passive streaming video, interactive video, and immersive videoconferences. It also addresses shifting bandwidth constraints and congestion points; improved hardware, software, and tools; and emerging QoS applications in network security. The authors first introduce QoS technologies in high-to-mid-level technical detail, including protocols, tools, and relevant standards. They examine new QoS demands and requirements, identify reasons to reevaluate current QoS designs, and present new strategic design recommendations. Next, drawing on extensive experience, they offer deep technical detail on campus wired and wireless QoS design; next-generation wiring closets; QoS design for data centers, Internet edge, WAN edge, and branches; QoS for IPsec VPNs, and more. Tim Szigeti, CCIE No. 9794 is a Senior Technical Leader in the Cisco System Design Unit. He has specialized in QoS for the past 15 years and authored Cisco TelePresence Fundamentals. Robert Barton, CCIE No. 6660 (R&S and Security), CCDE No. 2013::6 is a Senior Systems Engineer in the Cisco Canada Public Sector Operation. A registered Professional Engineer (P. Eng), he has 15 years of IT experience and is primarily focused on wireless and security architectures. Christina Hattingh spent 13 years as Senior Member of Technical Staff in Unified Communications (UC) in Cisco's Services Routing Technology Group (SRTG). There, she spoke at Cisco conferences, trained sales staff and partners, authored books, and advised customers. Kenneth Briley, Jr., CCIE No. 9754, is a Technical Lead in the Cisco Network Operating Systems Technology Group. With more than a decade of QoS design/implementation experience, he is currently focused on converging wired and wireless QoS.

- Master a proven, step-by-step best-practice approach to successful QoS deployment
- Implement Cisco-validated designs related to new and emerging applications
- Apply best practices for classification, marking, policing, shaping, markdown, and congestion management/avoidance
- Leverage the new Cisco Application Visibility and Control feature-set to perform deep-packet inspection to recognize more than 1000 different applications
- Use Medianet architecture elements specific to QoS configuration, monitoring, and control
- Optimize QoS in rich-media campus networks using the Cisco Catalyst 3750, Catalyst 4500, and Catalyst 6500
- Design wireless networks to support voice and video using a Cisco centralized or converged access WLAN
- Achieve zero packet loss in GE/10GE/40GE/100GE data center networks
- Implement QoS virtual access data center designs with the Cisco Nexus 1000V
- Optimize QoS at the enterprise customer edge
- Achieve extraordinary levels of QoS in service provider edge networks
- Utilize new industry standards and QoS technologies, including IETF RFC 4594, IEEE 802.1Q-2005, HQF, and NBAR2

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.

Foundations of Modern Networking is a comprehensive, unified survey of modern networking technology and applications for today's professionals, managers, and students. Dr. William Stallings offers clear and well-organized coverage of five key technologies that are transforming networks: Software-Defined Networks (SDN), Network Functions Virtualization (NFV), Quality of Experience (QoE), the Internet of Things (IoT), and cloudbased services. Dr. Stallings reviews current network ecosystems and the challenges they face—from Big Data and mobility to security and complexity. Next, he offers complete, self-contained coverage of each new set of technologies: how they work, how they are architected, and how they can be applied to solve real problems. Dr. Stallings presents a chapter-length analysis of emerging security issues in modern networks. He concludes with an up-to date discussion of networking careers, including important recent changes in roles and skill requirements. Coverage: Elements of the modern networking ecosystem: technologies, architecture, services, and applications Evolving requirements of current network environments SDN: concepts, rationale, applications, and standards across data, control, and application planes OpenFlow, OpenDaylight, and other key SDN technologies Network functions virtualization: concepts, technology, applications, and software defined infrastructure Ensuring customer Quality of Experience (QoE) with interactive video and multimedia network traffic Cloud networking: services, deployment models, architecture, and linkages to SDN and NFV IoT and fog computing in depth: key components of IoT-enabled devices, model architectures, and example implementations Securing SDN, NFV, cloud, and IoT environments Career preparation and ongoing education for tomorrow's networking careers Key Features: Strong coverage of unifying principles and practical techniques More than a hundred figures that clarify key concepts Web support at [williamstallings.com/Network/](http://williamstallings.com/Network/) QR codes throughout, linking to the website and other resources Keyword/acronym lists, recommended readings, and glossary Margin note definitions of key words throughout the text

The complete guide to seamless anytime/anywhere networking with LISP In an era of ubiquitous clouds, virtualization, mobility, and the Internet of Things, information and resources must be accessible anytime, from anywhere. Connectivity to devices and workloads must be seamless even when people move, and their location must be fully independent of device identity. The Locator/ID Separation Protocol (LISP) makes all this possible. The LISP Network is the first comprehensive, in-depth guide to LISP concepts, architecture, techniques, behavior, and applications. Co-authored by LISP co-creator Dino Farinacci and Victor Moreno—co-developer of the Cisco LISP implementation—it will help you identify the opportunities and benefits of deploying LISP in any data center, campus and branch access, WAN edge, or service provider core network. This largely implementation-agnostic guide will be valuable to architects, engineers, consultants, technical sales professionals, and senior IT professionals in any largescale network environment. The authors show how LISP overcomes key problems in large-scale networking, thoroughly introduce its key applications, guide you through designing real-world solutions, and present detailed deployment case studies based on their pioneering experience.

- Understand LISP's core principles, history, motivation, and applications
- Explore LISP's technical architecture, components, mechanisms, and workflows
- Use LISP to seamlessly deliver diverse network services and enable major advances in data center connectivity
- Improve mobility, network segmentation, and policy management
- Leverage software-defined WANs (SD-WANs) to efficiently move traffic from access to data center
- Evolve access networks to provide pervasive, mega-scale, high-density modern connectivity
- Integrate comprehensive security into the networking control and data plane, and learn how LISP infrastructure is protected against attacks
- Enforce access control policies, connection integrity, confidentiality for data in flight, and end-point anonymity
- Discover how LISP mobility mechanisms anticipate tomorrow's application use cases

Thoroughly revised and expanded, this second edition adds sections on MPLS, Security, IPv6, and IP Mobility and presents solutions to the most common configuration problems.

As a network administrator, auditor or architect, you know the importance of securing your network and finding security solutions you can implement quickly. This succinct book departs from other security

literature by focusing exclusively on ways to secure Cisco routers, rather than the entire network. The rationale is simple: If the router protecting a network is exposed to hackers, then so is the network behind it. *Hardening Cisco Routers* is a reference for protecting the protectors. Included are the following topics: The importance of router security and where routers fit into an overall security plan Different router configurations for various versions of Cisco's IOS Standard ways to access a Cisco router and the security implications of each Password and privilege levels in Cisco routers Authentication, Authorization, and Accounting (AAA) control Router warning banner use (as recommended by the FBI) Unnecessary protocols and services commonly run on Cisco routers SNMP security Anti-spoofing Protocol security for RIP, OSPF, EIGRP, NTP, and BGP Logging violations Incident response Physical security Written by Thomas Akin, an experienced Certified Information Systems Security Professional (CISSP) and Certified Cisco Academic Instructor (CCAI), the book is well organized, emphasizing practicality and a hands-on approach. At the end of each chapter, Akin includes a Checklist that summarizes the hardening techniques discussed in the chapter. The Checklists help you double-check the configurations you have been instructed to make, and serve as quick references for future security procedures. Concise and to the point, *Hardening Cisco Routers* supplies you with all the tools necessary to turn a potential vulnerability into a strength. In an area that is otherwise poorly documented, this is the one book that will help you make your Cisco routers rock solid.

*Software Defined Networks: A Comprehensive Approach, Second Edition* provides in-depth coverage of the technologies collectively known as Software Defined Networking (SDN). The book shows how to explain to business decision-makers the benefits and risks in shifting parts of a network to the SDN model, when to integrate SDN technologies in a network, and how to develop or acquire SDN applications. In addition, the book emphasizes the parts of the technology that encourage opening up the network, providing treatment for alternative approaches to SDN that expand the definition of SDN as networking vendors adopt traits of SDN to their existing solutions. Since the first edition was published, the SDN market has matured, and is being gradually integrated and morphed into something more compatible with mainstream networking vendors. This book reflects these changes, with coverage of the OpenDaylight controller and its support for multiple southbound protocols, the Inclusion of NETCONF in discussions on controllers and devices, expanded coverage of NFV, and updated coverage of the latest approved version (1.5.1) of the OpenFlow specification. Contains expanded coverage of controllers Includes a new chapter on NETCONF and SDN Presents expanded coverage of SDN in optical networks Provides support materials for use in computer networking courses

Thoroughly prepare for the revised Cisco CCIE Wireless v3.x certification exams *Earning Cisco CCIE Wireless certification* demonstrates your broad theoretical knowledge of wireless networking, your strong understanding of Cisco WLAN technologies, and the skills and technical knowledge required of an expert-level wireless network professional. This guide will help you efficiently master the knowledge and skills you'll need to succeed on both the CCIE Wireless v3.x written and lab exams. Designed to help you efficiently focus your study, achieve mastery, and build confidence, it focuses on conceptual insight, not mere memorization. Authored by five of the leading Cisco wireless network experts, it covers all areas of the CCIE Wireless exam blueprint, offering complete foundational knowledge for configuring and troubleshooting virtually any Cisco wireless deployment. Plan and design enterprise-class WLANs addressing issues ranging from RF boundaries to AP positioning, power levels, and density Prepare and set up wireless network infrastructure, including Layer 2/3 and key network services Optimize existing wired networks to support wireless infrastructure Deploy, configure, and troubleshoot Cisco IOS Autonomous WLAN devices for wireless bridging Implement, configure, and manage AireOS Appliance, Virtual, and Mobility Express Controllers Secure wireless networks with Cisco Identity Services Engine: protocols, concepts, use cases, and configuration Set up and optimize management operations with Prime Infrastructure and MSE/CMX Design, configure, operate, and troubleshoot WLANs with real-time applications This IBM® Redbooks® publication introduces the IBM Software Defined Environment (SDE) solution, which helps to optimize the entire computing infrastructure--compute, storage, and network resources--so that it can adapt to the type of work required. In today's environment, resources are assigned manually to workloads, but that happens automatically in a SDE. In an SDE, workloads are dynamically assigned to IT resources based on application characteristics, best-available resources, and service level policies so that they deliver continuous, dynamic optimization and reconfiguration to address infrastructure issues. Underlying all of this are policy-based compliance checks and updates in a centrally managed environment. Readers get a broad introduction to the new architecture. Think integration, automation, and optimization. Those are enablers of cloud delivery and analytics. SDE can accelerate business success by matching workloads and resources so that you have a responsive, adaptive environment. With the IBM Software Defined Environment, infrastructure is fully programmable to rapidly deploy workloads on optimal resources and to instantly respond to changing business demands. This information is intended for IBM sales representatives, IBM software architects, IBM Systems Technology Group brand specialists, distributors, resellers, and anyone who is developing or implementing SDE.

The CCNP Security Core SCOR 300-701 Official Cert Guide serves as comprehensive guide for individuals who are pursuing the Cisco CCNP Security certification. This book helps any network professionals that want to learn the skills required to develop a security infrastructure, recognize threats and vulnerabilities to networks, and mitigate security threats. Complete and easy to understand, it explains key concepts and techniques through real-life examples. This book will be valuable to any individual that wants to learn about modern cybersecurity concepts and frameworks.

*Migrate to Intent-Based Networking--and improve network manageability, cost, agility, security, and simplicity* With Intent-Based Networking (IBN), you can create networks that capture and automatically activate business intent, assure that your network responds properly, proactively detect and contain security threats, and remedy network issues before users even notice. Intent-Based Networking makes networks far more valuable, but few organizations have the luxury of building them from the ground up. In this book, leading expert Pieter-Jans Nefkens presents a unique four-phase approach to preparing and transforming campus network infrastructures, architectures, and organization--helping you gain maximum value from IBN with minimum disruption and cost. The author reviews the problems IBN is intended to solve, and illuminates its technical, business, and cultural implications. Drawing on his pioneering experience, he makes specific recommendations, identifies pitfalls, and shows how to overcome them. You'll learn how to implement IBN with the Cisco Digital Network Architecture and DNA Center and walk through real-world use cases. In a practical appendix, Nefkens even offers detailed technical configurations to jumpstart your own transformation. Review classic campus network deployments and understand why they need to change Learn how Cisco Digital Network Architecture (DNA) provides a solid foundation for state-of-the-art next generation network infrastructures Understand "intent" and how it can be applied to network infrastructure Explore tools for enabling, automating, and assuring Intent-Based Networking within campus networks Transform to Intent-Based Networking using a four-phased approach: Identify challenges; Prepare for Intent; Design and Deploy; and Enable Intent Anticipate how Intent-Based Networking will change your enterprise architecture, IT operations, and business

Design, operate, and troubleshoot advanced Cisco IP multicast in enterprise, data center, and service provider networks *IP Multicast, Volume II* thoroughly covers advanced IP multicast designs and protocols specific to Cisco routers and switches. It offers a pragmatic discussion of common features, deployment models, and field practices for advanced Cisco IP multicast networks, culminating with commands and methodologies for implementation and advanced troubleshooting. After fully discussing inter-domain routing and Internet multicast, the authors thoroughly explain multicast scalability, transport diversification, and multicast MPLS VPNs. They share in-depth insights into multicast for the data center, a full chapter of best-practice design solutions, and a start-to-finish troubleshooting methodology designed for complex environments. Reflecting the authors' extensive

experience with service provider and enterprise networks, IP Multicast, Volume II will be indispensable to IP multicast engineers, architects, operations technicians, consultants, security professionals, and collaboration specialists. Network managers and administrators will find its case studies and feature explanations especially valuable. Understand the fundamental requirements for inter-domain multicast Design control planes for identifying source and receiver, as well as the downstream control plane Support multicast transport where cloud service providers don't support native multicast Use multicast VPNs to logically separate traffic on the same physical infrastructure Explore the unique nuances of multicast in the data center Implement Virtual Port Channel (vPC), Virtual Extensible LAN (VXLAN), and Cisco's Application Centric Infrastructure (ACI) Design multicast solutions for specific industries or applications Walk through examples of best-practice multicast deployments Master an advanced methodology for troubleshooting large IP multicast networks

Trust the best-selling Official Cert Guide series from Cisco Press to help you learn, prepare, and practice for exam success. They are built with the objective of providing assessment, review, and practice to help ensure you are fully prepared for your certification exam. \* Master Cisco CCNP/CCIE ENCOR exam topics \* Assess your knowledge with chapter-opening quizzes \* Review key concepts with exam preparation tasks This is the eBook edition of the CCNP and CCIE Enterprise Core ENCOR 350-401 Official Cert Guide. This eBook does not include access to the Pearson Test Prep practice exams that comes with the print edition. CCNP and CCIE Enterprise Core ENCOR 350-401 Official Cert Guide presents you with an organized test preparation routine through the use of proven series elements and techniques. "Do I Know This Already?" quizzes open each chapter and enable you to decide how much time you need to spend on each section. Exam topic lists make referencing easy. Chapter-ending Exam Preparation Tasks help you drill on key concepts you must know thoroughly. CCNP and CCIE Enterprise Core ENCOR 350-401 Official Cert Guide focuses specifically on the objectives for the Cisco CCNP/CCIE ENCOR 350-401 exam. Networking experts Brad Edgeworth, Ramiro Garza Rios, Dave Hucaby, and Jason Gooley share 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. This complete study package includes\* A test-preparation routine proven to help you pass the exams \* Do I Know This Already? quizzes, which enable you to decide how much time you need to spend on each section \* Chapter-ending exercises, which help you drill on key concepts you must know thoroughly \* Practice exercises that help you enhance your knowledge \* More than 90 minutes of video mentoring from the author \* A final preparation chapter, which guides you through tools and resources to help you craft your review and test-taking strategies \* Study plan suggestions and templates to help you organize and optimize your study time Well regarded for its level of detail, assessment features, comprehensive design scenarios, and challenging review questions and exercises, this official study guide helps you master the concepts and techniques that will enable you to succeed on the exam the first time. The official study guide helps you master all the topics on the CCNP/CCIE ENCOR exam, including \* Enterprise network architecture \* Virtualization \* Network assurance \* Security \* Automation

The essential guide for understanding Ethernet switched networks Understand various Ethernet technologies from 10BASE-T to Gigabit Ethernet Learn about common switching modes, paths, and architectures Delve into the Cisco Catalyst switch architecture and examine the various Catalyst switch models, including the 6000/6500, 4500, and 3750 Become familiar with VLAN concepts, including types of trunks, VLAN Trunking Protocol (VTP), and private VLANs Understand Multilayer Switching (MLS) and the various hardware components that make MLS work Learn how to configure Cisco Catalyst switches in both native and hybrid mode Implement QoS on Cisco Catalyst switches Deploy multicast features and protocols, including PIM, IGMP snooping, and CGMP Utilize data link layer features such as BPDU Guard, BPDU Filter, Root Guard, Loop Guard, RSTP, and MST Evaluate design and configuration best practices Learn how to manage LANs and troubleshoot common problems Local-area networks (LANs) are becoming increasingly congested and overburdened because of a dramatic increase in traffic, faster CPUs and operating systems, and more network-intensive applications. Many organizations that use network and computing technology use LAN switching to take advantage of high-speed traffic forwarding and improved performance of traditional Ethernet technologies that don't require costly wiring upgrades or time-consuming host reconfiguration. Cisco LAN Switching Fundamentals provides administrators of campus networks with the most up-to-date introduction to LAN switching within a traditional Ethernet environment. Cisco LAN Switching Fundamentals presents an in-depth look at modern campus network requirements. It provides an easy-to-understand introduction to LAN switching best practices using Cisco Catalyst switches. This book provides you with a wealth of details on the architecture, operation, and configuration of the Cisco Catalyst family of switches. You learn about a wide range of topics, including quality of service (QoS), multicast, Rapid Spanning Tree Protocol (RSTP), Multiple Spanning Tree (MST), private virtual LANs (VLANs), and configuration using the native and hybrid software interfaces. Design advice and configuration examples are discussed liberally throughout the book to provide you with the best perspective on effective deployment techniques. Finally, the book wraps up with a discussion of steps necessary to troubleshoot common problems and optimize LAN performance. Whether you are looking for an introduction to LAN switching principles and practices or a Cisco Catalyst configuration and troubleshooting reference, this book provides you with the invaluable insight you need to design and manage high-performance campus networks.

Explore the rise of SD-WAN with CISCO and transform your existing WAN into an agile, efficient, and cost-effective network. Learning SD-WAN with Cisco helps you understand the development of SD-WAN and its benefits to modern networks. This book starts with an exploration of the different components of SD-WAN, such as vBond for orchestration, vManage for management, vSmart for control, and the vEdge devices. From there, it moves on to building a network from the ground up using EVE-NG, focusing on how to

install EVE-NG, get the required licenses via a SmartNET account, download the components, and begin to create your network by installing vManage. Once you have this foundation, you will create the organization and certificates, and look at local users as well as single- and multi-tenancy options and clustering. As you continue to build your network, you will dig down into the overlay protocols used in SD-WAN, and then deploy your controllers and edge devices, looking at zero-touch provisioning along the way. After building your network, you will configure and apply policies and templates to manage the control and data planes as well as VPNs, Internet access, security, and quality of service. The book also explores reporting and management using vManage, along with upgrading and troubleshooting the various components, using techniques from simple ping and trace route through to advanced techniques such as DTLS and TLOC troubleshooting and traffic simulation. After reading this book, you will have hands-on experience working with SD-WAN. You will understand how to deploy, configure, manage, and troubleshoot it. What You Will Learn Know what SD-WAN is, how it came about, and why we need it Understand troubleshooting and traffic simulation of DTLS and TLOC Monitor, report, and troubleshoot the SD-WAN environment Who This Book Is For Network professionals with experience in Linux and Cisco devices

This book is intended for any professional interested in gaining greater insight into the terms, concepts, and issues related to the ongoing evolution of security and networking. It has been developed for a range of readers: the executive seeking to understand how their business is changing, the IT leader responsible for driving the transition, and the technologist designing and implementing change. Upon conclusion of the book, the reader should have a better and deeper understanding of: -The state of enterprise technology today - legacy systems and networks, cloud compute and service providers, hybrid operating models-The ongoing evolution to hybrid models, bringing together disparate data center and cloud components under a single policy and security management umbrella.-The individual components that makeup networking and security ecosystems and how they come together to form an intrinsic security solution.-The path to move enterprise networking and security blueprint towards SASE architecture.-How the integration of SD-WAN and SASE will address latency, performance, and global policy-As a team at the forefront of SD-WAN technology, we are uniquely positioned to help IT transform WAN into SASE as we lead the evolution in its implementation and deployment. -Market trends that have contributed to this movement, the challenges that it poses, and its value to both individual users and the broader enterprise. -In the realms of implementation and deployment, we will cover SASE network flow, design principles and operation practices, the role of Artificial Intelligence and Machine Learning (AIOps/ML) in the SASE platform, and the necessary preparatory steps to ensure effective Day-0 through Day-N operations and management. This technical book has 100+ diagrams to simplify the concept. Get started on your SASE Journey.

Cisco Software-Defined AccessCisco Press

This authoritative guidebook combines comprehensive coverage of Cisco SD-WAN with complete official preparation for Cisco's new CCNP Enterprise ENSDWI 300-415 certification exam. Authored by a team of Cisco architects responsible for training both Cisco and partner engineers on SD-WAN solutions, it covers all facets of the product: benefits, use cases, components, workings, configuration, support, and more. Throughout, practical examples demonstrate Cisco SD-WAN at work in diverse cloud and premises environments, and the authors show how to apply Cisco SD-WAN technologies and tools in their own real-world environments. As Cisco's official ENSDWI 300-415 study guide, this book covers all exam objectives and is organized to simplify and streamline preparation. It also contains an access code for two full practice exams delivered through Pearson's advanced test prep application.

Leading Cisco authority Todd Lammle helps you gain insights into the new core Cisco network technologies Understanding Cisco Networking Technologies is an important resource for those preparing for the new Cisco Certified Network Associate (CCNA) certification exam as well as IT professionals looking to understand Cisco's latest networking products, services, and technologies. Written by bestselling author and internationally recognized Cisco expert Todd Lammle, this in-depth guide provides the fundamental knowledge required to implement and administer a broad range of modern networking and IT infrastructure. Cisco is the worldwide leader in network technologies—80% of the routers on the Internet are Cisco. This authoritative book provides you with a solid foundation in Cisco networking, enabling you to apply your technical knowledge to real-world tasks. Clear and accurate chapters cover topics including routers, switches, controllers and other network components, physical interface and cabling, IPv6 addressing, discovery protocols, wireless infrastructure, security features and encryption protocols, controller-based and software-defined architectures, and more. After reading this essential guide, you will understand: Network fundamentals Network access IP connectivity and IP services Security fundamentals Automation and programmability Understanding Cisco Networking Technologies is a must-read for anyone preparing for the new CCNA certification or looking to gain a primary understanding of key Cisco networking technologies. The perimeter defenses guarding your network perhaps are not as secure as you think. Hosts behind the firewall have no defenses of their own, so when a host in the "trusted" zone is breached, access to your data center is not far behind. That's an all-too-familiar scenario today. With this practical book, you'll learn the principles behind zero trust architecture, along with details necessary to implement it. The Zero Trust Model treats all hosts as if they're internet-facing, and considers the entire network to be compromised and hostile. By taking this approach, you'll focus on building strong authentication, authorization, and encryption throughout, while providing compartmentalized access and better operational agility. Understand how perimeter-based defenses have evolved to become the broken model we use today Explore two case studies of zero trust in production networks on the client side (Google) and on the server side (PagerDuty) Get example configuration for open source tools that you can use to build a zero trust network Learn how to migrate from a perimeter-based network to a zero trust network in production

Direct from Cisco, this comprehensive book guides networking professionals through all aspects of planning, implementing, and operating Cisco Software Defined Access, helping them use intent-based networking, SD-Access, Cisco ISE, and Cisco DNA Center to harden campus network security and simplify its management. Drawing on their unsurpassed experience architecting SD-Access solutions and training technical professionals inside and outside Cisco, the authors cover all facets of the product: its relevance, value, and use cases; its components and inner workings; planning and deployment; and day-to-day administration, support, and troubleshooting. Case studies demonstrate the use of Cisco SD-Access components to address Secure Segmentation, Plug and Play, Software Image Management (SWIM), Host Mobility, and more. Building on core concepts and techniques, the authors present full chapters on advanced SD-Access and Cisco DNA Center topics, as well as detailed coverage of fabric assurance.

ACI Advanced Monitoring and Troubleshooting provides a solid conceptual foundation and in-depth technical knowledge for monitoring and troubleshooting virtually any problem encountered during testing, deployment, or operation of Cisco Application Centric Infrastructure (ACI) infrastructure. Authored by leading ACI support experts at Cisco, it covers all you'll need to keep your ACI deployment working optimally. Coverage includes: Core ACI concepts and components, including Nexus 9000 Series platforms, APIC controllers, and protocols In-depth insight into ACI's policy model ACI fabric design options: single and multiple data centers, stretched vs. multiple fabrics, and multi-pod/multi-site Automation, orchestration, and the cloud in ACI environments ACI topology and hardware/software specifications End host and network connectivity VMM integration Network management configuration, including SNMP, AAA, and SPAN Monitoring ACI fabrics and health Getting immediate results through the NX-OS command line interface Troubleshooting use cases: fabric discovery, APIC, management access, contracts, external connectivity, leaf/spine connectivity, end-host connectivity, VMM problems, ACI multi-pod/multi-site problems, and more

Improve operations and agility in any data center, campus, LAN, or WAN Today, the best way to stay in control of your network is to address devices programmatically and automate network interactions. In this book, Cisco experts Ryan Tischer and Jason Gooley show you how to do just that. You'll learn how to use programmability and automation to solve business problems, reduce costs, promote agility and innovation, handle accelerating complexity, and add value in any data center, campus, LAN, or WAN. The authors show you how to create production solutions that run on or interact with Nexus NX-OS-based switches, Cisco ACI, Campus, and WAN technologies. You'll learn how to use advanced Cisco tools together with industry-standard languages and platforms, including Python, JSON, and Linux. The authors demonstrate how to support dynamic application environments, tighten links between apps and infrastructure, and make DevOps work better. This book will be an indispensable resource for network and cloud designers, architects, DevOps engineers, security specialists, and every professional who wants to build or operate high-efficiency networks. Drive more value through programmability and automation, freeing resources for high-value innovation Move beyond error-prone, box-by-box network management Bridge management gaps arising from current operational models Write NX-OS software to run on, access, or extend your Nexus switch Master Cisco's powerful on-box automation and operation tools Manage complex WANs with NetConf/Yang, ConfD, and Cisco SDN Controller Interact with and enhance Cisco Application Centric Infrastructure (ACI) Build self-service catalogs to accelerate application delivery Find resources for deepening your expertise in network automation

Fully updated: The complete guide to Cisco Identity Services Engine solutions Using Cisco Secure Access Architecture and Cisco Identity Services Engine, you can secure and gain control of access to your networks in a Bring Your Own Device (BYOD) world. This second edition of Cisco ISE for BYOD and Secure Unified Access contains more than eight brand-new chapters as well as extensively updated coverage of all the previous topics in the first edition book to reflect the latest technologies, features, and best practices of the ISE solution. It begins by reviewing today's business case for identity solutions. Next, you walk through ISE foundational topics and ISE design. Then you explore how to build an access security policy using the building blocks of ISE. Next are the in-depth and advanced ISE configuration sections, followed by the troubleshooting and monitoring chapters. Finally, we go in depth on the new TACACS+ device administration solution that is new to ISE and to this second edition. With this book, you will gain an understanding of ISE configuration, such as identifying users, devices, and security posture; learn about Cisco Secure Access solutions; and master advanced techniques for securing access to networks, from dynamic segmentation to guest access and everything in between. Drawing on their cutting-edge experience supporting Cisco enterprise customers, the authors offer in-depth coverage of the complete lifecycle for all relevant ISE solutions, making this book a cornerstone resource whether you're an architect, engineer, operator, or IT manager. · Review evolving security challenges associated with borderless networks, ubiquitous mobility, and consumerized IT · Understand Cisco Secure Access, the Identity Services Engine (ISE), and the building blocks of complete solutions · Design an ISE-enabled network, plan/distribute ISE functions, and prepare for rollout · Build context-aware security policies for network access, devices, accounting, and audit · Configure device profiles, visibility, endpoint posture assessments, and guest services · Implement secure guest lifecycle management, from WebAuth to sponsored guest access · Configure ISE, network access devices, and supplicants, step by step · Apply best practices to avoid the pitfalls of BYOD secure access · Set up efficient distributed ISE deployments · Provide remote access VPNs with ASA and Cisco ISE · Simplify administration with self-service onboarding and registration · Deploy security group access with Cisco TrustSec · Prepare for high availability and disaster scenarios · Implement passive identities via ISE-PIC and EZ Connect · Implement TACACS+ using ISE · Monitor, maintain, and troubleshoot ISE and your entire Secure Access system · Administer device AAA with Cisco IOS, WLC, and Nexus

Go beyond layer 2 broadcast domains with this in-depth tour of advanced link and internetwork layer protocols, and learn how they enable you to expand to larger topologies. An ideal follow-up to Packet Guide to Core Network Protocols, this concise guide dissects several of these protocols to explain their structure and operation. This isn't a book on packet theory. Author Bruce Hartpence built topologies in a lab as he wrote this guide, and each chapter includes several packet captures. You'll learn about protocol classification, static vs. dynamic topologies, and reasons for installing a particular route. This guide covers: Host routing—Process a routing table and learn how traffic starts out across a network Static routing—Build router routing tables and understand how forwarding decisions are made and processed Spanning Tree Protocol—Learn how this protocol is an integral part of every network containing switches Virtual Local Area Networks—Use VLANs to address the limitations of layer 2 networks Trunking—Get an indepth look at VLAN tagging and the 802.1Q protocol Routing Information Protocol—Understand how this distance vector protocol works in small, modern communication networks Open Shortest Path First—Discover why convergence times of OSPF and other link state protocols are improved over distance vectors

Explore the emerging definitions, protocols, and standards for SDN—software-defined, software-driven, programmable networks—with this comprehensive guide. Two senior network engineers show you what's required for building networks that use software for bi-directional communication between applications and the underlying network infrastructure. This vendor-agnostic book also presents several SDN use cases, including bandwidth scheduling and manipulation, input traffic and triggered actions, as well as some interesting use cases around big data, data center overlays, and network-function virtualization. Discover how enterprises and service providers alike are pursuing SDN as it continues to evolve. Explore the current state of the OpenFlow model and centralized network control Delve into distributed and central control, including data plane generation Examine the structure and capabilities of commercial and open source controllers Survey the available technologies for network programmability Trace the modern data center from desktop-centric to highly distributed models Discover new ways to connect instances of network-function virtualization and service chaining Get detailed information on constructing and maintaining an SDN network topology Examine an idealized SDN framework for controllers, applications, and ecosystems

Like sysadmins before them, network engineers are finding that they cannot do their work manually anymore. As the field faces new protocols, technologies, delivery models, and a pressing need for businesses to be more agile and flexible, network automation is becoming essential. This practical guide shows network engineers how to use a range of technologies and tools—including Linux, Python, JSON, and XML—to automate their systems through code. Network programming and automation will help you simplify tasks involved in configuring, managing, and operating network equipment, topologies, services, and connectivity. Through the course of the book, you'll learn the basic skills and tools you need to make this critical transition. This book covers: Python programming basics: data types, conditionals, loops, functions, classes, and modules Linux fundamentals to provide the foundation you need on your network automation journey Data formats and models: JSON, XML, YAML, and YANG for networking Jinja templating and its applicability for creating network device configurations The role of application programming interfaces (APIs) in network automation Source control with Git to manage code changes during the automation process How Ansible, Salt, and StackStorm open source automation tools can be used to automate network devices Key tools and technologies required for a Continuous Integration (CI) pipeline in network operations

Use data analytics to drive innovation and value throughout your network infrastructure Network and IT professionals capture immense amounts of data from their networks. Buried in this data are multiple opportunities to solve and avoid problems, strengthen security, and improve network performance. To achieve these goals, IT networking experts need a solid understanding of data science, and data scientists need a firm grasp of modern networking concepts. Data Analytics for IT Networks fills these knowledge gaps, allowing both groups to drive unprecedented value from telemetry, event analytics, network infrastructure metadata, and other network data sources. Drawing on his pioneering experience applying data science to large-scale Cisco networks, John Garrett introduces the specific data science methodologies and algorithms network and IT professionals need, and helps data scientists understand contemporary network technologies, applications, and data sources. After establishing this shared understanding, Garrett shows how to uncover innovative use cases that integrate data science algorithms with network data. He concludes with several hands-on, Python-based case studies reflecting Cisco Customer Experience (CX) engineers' supporting its largest customers. These are designed to serve as templates for developing custom solutions ranging from advanced troubleshooting to service assurance. Understand the data analytics landscape and its opportunities in Networking See how elements of an analytics solution come together in the practical use cases Explore and access network data sources, and choose the right data for your problem Innovate more successfully by understanding mental models and cognitive biases Walk through common analytics use cases from many industries, and adapt them to your environment Uncover new data science use cases for optimizing large networks Master proven algorithms, models, and methodologies for solving network problems Adapt use cases built with traditional statistical methods Use data science to improve network infrastructure analysis Analyze control and data planes with greater sophistication Fully leverage your existing Cisco tools to collect, analyze, and visualize data

Enterprise Networking, Security, and Automation (CCNA v7) Companion Guide is designed as a portable desk reference to use anytime, anywhere to reinforce the material from the Enterprise Networking, Security, and Automation course and organize your time. The book's features help you focus on important concepts to succeed in this course: Chapter Objectives - Review core concepts by answering the focus questions listed at the beginning of each chapter. Key Terms - Refer to the lists of networking vocabulary introduced and highlighted in context in each chapter. Glossary - Consult the comprehensive Glossary with more than 250 terms. Summary of Activities and Labs - Maximize your study time with this complete list of all associated practice exercises at the end of each chapter. Check Your Understanding - Evaluate your readiness with the end-of-chapter questions that match the style of questions you see in the online course quizzes. The answer key explains each answer. How To - Look for this icon to study the steps you need to learn to perform certain tasks. Interactive Activities - Reinforce your understanding of topics with dozens of exercises from the online course identified throughout the book with this icon. Packet Tracer Activities - Explore and visualize networking concepts using Packet Tracer exercises interspersed throughout the chapters and provided in the accompanying Labs & Study Guide book. Videos - Watch the videos embedded within the online course. Hands-on Labs - Work through all the course labs and additional Class Activities that are included in the course and published in the separate Labs & Study Guide. Part of the Cisco Networking Academy Series from Cisco Press, books in this series support and complement the Cisco Networking Academy curriculum.

The authoritative visual guide to Cisco Firepower Threat Defense (FTD) This is the definitive guide to best practices and advanced troubleshooting techniques for the Cisco flagship Firepower Threat Defense (FTD) system running on Cisco ASA platforms, Cisco Firepower security appliances, Firepower eXtensible Operating System (FXOS), and VMware virtual appliances. Senior Cisco engineer Nazmul Rajib draws on unsurpassed experience supporting and training Cisco Firepower engineers worldwide, and presenting detailed knowledge of Cisco Firepower deployment, tuning, and troubleshooting. Writing for cybersecurity consultants, service providers, channel partners, and enterprise or government security professionals, he shows how to deploy the Cisco Firepower next-generation security technologies to protect your network from potential cyber threats, and how to use Firepower's robust command-line tools to investigate a wide variety of technical issues. Each consistently organized chapter contains definitions of keywords, operational flowcharts, architectural diagrams, best practices, configuration steps (with detailed screenshots), verification tools, troubleshooting techniques, and FAQs drawn directly from issues raised by Cisco customers at the Global Technical Assistance Center (TAC). Covering key Firepower materials on the CCNA Security, CCNP Security, and CCIE Security exams, this guide also includes end-of-chapter quizzes to help candidates prepare. · Understand the operational architecture of the Cisco Firepower NGFW, NGIPS, and AMP technologies · Deploy FTD on ASA platform and Firepower appliance running FXOS · Configure and troubleshoot Firepower Management Center (FMC) · Plan and deploy FMC and FTD on VMware virtual appliance · Design and implement the Firepower management network on FMC and FTD · Understand and apply Firepower licenses, and register FTD with FMC · Deploy FTD in Routed, Transparent, Inline, Inline Tap, and Passive Modes · Manage traffic flow with detect-only, block, trust, and bypass operations · Implement rate limiting and analyze quality of service (QoS) · Blacklist suspicious IP addresses via Security Intelligence · Block DNS queries to the malicious domains · Filter URLs based on category, risk, and reputation · Discover a network and implement application visibility and control (AVC) · Control file transfers and block malicious files using advanced malware protection (AMP) · Halt cyber attacks using Snort-based intrusion rule · Masquerade an internal host's original IP address using Network Address Translation (NAT) · Capture traffic and obtain troubleshooting files for advanced analysis · Use command-line tools to identify status, trace packet flows, analyze logs, and debug messages

An Essential Guide to Understanding and Implementing IP Routing Protocols Cisco's authoritative single-source guide to IP routing protocols for enterprise and service provider environments Service providers and large enterprises are converging on a common IP infrastructure that supports rapid deployment of high-value services. Demand is soaring for highly skilled IP network engineers who can implement and run these infrastructures. Now, one source combines reliable knowledge about contemporary IP routing protocols and expert hands-on guidance for using them with Cisco IOS, IOS XE, and IOS XR operating systems. After concisely reviewing the basics, three Cisco experts fully explain static routing, EIGRP, OSPF, IS-IS, and BGP routing protocols. Next, they introduce advanced routing with policies and redistribution, sophisticated BGP-based traffic engineering, and multicast. They present comprehensive coverage of IPv6, from its multicast implementation to its completely revamped address structure. Finally, they discuss advanced high availability techniques, including fast routing convergence. IP Routing on Cisco IOS, IOS XE, and IOS XR presents each protocol conceptually, with intuitive illustrations, realistic configurations, and appropriate output. To help IOS users master IOS XE and IOS XR, differences in operating systems are explicitly identified, and side-by-side feature command

references are presented. All content fully aligns with Learning@Cisco, providing efficient self-study for multiple Cisco Career Certifications, including CCNA®/CCNP®/CCIE® Service Provider, CCIE Routing & Switching, Cisco IOS XR Specialist Certification, and the routing components of several additional Cisco Certifications. Brad Edgeworth, CCIE No. 31574 (R&S & SP) has been with Cisco since 2011 as Systems Engineer and Technical Leader. Formerly a network architect and consultant for various Fortune® 500 companies, his 18 years of IT experience includes extensive architectural and operational work in enterprise and service provider environments. He is a Cisco Live distinguished speaker presenting on IOS XR. Aaron Foss, CCIE No. 18761 (R&S & SP), a High Touch Engineer with the Cisco Focused Technical Support (FTS) organization, works with large service providers to troubleshoot MPLS, QoS, and IP routing issues. He has more than 15 years of experience designing, deploying, and troubleshooting IP networks. Ramiro Garza Rios, CCIE No. 15469 (R&S, SP, and Security), Senior Network Consulting Engineer with Cisco Advanced Services, plans, designs, implements, and optimizes next-generation service provider networks. Before joining Cisco in 2005, he was Network Consulting and Presales Engineer for a Cisco Gold Partner in Mexico, where he planned and deployed both enterprise and service provider networks. Foreword by Norm Dunn, Senior Product Manager, Learning@Cisco Global Product Management, Service Provider Portfolio Understand how IOS®, IOS XE, and IOS XR operating systems compare Master IPv4 concepts, addressing structure, and subnetting Learn how routers and routing protocols work, and how connected networks and static routes behave from the router's perspective Work with EIGRP and distance vector routing Deploy basic and advanced OSPF, including powerful techniques for organizing routing domains, path selection, and optimization Compare IS-IS with OSPF, and implement advanced IS-IS multilevel routing, optimization, and path selection Make the most of BGP and route manipulation, including IOS/IOS XE route maps and IOS XR's highly scalable Route Policy Language Use advanced policy-based route manipulation and filtering Implement route redistribution: rules, potential problems, and solutions Leverage BGP communities, summaries, and other router conservation techniques Discover how IPv6 changes IP address and command structure Establish highly efficient multicast routing in IPv4 and IPv6 environments Systematically improve network availability and operational uptime through event driven detection and fast routing convergence

The complete guide to transforming enterprise networks with Cisco DNA As networks become more complex and dynamic, organizations need better ways to manage and secure them. With the Cisco Digital Network Architecture, network operators can run entire network fabrics as a single, programmable system by defining rules that span their devices and move with their users. Using Cisco intent-based networking, you spend less time programming devices, managing configurations, and troubleshooting problems so you have more time for driving value from your network, your applications, and most of all, your users. This guide systematically introduces Cisco DNA, highlighting its business value propositions, design philosophy, tenets, blueprints, components, and solutions. Combining insider information with content previously scattered through multiple technical documents, it provides a single source for evaluation, planning, implementation, and operation. The authors bring together authoritative insights for multiple business and technical audiences. Senior executives will learn how DNA can help them drive digital transformation for competitive advantage. Technical decision-makers will discover powerful emerging solutions for their specific needs. Architects will find essential recommendations, interdependencies, and caveats for planning deployments. Finally, network operators will learn how to use DNA Center's modern interface to streamline, automate, and improve virtually any network management task. · Accelerate the digital transformation of your business by adopting an intent-based network architecture that is open, extensible, and programmable · Integrate virtualization, automation, analytics, and cloud services to streamline operations and create new business opportunities · Dive deep into hardware, software, and protocol innovations that lay the programmable infrastructure foundation for DNA · Virtualize advanced network functions for fast, easy, and flexible deployments · Translate business intent into device configurations and simplify, scale, and automate network operations using controllers · Use analytics to tune performance, plan capacity, prevent threats, and simplify troubleshooting · Learn how Software-Defined Access improves network flexibility, security, mobility, visibility, and performance · Use DNA Assurance to track the health of clients, network devices, and applications to reveal hundreds of actionable insights · See how DNA Application Policy supports granular application recognition and end-to-end treatment, for even encrypted applications · Identify malware, ransomware, and other threats in encrypted traffic

Change is the one true constant in business. More mobile employees, working in diverse locations, on more devices. Businesses are employing new technologies like cloud, virtualization, and rich, real-time applications with demanding bandwidth needs, often as-a-service. These needs put immense pressure on traditional network infrastructure and connectivity, and today's WAN simply cannot meet these growing demands. It's time for a better approach. With SD-WAN, A software-defined approach that lets you optimize your architecture for the cloud era--for a more agile, flexible business. Learn the basics about SD-WAN and discover why VMware SD-WAN by VeloCloud is the platform of choice for so many organizations. Explore how VMware SD-WAN by VeloCloud is delivering real-world benefits for enterprises like yours. See how your peers are: \*Engaging omnichannel retail customers\* Delivering better telehealth services to patients anywhere \*Taking control over IoT and manufacturing Edition 2 has new content on Healthcare Plus an exciting vision statement on what lies ahead for SD-WAN by Sanjay Uppal, Vice President and General Manager, VeloCloud Business Unit, VMware. Spotlight section on Driving Innovation in Healthcare by Frank Nydam, VP Global Healthcare Alliances, VMware

With the proliferation of mobile devices and bring-your-own-devices (BYOD) within enterprise networks, the boundaries of where the network begins and ends have been blurred. Cisco Identity Services Engine (ISE) is the leading security policy management platform that unifies and automates access control to proactively enforce role-based access to enterprise networks. In Practical Deployment of Cisco Identity Services Engine (ISE), Andy Richter and Jeremy Wood share their expertise from dozens of real-world implementations of ISE and the methods they have used for optimizing ISE in a wide range of environments. ISE can be difficult, requiring a team of security and network professionals, with the knowledge of many different specialties. Practical Deployment of Cisco Identity Services Engine (ISE) shows you how to deploy ISE with the necessary integration across multiple different technologies required to make ISE work like a system. Andy Richter and Jeremy Wood explain end-to-end how to make the system work in the real world, giving you the benefit of their ISE expertise, as well as all the required ancillary technologies and configurations to make ISE work.

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