

# Designing And Deploying 802.11 Wireless Networks A Practical Guide To Implementing 802.11n And 802.11ac Wireless Networks For Enterprise Based Applications Networking Technology

A handy resource for network engineers and administrators working with Cisco wireless technologies covers the fundamentals of designing, deploying, managing, optimizing, and troubleshooting a wireless network, furnishing easy-to-understand explanations and guidelines, description and analysis of Cisco wireless LAN devices, configuration essentials, and tuning and performance management. Original. (Intermediate)

For more than 40 years, Computerworld has been the leading source of technology news and information for IT influencers worldwide. Computerworld's award-winning Web site (Computerworld.com), twice-monthly publication, focused conference series and custom research form the hub of the world's largest global IT media network.

Written for network engineers by highly experienced wireless and Ethernet experts, this title is one of the first to provide the know-how for enterprise implementations.

"Performing a wireless LAN (WLAN) site survey before installing a wireless network is the key to any successful WLAN deployment. Yet each location and company have unique needs that must be taken into account. 802.11 Wireless Network Site Surveying and Installation helps you understand the challenges associated with any site survey, including multipath mitigation, reflection, absorption, and radio wave interference, plus the added complexity of user and application demands. This book helps you identify obstacles to a successful deployment and guides your equipment decisions to ensure that your WLAN reaches its maximum potential."--BOOK JACKET.

802.11 Wireless LAN Fundamentals gives you the background and practical details you need to select, design, install, and run your own WLAN. This book begins with an overview of Ethernet technologies, 802.11 standards, and physical layer technologies, providing you with a frame of reference for the rest of the book. Subsequent chapters address challenges and solutions associated with security, mobility, and QoS. Radio frequency fundamentals are reviewed in detail, as are site-surveying methods. A series of case studies that highlight WLAN design considerations in various business environments helps place all the concepts covered in this book in the context of real-world applications.

Master Modern Networking by Understanding and Solving Real Problems Computer Networking Problems and Solutions offers a new approach to understanding networking that not only illuminates current systems but prepares readers for whatever comes next. Its problem-solving approach reveals why modern computer networks and protocols are designed as they are, by explaining the problems any protocol or system must overcome, considering common solutions, and showing how those solutions have been implemented in new and mature protocols. Part I considers data transport (the data plane). Part II covers protocols used to discover and use topology and reachability information (the control plane). Part III considers several common network designs and architectures, including data center fabrics, MPLS cores, and modern Software-Defined Wide Area Networks (SD-WAN). Principles that underlie technologies such as Software Defined Networks (SDNs) are considered throughout, as solutions to problems faced by all networking technologies. This guide is ideal for beginning network engineers, students of computer networking, and experienced engineers seeking a deeper understanding of the technologies they use every day. Whatever your background, this book will help you quickly recognize problems and solutions that constantly recur, and apply this knowledge to new technologies and environments. Coverage Includes · Data and

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networking transport · Lower- and higher-level transports and interlayer discovery · Packet switching · Quality of Service (QoS) · Virtualized networks and services · Network topology discovery · Unicast loop free routing · Reacting to topology changes · Distance vector control planes, link state, and path vector control · Control plane policies and centralization · Failure domains · Securing networks and transport · Network design patterns · Redundancy and resiliency · Troubleshooting · Network disaggregation · Automating network management · Cloud computing · Networking the Internet of Things (IoT) · Emerging trends and technologies

A systems analysis approach to enterprise network design Master techniques for checking the health of an existing network to develop a baseline for measuring performance of a new network design Explore solutions for meeting QoS requirements, including ATM traffic management, IETF controlled-load and guaranteed services, IP multicast, and advanced switching, queuing, and routing algorithms Develop network designs that provide the high bandwidth and low delay required for real-time applications such as multimedia, distance learning, and videoconferencing Identify the advantages and disadvantages of various switching and routing protocols, including transparent bridging, Inter-Switch Link (ISL), IEEE 802.1Q, IGRP, EIGRP, OSPF, and BGP4 Effectively incorporate new technologies into enterprise network designs, including VPNs, wireless networking, and IP Telephony

Top-Down Network Design, Second Edition, is a practical and comprehensive guide to designing enterprise networks that are reliable, secure, and manageable. Using illustrations and real-world examples, it teaches a systematic method for network design that can be applied to campus LANs, remote-access networks, WAN links, and large-scale internetworks. You will learn to analyze business and technical requirements, examine traffic flow and QoS requirements, and select protocols and technologies based on performance goals. You will also develop an understanding of network performance factors such as network utilization, throughput, accuracy, efficiency, delay, and jitter. Several charts and job aids will help you apply a top-down approach to network design. This Second Edition has been revised to include new and updated material on wireless networks, virtual private networks (VPNs), network security, network redundancy, modularity in network designs, dynamic addressing for IPv4 and IPv6, new network design and management tools, Ethernet scalability options (including 10-Gbps Ethernet, Metro Ethernet, and Long-Reach Ethernet), and networks that carry voice and data traffic. Top-Down Network Design, Second Edition, has a companion website at <http://www.topdownbook.com>, which includes updates to the book, links to white papers, and supplemental information about design resources. 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.

Authorized Self-Study Guide Designing Cisco Network Service Architectures (ARCH) Second Edition Foundation learning for ARCH exam 642-873 Keith Hutton Mark Schofield Diane Teare

Designing Cisco Network Service Architectures (ARCH), Second Edition, is a Cisco®-authorized, self-paced learning tool for CCDP® foundation learning. This book provides you with knowledge of the latest developments in network design and technologies, including network infrastructure, intelligent network services, and converged network solutions. By reading this book, you will gain a thorough understanding of issues and considerations for fundamental infrastructure services, including security, network management, QoS, high availability, bandwidth use optimization through IP multicasting, and design architectures for network solutions such as voice over WLAN and e-commerce. Whether you are preparing for CCDP certification or simply want to gain a better understanding of modular campus and edge network design and strategic solutions for enterprise networks such as storage area networking, virtual private networking, advanced addressing and routing, and data centers, you will benefit from the foundation information presented in this book. Designing Cisco Network

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Service Architectures (ARCH), Second Edition, is part of a recommended learning path from Cisco that includes simulation and hands-on training from authorized Cisco Learning Partners and self-study products from Cisco Press. To find out more about instructor-led training, e-learning, and hands-on instruction offered by authorized Cisco Learning Partners worldwide, please visit [www.cisco.com/go/authorizedtraining](http://www.cisco.com/go/authorizedtraining). Keith Hutton is a lead architect for Bell Canada in the enterprise customer space. Keith still retains his certified Cisco instructor accreditation, as well as the CCDP, CCNP®, and CCIP® certifications. Mark Schofield has been a network architect at Bell Canada for the past six years. During the past five years, he has been involved in the design, implementation, and planning of large national networks for Bell Canada's federal government customers. Diane Teare is a professional in the networking, training, project management, and e-learning fields. She has more than 20 years of experience in designing, implementing, and troubleshooting network hardware and software, and has been involved in teaching, course design, and project management. Learn about the Cisco SONA framework, enterprise campus architecture, and PPDIOO network life-cycle approach Review high availability designs and implement optimal redundancy Plan scalable EIGRP, OSPF, and BGP designs Implement advanced WAN services Evaluate design considerations in the data center core, aggregation, and access layers Design storage area networks (SANs) and extend the SAN with various protocols Design and tune an integrated e-commerce architecture Integrate firewall, NAC, and intrusion detection/prevention into your network design Design IPsec and SSL remote access VPNs Deploy IP multicast and multicast routing Incorporate voice over WLAN in the enterprise network Utilize the network management capabilities inherent in Cisco IOS® software This volume is in the Certification Self-Study Series offered by Cisco Press®. Books in this series provide officially developed self-study solutions to help networking professionals understand technology implementations and prepare for the Cisco Career Certifications examinations. Category: Network Design Covers: ARCH exam 642-873 This book highlights practical quantum key distribution systems and research on the implementations of next-generation quantum communication, as well as photonic quantum device technologies. It discusses how the advances in quantum computing and quantum physics have allowed the building, launching and deploying of space exploration systems that are capable of more and more as they become smaller and lighter. It also presents theoretical and experimental research on the potential and limitations of secure communication and computation with quantum devices, and explores how security can be preserved in the presence of a quantum computer, and how to achieve long-distance quantum communication. The development of a real quantum computer is still in the early stages, but a number of research groups have investigated the theoretical possibilities of such computers.

The authors of *Practical Network Design Techniques, Second Edition: A Complete Guide for WANs and LANs* build upon the popular first edition by combining pre-existing network design fundamentals with new material on LAN devices and topologies, wireless local networks, and LAN internetworking issues. This new edition has two parts. The first p

Cisco's authorized foundation learning self-study guide for the latest CCDP® ARCH exam • •Developed in conjunction with the Cisco certification team, creators of the newest CCDP ARCH exams and courses. •Fully covers Cisco network design to deliver fundamental infrastructure services. •Contains new

coverage of network virtualization, voice, video, QoS, WAN services, and more.

- Contains many self-assessment review questions, and a running case study.

This is Cisco's authorized, self-paced, foundation learning tool for the latest version of the Cisco ARCH exam, required for the current CCDP certification. It brings together practical knowledge of the latest developments in network design and technologies, including network infrastructure, intelligent network services, and converged network solutions. Readers will gain a thorough understanding of the issues and considerations associated with designing networks that deliver fundamental infrastructure services. As an Authorized Self-Study Guide, this book fully reflects the content of the newest version of the Cisco ARCH course. Each chapter ends with questions designed to help readers assess their understanding as they prepare for the exam. An ongoing case study illustrates and reinforces concepts presented throughout the book. Coverage also includes: network design in the context of Cisco's Preparing, Planning, Designing, Implementing, Operating, and Optimizing (PPDIOO) framework; enterprise campus network and data center design; e-commerce design; SAN design; security services design; IPsec and SSL VPN design; IP multicast design; and network management.

Sybex is now the official publisher for Certified Wireless Network Professional, the certifying vendor for the CWSP program. This guide covers all exam objectives, including WLAN discovery techniques, intrusion and attack techniques, 802.11 protocol analysis. Wireless intrusion-prevention systems implementation, layer 2 and 3 VPNs used over 802.11 networks, and managed endpoint security systems. It also covers enterprise/SMB/SOHO/Public-Network Security design models and security solution implementation, building robust security networks, wireless LAN management systems, and much more.

The authors of Practical Network Design Techniques, Second Edition: A Complete Guide for WANs and LANs build upon the popular first edition by combining pre-existing network design fundamentals with new material on LAN devices and topologies, wireless local networks, and LAN internetworking issues. This new edition has two parts. The first part focuses on wide area networks; the second, which is entirely new, focuses on local area networks. Because Ethernet emerged victorious in the LAN war, the second section pays particular attention to Ethernet design and performance characteristics. The volume retains much valuable information from the first edition, and integrates and prominently highlights WAN information that is also relevant to the LAN design process. To maximize the book's utility, the authors include a number of practical networking problems and their solutions, along with examples of methods needed to perform economic comparisons among differing communications services and hardware configurations. The second edition provides a thorough understanding of major network design problems and is an invaluable reference for data communications professionals.

This is Cisco's comprehensive practical guide to planning, designing, installing,

testing, and supporting both 802.11ac and 802.11n wireless networks for enterprise-based applications. Fully updated for the new 802.11ac standard, this Second Edition delivers expert hands-on guidance for mastering 802.11ac's fundamentally different design, site survey, implementation, and network configuration techniques. Designing and Deploying 802.11 Wireless Networks, Second Edition presents multiple examples using Cisco wireless products, while offering methodologies and tips that are applicable with any vendor's equipment. The authors offer in-depth coverage of building new wireless networks and migrating existing wireless networks (802.11a,b,g,n) to 802.11ac. After introducing fundamental wireless and 802.11 concepts, the authors present fully-updated coverage of all aspects of network design: requirements, architecture, performance, roaming, RF considerations, security, and much more. Drawing on extensive field experience, they walk through installation and testing, and share comprehensive operational guidance for managing security, troubleshooting roaming and connections, and training support staff. This edition's revamped coverage ranges from new site survey methods to best practices for WPA authentication configuration; advanced design guidelines for city-wide deployments to the latest Cisco equipment. Simply put, you'll find all you need to succeed with your next wireless project -- in any environment, no matter how challenging.

**Objectives** The purpose of Top-Down Network Design, Third Edition, is to help you design networks that meet a customer's business and technical goals. Whether your customer is another department within your own company or an external client, this book provides you with tested processes and tools to help you understand traffic flow, protocol behavior, and internetworking technologies. After completing this book, you will be equipped to design enterprise networks that meet a customer's requirements for functionality, capacity, performance, availability, scalability, affordability, security, and manageability. **Audience** This book is for you if you are an internetworking professional responsible for designing and maintaining medium- to large-sized enterprise networks. If you are a network engineer, architect, or technician who has a working knowledge of network protocols and technologies, this book will provide you with practical advice on applying your knowledge to internetwork design. This book also includes useful information for consultants, systems engineers, and sales engineers who design corporate networks for clients. In the fast-paced presales environment of many systems engineers, it often is difficult to slow down and insist on a top-down, structured systems analysis approach. Wherever possible, this book includes shortcuts and assumptions that can be made to speed up the network design process. Finally, this book is useful for undergraduate and graduate students in computer science and information technology disciplines. Students who have taken one or two courses in networking theory will find Top-Down Network Design, Third Edition, an approachable introduction to the engineering and business issues related to developing real-world networks that

solve typical business problems. Changes for the Third Edition Networks have changed in many ways since the second edition was published. Many legacy technologies have disappeared and are no longer covered in the book. In addition, modern networks have become multifaceted, providing support for numerous bandwidth-hungry applications and a variety of devices, ranging from smart phones to tablet PCs to high-end servers. Modern users expect the network to be available all the time, from any device, and to let them securely collaborate with coworkers, friends, and family. Networks today support voice, video, high-definition TV, desktop sharing, virtual meetings, online training, virtual reality, and applications that we can't even imagine that brilliant college students are busily creating in their dorm rooms. As applications rapidly change and put more demand on networks, the need to teach a systematic approach to network design is even more important than ever. With that need in mind, the third edition has been retooled to make it an ideal textbook for college students. The third edition features review questions and design scenarios at the end of each chapter to help students learn top-down network design. To address new demands on modern networks, the third edition of Top-Down Network Design also has updated material on the following topics:

- Network redundancy
- Modularity in network designs
- The Cisco SAFE security reference architecture
- The Rapid Spanning Tree Protocol (RSTP)
- Internet Protocol version 6 (IPv6)
- Ethernet scalability options, including 10-Gbps Ethernet and Metro Ethernet
- Network design and management tools

This book covers all the communication technologies starting from First Generation to Third Generation cellular technologies, wired telecommunication technology, wireless LAN (WiFi), and wireless broadband (WiMax). It covers intelligent networks (IN) and emerging technologies like mobile IP, IPv6, and VoIP (Voice over IP). The book is replete with illustrations, examples, programs, interesting asides and much more!

Best practices for planning and deployment of broadband WWANs Learn insider tips from an experienced wireless industry leader Understand the principles that underlie the operation of all wireless systems Learn how to provide profitable and reliable wireless Internet access Select the most effective equipment and antenna systems for your area Avoid common pitfalls encountered by new wireless network operators Minimize the effects of noise and interference on your network Enjoy the satisfaction of providing wireless Internet access to your community Practice the business principles used by successful wireless ISPs (WISPs) Use 802.11a, 802.11b, and 802.11g equipment more successfully in your own home, office, or outdoor environment Choose the right network architecture for your wireless network Conduct physical site surveys and radio-frequency (RF) site surveys License-free broadband wireless wide-area networks (WWANs) provide fast deployment of low-cost, high-speed "last-mile" wireless Internet access. License-free wireless technology delivers these benefits without requiring the use of products or services provided by local telephone or cable companies. WWANs enable Internet service providers (ISPs) and corporate IT managers to deploy their own cost-efficient broadband networks that deliver high-speed access for buildings and areas where traditional wired connectivity is either completely unavailable or is cost-prohibitive. Deploying License-Free Wireless Wide-Area Networks is the first book that provides complete, real-world "start-to-

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finish" design, installation, operation, and support information for wireless ISPs and other organizations deploying outdoor wireless WANs—including coverage of 802.11a, 802.11b, 802.11g, and proprietary-protocol networks. This vendor-neutral book covers all brands of broadband wireless equipment and explains the principles upon which all wireless equipment is based. Inside, you'll find step-by-step instructions and crystal-clear explanations that walk you through initial planning stages and onto full wireless network operation. End-of-chapter review questions reinforce important concepts. Whether you're an IT director, ISP engineer, network architect, or field technician, *Deploying License-Free Wireless Wide-Area Networks* is your essential reference. With practical, in-depth coverage of the real-world challenges of outdoor, license-free wireless WAN deployment, this book provides a comprehensive, vendor-neutral guide to successful wireless network design and

As we all know by now, wireless networks offer many advantages over fixed (or wired) networks. Foremost on that list is mobility, since going wireless frees you from the tether of an Ethernet cable at a desk. But that's just the tip of the cable-free iceberg. Wireless networks are also more flexible, faster and easier for you to use, and more affordable to deploy and maintain. The de facto standard for wireless networking is the 802.11 protocol, which includes Wi-Fi (the wireless standard known as 802.11b) and its faster cousin, 802.11g. With easy-to-install 802.11 network hardware available everywhere you turn, the choice seems simple, and many people dive into wireless computing with less thought and planning than they'd give to a wired network. But it's wise to be familiar with both the capabilities and risks associated with the 802.11 protocols. And *802.11 Wireless Networks: The Definitive Guide, 2nd Edition* is the perfect place to start. This updated edition covers everything you'll ever need to know about wireless technology. Designed with the system administrator or serious home user in mind, it's a no-nonsense guide for setting up 802.11 on Windows and Linux. Among the wide range of topics covered are discussions on: deployment considerations network monitoring and performance tuning wireless security issues how to use and select access points network monitoring essentials wireless card configuration security issues unique to wireless networks With wireless technology, the advantages to its users are indeed plentiful. Companies no longer have to deal with the hassle and expense of wiring buildings, and households with several computers can avoid fights over who's online. And now, with *802.11 Wireless Networks: The Definitive Guide, 2nd Edition*, you can integrate wireless technology into your current infrastructure with the utmost confidence.

*Designing and Deploying 802.11 Wireless Networks* A Practical Guide to Implementing 802.11n and 802.11ac Wireless Networks for Enterprise-Based Applications Cisco Press

Make informed decisions about planning and installing 802.11 'Wi-Fi' wireless networks. This book helps you tackle the challenge, whether installing Wi-Fi within an existing corporate network or setting up a wireless network from scratch in any business

Get in-depth technical guidance for deploying a security-enhanced wireless network for your corporate, public, or small business network—direct from the Microsoft Windows Networking and Communications team. This essential reference details the latest IEEE 802.11 and related technologies for public and private wireless LANs, including the new Wi-Fi Protected Access (WPA) standard. You'll learn how to design and deploy an authentication infrastructure—including how to configure clients, Internet Authentication Service (IAS) servers, Active Directory directory service users and groups, certificate services, wireless access points, and other components—using best practices and real-world troubleshooting tactics from the extensive wireless LAN deployment at Microsoft. Get the technical drill-down you need to: Configure wireless client support for Windows XP, Windows Server 2003, and Windows 2000 Build the authentication infrastructure—including IAS RADIUS servers and proxies, Active Directory users and groups, and a public key infrastructure (PKI) Determine the placement of wireless access points Configure a Windows PKI to issue certificates for authentication of

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wireless access Use the EAP-TLS or PEAP-MS-CHAP v2 authentication protocol to help maximize security for a wireless intranet Design wireless intranets for business partners, cross-forest authentication, or large-scale deployment Help mitigate network attacks by using the new Temporal Key Integrity Protocol (TKIP) and Michael features of WPA Troubleshoot Windows wireless clients, wireless access points, and the authentication infrastructure To learn about the changes in wireless standards and wireless support in Windows that have occurred since the publication of this book, download Updates to Deploying Secure 802.11 Wireless Networks with Microsoft Windows, a white paper by author Joseph Davies.

Designing and Deploying 802.11 Wireless Networks Second Edition A Practical Guide to Implementing 802.11n and 802.11ac Wireless Networks For Enterprise-Based Applications Plan, deploy, and operate high-performance 802.11ac and 802.11n wireless networks The new 802.11ac standard enables WLANs to deliver significantly higher performance. Network equipment manufacturers have refocused on 802.11ac- and 802.11n-compliant solutions, rapidly moving older versions of 802.11 toward "legacy" status. Now, there's a complete guide to planning, designing, installing, testing, and supporting 802.11ac and 802.11n wireless networks in any environment, for virtually any application. Jim Geier offers practical methods, tips, and recommendations that draw on his decades of experience deploying wireless solutions and shaping wireless standards. He carefully introduces 802.11ac's fundamentally different design, site survey, implementation, and network configuration techniques, helping you maximize performance and avoid pitfalls. Geier organizes each phase of WLAN deployment into clearly defined steps, making the entire planning and deployment process easy to understand and execute. He illuminates key concepts and methods through realistic case studies based on current Cisco products, while offering tips and techniques you can use with any vendor's equipment. To build your skills with key tasks, you'll find several hands-on exercises relying on free or inexpensive tools. Whether you're deploying an entirely new wireless network or migrating from older equipment, this guide contains all the expert knowledge you'll need to succeed. Jim Geier has 30 years of experience planning, designing, analyzing and implementing communications, wireless, and mobile systems. Geier is founder and Principal Consultant of Wireless-Nets, Ltd., providing wireless analysis and design services to product manufacturers. He is also president, CEO, and co-founder of Health Grade Networks, providing wireless network solutions to hospitals, airports, and manufacturing facilities. His books include the first edition of Designing and Deploying 802.11n Wireless Networks (Cisco Press); as well as Implementing 802.11X Security Solutions and Wireless Networking Handbook. Geier has been active in the IEEE 802.11 Working Group and Wi-Fi Alliance; has chaired the IEEE Computer Society (Dayton Section) and various conferences; and served as expert witness in patent litigation related to wireless and cell ...

Finally--an 802.11 deployment guide for business and home use that demystifies the alphabet soup of IEEE standards and explains the features and benefits of each with regards to speeds and feeds.

Overview Today, Wi-Fi is everywhere, and the need to provide good Wi-Fi is an essential part of doing business. But "good Wi-Fi" is not just about coverage or converting your APs to 802.11ac or 802.11ax. Good Wi-Fi means that your user experience is seamless. Most of the wireless networks today are designed to support only data applications and not real-time applications. In recent years, more and more companies are deploying real-time applications, and enterprise-quality is expected. This Real Time over Wireless LiveLessons is a unique video course that provides the knowledge and details you need to create the best real time wireless experience for your organization. With more than eight hours of video training, Real Time Over Wireless LiveLessons demonstrates the process of designing, deploying, configuring and troubleshooting Wi-Fi networks for real time application support. The videos cover the full range of topics you need to successfully deploy real time applications over Wi-Fi.



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This video series will help any network engineer successfully design wireless for real time applications and deploy common real time applications (Spark, Jabber, and Skype for Business) over Wi-Fi networks. Coverage includes: Module 1: Real Time Over Wireless Foundations An Intro to Deploying Mobile Applications over Wireless Building RF Foundations Taking Care of the Roaming Path Client Device Requirements Wireless LAN QoS Fundamentals IEEE 802.11e and WMM 802.11ax QoS enhancements WLAN QoS Design Principles Module 2: WLAN Deployment Strategies AireOS QoS Basics Advanced QoS Configuration in AireOS Deploying Real Time Applications with Meraki QoS Orchestration with APIC-EM Module 3: The Design Studio FastLane, Deploying Apple Devices on a Cisco Wireless Infrastructure Deploying Real Time Applications Running on Microsoft Endpoints Troubleshooting Real Time Mobility Issues About the Instructors Rob Barton , CCIE No. 6660 (R&S and Security), CCDE No. 2013:6, is a Principal Systems Engineer based in Canada. Rob is a registered professional engineer (P.Eng) and has worked in the IT industry for more than 20 years, the last 17 of which have been at Cisco. Rob graduated from the University of British Columbia with a degree in Engineering Physics, where he specialized in computer and radio communications. Rob's areas of work include wireless communications, IPv6, IoT, and industrial networking systems. Rob coauthored the Cisco Press book End-to-End QoS , 2nd edition. H...

The next frontier for wireless LANs is 802.11ac, a standard that increases throughput beyond one gigabit per second. This concise guide provides in-depth information to help you plan for 802.11ac, with technical details on design, network operations, deployment, and monitoring. Author Matthew Gast—an industry expert who led the development of 802.11-2012 and security task groups at the Wi-Fi Alliance—explains how 802.11ac will not only increase the speed of your network, but its capacity as well. Whether you need to serve more clients with your current level of throughput, or serve your existing client load with higher throughput, 802.11ac is the solution. This book gets you started.

Understand how the 802.11ac protocol works to improve the speed and capacity of a wireless LAN Explore how beamforming increases speed capacity by improving link margin, and lays the foundation for multi-user MIMO Learn how multi-user MIMO increases capacity by enabling an AP to send data to multiple clients simultaneously Plan when and how to upgrade your network to 802.11ac by evaluating client devices, applications, and network connections

Wireless has finally come of age. With a significant jump in throughput over previous standards, 802.11n is the first wireless technology that doesn't trade speed for mobility, and users have stormed onto wireless networks with a passion. In this concise guide, Matthew Gast—chair of the IEEE group that produced revision 802.11-2012—shows you why wireless has become the default method of connecting to a network, and provides technical details you need to plan, design, and deploy 802.11n today. Building a network for the multitude of new devices is now a strategic decision for network engineers everywhere. This book gives you an in-depth look at key parts of 802.11n, and shows you how to achieve an Ethernet-free wireless office. Learn how MIMO's multiple data streams greatly increase wireless speed Discover how 802.11n modifications improve MAC efficiency Examine advanced PHY features such as beamforming

and space-time code block Use advanced MAC features to maintain interoperability with older devices Plan an 802.11n network by determining traffic demand, key applications, power requirements, and security Choose the architecture, select hardware, and plan coverage to design and build your network

This is Cisco's official, comprehensive self-study resource for both wireless exams associated with the new Cisco Certified Network Professional (CCNP) Enterprise certification: Designing Cisco Enterprise Wireless Networks (ENWLSD 300-425) and Implementing Cisco Enterprise Wireless Networks (ENWLSI 300-430). It brings together all the conceptual and practical knowledge needed to design, survey, implement, maintain and troubleshoot modern Cisco wireless networks. Designed to help you study, prepare for, and pass the CCNP Enterprise ENWLSD 300-425 (design) and ENWLSI 300-430 300-420 ENSLD exams on your first attempt, this guide covers every exam objective concisely and logically, with extensive teaching features designed to promote retention and understanding. You'll find: Pre-chapter quizzes to assess knowledge upfront and focus your study more efficiently Foundation topics sections that explain concepts and configurations, and link theory to practice Key topics sections calling attention to every figure, table, and list you must know Exam Preparation sections with additional chapter review features Final preparation chapter providing tools and a complete final study plan A customizable practice test library, including access to sample exams offering realistic practice delivered through Pearson's state-of-the-art test prep test engine CCNP Enterprise Wireless Design and Implementation ENWLSD 300-425 and ENWLSI 300-430 Official Cert Guide offers comprehensive, up-to-date coverage of all topics related to: Designing Cisco Enterprise Wireless Networks (ENWLSD): Site surveys Wired and wireless infrastructure Mobility WLAN high availability Implementing Cisco Enterprise Wireless Networks (ENWLSI): FlexConnect QoS Multicast Advanced location services Security for client connectivity Monitoring Device hardening

Discusses the fundamentals of wireless security and of the popular wireless LAN protocol 802.11, covering topics including station security configurations, network weaknesses, access points, and client security.

Controller-Based Wireless LAN Fundamentals An end-to-end reference guide to design, deploy, manage, and secure 802.11 wireless networks As wired networks are increasingly replaced with 802.11n wireless connections, enterprise users are shifting to centralized, next-generation architectures built around Wireless LAN Controllers (WLC). These networks will increasingly run business-critical voice, data, and video applications that once required wired Ethernet. In Controller-Based Wireless LAN Fundamentals, three senior Cisco wireless experts bring together all the practical and conceptual knowledge professionals need to confidently design, configure, deploy, manage, and troubleshoot 802.11n networks with Cisco Unified Wireless Network (CUWN) technologies. The

authors first introduce the core principles, components, and advantages of next-generation wireless networks built with Cisco offerings. Drawing on their pioneering experience, the authors present tips, insights, and best practices for network design and implementation as well as detailed configuration examples. Next, they illuminate key technologies ranging from WLCs to Lightweight Access Point Protocol (LWAPP) and Control and Provisioning of Wireless Access Points (CAPWAP), Fixed Mobile Convergence to WiFi Voice. They also show how to take advantage of the CUWN's end-to-end security, automatic configuration, self-healing, and integrated management capabilities. This book serves as a practical, hands-on reference for all network administrators, designers, and engineers through the entire project lifecycle, and an authoritative learning tool for new wireless certification programs. This is the only book that Fully covers the principles and components of next-generation wireless networks built with Cisco WLCs and Cisco 802.11n AP Brings together real-world tips, insights, and best practices for designing and implementing next-generation wireless networks Presents start-to-finish configuration examples for common deployment scenarios Reflects the extensive first-hand experience of Cisco experts Gain an operational and design-level understanding of WLAN Controller (WLC) architectures, related technologies, and the problems they solve Understand 802.11n, MIMO, and protocols developed to support WLC architecture Use Cisco technologies to enhance wireless network reliability, resilience, and scalability while reducing operating expenses Safeguard your assets using Cisco Unified Wireless Network's advanced security features Design wireless networks capable of serving as an enterprise's primary or only access network and supporting advanced mobility services Utilize Cisco Wireless Control System (WCS) to plan, deploy, monitor, troubleshoot, and report on wireless networks throughout their lifecycles Configure Cisco wireless LANs for multicasting Quickly troubleshoot problems with Cisco controller-based wireless LANs This book is part of the Cisco Press® Fundamentals Series. Books in this series introduce networking professionals to new networking technologies, covering network topologies, sample deployment concepts, protocols, and management techniques. Category: Wireless Covers: Cisco Controller-Based Wireless LANs This book describes new approaches to wireless security enabled by the recent development of new core technologies for Wi-Fi/802.11. It shows how the new approaches work and how they should be applied for maximum effect. For system administrators, product designers, or advanced home users. Gain a practical understanding of the underlying concepts of the 802.11n standard and the methodologies for completing a successful wireless network installation Practical, start-to-finish guidance for successful deployment of 802.11n wireless LANs With the ratification of the 802.11n wireless LAN standard, thousands of companies are moving rapidly toward implementation. However, 802.11n is very different from legacy 802.11a, 802.11b, and 802.11g wireless standards, and successful deployment requires new knowledge and

techniques. In this book, leading wireless expert Jim Geier systematically presents all the information and guidance that network architects, engineers, administrators, and managers need to maximize the performance and business value of new 802.11n networks. Drawing on extensive experience with real-world 802.11n deployments, Geier guides you through the entire project lifecycle: planning, design, installation, testing, monitoring, and support. Each phase of wireless LAN deployment is organized into clearly defined steps, and multiple case studies and hands-on exercises show how to apply each technique. You'll find practical guidance for deploying in enterprises without existing wireless infrastructure, as well as migrating from legacy 802.11a, 802.11b, or 802.11g networks. For convenient reference, Geier also provides an extensive, up-to-date wireless networking glossary. Understanding 802.11n MAC, physical layer, and related standards

Designing 802.11n wireless networks for diverse scenarios: considering architecture, range, performance, roaming, and RF issues Migrating from 802.11a, 802.11b, and 802.11g wireless networks Choosing the right tools and equipment, and using them effectively Planning effectively: scoping projects; creating work breakdown structures; organizing teams, schedules, and budgets; defining requirements, and more Securing WLANs via encryption, authentication, rogue access point detection, RF shielding, and polices Performing site surveys and identifying optimum access point locations Installing and configuring wireless LANs: planning, staging, deployment, documentation, and more Systematic testing to improve signal coverage, performance, and security Managing wireless LANs: help desk support, network monitoring, maintenance, engineering, configuration management, security, tools, and more Troubleshooting 802.11n networks: identifying issues with connectivity, performance, and more

Computer security touches every part of our daily lives from our computers and connected devices to the wireless signals around us. Breaches have real and immediate financial, privacy, and safety consequences. This handbook has compiled advice from top professionals working in the real world about how to minimize the possibility of computer security breaches in your systems. Written for professionals and college students, it provides comprehensive best guidance about how to minimize hacking, fraud, human error, the effects of natural disasters, and more. This essential and highly-regarded reference maintains timeless lessons and is fully revised and updated with current information on security issues for social networks, cloud computing, virtualization, and more.

Designing and Deploying 802.11 Wireless Networks Second Edition A Practical Guide to Implementing 802.11n and 802.11ac Wireless Networks For Enterprise-Based Applications Plan, deploy, and operate high-performance 802.11ac and 802.11n wireless networks The new 802.11ac standard enables WLANs to deliver significantly higher performance. Network equipment manufacturers have refocused on 802.11ac- and 802.11n-compliant solutions, rapidly moving older versions of 802.11 toward "legacy" status. Now, there's a complete guide to planning, designing, installing, testing, and supporting 802.11ac and 802.11n wireless networks in any environment, for virtually any application. Jim Geier offers practical methods, tips, and recommendations that draw on his decades of experience deploying wireless

solutions and shaping wireless standards. He carefully introduces 802.11ac's fundamentally different design, site survey, implementation, and network configuration techniques, helping you maximize performance and avoid pitfalls. Geier organizes each phase of WLAN deployment into clearly defined steps, making the entire planning and deployment process easy to understand and execute. He illuminates key concepts and methods through realistic case studies based on current Cisco products, while offering tips and techniques you can use with any vendor's equipment. To build your skills with key tasks, you'll find several hands-on exercises relying on free or inexpensive tools. Whether you're deploying an entirely new wireless network or migrating from older equipment, this guide contains all the expert knowledge you'll need to succeed. Jim Geier has 30 years of experience planning, designing, analyzing and implementing communications, wireless, and mobile systems. Geier is founder and Principal Consultant of Wireless-Nets, Ltd., providing wireless analysis and design services to product manufacturers. He is also president, CEO, and co-founder of Health Grade Networks, providing wireless network solutions to hospitals, airports, and manufacturing facilities. His books include the first edition of *Designing and Deploying 802.11n Wireless Networks* (Cisco Press); as well as *Implementing 802.11 Security Solutions* and *Wireless Networking Handbook*. Geier has been active in the IEEE 802.11 Working Group and Wi-Fi Alliance; has chaired the IEEE Computer Society (Dayton Section) and various conferences; and served as expert witness in patent litigation related to wireless and cellular technologies. Review key 802.11 concepts, applications, markets, and technologies Compare ad hoc, mesh, and infrastructure WLANs and their components Consider the impact of radio signal interference, security vulnerabilities, multipath propagation, roaming, and battery limitations Thoroughly understand today's 802.11 standards in the context of actual network deployment and support Plan your deployment: scoping, staffing, schedules, budgets, risks, feasibility analysis, and requirements Architect access networks and distribution system for maximum reliability, manageability, and performance Make the right tradeoffs and decisions to optimize range, performance, and roaming Secure WLANs via encryption, authentication, rogue AP detection, RF shielding, and policies Master design and site survey tools and methods for planning 802.11ac networks and migrations Efficiently install and test any 802.11ac or 802.11n wireless network Establish specialized support for wireless networks, including help desk operations Systematically troubleshoot connectivity, performance, and roaming issues Design efficient mesh networks and city-wide deployments

Best-practice QoS designs for protecting voice, video, and critical data while mitigating network denial-of-service attacks Understand the service-level requirements of voice, video, and data applications Examine strategic QoS best practices, including Scavenger-class QoS tactics for DoS/worm mitigation Learn about QoS tools and the various interdependencies and caveats of these tools that can impact design considerations Learn how to protect voice, video, and data traffic using various QoS mechanisms Evaluate design recommendations for protecting voice, video, and multiple classes of data while mitigating DoS/worm attacks for the following network infrastructure architectures: campus LAN, private WAN, MPLS VPN, and IPSec VPN Quality of Service (QoS) has already proven itself as the enabling technology for the convergence of voice, video, and data networks. As business needs evolve, so do the demands for QoS. The need to protect critical applications via QoS mechanisms in business networks has escalated over the past few years, primarily due to the increased frequency and sophistication of denial-of-service (DoS) and worm attacks. *End-to-End QoS Network Design* is a detailed handbook for planning and deploying QoS solutions to address current business needs. This book goes beyond discussing available QoS technologies and considers detailed design examples that illustrate where, when, and how to deploy various QoS features to provide validated and tested solutions for voice, video, and critical data over the LAN, WAN, and VPN. The book starts with a brief background of network infrastructure evolution and the subsequent need for QoS. It

then goes on to cover the various QoS features and tools currently available and comments on their evolution and direction. The QoS requirements of voice, interactive and streaming video, and multiple classes of data applications are presented, along with an overview of the nature and effects of various types of DoS and worm attacks. QoS best-practice design principles are introduced to show how QoS mechanisms can be strategically deployed end-to-end to address application requirements while mitigating network attacks. The next section focuses on how these strategic design principles are applied to campus LAN QoS design. Considerations and detailed design recommendations specific to the access, distribution, and core layers of an enterprise campus network are presented. Private WAN QoS design is discussed in the following section, where WAN-specific considerations and detailed QoS designs are presented for leased-lines, Frame Relay, ATM, ATM-to-FR Service Interworking, and ISDN networks. Branch-specific designs include Cisco® SAFE recommendations for using Network-Based Application Recognition (NBAR) for known-worm identification and policing. The final section covers Layer 3 VPN QoS design-for both MPLS and IPsec VPNs. As businesses are migrating to VPNs to meet their wide-area networking needs at lower costs, considerations specific to these topologies are required to be reflected in their customer-edge QoS designs. MPLS VPN QoS design is examined from both the enterprise and service provider's perspectives. Additionally, IPsec VPN QoS designs cover site-to-site and teleworker contexts. Whether you are looking for an introduction to QoS principles and practices or a QoS planning and deployment guide, this book provides you with the expert advice you need to design and implement comprehensive QoS solutions.

Plan and deploy identity-based secure access for BYOD and borderless networks Using Cisco Secure Unified Access Architecture and Cisco Identity Services Engine, you can secure and regain control of borderless networks in a Bring Your Own Device (BYOD) world. This book covers the complete lifecycle of protecting a modern borderless network using these advanced solutions, from planning an architecture through deployment, management, and troubleshooting. Cisco ISE for BYOD and Secure Unified Access begins by reviewing the business case for an identity solution. Next, you'll walk through identifying users, devices, and security posture; gain a deep understanding of Cisco's Secure Unified Access solution; and master powerful techniques for securing borderless networks, from device isolation to protocol-independent network segmentation. You'll find in-depth coverage of all relevant technologies and techniques, including 802.1X, profiling, device onboarding, guest lifecycle management, network admission control, RADIUS, and Security Group Access. Drawing on their cutting-edge experience supporting Cisco enterprise customers, the authors present detailed sample configurations to help you plan your own integrated identity solution. Whether you're a technical professional or an IT manager, this guide will help you provide reliable secure access for BYOD, CYOD (Choose Your Own Device), or any IT model you choose. Review the new security challenges associated with borderless networks, ubiquitous mobility, and consumerized IT Understand the building blocks of an Identity Services Engine (ISE) solution Design an ISE-Enabled network, plan/distribute ISE functions, and prepare for rollout Build context-aware security policies Configure device profiling, 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 Walk through a phased deployment that ensures zero downtime Apply best practices to avoid the pitfalls of BYOD secure access Simplify administration with self-service onboarding and registration Deploy Security Group Access, Cisco's tagging enforcement solution Add Layer 2 encryption to secure traffic flows Use Network Edge Access Topology to extend secure access beyond the wiring closet Monitor, maintain, and troubleshoot ISE and your entire Secure Unified Access system

Mobile communications users are demanding increased reliability, functionality, and

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accessibility; they want "always on" access to voice, e-mail, text, and multimedia services as they roam from home to auto to office to outdoor/indoor locations. In addition, there is an increasing demand to replace separate landline/mobile telephones with a single handset that can be used wherever its owner might be. Answering those customer needs, fixed/mobile convergence (FMC) marries the mobility provided by cellular networks with the extended connectivity provided by 802.11-based WiFi services and integrates them with landline networks using a single handset. This book provides the theoretical and practical background necessary to successfully plan, develop, and deploy effective FMC networks. This book discusses the various 802.11 and VoIP protocols used in FMC networks, open and proprietary communications protocols, integration of FMC networks to wired telephone networks, mobilizing applications such as text messaging and video, security issues, mobile handset requirements for FMC networks, and the administration/management of FMC networks. Special attention is given to selecting appropriate components for FMC, and numerous case histories and examples from the author's experience are provided. This book is an essential tutorial and reference for any RF/wireless, communications, and networking professional who will work with the next generation of wireless networks. Describes how to develop, deploy, and manage networks that seamlessly combine landline, cellular, and WiFi networks into one converged communications network. Thorough coverage of various 802.11 and voice over internet protocol (VoIP) standards and how they impact integration with cellular networks. Discusses security considerations and how to successfully manage converged networks. Includes numerous case histories and examples from the author's experience---this is not a purely theoretical treatment of the subject!

Communications represent a strategic sector for privacy protection and for personal, company, national and international security. The interception, damage or loss of information during communication can generate material and non material economic damages from both a personal and collective point of view. The purpose of this book is to give the reader information relating to all aspects of communications security, beginning at the base ideas and building to reach the most advanced and updated concepts. The book will be of interest to integrated system designers, telecommunication designers, system engineers, system analysts, security managers, technicians, intelligence personnel, security personnel, police, army, private investigators, scientists, graduate and postgraduate students and anyone that needs to communicate in a secure way.

While wireless technologies continue to provide an array of new challenges and multi-domain applications for business processes and solutions, there still remains to be a comprehensive understanding of its various dimensions and environments. Security, Design, and Architecture for Broadband and Wireless Network Technologies provides a discussion on the latest research achievements in wireless networks and broadband technology. Highlighting new trends, applications, developments, and standards, this book is essential for next generation researchers and practitioners in the ICT field.

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