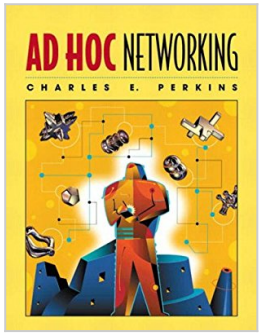

Ad Hoc Networking

By Charles E. Perkins

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"Ad hoc networking" enables wireless devices to network with each other as needed, even when access to the Internet is unavailable. It enables a wide range of powerful applications, from instant conferencing between notebook PC users to emergency and military services that must perform in the harshest conditions. In this book, the field's leading researchers present today's newest, most sophisticated techniques for making network applications available anytime, anywhere. They present state-of-the-art design and implementation techniques designed to instantly network a wide variety of mobile, wireless devices without access to routers, base stations, or Internet Service Providers. Learn how ad hoc networks utilize existing IP addresses, but require new protocol engineering. Understand cluster-based networks, Dynamic Source Routing (DSR) protocols, Ad Hoc Routing Protocols, reconfigurable wireless and other approaches. Finally, review each leading application for ad hoc networking, including mobile conferencing, home networking, emergency/disaster services, Personal Area Networks (PANs), Bluetooth integration; and embedded, military, and automotive applications.

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Ad Hoc Networking By Charles E. Perkins Bibliography

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Editorial Review

Amazon.com Review
Ad hoc networks are to computing devices what Yahoo Personals are to single people: both help individuals communicate productively with strangers while maintaining security. Under the rules of ad hoc networking--which continue to evolve--your mobile phone can, when placed in proximity to your handheld address book, establish a little network on its own and enable data sharing between the two devices. In *Ad Hoc Networking*, Charles Perkins has compiled a series of technical papers about networking on the fly from a variety of laboratories and experts. The collection explains the latest thinking on how mobile devices can best discover, identify, and communicate with other devices in the vicinity.

In this treatment, ad hoc networking covers a broad swath of situations. An ad hoc network might consist of several home-computing devices, plus a notebook computer that must exist on home and office networks without extra administrative work. Such a network might also need to exist when the people and equipment in normally unrelated military units need to work together in combat. Though the papers in this book are much more descriptive of protocols and algorithms than of their implementations, they aim individually and collectively at commercialization and popularization of mobile devices that make use of ad hoc networking. You'll enjoy this book if you're involved in researching or implementing ad hoc networking capabilities for mobile devices. --*David Wall*

Topics covered: The state-of-the-art in protocols and algorithms to be used in ad hoc networks of mobile devices that move in and out of proximity to one another, to fixed resources like printers, and to Internet connectivity. Routing with Destination-Sequenced Distance Vector (DSDV), Dynamic Source Routing (DSR), Ad hoc On-Demand Distance Vector (AODV), and other resource-discovery and routing protocols; the effects of ad hoc networking on bandwidth consumption; and battery life.

From the Inside Flap
The field of ad hoc networking is reemerging amid unprecedented growth in the scale and diversity of computer networking. New horizons for wireless connectivity have come into view along with a new sense of the inevitability of wireless data transmission over IP, the Internet Protocol that patches the Internet together. With new wireless products and research have come a more widespread familiarity between network protocol engineers and wireless media and some recognition that wireless media are almost as good as wired media for transmitting data--as long as one can overlook the differences in transmission speed. Almost--or perhaps even better--because of the dramatically greater convenience promised by mobile computing.

Unfortunately, there is another reason that mobile computing is often not truly as convenient as conventional computing. The Internet cannot yet handle mobile computers very well. Although this situation is changing quickly, almost no one would disagree that a fixed computer with wired media offers a better computing and communications environment than a mobile wireless computer--even more so for PDAs. The task set before today's network engineers is to eliminate the shortcomings of mobile computers and wireless media so that the inherent convenience of mobility will no longer suffer the burden of inadequate or inappropriate system design.

Part of the inadequacy of current system design starts with the outdated assumptions made in the network and routing protocols deployed in the Internet today. Many efforts to repair these outdated assumptions rely on additional infrastructure elements for managing data related to mobile computers--for example, Mobile

IP--and various proxy architectures. These efforts and others offer new design perspectives that either preserve the time-honored end-to-end model of Internet communications or that offer new models aimed at improving user experience.

Perhaps naturally, the wide deployment of the Internet has provided additional impetus for exploring the benefits of computer internetworking even for situations in which neither the Internet per se nor any other internetwork is reachable. In such situations, one might still wish to use familiar network programs to carry on the same kinds of interactive computing with neighbors and associates in the area. Network programs can typically continue to work as long as they can identify the IP address of the desired destination and a path of one or more network links toward the destination.

Finding such paths is the job of ad hoc network algorithms and protocols. Exploring that design space has been an increasingly active area of research in the last few years. It is our hope that the diverse algorithms and protocols described in this book will give the reader a good idea of the current state of the art in ad hoc networking. The authors of each chapter are among the foremost practitioners in the field, and each one will no doubt try to convince the reader that his or her approach is best. The result may be as confusing or as delightful as trying to order the best meal in a fabulous restaurant with a menu created by a crew of creative and distinctively different chefs. Bon Appetit!

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From the Back Cover

"Ad hoc" networks are wireless, mobile networks that can be set up anywhere and anytime--outside the Internet or another preexisting network infrastructure. The field has tremendous commercial and military potential, supporting applications such as mobile conferencing outside the office, battlefield communications, and embedded sensor devices that automate everyday functions, among others.

Ad Hoc Networking is a collection of algorithms, protocols, and innovative ideas from the leading practitioners and researchers that will propel the technology toward mainstream deployment. It discusses numerous potential applications, reviews relevant networking concepts, and examines the various approaches that define emerging ad hoc networking technologies. Specific topics covered include:

- The Ad Hoc On-Demand Distance-Vector (AODV) protocol, which reduces memory and processing requirements
- The Dynamic Source Routing (DSR) algorithm, in which paths are carried along with the data packets
- Ad hoc networking for the military
- Cluster-based networks for transmission management and routing efficiency
- The Destination-Sequenced Distance-Vector (DSDV) protocol
- The Zone Routing Protocol (ZRP)--a hybrid proactive/reactive protocol
- The Temporally Ordered Routing Algorithm (TORA)--a link-reversal protocol
- The Associative Bit Routing (ABR) algorithm, in a chapter which addresses battery life concerns
- Source Tree Adaptive Routing (STAR) protocol--a bandwidth-efficient partial link-state algorithm

Throughout this book, important issues--scalability, cost, bandwidth efficiency, power requirements, compatibility, quality of service, and security--are considered; possible solutions to these challenges are presented.

With cutting-edge contributions by such leading experts as Scott Corson, Jim Freebersyser, J. J. Garcia-Luna-Aceves, Zygmunt Haas, David B. Johnson, Barry M. Leiner, Martha Steenstrup, and C-K. Toh, Ad Hoc Networking lays the foundation for the next generation of mobile computer networking.

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Users Review

From reader reviews:

Adam Whittington:

Reading can called head hangout, why? Because when you are reading a book specifically book entitled Ad Hoc Networking your head will drift away trough every dimension, wandering in most aspect that maybe not known for but surely might be your mind friends. Imaging each and every word written in a reserve then become one application form conclusion and explanation in which maybe you never get just before. The Ad Hoc Networking giving you yet another experience more than blown away your head but also giving you useful info for your better life in this particular era. So now let us show you the relaxing pattern is your body and mind is going to be pleased when you are finished reading through it, like winning an activity. Do you want to try this extraordinary wasting spare time activity?

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Veronica Shriner:

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