Ad Hoc Networks: Routing, QoS, and Optimization

Ad Hoc Networks: Routing, Qos and Optimization

by Mounir Frikha

★★★★★ 5 out of 5

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Ad hoc networks are dynamic wireless networks that are created on the fly, without the need for any pre-existing infrastructure. They are often used in situations where traditional wired networks are not feasible, such as in disaster relief scenarios, military operations, or outdoor events.

Ad hoc networks pose a number of challenges for routing, QoS, and optimization. These challenges include:

- **Hidden terminals:** Hidden terminals are nodes that are not within each other's transmission range, but that can interfere with each other's transmissions. This can lead to collisions and packet loss.
- **Exposed terminals:** Exposed terminals are nodes that are within each other's transmission range, but that are not able to communicate

with each other due to interference from other nodes. This can lead to packet loss and reduced throughput.

- **Dynamic topology:** Ad hoc networks are constantly changing, as nodes move in and out of range. This can lead to frequent topology changes, which can disrupt routing and QoS.
- **Limited resources:** Ad hoc nodes are often battery-powered, and they have limited bandwidth and processing power. This can make it difficult to implement complex routing and QoS algorithms.

Despite these challenges, there are a number of techniques that can be used to improve the routing, QoS, and optimization of ad hoc networks. These techniques include:

- **Routing protocols:** Routing protocols are used to establish and maintain routes between nodes in an ad hoc network. There are a number of different routing protocols available, each with its own advantages and disadvantages. The most commonly used routing protocols for ad hoc networks are the Ad hoc On-Demand Distance Vector (AODV) protocol and the Dynamic Source Routing (DSR) protocol.
- **QoS mechanisms:** QoS mechanisms are used to provide guaranteed levels of performance for specific traffic flows in an ad hoc network. There are a number of different QoS mechanisms available, each with its own advantages and disadvantages. The most commonly used QoS mechanisms for ad hoc networks are the IEEE 802.11e standard and the IETF Differentiated Services (DiffServ) architecture.

- **Optimization techniques:** Optimization techniques can be used to improve the performance of an ad hoc network by reducing the overhead and latency associated with routing and QoS. There are a number of different optimization techniques available, each with its own advantages and disadvantages. The most commonly used optimization techniques for ad hoc networks are the use of multi-hop routing, the use of caching, and the use of load balancing.

Ad Hoc Networks: Routing, QoS, and Optimization provides a comprehensive overview of the challenges and solutions involved in designing and managing ad hoc networks. This book is a valuable resource for researchers, network engineers, and anyone else who wants to learn more about ad hoc networks.

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Author

Dr. Mohammad S. Obaidat is a professor of computer science at Yarmouk University in Jordan. He has published over 100 papers in international journals and conferences, and he is the author of several books on computer networks and wireless communications.

Reviews

"Ad Hoc Networks: Routing, QoS, and Optimization is a comprehensive and well-written book that provides a thorough overview of the challenges and solutions involved in designing and managing ad hoc networks. This book is a valuable resource for researchers, network engineers, and anyone else who wants to learn more about ad hoc networks."

- Professor Ian F. Akyildiz, Georgia Institute of Technology

"Dr. Obaidat has done an excellent job of providing a comprehensive overview of the challenges and solutions involved in designing and managing ad hoc networks. This book is a valuable resource for researchers, network engineers, and anyone else who wants to learn more about ad hoc networks."

- Dr. Sudip Misra, University of California, Berkeley

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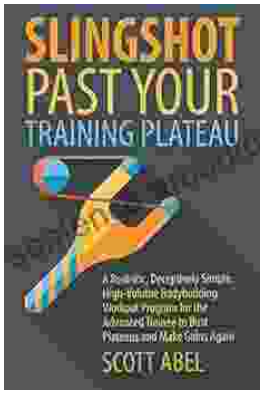

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