

1. Record Nr.	UNINA9911018900403321
Autore	Santi Paolo
Titolo	Topology control in wireless ad hoc and sensor networks / / Paolo Santi
Pubbl/distr/stampa	Chichester, England ; ; Hoboken, N.J., : Wiley, c2005
ISBN	9786610276417 9781280276415 128027641X 9780470094556 0470094559 9780470094549 0470094540
Descrizione fisica	1 online resource (281 p.)
Disciplina	004.6/8
Soggetti	Wireless communication systems Wireless LANs Sensor networks
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Topology Control in Wireless Ad Hoc and Sensor Networks; Contents; About the Author; Preface; Acknowledgments; List of Abbreviations; List of Figures; List of Tables; I Introduction; 1 Ad Hoc and Sensor Networks; 1.1 The Future ofWireless Communication; 1.1.1 Ad hoc networks; 1.1.2 Wireless sensor networks; 1.2 Challenges; 1.2.1 Ad hoc networks; 1.2.2 Wireless sensor networks; 2 Modeling Ad Hoc Networks; 2.1 TheWireless Channel; 2.1.1 The free space propagation model; 2.1.2 The two-ray ground model; 2.1.3 The log-distance path model; 2.1.4 Large-scale and small-scale variations 2.2 The Communication Graph2.3 Modeling Energy Consumption; 2.3.1 Ad hoc networks; 2.3.2 Sensor networks; 2.4 Mobility Models; 2.5 Asymptotic Notation; 3 Topology Control; 3.1 Motivations for Topology Control; 3.1.1 Topology control and energy conservation; 3.1.2 Topology control and network capacity; 3.2 A Definition of Topology Control; 3.3 A Taxonomy of Topology Control; 3.4 Topology Control in

the Protocol Stack; 3.4.1 Topology control and routing; 3.4.2 Topology control and MAC; II The Critical Transmitting Range; 4 The CTR for Connectivity: Stationary Networks
 4.1 The CTR in Dense Networks 4.2 The CTR in Sparse Networks; 4.3 The CTR with Different Deployment Region and Node Distribution; 4.4 Irregular Radio Coverage Area; 5 The CTR for Connectivity: Mobile Networks; 5.1 The CTR in RWPMobile Networks .; 5.2 The CTR with Bounded, Obstacle-free Mobility; 6 Other Characterizations of the CTR; 6.1 The CTR for k-connectivity; 6.2 The CTR for Connectivity with Bernoulli Nodes; 6.3 The Critical Coverage Range; III Topology Optimization Problems; 7 The Range Assignment Problem; 7.1 Problem Definition; 7.2 The RA Problem in One-dimensional Networks 7.3 The RA Problem in Two- and Three-dimensional Networks 7.4 The Symmetric Versions of the Problem; 7.4.1 The SRA problem in one-dimensional networks; 7.4.2 The SRA problem in two- and three-dimensional networks; 7.4.3 Approximation algorithms for WSRA; 7.5 The Energy Cost of the Optimal Range Assignment; 8 Energy-efficient Communication Topologies; 8.1 Energy-efficient Unicast; 8.2 Energy-efficient Broadcast; IV Distributed Topology Control; 9 Distributed Topology Control: Design Guidelines; 9.1 Ideal Features of a Topology Control Protocol; 9.2 The Quality of Information 9.3 Logical and Physical Node Degrees 10 Location-based Topology Control; 10.1 The R&M Protocol; 10.1.1 The power consumption model; 10.1.2 Relay region and enclosure graph; 10.1.3 Protocol description; 10.1.4 Discussion; 10.2 The LMST Protocol; 10.2.1 Protocol description; 10.2.2 Protocol analysis; 10.2.3 The FLSSk protocol; 11 Direction-based Topology Control; 11.1 The CBTC Protocol; 11.1.1 The basic CBTC protocol; 11.1.2 Dealing with asymmetric links; 11.1.3 Protocol analysis; 11.1.4 Removing energy-inef.cient links; 11.1.5 Discussion; 11.1.6 CBTC variants; 11.2 The DistRNG Protocol 12 Neighbor-based Topology Control

Sommario/riassunto

Topology control is fundamental to solving scalability and capacity problems in large-scale wireless ad hoc and sensor networks. Forthcoming wireless multi-hop networks such as ad hoc and sensor networks will allow network nodes to control the communication topology by choosing their transmitting ranges. Briefly, topology control (TC) is the art of co-ordinating nodes' decisions regarding their transmitting ranges, to generate a network with the desired features. Building an optimized network topology helps surpass the prevalent scalability and capacity problems.