Chapter 7

Effective Routing in Mobile Ad-hoc Networks With Power and End-to-End Delay Optimization:
Well Matched With Modern Digital IoT Technology

Mamata Rath
C. V. Raman College of Engineering, India

ABSTRACT

Mobile ad-hoc network (MANET) has always been a challenging and pioneering wireless network providing magnificent technology support starting from everyday life to disaster and critical environment. In industrial applications and most of the real-world solicitations, the MANET technology greatly suffers due to practical challenges faced by the network, power deficiency, and dynamic topology change being the prominent factors. Many cross-layer platforms supporting real-time applications have been developed by many researchers with the basic intention being maximum utilization of resources in the resource constrained environment of MANET, minimum power consumption using limited residual battery power of the highly transferable mobile nodes. This chapter presents the design of an optimized network layer protocol with delay management and power efficiency.

INTRODUCTION

In Mobile Ad hoc Networks(MANETs) group of wireless nodes are connected which are always in mobile state and are linked with each other through radio waves in the absence of any central access point. Every node functions not as a node, as well as a router which forward the packets to the nest hop towards destination. Adhoc networks are helpful in situations where temporary network connectivity is required in emergency cases or in rescue processes, disaster relief assignments and also in military applications. Designing power management routing protocols is very much necessary in multi-hop wireless mobile ad-hoc networks because individual node contains insufficient battery power. So it is difficult to provide more power to the nodes in the network or to recharge them as these are infrastructure less and are difficult to access. Again the nodes are mobile and the network topology changes frequently due to frequent node mobility.

In Emergency and relief operations MANETs are very useful because they can be created quickly as and when required without an existing infrastructure. Figure 1 Shows a MANET and Wireless Mobile Network. In military exercises, conferences and classroom meetings application of MANETs in also equally important. In all these cases there is high movement of nodes and compactness of the network increases giving rise to disturbance in transmission. Therefore design of effective routing protocols is essential to meet successful routing.Designing a sustainable Adhoc Network is a demanding issue as the energy-controlled nodes are ordinary to run independently for long periods. Communication over wireless media within time constrained is needed to permit real-time mobile applications such as interaction between mobile robots and inter-communication among mobile vehicles. A proper high-level communication method to connect independent domains is achieved through real-time event-based communication prototype which has been widely implemented in large distributed control systems. In this work the authors try to make an attempt to investigate different strategies of power management of mobile nodes and delay computation with careful observation on realtime applications. In Mobile Adhoc Networks (MANET) data transmission is very challenging as there is no dedicated infrastructure, so forwarding data from source to destination through a multi-hop communication is difficult due to frequent change in network topology. There are other constraints such as limited battery power of the nodes, high mobility rate of nodes, delay constraints, Qos requirements of multi cast and real time communication etc.The Objective of this paper is to make a comprehensive study on heterogeneous challenges faced by MANET, basically for dynamic routing purpose and present a report on novel proposals with technical mechanism used in them to meet such challenges. Objective and Feature of all the novel works are listed

Related Content

Exploring Tools, Places, and Ways of Being: Audience Matters for Developing Writers
Jayne C. Lammers, Alecia Marie Magnificoand Jen Scott Curwood (2014). *Exploring Technology for Writing and Writing Instruction (pp. 186-201).*
www.irma-international.org/chapter/exploring-tools-places-ways-being/78576

Innovative Policy Approaches and Collaborations to Support Sustainable Procurement
Adam Sandow Saani, Lord Emmanuel Yamoahand Abdul-Basit Danjoe Munkaila (2025). *Enhancing Public Sector Accountability and Services Through Digital Innovation (pp. 437-456).*
www.irma-international.org/chapter/innovative-policy-approaches-and-collaborations-to-support-sustainable-procurement/381772

Analyzing Blending Social and Mass Media Audiences through the Lens of Computer-Mediated Discourse
Asta Zelenkauskaite (2014). *Digital Arts and Entertainment: Concepts, Methodologies, Tools, and Applications (pp. 1360-1382).*
www.irma-international.org/chapter/analyzing-blending-social-and-mass-media-audiences-through-the-lens-of-computer-mediated-discourse/115078

Social Media and the Public Sphere in China: A Case Study of Political Discussion on Weibo after the Wenzhou High-Speed Rail Derailment Accident
Zhou Shanand Lu Tang (2017). *Handbook of Research on Citizen Engagement and Public Participation in the Era of New Media (pp. 410-425).*
www.irma-international.org/chapter/social-media-and-the-public-sphere-in-china/172245

Practice and Modeling of Advertising Communication Strategy: Sender-Driven and Receiver-Driven