

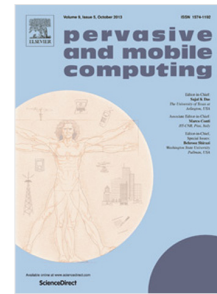
Accepted Manuscript

Topological dynamics of comparison-based fault identification in ad hoc networks

Tzu-Liang Kung, Hsing-Chung Chen

PII: S1574-1192(17)30045-7
DOI: <http://dx.doi.org/10.1016/j.pmcj.2017.07.013>
Reference: PMCJ 879

To appear in: *Pervasive and Mobile Computing*



Please cite this article as: T. Kung, H. Chen, Topological dynamics of comparison-based fault identification in ad hoc networks, *Pervasive and Mobile Computing* (2017), <http://dx.doi.org/10.1016/j.pmcj.2017.07.013>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Topological dynamics of comparison-based fault identification in ad hoc networks

Tzu-Liang Kung^a and Hsing-Chung Chen^{a,b,*}

^a Department of Computer Science and Information Engineering, Asia University
Taichung City 413, Taiwan, R.O.C.

^b Department of Medical Research, China Medical University Hospital, China Medical University
Taichung City 404, Taiwan, R.O.C.

Abstract

The class of ad hoc networks is of great applicability for pervasive and mobile computing. As an ad hoc network has highly dynamic, variable underlying topologies, its mobility management has long been a challenging issue in the area of wireless networking. The localized fault diagnosis can be an effective strategy of the periodic topology control for mobility management applications by identifying fault status of each node. The main contributions of this paper are highlighted as follows: (1) We first establish a topological condition for recognizing whether or not a node is restrictively one-step f -identifiable in an ad hoc network, where f denotes the amount of faulty nodes that are tolerable in our condition. (2) Then we propose a robust comparison-based fault identification algorithm that is applicable to topology formation taken for the maintenance of ad hoc networks. (3) Numerical robustness evaluation is presented to figure out the scalability of the proposed algorithm.

Keywords: Fault identification; diagnosability; reliability; topology control; mobility management.

1. Introduction

As remarkable advances in wireless networking emerge, high-performance computing has become popular in real applications. For example, a typical development of pervasive and mobile networks relies on the achievement of high-performance computing for the sake of utilizing reliable computation and communication resources. A traditional high-performance computing system, such as supercomputers, are configured by a collection of interconnected units, such as a huge number of processors and storage devices that are structured within a predefined underlying topology. However, the growing popularity

*Corresponding author. *Email:* cdma2000@asia.edu.tw. *Tel:* +886-4-23323456 ext. 48015. *Fax:* +886-4-23320718.

Download English Version:

<https://daneshyari.com/en/article/4957361>

Download Persian Version:

<https://daneshyari.com/article/4957361>

[Daneshyari.com](https://daneshyari.com)