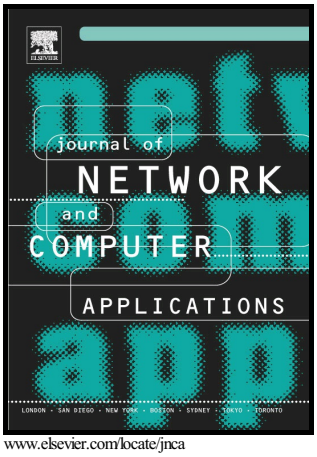
Author's Accepted Manuscript

Data aggregation mechanisms in the Internet of things: a systematic review of the literature and recommendations for future research

Behrouz Pourghebleh, Nima Jafari Navimipour



www.elsevier.com/locate/jnca

PII: S1084-8045(17)30269-2
DOI: http://dx.doi.org/10.1016/j.jnca.2017.08.006
Reference: YJNCA1952

To appear in: *Journal of Network and Computer Applications*

Received date: 20 April 2017
Revised date: 9 July 2017
Accepted date: 20 August 2017

Cite this article as: Behrouz Pourghebleh and Nima Jafari Navimipour, Data aggregation mechanisms in the Internet of things: a systematic review of the literature and recommendations for future research, *Journal of Network and Computer Applications,* http://dx.doi.org/10.1016/j.jnca.2017.08.006

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 galley proof before it is published in its final citable 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.

ACCEPTED MANUSCRIPT

Data aggregation mechanisms in the Internet of things: a systematic review of the literature and recommendations for future research

Behrouz Pourghebleh, Nima Jafari Navimipour*

Department of Computer Engineering, Tabriz Branch, Islamic Azad University, Tabriz, Iran

*jafari@iaut.ac.

Abstract

Internet of Things (IoT) as a new interesting subject in information technology enables data receiving and sending for each creature through the communication network. Also, network lifetime is the critical challenge in the IoT, which tries to lengthen the lifetime of the IoT. In this regard, data aggregation as an efficient method is used to decrease the number of transmissions among objects. The loss of data redundancy leads to lengthen the network lifetime and decrease the energy consumption. Although the data aggregation has a vital role in the IoT, there is not any systematic and comprehensive study about analyzing its important mechanisms. Therefore, this paper aims to study and review the present data aggregation mechanisms in the IoT systematically. The data aggregation mechanisms are categorized into three main groups, including tree-based, cluster-based and centralized. Also, the detailed comparison of the significant techniques in each class brings a recommendation for further studies.

Keywords: Internet; Internet of things; IoT; data aggregation; review; SLR.

1. Introduction

Recently, the fast growth of distributed and Internet-based systems such as Internet of Things (IoT), grid computing and cloud computing have led to the explosive development of data in almost each engineering and commercial field (Fouladi & Navimipour, 2017; Hajizadeh & Jafari Navimipour, 2017; Jin, Wah, Cheng, & Wang, 2015). Also, an expanding number of physical objects are being related with a notable rate identifying the idea of the IoT (Piccialli, Chianese, & Jung, 2017; Qin et al., 2016; Whitmore, Agarwal, & Da Xu, 2015). The IoT is the network of physical objects that can be monitored and handled through the Internet (Mao et al., 2016; Moschakis & Karatza, 2015; Yan, Zhang, & Vasilakos, 2014). In the IoT, billions of objects can be found through various types of actuators and sensors, which are related to the Internet via wireless sensor network (WSN) (Abdollahzadeh & Navimipour, 2016). Connectivity, sensing, and interactivity among objects are considered as the main features of the IoT (Levi & Sarimurat, 2016). Despite the heterogeneity of the IoT devices (Baccelli, Hahm, Gunes, Wahlisch, & Schmidt, 2013), the data in IoT applications such as smart home, smart city, and smart energy services will be easily combined, correlated, compared and merged to match the people's needs and requirements (Piccialli et al., 2017). Small devices are typically powered by limited batteries and energy supplies in the IoT (Thar Baker, Asim, Tawfik, Aldawsari, & Buyya, 2017). Therefore, it is necessary to improve the lifetime of long-term applications such as continuous environmental monitoring (Choi, Park, Na, & Jo, 2015).

Accepted manuscript

Download English Version:

https://daneshyari.com/en/article/4955808

Download Persian Version:

https://daneshyari.com/article/4955808

Daneshyari.com