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Content Based Routing Using Information Centric Network For IoT

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Abstract

Internet of Things (IoT) can be used for many applications across industrial domains. However gathering data from such network increases traffic. To regulate this problem, Content Centric Routing (CCR) technique is adopted. An algorithm named as ETERNAL (contEnT cEntRic aNd loAd baLancing) has been proposed, to transmit data based on content. Routing the interrelated data in same route reduces traffic.Hence latency is reduced, resulting in less traffic and conservation of battery energy. The outcome of the proposed work claims minimal network delay, and higher energy efficiency. Consistency is also ensured that claims the proposed methodology superior to existing techniques.

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Keywords: wireless sensor network; routing, energy consumption;Content Centric Routing;ICN

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1. Introduction

The definition of Internet of Things (IoT) is "a persistent and ever-present network which enables monitoring and manages of the physical surroundings by collecting, processing, and analyzing the data generated by sensors or smart objects". Recently wireless networks has been attracted by distributed computing technique it has more attention specially on promising prototype in communication of Internet of Things (IoT) where the devices of IoT has enough storage capacity, self governing process, and good communication capabilities, the main idea is instead of sending all original data straight through an exclusive(multi-hop) wireless network generally interrelated among high energy utilization and time latency, the most cost-effective method is to first decreases the amount of data locally through the in-network dealing and consequently transfer processed data alone. Therefore, it can have high energy, bandwidth and reduces the latency and also the network lifetime is extend in resource controlled IoT network.

In several cases, highly interrelated data are collected for the similar application and while transferring to the sink it will process together. For example, the process of fusing the various sensor values based on the similar physical event. This kind of data aggregation process will limit the overall amount of data to be transferred over the wireless links, it has an considerable impact on overall network efficiency and energy consumption. The aggregation of unrelated data’s and forwarding through the network will increase the traffic level, energy consumption and reduces the network lifetime at the same time the redundant data transmission will increase. Therefore to overcome these difficulties we have proposed an algorithm to improve the network lifetime, energy conserving and limit the traffic and redundant data transfer over the networks by routing the data from the sensors in the separate channels based on the nature of data.

In this paper we have discussed related work in section 2 and is followed by proposed work as section 3 that outlines the proposed ETERNAL model with the relevant architecture. Section 4 discusses the result obtained and then concluded.

2. Related work

Unlike from current fashionable concept of Named Data Networks (NDN) or Content-Centric Networking (CCN) [1-3] have proposed an subscribing information and caching techniques depends upon data rather than based on the host. It has the major focus on CCR technology to give an correct and better routing topology to limit the network traffic and to assist in-network aggregation of data.

The mechanisms of Routing and data aggregation has a significant consideration in the literature [4,5] in the perspective of WSN (Wireless Sensor Network). The presented work can be generally divided into two approaches -distributed and centralized. In Centralized method [6-11] generally pre-compute and make the finest suitable routing structure prior to the network starts to function. In [7], a network duration greatest aggregation tree result is projected.[9] have a attention of Load balancing,[11]authors has consider about the computational cost of aggregation. To control a overhead global network data is introduced in above literatures. In[12-18] has a distributed clustering method such as route to make an hierarchical routing topologies through local data gossiping.[16] has adopted a shortest pathway tree topology. Dynamic clustering method is adopted in [17].While making the clusters high transmission cost is occur when the process of clustering is triggered for each application or event. In addition, like a clustering method, tree ([7,8,19]) or Direct Acyclic Graph (DAG) [20] based methods also necessitate to a precise routing topology to function, and hence reduces their capacity to deal with dynamic network circumstances. This is due to every time a network alteration will take place like a connection breakage or early energy deficiency of several serious routing nodes, the network topology messages needs to be updated to replicate the existing circumstances.