

Investigating Transport Protocols for Mobile Health Applications of WSNs

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Abstract

Background: In recent years, wireless sensor networks (WSN) has attracted the interest of many researchers due to great potential in various applications such as healthcare and mobile patient monitoring. WSNs have limitations such as storage space, energy resources, and wireless communication issues. Accordingly, popular transport protocols like TCP may not enjoy sufficient efficiency in such networks. It creates specific ideas for designing the transport protocol for the mobile health applications of WSNs to insure reliable transmission in these networks.

Objectives:

In this paper, we study the characteristics leading to design a transport layer protocol for healthcare WSNs and also aim to examine the efficiency of TCP and its variants, which are introduced to wireless networks.

Methods:

Proxy method was an idea presented in this study. In proxy state, when packets were sent to the proxy node, in case a packet was congested or lost, it was rapidly identified and packet recovery or congestion prevention operation was employed on the basis of transport protocol structure.

Results:

In our NS-2 simulations, we examine the effect of proxy nodes on the performance by changing their location and network size. We propose to employ proxy nodes for near to sink for improving the performance of the transport layer. Our NS-2 simulation results indicate that through put and packet delivery ratio are improved, 200 up to 50% after employing proxy nodes, while the average message delay is almost doubled.

Conclusions:

The present study aimed to examine and introduce a method of improving transport protocol in healthcare WSNs. Given limitations in healthcare WSNs and also in introducing an appropriate transport protocol, the use should be made of simple and general methods applicable to all healthcare WSNs

Keywords: Mobile Health; Wireless Sensor Networks (WSN); Transport Layer Protocol