Energy efficient model for the sensor cloud systems

Publisher: IEEE

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Abstract:
At the present time sensor is needed for many applications. A number of sensors combine to form Wireless Sensor Networks (WSN). Cloud computing is an emerging technique provides shared processing resources and data to the end user. The sensor cloud infrastructure constitutes WSN and cloud for managing physical sensors on IT infrastructure. Sensor cloud should be energy efficient as the battery in the sensor has a limited lifetime and there is requirement of more energy to run the servers. User requests are very frequent and if any user requests to access sensor network through cloud system, the request redirects to the sensor network every time which consumes more energy of the sensor. We have proposed a model in which cloud systems can predict the future sensor data and due to this, there is no need to redirect every user request to sensor network. The sensor network also uses load-balancing routing scheme, which uses different paths to route the data from sensor node to the gateway as a result all nodes are used uniformly and the network lifetime is more. There is less transmission overhead in our proposed approach due to the use prediction scheme in cloud system and the network lifetime of the sensor network is more as the variance of consumption of power of all nodes in the sensor network is less due to load balancing routing. Use of prediction scheme in cloud system and load-balancing routing in the sensor network will be the future direction of research to minimize energy consumption in the sensor cloud environment.

Published in: 2017 2nd IEEE International Conference on Recent Trends in Electronics, Information & Communication Technology (RTEICT)

Date of Conference: 19-20 May 2017

INSPEC Accession Number: 17504300

Date Added to IEEE *Xplore*: 15 January 2018

DOI: 10.1109/RTEICT.2017.8256619

ISBN Information:

Publisher: IEEE

Conference Location: Bangalore, India

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Contents

Sensors are used for various applications. Sensors generally connected with each other through wireless medium to form wireless sensor networks. Sensor device has a low power embedded processor, memory, transceiver, sensing unit and battery. Cloud computing is an emerging technique provides shared processing resources and data to the end user. Through virtual servers, user get service in the cloud computing. There is no need for the user to worry about the location of the servers and its configurations. The sensor cloud infrastructure combines WSN and cloud for managing physical sensors on IT infrastructure. Through sensor cloud infrastructure an end user can access the sensor network through the cloud computing. If the owner of the sensors wants to rent his sensor, he has to attach his sensors to cloud computing infrastructure. He can get money according to the usage of his sensors. The owner can add and delete his sensor in the sensor cloud infrastructure. The major issue in sensor network is efficient utilization of energy as the life time of battery in the sensor is finite. It is difficult to replace the battery of the sensor after deployment in most of the scenarios. Due to design constraint battery size can't be more to provide more lifetime. To run the server in the cloud computing environment, huge energy is required. Traditionally, when an user requests to access the sensor through the cloud computing environment, the sensor has to respond the every request. If user requests are very frequent then the sensor has to respond frequently, which result less network life time for the sensor network. Data compression and aggregation schemes can reduce the size of transmitting data, but the number of transmissions can't be reduced and every user request must be responded by the sensor. There is a need to reduce the number of transmissions from the sensor to the cloud systems.

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