International Journal of Trend in Research and Development, Volume 3(4), ISSN: 2394-9333
www.ijtrd.com

Extending Sensor Network Using Advanced TPSS in Mobile Cloud

[1]P.B.Priyanka, [2]Dr.S.Muthusundari and [3]Manne Rajesh,
[1]M.E(CSE), [2]Associate Professor, [3]Senior Engineer,
[1,2]CSE Department,
[1,2]R.M.D Engineering College, kavaraipettai, chennai-601206 TamilNadu, India
[3]Bharat Heavy Electricals Limited, Ranipet-632406 TamilNadu, India

***Abstract*--** Cloud computing is to integrate wireless sensor network (WSN) and mobile cloud to offer reliable data that are useful to mobile users from WSN to cloud. WSN provides data to the cloud and mobile users request data from cloud. WSN-MCC integration application support and needed to provide reliable data to mobile users. Due to limited wireless communication range the network is divided to sub networks and its affect the usefulness of sensory data and reliability of WSN. In proposed model a WSN-MCC integration named TPSS consists two main parts: Time and Priority-Based selective data transmission (TPSDT) for WSN gateway to selectively transmit sensory data to cloud. Priority-Based Sleep Scheduling (PBSS) algorithm for save the energy consumption in reliable way and another scheme priority based packet scheduling send the data packets into priority queues. The real time packets are send to highest priority queue can pre-empt data in other queues and non-real time placed on other queues based on threshold processing time. TPSS will maintain by cloud and send priority table to each gateway send the request to particular sensor and data based on priority table. The Location-Based Sleep Scheduling algorithm will find their location for history table and then result of TPSS and LBSS is to improving usefulness of sensory data and reliability of WSN.

***Keywords*--** *Wireless Sensor Network, Mobile Cloud Computing, Integration, usefulness, Reliability.*

I. INTRODUCTION

Wireless sensor network(WSN) is a distributed network consisting of autonomous sensors that monitors the physical or environmental conditions(e.g.,sound,temperature,humidity etc)[1].The data gathering ability of sensors of WSN provides great potential to enable a lot of significant applications. Mobile cloud computing(MCC) is an infrastructure where both data storage and data processing happen outside of the mobile devices by offlsoading much of data processing and storage from mobile device in more reliable way in clouds. The advantages of MCC are the extending battery lifetime, improve data storage capacity, improve reliability. It also enhances the performance of a lot of traditional mobile services(e.g., mobile learning, mobile gaming, mobile health).The mobile gaming can exploit MCC to move the game engine that requires computing resources from mobile devices to powerful servers in the cloud to greatly reducethe energy consumption. Cloud computing(CC) is a new computing paradigm enabling users to elastically utilize a shared pool of cloud resources in an on-demand fashion mobile CC(MCC).It translates the data storage and data processing tasks from the mobile devices to powerful cloud. MCC is not only alleviates the limitations(e.g.,mobile learning,mobile gaming,mobile health).For instance mobile gaming can exploit MCC to move the game engine that requires substantial computing resources from mobile devices to powerful servers in cloud to reduce the energy consumption and improve the performance of mobile devices.WSN-MCC integration paradigm,the WSN act as a data source and mobile users are data requesters for cloud mobile users can access to required sensory data from the cloud when and where there is network connection. Sensor network is composed of numerous sensor nodes are largely deployed either inside the phenomenon or near to it. There is no need to determine the positions of the sensor nodes, it can be randomly placed on networks and another unique feature is cooperative in networks the sensor nodes placed on the on-board processor [2]-[3]. Sensory data that are more useful to the mobile users should be offered from WSN to cloud, on other hand to perform the goal of monitoring the house intelligently the WSN needs to successfully gather and transmit the collected information to the cloud. Sensory data still need able to be collected by sensor as mobile users may request data from any sensor at any time with high probabilities. The sensory data should be reliably offered from the WSN to the cloud. Sensors can be positioned far from the actual phenomenon, i.e., something known by sense perception in this approach large sensors that use some complex techniques to distinguish the targets from environmental noise. The positions of sensors and communication topology are carefully engineered. They can transmit time series of the sensed phenomenon to the central nodes where fused [4] on experimental results.

II. RELATED WORK

There are a number of works related to WSN-MCC integration and focus on following two aspects:1)improving the performance of WSN, and 2)better utilizing the data collected by the WSN. Specifically with respect to improve the performance of WSN with WSN-MCC integration is able to support the dynamic loads that are generated by environmental WSN applications. It is demonstrated in that integration of WSN and MCC could address the challenge of data management in WSN for patient supervision. It is suggested in[5] that the cloud could potentially enhance the visualization performance of a WSN for living environment. A collaborative location-based sleep scheduling algorithm is proposed in [6] to improve the network lifetime performance of the integrated WSN. This algorithm addresses the WSN reliability issue to some extent by extending the network lifetime and the usefulness of sensory data is not considered. The better utilizing data collected by the WSN with WSN-MCC integration, the focus of framework to utilize the ever-expanding sensory data for various next generation community-centric sensing applications on the cloud. Similarly, the motivation is to facilitate the shift of data from the WSN to the cloud computing environment so that scientifically and economically valuable WSN data may be fully utilized. It is a cloud design for user-controlled storage and processing of sensory data is proposed in make data owner's trust that the management of the sensitive data is

secure. Finally the management puts forward a framework providing desirable sensory data to users faster with data analysis techniques, so that the sensory data could be better utilized with cloud computing. To the best our knowledge, currently there is no research work focusing jointly on issues about the usefulness of sensory data and reliability of WSN in WSN-MCC integration and our proposed TPSS is the first work that considers together the usefulness of sensory data and reliability of WSN for WSN-MCC integration. It is particularly TPSS incorporates TPSDT and PSS to improve both the usefulness of sensory data and reliability of WSN.

III. PROPOSED ANALYSIS

The proposed work considers to improve the usefulness of sensory data and reliability of WSN and also to predict and maintain the history data's of the usersin WSN-MCC integration scheme. The TPSS and LPSS are the major work in this context. In this analysis have four modules are:

1. Considered Network Model.
2. Gateway And The Mobile Cloud.
3. Time And Priority Based Sleep Scheduling (TPSS).
4. Location Based Sleep Scheduling (LBSS).

A. Architecture Diagram for Proposed System

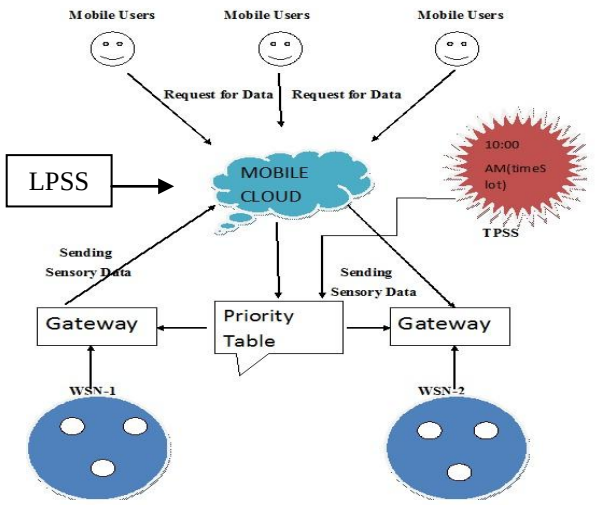

Figure 1: System Architecture

In fig 1, each WSN connected with gateway and sends the sensory data to gataway. Whenever the users want the data, the mobile user sends the request to cloud and each gateway sends the sensory data to the cloud. Based on individual users request, TPSS and LBSS table will be maintain. Sensor collects highest priority data are in active then other sensor in deactivate state (sleep mode).

B. Working Principles

a. Considered Network Model

In this module, we have to create multiple Wireless Sensor Networks (WSN) and each sensor senses the unique data such as temperature, humidity, co2 and wind etc. Each WSN have its own gateway and sensor is listed in a gateway.

b. Gateway and the Mobile Cloud

In this module, each sensor sends the sensed data to gateway and each gateway stores sensory data send to the cloud. Multiple mobile users are created. It is based on mobile users request time based priority scheduling is maintained. Each user will request data in time period consequently and data requested are stored in MCC and the priority table is maintained for every user based on time space.

c. Time and Priority Based Sleep Scheduling (TPSS)

The TPSS scheme is to gather and transmit sensory data for WSN-MCC integration and reliably offering data which are useful to mobile users from WSN to cloud. Sensor nodes are determining their awake and asleep states with PSS. Sensor nodes sense the environmental data with a set frequency and store the data as well as process the sensory data. It will send the processed sensory data to the gateway g with many to one and hop by hop pattern. Gateway g stores the received sensory data and then processes this data. It is based on priority user gets the data using the timeslot. The data requested are stored and the data are automatically sent to that user continuously.

The Point vs Time And priority (PTP) table will be maintained in cloud for each mobile user, each point corresponds to a sensor node and the time reflects the specific time period and priority reflects the probability of mobile user requests data from corresponding sensor node during that time period.

The probability that the data request concern the sensor node **i** in each specific time period **t** is calculated as follows

$$P^t_i = r^t_i / R^t$$

P^t_i	Probability of data request
r^t_i	Number of data request issued for point of interest during time period t
R^t	Number of data request issued to all points for specific time period t

Pseudocode of TPSS Algorithm
Run the following at gateway g during each time period t.

1. Gateway g obtains PTP table.
2. If $P^t_i > 0$, g sends flag A to node i.
3. Run the second part at each node i.

d. Location Based Sleep Scheduling (LBSS)

Location Based Sleep Scheduling (LBSS) is implemented based on individual user's history table will be maintained. Now gateway sends the request to the particular sensor and gets sensory data based on user history. Sensor which it collects the user history data based on LBSS are in active then all the other sensor are in deactivate state (sleep mode).

e. Priority Based Packet Scheduling

The priority based packet scheduling scheme aims to provide different types of data packets in real time and non-real time data packets at sensor nodes in WSN using priority queues. Real-time packets are placed in highest priority queues and pre-empt data packets in other queues. Non-real-time packets placed on two other queues based on threshold processing time. These schemes will reduce sensor energy consumption.

CONCLUSION

We have proposed two schemes (i.e. TPSS and LBSS) for WSNs integrated with MCC. The LBSS and TPSS schemes will involve both the WSN and the cloud are dynamically change the awake or asleep status of the sensor node in the integrated WSN, based on the locations of mobile users and user requested data priority. The Time Based Priority Sleep Scheduling will be maintained and sends to the each gateway based on priority table. Sensor which collects the highest

priority data are in active then other sensor are in deactivates state. The LBSS will maintain the location history table and sends to gateway based on user history. In both analytical and experimental results regarding TPSS and LBSS will improve the usefulness of sensory data and reliability of WSN, history table will be maintained and also reduce energy consumption.

References

[1] C. Zhu, L. Shu, T. Hara, L. Wang and L. T. Yang, "A Survey on Communication and Data Management issues in Mobile Sensor Networks",Wireless comm. Mobile Comput., vol.14, no. 1, pp.19-36, Jan.2014.

[2] S. Abolfazli, Z. Sanaei, A. Gani and F. Xia, "An experimental analysis on cloud-based mobile augmentation in mobile cloud computing", IEEE Trans. Consum.Electron., vol. 60, no. 1, pp. 146-154, Feb.2014.

[3] L.D. P.Mendes, J. J.P.C. Rodrigues, and S. Sendra, "Cross-layer dynamic admission control for cloud-based multimedia sensor networks", IEEE Syst. J., vol.8, no. 1, pp. 235-246, Mar. 2014.

[4] S. Madria, V. Kumar, and R. Dalvi, "Sensor cloud: A cloud of virtual sensors" IEEE Softw., vol. 31, no. 2, pp. 70-77, Mar/Apr. 2014.

[5] Y. Takabe, K. Matsumoto, M. Yamagiwa, and M. Uehara, "Proposed sensor network for living environments using cloud computing", in Proc. 15th Int. Conf. Netw. Based Inf. Syst. (NBiS), 2012, pp.838-843.

[6] C. Zhu, V. C. M. Leung, L.T. Yang, and L. Shu, "Collaborative location-based sleep scheduling to integrate wireless sensor networks with mobile cloud computing", Proc. IEEE Globecom Workshop Cloud Comput. Syst., Netw., Appl. (CCSNA), Dec. 2013, pp. 618-626.

[7] Y. Padma, K. Pavan Kumar, A. Durgabhavani, "A simple analysis of service oriented architecture for mobile cloud computing" IEEE J., vol 11, no. 1, May 2014.

[8] Margaret Richardson Ansah, Yan Shu, Cao Qing Hua, "High temperature wireless sensor network monitoring system for coalmine fire", IOSR J., electronics and communication engineering., vol 9, pp.73-78, May/June 2014.

[9] Sumit Kumar, Siddhartha Chauhan, "A survey on scheduling algorithms for wireless sensor networks" IEEE J., computer applications, vol 20, no. 5, April 2011.

[10] Abid Shahzad, Mureed Hussain, "Security issues and challenges of mobile cloud computing" IEEE J., grid and distributed computing., vol.6, pp. 37-50, 2013.

[11] C. M. Sukanya, K.V. Priya, Vince Paul, Mr. P. N. Sankaranayan, "A survey of integration of wireless sensor networks and mobile cloud", vol 6(1), pp. 159-163, 2015.