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## **INTEGRATION OF WSN AND MCC FOR PROVIDING MORE RELIABLE DATA**

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### **Abstract**

The cloud computing over mobile system have been introduced and developed within a decades, the mobile computing models are namely as MCC (Mobile Cloud Computing) that resulting the emerges of powerful connection over cloud computing with mobile devices. The challenges of operations over WSN (Wireless Sensor Network) have increased the additional requirement to support several paradigms. The advantage has been added in both services MCC (Mobile Cloud Computing) and Wireless Sensor Network (WSN). The operation of secure and fast processing of data within priority has specified the user request precedence for accessing the data. A complete framework needs to integrate within MCC and WSN, which could handle the issues of data management and communication over MSN (Mobile Sensor Network). The existing system of WSN-MCC is having several issues over the communication, data transmission, reliability and etc. The proposed technique has been presented for solving the existing issues and decreasing the additional requirement for storage over network gateway and sensor nodes and also minimizing the overhead of traffic and requirement of bandwidth for sensor network.

The proposed framework is making a surety for the users mobile to obtain their process faster and describing the dynamic environmental alerting and monitoring for specific system to use MCC and WSN. The sensor is being used for monitoring the condition of environment. The sensory data could be observing, collecting and managing frequently. The traffic of data prediction, filtering, compression and monitoring are being performed over the gateway of Wireless Sensor Network.

### **Keywords:**

MCC-WSN, Time Based Priority Sleep Scheduling, Location based Sleep Scheduling, Priority Filter.

## **1. Introduction**

Nowadays, the mobile phone is not in use only for serving the communication and key computing over mobile devices choice but also for embedding the sensor set. The sensor has become most common device in some few years within incorporating the maximum phone sensors. The sensors of phone is collecting the process and distributing the data amid of users. These sensors are enabled across the novel application varied within the several domains such as healthcare, safety, ecommerce, environmental monitoring, homecare, transportation and social network [1]. WSNs (Wireless Sensor Networks) is providing the mechanism for collecting the environment and physical information or content such as vibration, temperature, motion, sound, pressure and so on for several distribution over versatile application [2]. There are some enhanced and new solution has been considered for the collection of wide spectrum information through WSNs applications [3] for making an interaction amid of the real world and people which may get revolutionized. The monitoring of the battlefield, deployment of sensor nodes has been monitored constantly for the opposing the forces and critical region situation without intervention of physical feelers. The mobile technology is also been transplanted over healthcare system by deploying the sensor nodes for collecting the information for patients and any analysis or diagnosis status [5]. However, the system is shaving a shortcoming significant system for collecting the status stochastically from several places. So, a secure and fast approach is required over the data sensor processing and for collecting the simultaneous record. In recent time, such better technique has been introduced for the digital electronics, wireless communication and electrochemical systems within that WSNs implementation could be improved [7]. The cloud computing resources are using common tools for more enhanced and quick manner for on-demand service through profit of internet over direct investment or without necessity, lower expenses for operations, direct investment, easy accessing, minimum risk of business, easier accessibility, maintenance and scalability cost for the user to demand computational services [6]. The MCC and WSN integration is providing the scalability and robustness with several of applications. The capacity of MCC processing is collecting data over WSN is a major concern for integration process. The demand increment over WSN is supporting the mobile cloud for several services [8]. The Wireless Sensor Network is initializing the clustered sensor nodes which passing through sensory gateway. There are five major components being mentioned for processing the sensory data:

- 1) Monitoring of Traffic,
- 2) Prediction,
- 3) Filtration,

- 4) Encryption & Decryption, and
- 5) Compression & Decompression.

The sensory data has been processed for transferring the gateway of cloud to transmit the request over Smartphone [9].

## **2. Related Work**

The authors [10] have proposed an approach based on dynamic proxy for connecting the sensor and cloud. The sensor tier is aggregating sensory data within the sink node for sending local proxy through mechanism of local communication.

At the tier of gateway, local proxy also parsing received message and generating the dynamic components within event bus for detecting the new sensor. The authors [11] have presented a model for sensory data which relayed to cloud. The presented framework is integrating the cloud and wireless sensor network and the framework is also including the DPU (Data Processing Unit), request subscriber, Sub/Pub broker, data repository, accessing management unit and identity. The sensory data is being collected from the Wireless Sensor Network and transmitting through DPU gateway that processing the data in cloud storage and sending data or packet to secure integrated cloud computing over WSN [12]. The sensor data of real time must be got processed and the action has to be used continuously. The module for integrated controller is proposing the integrated architecture for sensor network and the cloud techniques with internet services are offering several services like availability, extensibility and reliability. The authors [4] have proposed integration of MCC and WSN which concentrate a huge attention within both industry and academic, because of utilization of collection of data over WSNs and storing of the data and powerful capabilities for processing the data through MCCs. The powerful exploitation of cloud computing is processing and storing sensory data such as temperature, traffic, humidity and etc. The authors [13] have introduced agricultural system for monitoring the pH value, humidity and temperature with WSN. The consideration is over the more convenient and faster platform for obtaining the information by client from sensor node over agricultural platform.

The WSN is collecting the several parameters value from the end host of sensor. The internet is being used at client side for sending the Web Services request which stores the huge content in distributed SQL database. The authors [14] have presented an application over the wireless sensor network in important field such as monitoring of critical infrastructure, manufacturing, healthcare and environment. There are several limitations occurring such as energy, scalability, communication, memory, efficient management and computation within number of wireless sensor networks data or content.

### 3. Proposed Work

#### 3.1. Time Based Priority Sleep Scheduling (TPSS):

The (TPSS) Time based Priority Sleep Scheduling is transmitting and gathering the integration information of MCC-WSN over the data reliability that is most useful for any users over the cloud system. The sensor nodes are determining the a sleep and awake status of Priority Sleep Scheduling (PSS). The environment senses by sensor nodes within frequency set and storing the sensory data and processing as well. Sensor nodes are sending the processed data to gateway.

#### 3.2. Time analysis:

The applications over mobile-cloud is executing the overall mobile values within delay of round-trip, computation time of cloud and computation time of mobile. The computation over mobile is performing the native computation for time. The latency of round trip is processing the request delay over cloud and response receiving.

The overall execution time is represented by  $T_{total}$  as

$T_{Total} = T_{Mobile} + T_{RT} + T_{Cloud}$ , where  $T_{mobile}$  is presenting the computation over native model, round trip delay is presenting  $TRT$  and cloud latency is being presented by  $T_{cloud}$ .

#### 3.3. Overall Architecture

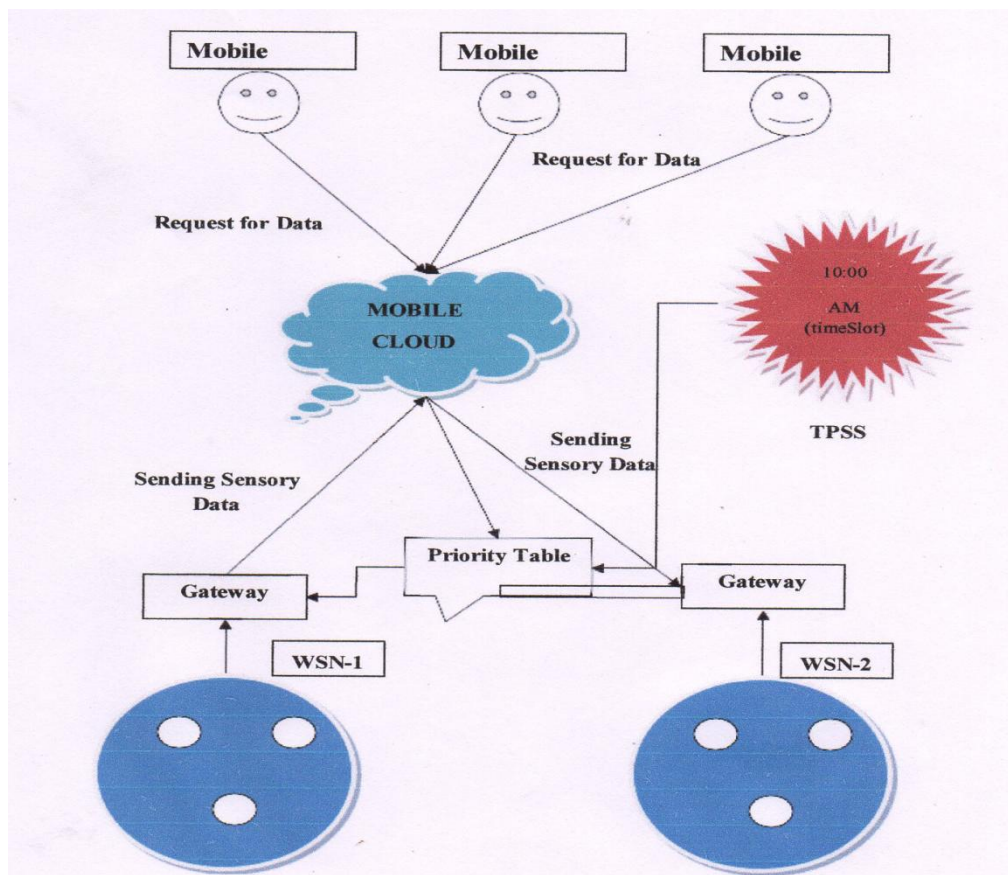


Figure 1: Overall Architecture

### 3.4. Mobile Cloud Computing Heterogeneity:

The heterogeneity is being considered over the integration of WSN and MCC by using different infrastructure, architecture, mobile devices technologies, wireless network and clouds. The integration over cloud and mobile has been proposed within the system. The hardware, several techniques, and software are being considered over the mobile devices integration for domain heterogeneity. The increased popularity of the smartphones is making a dynamic demand in market within different dimension. The cloud service providers have been considered for providing the different services within several platforms, infrastructure, API and policies over custom-built for the landscape heterogeneity.

**3.5. Reliability of WSN:** The WSN reliability is being considered for attracting the sensor data security and for transmitting and collecting the sensory data from cloud. The network lifetime is a major concern over here which is deploying the instant energy and strength of the nodes. The proposed technique is proposing the priority based system which selecting the content to transmit to the destination within the every available life of the sensor nodes.

**3.6. Location based Sleep Scheduling (LPSS):** The location based Sleep Scheduling has been implemented within the history of individual user's. The gateway is being considered for sending a request to the particular node and based on the sensory data for history of particular users. The sensor is allowing collecting the data and user history on the basis of active LPSS and several deactivated nodes.

### 3.7. Data Collection & Priority Filter

The data and component is associating with sensor data collection from physical world as well data is being get converted over the concise format of message. The data might be having or get resized within the transferred message to sensory gateway. The application with high rate is monitoring and generating the sensor node.

### 3.8. Algorithm

#### Pseudocode of PSS Algorithm

Initialize the gateway g fro time period t

Assign PTP table to gateway g

Consider  $pt_i > 0$ , g

Compute the energy  $e_i$

Broadcast the energy and awake neighbor node

Compute the remaining node energy and awake  
Communicate two nodes,  
Make direct communication,  
If neighbor node have same energy  $e_i$   
Compute hop value of the neighbor node and message size  
Make indirect communication,  
If neighbor node energy  $e$  is greater than  $e_i$   
Receive the packet at destination  
return

### **Time Scheduling Algorithm**

Require: Tree T  
Ensure: Time schedule T~S  
Step 1: Convert collection to distribution problem  
Distribute data packet at every sink node  
Tree topology with multi linearize  
Convert the tree into multi topology  
Compute maximum hop count within sub tree  $B_i$   
Initialize packet  $P_i(m)$  with  $L_i$  node,  
initialize  $P_i(m) = 0$   
 $P_i(h) = P_i(h) + 1$   
End for  
End for

## **4. Result & Discussion**

**Experimental Setup:** The proposed system implements with following system configuration such as Intel(R) Pentium (R) processor, G2020 CPU with 2.90 GHz clock speed, Windows 7 Professional operating system and 4 GB RAM.

### **Data collection within TPSS Sensor Information**

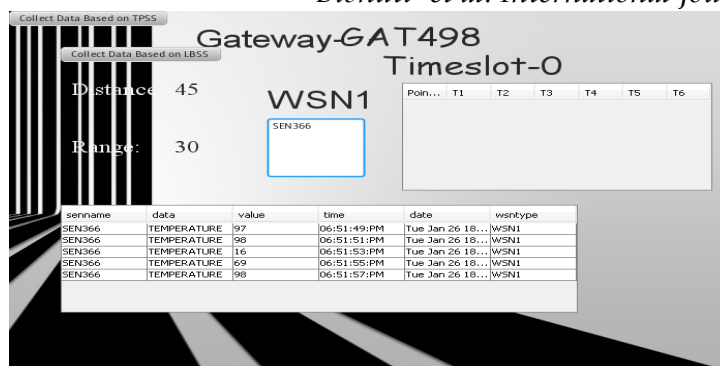


Figure 2: Sensor Node Information

The above mentioned figure is presenting the sensor node information within every particular date and time. The temperature value being consider over the node information and timeslot-0 considered.

Priority Information

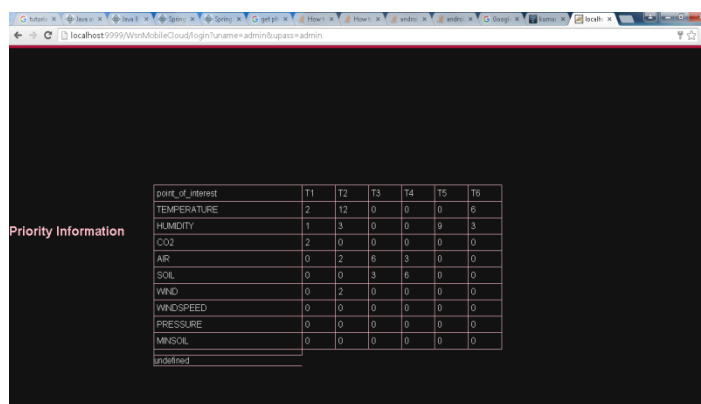


Figure 3: Priority Information

The above mentioned figure is presenting the priority information value within several point of interest. The selected value T1, T2, T6 has been considered over the parameters such as Humidity, Temperature, Soil, Air and etc.

Sensor Information

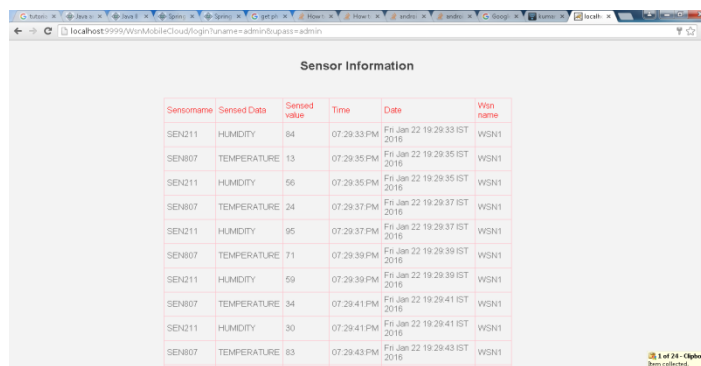
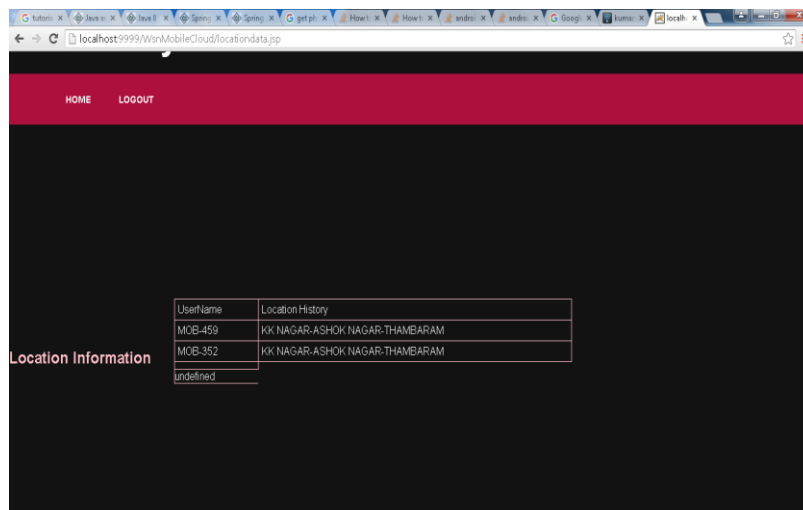


Figure 4: Sensor Information

The above mentioned figure is presenting the sensor information within wireless sensor name, date, time, sensed value and sensed data.

## Location Information



UserName	Location History
MOB-499	KK NAGAR,ASHOK NAGAR,THAMBARAM
MOB-352	KK NAGAR,ASHOK NAGAR,THAMBARAM

**Figure 5: Location Information.**

The above figure is presenting the location information of the user, the location is presenting the history of user's detail.

## 5. Conclusion

The MCC (Mobile Cloud Computing) and WSNs (Wireless Sensor Networks) has been attracted widely over the consideration of attention. The proposed technique is focusing over issues of context non-awareness amid of WSNs and mobile users. The recent framework has provided and efficient data for the mobile users while MCC and WSNs Integrating.

The framework is describing the platform for user location identification, battery lifetime and the sensor information within the WSNs potential. The information is producing the potential of sensor, priority of the sensor data for achieving the data priorities with the requested data information for managing the WSNs status. The proposed techniques TPSS and LPSS are proposing the WSN-MCC integration over offered data reliability.

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