SLIDING WINDOW BLOCKCHAIN ARCHITECTURE FOR IOT

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Abstract -This project is describing concept to provide security to IOT devices using Blockchain technology as this technology supports decentralized data storage which means data will be stored at multiple nodes compare to centralized storage where data is stored at single centralized server. Decentralized data storage provides facility of receiving data from any available node and it has strong security where a single data store will verify hash value of all nodes . To overcome from this problem it is introduce Sliding window technique where the window size will be fixed and all Blockchain transaction hash values will be stored in window and if window size exceeded then old transaction blocks will be slided or removed and maintain only recent blocks due to this technique memory storage and data transfer overhead will be reduced.

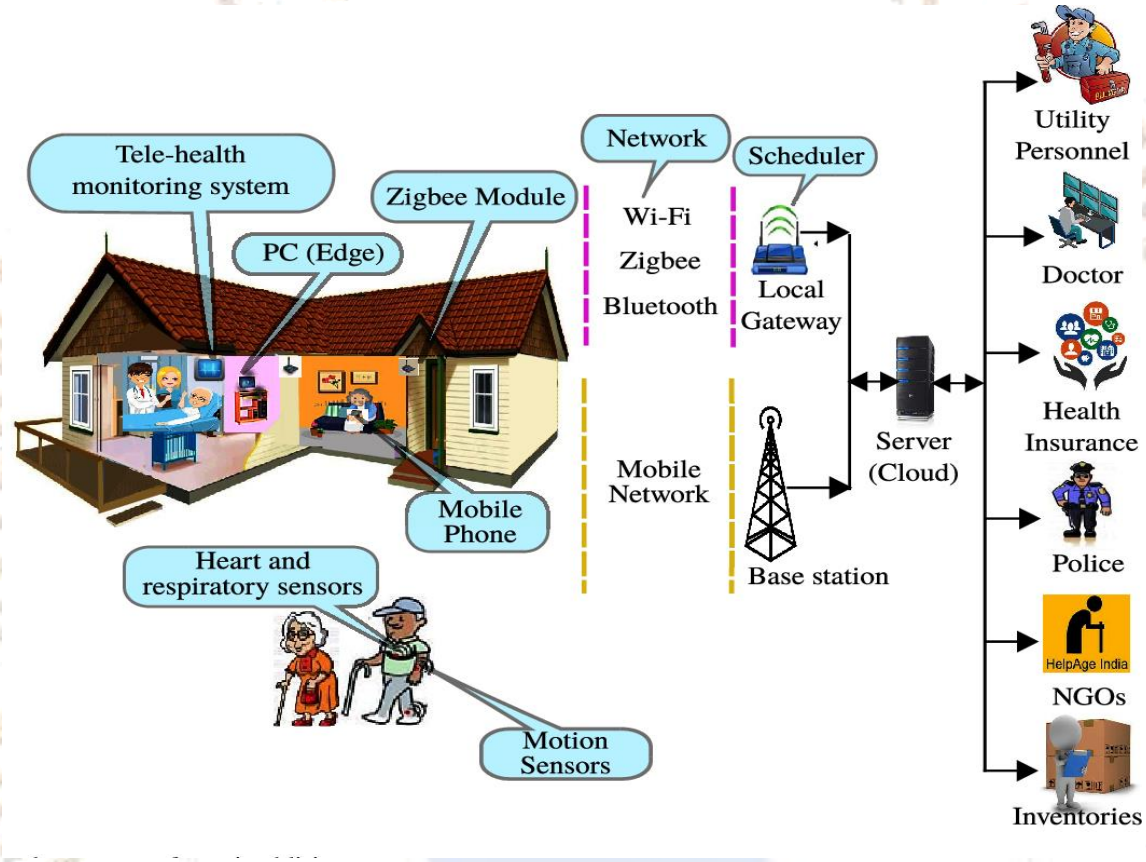
I .INTRODUCTION

Blockchain is a distributed ledger used to record transactions between two or more parties. Unlike relational database systems, blockchain is a data structure where new entries get appended at the end of the ledger, and there exist no administrator permissions within a blockchain which allow modification of the data. Also, the addition of a new block to the chain needs to be verified by all other parties through a consensus algorithm. Since there exists a distributed control over the blockchain, it is difficult for attackers tomodify the data compared to a relational database system. Relational databases are primarily designed for centralized data storage and blockchain are specifically designed for decentralize data storage.

II Literature survey

Traditional blockchain approach is not suitable for IoT with real-time data streams due to their computationally complex Proof-of-Work (PoW). As the computational time increases, blockchain security becomes infeasible to be used for IoT. The computational complexity depends on difficulty

level and Merkle tree size. Merkle tree is a tree in which every leaf node is labeled with the hash of a transaction data and every non-leaf node is labeled with the cryptographic hash of the labels of its child nodes. Merkle tree grows with the number of transactions made and thereby, increasing the time consumed for Proof-of-Work, which is less favorable for an IoT network. To overcome from this problem author, introduce Sliding window technique were thewindow size will be fixed and all Blockchain transaction hash values will be stored in window and if window size exceeded then old transaction blocks will be sided or removed and maintain only recent blocks due to this technique memory storage and data transfer overhead will be reduced. In extension author is saying to further save energy so I am adding concept of monitoring data in time interval and if sensor generate same random data within time interval then IOT will not process that data to store in Blockchain and this duplicate avoidance can further save energy.



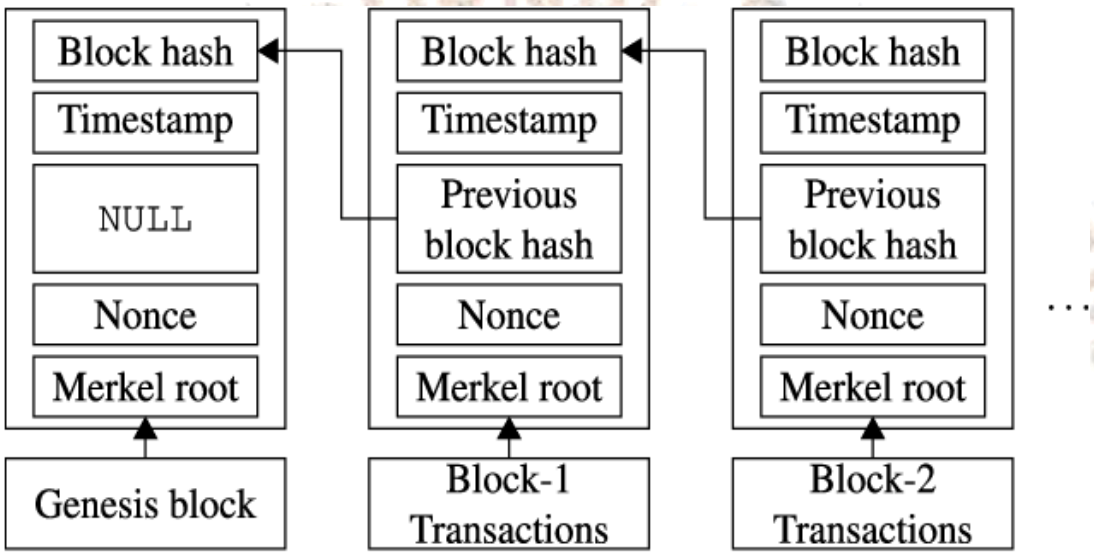
III .EXISTING SYSTEM

Traditional blockchain approach is not suitable for IoT with real-time data streams due to their computationally complex Proof-of-Work (PoW). As the computational time increases, blockchain security becomes infeasible to be used for IoT. The computational complexity depends on difficulty level and Merkle tree size. Merkletree is a tree in which every leaf node is labeled with the hash of a transaction data and every non-leaf node is labeled with the cryptographic hash of the labels of its child nodes. Merkle tree grows with the number of transactions made and, thereby, increasing the time consumed for Proof-of-Work, which is less favorable for an IoT network. Decentralized data storage provides facility of receiving data from any available node and it has strong security where a single data store will verify hash value of all nodes.

IV. PROPOSED SYSTEM

Decentralized data storage provides facility of receiving data from any available node and it has strong security where a single data store will verify hash value of all nodes. Verification of all nodes hash is computation intensive and its cannot be applied to IOT small devices due to memory, CPU and energy consumption restrictions.To overcome from this problem author, introduce Sliding window technique where the window size will be fixed and all Blockchain transaction hash values will be stored in window and if window size exceeded then old transaction blocks will be slided or removed and maintain only recent blocks due to this technique memory storage and datatransfer overhead will be reduced.

V.SYSTEM ACHITECTURE



Block Diagram

VI . CONCLUSION

IoT devices face constraints on resources such as computational capability, energy sources, and memory. Therefore, the standard security algorithms are not feasible for IoT. We proposed a sliding window blockchain that meets the requirements of a resource constrained IoT network by reducing the memory overhead and limiting the computational overhead. From the experimental results, we observed that ,the computational time of PoW for each level of difficulty increases exponentially. The total block addition time increases with the increase in the number of miners in the group. As the window size increases, the hash computation time increases linearly. A random selection of difficulty for each block in a blockchain reduces the total block addition time .

VII .REFERENCES

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