Ph.D Research Proposal

Supervisor:

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Area of Research :

Vehicular Network

Title of Research Work :

Security management of vehicular network with blockchain technology.

Abstract:

Internet of Vehicle is a technology which consists of cars as nodes in a network to create a mobile network.(Vehicular Ad-hoc Network)VANET turns every participating car into a WIRELESS ROUTER / NODE. Wireless communication network that includes car,bus,traffic signals, cell phones. Its applications associated with traffic safety,traffic efficiency and infotainment. The growth of Internet of Vehicle(IOV) has brought huge challenges for "Large data storage", intelligent management and information security for the entire system. The traditional centralized management approach for IOV faces the difficulty in dealing with real time response. The unique security and privacy challenges posed by VANET include integrity,confidentiality,non-repudiation,accesscontrol,realtimeoperational constraints/demands,availability,and privacy protection.

The Blockchain is an effective technology for decentralized distributed storage and security management in all engineering applications. It offers a peer-to-peer system in which distributed nodes collaboratively affirm transaction provenance. Blockchain enforces Continuous storage of transaction history,Secured via digital signature and Affirmed through consensus. Blockchain has been applied in Internet of things(IOT),Big data,Cloud and Edge computing paradigms along with many other emerging applications.

The proposed research work is to investigate how Blockchain technology could be extended to the application of vehicle networking, especially with the consideration of the distributed and secure storage of big data. Data trust is evaluated based on the data sensed and collected from multiple vehicles, node trust is assessed in two dimensional,i.e functional trust and recommendation trust. Using ledgers, the block chain database(information's) act as a decentralized manner. Merkel Tree (Binary hash tree) is a data structure used in computer applicationespecially for Vehicular network. A MERKEL root is the hash of all the sub hashes for the transactions, which are part of blocks in block chain network. A Merkle tree / binary tree is a data structure that is used in computer science application. Using this Merkle tree to encode blockchain data more efficiently and securely.

by

(M.Jeya Sundari)