Chapter 5
Experiment and Simulation of Proposed V2I System:
An Approach Using Quantum Key Distribution for E-Mobility System

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ABSTRACT

Research and development in Next generation networks is a growing field, including subfields like Vehicle to Infrastructure (V2I), Vehicle to Vehicle (V2V) and Vehicle to everything (V2X) that helps application development and participating towards advanced smart city projects in India. Smart City projects in India demands fast communication channel, secure channel as well as data exchange policies to control infrastructure components. This article proposed a real-time simulation of a next generation network improving existing infrastructure of cities through the involvement of Quantum Computing. Quantum key based protocol BB84 has been

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simulated and tested in this article work for comparing Traditional and modern V2I based software defined network. Comparative results of proposed simulation in PoliQI and NS3 found effective in terms of security, performance, and scalability for different numbers of nodes. This article delivers a computational technique that may be used creates secure channels for key exchange between cloud service providers and customers, ensuring encryption keys

1. INTRODUCTION AND BACKGROUND

Recently the new industrial era in automobile companies rapidly moving on advanced driver assistance to bring out safety and support for the customers. As the safety and support is important for all users of car and rolling managing authorities like traffic management department, highway vehicle support, etc. The demand for automation in information exchange is increasing day by day, enforcing the scope of real problems in the vehicular communication domain. ADAS and V2X are two technologies, recently supporting automated services for application development. ADAS supported by sensors camera's, LiDAR, radar and ultrasonic methods which supports short range of communication over channel and detecting the objects for assisting and minimising the risk of accidents. V2X can support recent areas through precision management using wireless communication channel where system for vehicles through V2I, V2V and V2P can be maintained for the system against traditional technologies. V2X system simulation is easy compare to V2I which refers method of exchanging vehicle information to the central agency like server comma to promote automation and use through TCP/IP. This vehicle-to-infrastructure (V2I), Vehicle-to-vehicle (V2V), vehicle-to-everything (V2X) and connect as a research field for automation and is a need for smart cities. Providing communication between two defined vehicles, infrastructure or systems is not a single point to improve the E-Mobility field, privacy is also a point of concern in this area.

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