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STUDY OF SERVICE DISCOVERY AND SERVICE SELECTION AT NETWORK LAYER ON AODV BASED QUANTUM COMPUTING MANET

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ABSTRACT : *Fast speed is the need for today. Since the end of 20th century, use of MANET is experiencing a great need. The need to exchange digital information outside the typical wired office environment is growing. For example, a class of students may need to interact during a lecture; business associates serendipitously meeting in an airport may wish to share files; or disaster recovery personnel may need to coordinate relief information after a hurricane or flood. Each of the devices used by these information producers and consumers can be considered a node in an ad hoc network.*

This paper will study about different characteristics of quantum cryptography and advantages of quantum computing in the near future to provide all these needs to the users. We will focus on services provided by different service providers and how one can gain maximum of these services features as fast as possible.

Keywords: **Quantum, Cryptography, Network, Digital, MANET**

1. INTRODUCTION

Traditional computers were working with two states zero and one. We call them binary digits. It means our digits were having only two choices. All computations were done on these bases. We design truth tables and logic gates based on binary digits. Simple problems can be solved by this. But, what if we want neither an on state nor a off state. That state was called as halt state in Turing machine. Now the era has changed with the help of Qubits or simply quantum bits.

With the development of internet, human era has entered in a critical phase. Human society wants connectivity to social media as part of their life. But, this advancement also created risk of hacking. Cryptography is the way of secret writing. People encode their data to protect it from everyone who is not in their contact list by using symmetric or asymmetric key cryptography. "Cyberspace" helps them to secure their data but not at much extent. Typical applications based on cyberspace include cloud computing [1], quantum computing etc.

Quantum computing is special. Quantum computers provide us efficient way to solve our problem by using quantum mechanical phenomena. We develop sequence of Qubits which represents zero, one or combination of both. We can represent 2^n states simultaneously.[2] By confounding large number of Qubits together we can solve complex computational problems that were typical for classical computers. Quantum computers have more capacity than that of supercomputer. We uses concept of superposition in quantum computing.

In this survey we will study about the network layer in MANET and the services that are provided by them. Then we will try to compare those services which can be provided with quantum computing.

2. RELATED WORKS

Max Plank first introduced the concept of quantum in 1900. After him many of physicists study about quantum mechanics. Quantum cryptography is based on quantum mechanics that relates quantum physics to computers. Quantum cryptography started in early 1970s in New York that uses conjugate coding by Stephen Wisener. His first paper was rejected by IEEE society and remains unpublished till 1983. Conjugate coding also known as quantum coding or quantum multiplexing was proposed by him to secure quantum money. His paper was then published in SIGACT news (15:1 pp. 78–88, 1983)

In 1982, Richard P. Feyman [3] dreamed of a quantum computer and proposed a related theory in which he combined physics concept with computers in his paper. Real work on cryptography was started when Bennett and Brassard proposed QKD [4] protocol. QKD secure our data from eavesdropping. Best known QKD protocols are BB84, E91, CV, cow and 6-state. BB84 protocol was proposed by Majid Safari & Murat Uysal (2009). They investigated a

terrestrial relay-assisted scheme for a free-space quantum key distribution (QKD) system based on BB84 protocol. They derive an upper bound on quantum bit error rate (QBER) of the relay-assisted QKD system. Many of other protocols were also investigated and research is still continuing on these protocols. Our main aim is to secure the digital future and assure the users that their data will not be stolen again.

3. IMPLEMENTATION OF QUANTUM COMPUTOR AND MANET AT NETWORK LAYER

There are several ways present in which can implement and compare different services that are present in the network. When a service is offered by multiple servers in a MANET, the manner in which clients and servers are paired together, referred to as service selection, is crucial to network performance. Good service selection groups clients with nearby servers, localizing communication, which in turn reduces inter-node interference and allows for multiple concurrent transmissions in different parts of the network.

The major challenges in enabling service delivery, i.e., service discovery and service invocation, within MANETs lie in:

- Enabling resource-constrained, wireless devices to discover services dynamically, while both minimizing the traffic generated by the discovery process and tolerating the intermittent connectivity of devices.
- Enabling service delivery to a wide spectrum of devices, regardless of their hardware and software platforms.
- Enabling service requesters to differentiate service instances according to provided non-functional properties, so that services can be matched against the applications' quality of service requirements.
- Enabling service discovery in large MANETs, composed of hundreds of nodes, so as support the large class of applications envisioned for MANETs, in areas as diverse as military operations, rescue missions, pervasive computing and ambient intelligence.
- Enabling bridging MANETs with infrastructure-based networks since Intranet and/or Internet connectivity remains the primary source of service provisioning. Such a feature allows devices that are located in the MANET to transparently access services offered in the interconnected networks (Internet or Intranet), and devices located outside the network to discover services provided in the interconnected MANETs.

We can cover all these challenges with the help of latest trending technology i.e quantum computers. If this technology worked then we will be able to satisfy our users with fast speed services in minimum time.

4. FUTURE WORK

We will implement our work with simple network simulator (sim2net). It is a discrete event simulator of MANET implemented in python. The simulator allows us to simulate networks of a given number of nodes that move according to the selected mobility model, run custom applications, and communicate only by sending application messages through wireless links.[8]

5. REFERENCES

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