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A NOVEL ALGORITHM FOR NETWORK SELF HEALING AND SECURED DATA TRANSMISSION BASED ON SOFTWARE DEFINED NETWORK

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Abstract *— Spatial information network is an important part of the integrated space-terrestrial information network, its bearer services are becoming increasingly complex and real-time requirements are also rising. Due to the structural vulnerability of the spatial information network and the dynamics of the network, this poses a serious challenge to how to ensure reliable and stable data transmission. Software Defined Networking (SDN), as new network architecture, not only can quickly adapt to new business but also make network reconfiguration more intelligent. In this, SDN is used to design the spatial information network architecture. An optimization algorithm for network self-healing based on SDN is proposed. With the guarantee of Quality of Service (Quos) requirement the cluster head energies are self healed after every data transmission with less time. The simulation results show that the algorithm proposed in this project can effectively reduce the delay caused by energy self healing.*

1. INTRODUCTION

The wireless network allows users to communicate with anyone at any time, anywhere, with high quality. Because of the dynamic and time-varying nature of wireless network, it poses a serious challenge to the stability and reliability of the network, especially when the space network node fails, it needs to reconfigure the network quickly[1]. At the same time, because the spatial link bandwidth is relatively limited, it requires to minimize the signaling overhead in the network reconstruction. Software Defined Network (SDN) is a logical centralized new network model, which is characterized by data plane and control plane separation, with a logical centralized control plane, and through a unified and opened south interface to achieve the control of the network[2]. It also supports dynamic and flexible management, and becomes the ideal model to achieve high bandwidth and dynamic network[4]. SDN is not only reconstructs the function of the network system, realizes the numerical control separation, but also abstracts the network resources and establishes the new network abstraction model.

SDN separates control of network devices and is managed by a centralized controller without relying on underlying network devices (routers, switches, firewalls), and shielding the differences of underlying network devices and the control is completely open, the user can customize any network routing and transmission rules to achieve the strategy, which is more flexible and intelligent[5]. Link discovery technology is the key of SDN controller to obtain the whole network information, which is the necessary basis to achieve network address learning, VLAN, routing and forwarding network functions and so on[3]. The SDN controller uses Link Layer Discovery Protocol (LLDP) as the link discovery protocol. The main role of topology management is to monitor and collect the information of the SDN switch in the network at any time, timely feedback of the working status and link connection status of the network Flow table is the most fundamental basis of the SDN switch for packet processing , it directly affects the efficiency of data forwarding and the performance of the entire network[6].

2. SYSTEM DESIGN

In the architecture there will be different moving nodes in every cluster. The cluster head will be selected based upon the power. The communication is going to happen whenever the two different nodes want to communicate. All the related information about the clusters will be updated into the central repository. The central repository is going to send the information to the destination node.

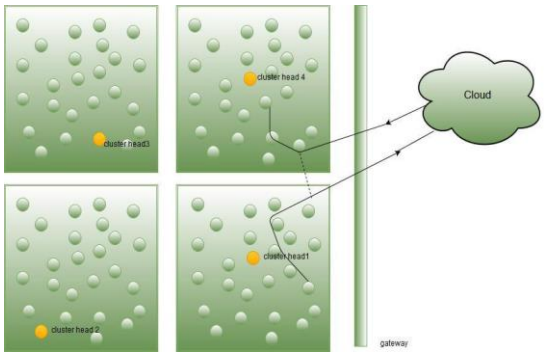

Fig.(a) Architecture

Cloud is nothing but a central repository which handles all the task. There will be different moving nodes in every cluster. The cluster head will be selected based upon the energy. The communication is going to happen whenever the two different nodes want to communicate. All the related

information about the clusters will be updated into the central repository. The central repository is going to send the information to the destination node

3. DATA FLOW DIAGRAM

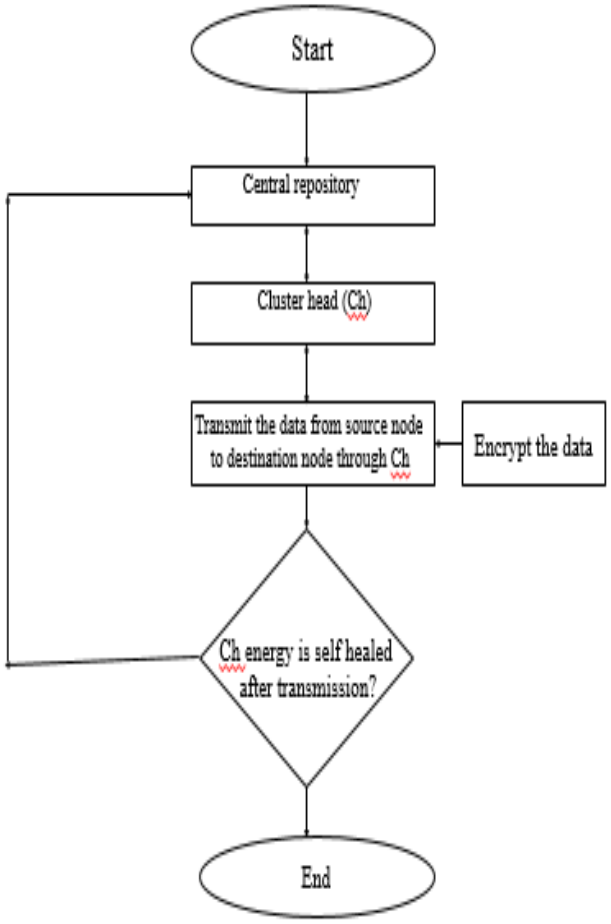

Fig.(b)Flow diagram

Once the data is transmitted cluster head will loose its energy so for the next communication it must be healed. So this self-healing is done by software defined network which will be in central repository.

4. RESULTS

Four clusters are created with random number of nodes. Cluster head is chosen for each clusters with maximum energy. Source node will transmit the data to the destination node through cluster heads. while transmitting data is double encrypted for high security purpose. SDN will do the self healing of cluster head after every data transmission.

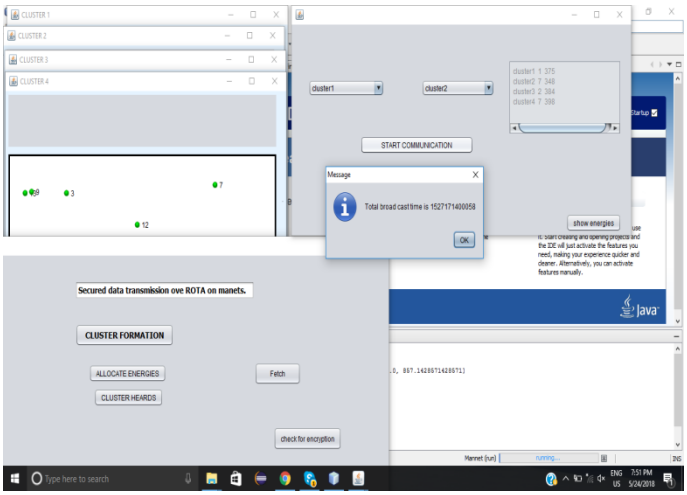

Fig.(c)Data transmission

5. CONCLUSION

This paper analyze the shortcomings of the existing SDN optimal path algorithm and propose a new algorithm for network self-healing optimization for fast dynamic reconstruction of wireless network. It performs simulation and compare with the current algorithms. From the result the delay of fault recovery consumes less time, while the user's QoS has been guaranteed. It is Highly secured because double encryption algorithm is used.

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