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HANDOFF MANAGEMENT AND PERFORMANCE OPTIMIZATION OF SATELLITE NETWORK
BASED ON CROSS-LAYER DESIGN AND NETWORK CODING

Abstract

Abstract-the earth observation system has evolved from a single satellite platform to a multi-satellite network system. The satellites based on inter-satellite links form a space wireless Ad hoc network system. When the satellites move round the earth, the connection of the satellite with ground will transfer from a ground station to another ground station. The connection and disconnection between the satellite and the ground station will bring the problem of network IP layer mobility management and the satellite connection handoff. In order to ensure the continuity of satellite network communication, the mobile and handoff management problem of satellite network must be solved. The mobile and handoff management of satellite network is one of the key technologies especially for the LEO satellite network. There are several methods for satellite network mobile and handoff management, such as mobile IP, Seamless IP Diversity-based Generalized Mobility Architecture (SIGMA). These methods have some defects that there is long handoff delay or high packet loss rate. In this paper, the mobility characteristics of space satellite network are discussed and the cross-layer design and network coding methods are proposed for satellite network handoff management. Through theoretical analysis and simulation, the network cross-layer design and network coding method can effectively improve the satellite network handoff latency, and reduce the packet loss rate, by the scheme the handoff performance is optimized and can be used as reference for satellite network design. Keywords- Satellite network; Handoff management; Cross-layer; Network coding