

A novel energy efficient key distribution scheme for mobile WiMAX networks

ABSTRACT

In Mobile WiMAX, a Base Station (BS) delivers security keys to Mobile Stations (MSs) through a key distribution scheme to guarantee security and access control. The MSs need to perform ciphering operations to access the keys upon rekeying process. In this way, the MSs consume energy to receive and decrypt the keys for further communication with a BS, while the BS consumes energy to encrypt and transmit the keys. In current key distribution schemes, any member join or leave event results in a key updating, and the duration of the MSs stay in the cell is not important, but on average low speed MSs tend to stay longer in the cell, while fast MSs will leave the cell faster. This paper proposes an Efficient Key Distribution scheme to decrease the number of exchanged keys which results in minimizing energy consumption of the network by grouping the MSs into the different subgroups based on their speeds using complete binary tree. Analysis shows that the proposed scheme reduces energy consumption during key updating process.

Keyword: Mobile WiMAX; Key distribution scheme; Energy consumption; Key updating process