

ABSTRACT

Investment of communication satellite consists of two segment, i.e space segment and ground segment. Currently, the investments are not managed efficiently due to lack of strategy in assigning the customer bandwidth. In fact, an optimization of the customer bandwidth assignment can save telecommunication investment resources, especially transponder bandwidth, transponder power, and ground segment. Many works have been performed to optimize both transponder power and transponder bandwidth investment. However, there is no effort has been devoted to optimize ground segment resources. As result, the optimization is not comprehensive. Indeed, identification on the ground segment resource is still performed manually that causes increasing overhed of investments. This study addresses above the issues by proposing new schemes to solve the problems. It introduces a comprehensive method for customer bandwidth assignment and automation of ground segment identification, especially Up Converter and Down Converter. The proposed schemes for customer bandwidth assignment and automation ground segment investment use Genetic Algorithm with modification in objective function. Financial efficient matrix is used for evaluating the performance of the proposed schemes. The experimental result shows that the proposed schemes have a good performance when number of individuals is 1000, number of generation is 10, probability of crossover is 0.8, probability of mutation is 0.5, mutation startegy is using unifrom strategy, and parent selection method is Roulette Wheel. The amount of saving in terms of ground segment investment is over than USD 500,000. It is achieved when all the existing carriers are simultaneously reorganized or migrated from existing satellites to new satellite.