Defending Collaborative Attacks in Mobile Ad Hoc Networks Using Cooperative Immunization

In this project, a security problem of cooperative immunization against collaborative attacks such as the blackhole attacks and the wormhole attacks in a real heterogeneous mobile ad hoc network is investigated. Due to the vulnerabilities of the protocol suites, collaborative attacks in the mobile ad hoc network may cause more damages than individual attacks. In human immune system, non-selfs (i.e. viruses, bacteria and cancers etc.) often attack human body in a collaborative way, and cause diseases in the whole body. Inspired from the human immune system, we built a tri-tier cooperative immunization model to detect the collaborative attacks (non-selfs) and eliminate them in the real mobile ad hoc network. The threat model of the collaborative attacks is developed to analyze the vulnerabilities of the real heterogeneous mobile ad hoc network. We will conduct experimental results and simulations to demonstrate the validation and effectiveness of the proposed secure model in minimizing the collaborative attacks.