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Wire and Wireless Local Area Networks Simulation: OPNET Tutorial

Abstract

There has been a tremendous increase in the use of wire/wireless local area networks (LAN) with different network configurations. Therefore, it is so vital to have an accurate and a reliable generic platform to enable network developers, managers, security managers, researchers, and students evaluating and investigating the performance of LANs of different technologies and configurations. Many network simulators have been developed throughout the years, such as: the optimized network engineering tool (OPNET), the network simulator (NS), the global mobile simulator (GloMoSim), etc. One of the most widely-used and powerful general-purpose network simulators is OPNET, which is an object-oriented simulation environment. This chapter provides two walk through tutorials on using OPNET IT Guru (Academic Edition of OPNET) for wire/wireless LANs simulations. These tutorials demonstrate in step-by-step fashion, the procedures of initiating new simulation, setting up the simulation parameters, running the simulation, and viewing the results. The first tutorial (Tutorial #1) simulates a wired LAN of 10 computers and one server connected to a single switch, and the second tutorial (Tutorial #2) simulates a wireless ad hoc network of 10 mobile nodes and one server. This chapter demonstrates that OPNET IT Guru is a powerful tool that can be used by a range of professional users to simulate, evaluate, and investigate the performance of wire and wireless LANs. Moreover, it encourages and helps students to easily perform network simulation for better understanding to the network performance under different network conditions.