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A Survey on Emulation Testbeds for Mobile Ad-hoc Networks

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Abstract

Mobile Ad hoc Network (MANET) can be said as a collection of mobile nodes, which builds a dynamic topology and a A resource constrained network. In this paper, we present a survey of various testbeds for Mobile Ad hoc Networks. Emulator provides environment without modifications to the software and validates software solutions for ad hoc network. A field test will show rather the simulation work is going on right track or not and going from the simulator to the real thing directly to analyze the performance and compare the results of routing protocols and mobility models. Analyzing and choosing an appropriate emulator according to the given environment is a time-consuming process. We contribute a survey of emulation testbeds for the choice of appropriate research tools in the mobile ad hoc networks.

1. Introduction

MANET (Mobile ad hoc networks) [5] is a self-configuring infrastructure less network in which the mobile devices are connected by wireless medium. In MANET devices are free to move independently in any direction, and can change its links to any other devices in the network frequently. The phenomenon of movement of the data packet from source to destination is known as routing which means that the process of selecting best paths in a network. A routing protocol uses routing algorithms as well as software to find an optimal path in network for transfer and communication between network nodes. Examining and evaluating protocols for MANET [33] is a guarantee success of a real world application.

Simulation [35] is the process of designing a model of a real system and conducting experiments on the node and understanding the behaviour of the node in the network and also evaluating various operations. Simulations are used to understand the behaviour of routing protocols, mobility models. There are many network simulators. Simulators can be categorized as: NetSim, OPNET, Network Simulator (NS2/NS3).

This paper is organized as follows. Section-II highlights the Emulation. The testbed category and architecture in section-III. Section-IV includes issues addressed. Section-V discusses related work. The conclusion is presented in section-VI.

2. Emulation

Emulation [17] focuses on creating an original environment of computer, which can be time-consuming and difficult to achieve, and also it is very costly because of its ability to maintain a close connection to the legitimacy object.

Fig.1. Network emulation [36]

Emulation [29][31] provide fully controlled and reproducible environment and it shows realism. The most important thing in the emulation is protocols which are implemented will be tested without any modification. It is cost effective and scalable. It is not a simulator but necessity of hardware equipment. Each node is a device that has a wireless 802.11 interface, so that it can communicate with other ad-hoc nodes and run MANET protocols.

2.1   Simulation Vs Emulation[36]

1. A system represents by an off line software.	1. In emulation system is seems like other system.
2. Simulation can run at any speed compare to real world.	2. Emulation creates visions like real thing and used for testing without buying real things.

2.2   Why Emulation ?

Emulation [29] is required to introduce the simulator into a live network. In emulation object within the simulator are capable of introducing live traffic into the simulator and injecting traffic from the simulator into the live network.