Computer Network Experiments, Fall 2006

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Course Objective:

This undergraduate course aims to reinforce the knowledge and skills taught in the traditional computer network courses. A series of experiments are designed to get students well exposed to the protocol issues ranging from the overall networking hardware and software architectures, adaptor and protocol drivers, LAN MAC protocols, TCP/IP protocol suite, to planning and configuration of LAN and WAN.

Experiments are to be done by 2-person or 1-person teams. Each team needs to conduct 6 experiments where 3 of them are pre-selected (see * in the list below) and 3 are chosen by students. For each experiment report and presentation, the student in charge of writing up the report receives up to 18 points, while his/her teammate receives up to 9 points, thus the 6 experiment reports account for 81 points, i.e. 3x18+3x9. The report should cover experiment records and problem discussions. At the end of the semester, a hands-on individual (not in a team) quiz accounts for 19 points. In the hands-on quiz, the TA picks 3 questions, on the experiments a student has done, for the student to operate and explain on the computer or testbed. Students need to decide the experiments by 10/5 so as to arrange the slides presentation slots. Each in-class presentation is allocated 15 minutes. A mail alias shall be established to facilitate the after-class discussions.

Pre-requisite: Computer Networks (undergraduate) or equivalent

Textbook: Computer Network Experiments, Ying-Dar Lin, Wei-Ker Publishing, 1999. (also on-line) Course homepage: <u>http://www.cis.nctu.edu.tw/~ydlin/course/cn/exp/index.html</u> Grade: 81% for 6 reports and presentations (3x18+3x9=81), 19% for hands-on quiz. Lecture: 1:30-3:20PM Thursday Student Presentation: 12:30-1:20PM Thursday

List of Experiments

I. Access Devices

Network Adaptor Drivers: Installation and Comparison **Tracing Linux Adaptor Drivers (*) Sniffing and Analyzing Protocol Messages (*)** Simulating Medium Access Control Protocols Physically Wiring and Connecting LANs Configuring WLAN and Mobile IP

II. Core Devices

Linux Router: Setup, Testing, and Tracing (*) Probing Internet: Path and Delay Measurements Configuring Cisco Routers Subnetting: Configuration and Tracing in Linux Benchmarking L2/L3 Switches with Smartbits

III. Edge/Server/Proxy Devices

IP Tools: Tracing finger and fingerd Building Intranet with Linux Building Firewall with Linux Building Servers with Linux Building Anti-Virus and Anti-Spam Gateway with Linux Building Intrusion Detection and Prevention Gateway with Linux