網路系統總整與實做(1162)
Syllabus

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網路系統總整與實做(1162)
Network System Capstone

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Pre-requisites: 計算機網路概論、網路程式設計概論、通訊原理與無線網路		
TAs: 胡閔智、歐任鈞、陳志祥、楊宇正 EC638, 31892 葉昱萱、林榮崙、林亮穎、李元毓 EC635, 54748	e-mail: nscap@win.cs.nctu.edu.tw	
References: 1. J. F. Kurose and K. W. Ross, *Computer Networking: A Top Down Approach,* 7th Ed., Addison-Wesley 2. IETF RFCs, http://www.ietf.org 3. Mininet: http://mininet.org 4. WARPLab: https://warpproject.org/trac/wiki/WARPLab/Examples 5. NS3: https://www.nsnam.org/ 6. OpenWrt: https://openwrt.org/		
Evaluation: Labs: 7 x 10%, Project: 2 x 15%		

Topics

1. Computer Networking Basics
2. Private Network and NAT Traversal
3. Virtual Private Network and Tunneling
4. Remote Gateway and Dynamic Tunneling
5. Network Function Virtualization and Software Routers
6. Software Defined Networks and OpenFlow
7. Impact of Mobility on TCPIP
8. Wireless Basics
9. Simulation and Emulation
10. Multiple Access
11. Modulation and AutoRate
12. MIMO and Interference Cancellation
13. mmWave and Beamforming

- 課程網頁: http://e3.nctu.edu.tw/

Lab Assignments

- Labs: (7 x 10)

  1. Mininet, Wireshark, Container and MAC Learning

  2. IP Assignment and Hop-by-hop Forwarding

  3. Network Address Translation and IP Tables

  4. Dynamic Tunnel Establishment

  5. WiFi traffic generation and CSMA/CA (Matlab-based simulation)

  6. Equalization, modulation and MIMO decoding (Matlab-based simulation)

  7. Mobility over WLAN (NS3-based simulation)

- Project: (2x15)

  1. Implementation of Virtual Customer Premise Equipment

  2. Implementation of AP association and blacklist (OpenWrt)