

### Project #3 for ECE478/578

#### Preliminaries

- You must form a group of (strictly) two people.
- **Due date:** Wednesday May 2nd, 2012, 11:59pm.

#### Project Description

In this project you are to read two technical papers related to concepts of networking (primarily transport and routing concepts) and write a five page summary document describing the technical problem addressed by the papers that you have studied. Topics and suggested papers are provided below. Please choose two **related papers** of your liking. You may also choose one paper and trace a second paper based on the references in the related work of the former.

#### Topics and Papers

##### TCP over Wireless

1. Mun Choon Chan; Ramjee, R., "Improving TCP/IP Performance over Third-Generation Wireless Networks," *IEEE Transactions on Mobile Computing* vol.7, no.4, pp.430-443, April 2008.
2. Božidar Radunović, Christos Gkantsidis, Dinan Gunawardena, and Peter Key. 2008. Horizon: balancing tcp over multiple paths in wireless mesh network. In *Proceedings of the 14th ACM international conference on Mobile computing and networking (MobiCom '08)*. ACM, New York, NY, USA, 247-258.
3. Ming Li, Devesh Agrawal, Deepak Ganesan, and Arun Venkataramani. 2009. Block-switched networks: a new paradigm for wireless transport. In *Proceedings of the 6th USENIX symposium on Networked systems design and implementation (NSDI'09)*.
4. Jiwei Chen, Mario Gerla, Yeng Zhong Lee, M.Y. Sanadidi, TCP with delayed ack for wireless networks, *Ad Hoc Networks*, Volume 6, Issue 7, September 2008, Pages 1098-1116.
5. Zhenghua Fu; Haiyun Luo; Zeros, P.; Songwu Lu; Lixia Zhang; Gerla, M.; "The impact of multihop wireless channel on TCP performance," *IEEE Transactions on Mobile Computing*, vol.4, no.2, pp. 209- 221, March-April 2005.
6. Sumit Rangwala, Apoorva Jindal, Ki-Young Jang, Konstantinos Psounis, and Ramesh Govindan. 2008. Understanding congestion control in multi-hop wireless mesh networks. In *Proceedings of the 14th ACM international conference on Mobile computing and networking (MobiCom '08)*.

## Attacks on TCP

7. Wang, H. and Zhang, D. and Shin, K.G, "Detecting SYN flooding attacks," *In Proceedings of IEEE Infocom*, pp. 1530 – 1539, 2002.
8. Schuba, C.L.; Krsul, I.V.; Kuhn, M.G.; Spafford, E.H.; Sundaram, A.; Zamboni, D.; "Analysis of a denial of service attack on TCP," *Proceedings of IEEE Symposium on Security and Privacy*, pp.208-223, 1997.
9. Jelena Mirkovic and Peter Reiher. "A taxonomy of DDoS attack and DDoS defense mechanisms." *SIGCOMM Comput. Commun. Rev.* 34, 2 (April 2004), 39-53.
10. RFC 5927: ICMP Attacks against TCP.
11. RFC 4953: Defending TCP Against Spoofing Attacks.
12. RFC 2827: Ingress Filtering for Multihomed Networks.

## Network Coding

13. Sachin Katti, Hariharan Rahul, Wenjun Hu, Dina Katabi, Muriel Medard, and Jon Crowcroft. 2008. XORs in the air: practical wireless network coding. *IEEE/ACM Transactions on Networking*. 16, 3 (June 2008), 497-510.
14. Gkantsidis, C.; Rodriguez, P.R.; , "Network coding for large scale content distribution," *24th Annual Joint Conference of the IEEE Computer and Communications Societies*. vol. 4, no., pp. 2235- 2245 vol. 4, 13-17 March 2005.
15. Fragouli, Christina; Katabi, Dina; Markopoulou, Athina; Medard, Muriel; Rahul, Hariharan, "Wireless Network Coding: Opportunities & Challenges," *Military Communications Conference*, 2007. MILCOM 2007. IEEE, vol., no., pp.1-8, 29-31 Oct. 2007.
16. Sachin Katti, Shyamnath Gollakota, and Dina Katabi. 2007. Embracing wireless interference: analog network coding. *In Proceedings of the 2007 conference on Applications, technologies, architectures, and protocols for computer communications (SIGCOMM '07)*. ACM, New York, NY, USA, 397-408

## Project Report

Include with your report

1. An abstract.
2. An introduction that describes the technical problem addressed and briefly mentions related work.
3. Any modeling/system assumptions

4. The technical approach to the problem addressed and contrast between the two papers you have selected.
5. Analytical evaluation and or experimentation that validates the proposed solution
6. A discussion on your opinion on the importance of the problem, the adequacy of the solution and any suggestion in regards to open problems.
7. Submit your files through D2L dropbox.