MISSOURI S&T University of Science & Technology

Computer Science seminar Series

Designing Delay Constrained Hybrid Ad Hoc Network Infrastructure for post-disaster Communication

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CS 209

Abstract - Following a large-scale natural disaster, the availability of conventional communication facilities is often ruled out. Wireless communication and mobile phones may not be usable either except in only selected areas. Besides, geographical obstructions such as broken bridges or damaged roads add to the worries of personnel trying to deploy a temporary network infrastructure for effective communication. Hence, it is essential to design a rapid deployable and reliable adhoc network infrastructure to facilitate seamless information exchange about the status of victims, requirement of relief personnel/commodities, supply chain of goods and services, and so on, between relief/rescue workers in the affected regions, and the control stations located at a distance. The challenge lays in addressing resources constraints - both technological and financial - in case of such disasters occurring in under-developed regions. Under such circumstances, a Post-disaster Communication Network need to be developed to meet the following: (i) Close to 100% information packet delivery, (ii) Minimum latency for information exchange, and (iii) Compliance to the resource constraints. In this talk, I particular, I will discuss about a delay-aware adhoc hybrid network architecture to tackle the aforementioned challenges and highlight some of the underlying optimization problems. Next, I will focus on some of our enhancements done in the ONE simulator required for the evaluation of such infrastructures. Finally, I discuss about the underlying challenges we faced in developing a test-bed for validation.

Brief Bio - Dr. Subrata Nandi is an Associate Professor in the Dept. of Computer Science & Engineering, in the National Institute of Technology, Durgapur, West Bengal, India. He received his Ph.D. from Indian Institute of Technology, Kharagpur, India on Information Management in Large Scale Networks in 2011. He received his M.Tech and B. Tech from Jadavpur University and the University of Calcutta, respectively in 1999 and 1997. His current research interest lies in designing systems for developing regions to address problem related to transportation, disaster-management, etc. He has published papers in the area of peer-to-peer networks, delay tolerant networks and cellular networks.