

CS549 -- 500-Level Semester Project 2007

Fault-tolerance in Ad hoc Networks

Ad hoc networks are especially vulnerable to faults, due to the dynamic nature of their communication links and the fact that they might operate in hostile environments.

We want to look at fault-tolerance issues in ad hoc networks. Of specific interest is the detection and recovery of specific faults. Which faults are we interested in? We want to view faults in the context of hybrid fault models. As such, we start out with benign faults and work our way towards arbitrary faults. You will notice that most of the literature simply elects simple omission faults, i.e. the communication link is broken.

What is expected:

You are to assemble a list of recent research efforts, i.e. papers, and put them into perspective. This means that you discuss how they relate to each other and what their main accomplishments are. Take the "Background" section of research papers as a guide.

Example: "...whereas the initial paper by Lamport [1] gave the number of processors required to reach agreement using more than $3m$ processors, where m is the number of malicious faults assumed, this assumption that all faults are malicious was seen as too restrictive. Thus, the following work by Meyer [2] and Thambidurai & Park [3] introduced hybrid fault models in an attempt to derive higher reliabilities under the assumptions that the fail rate of malicious faults is smaller than that of non malicious faults...".

Discuss the main contribution of the works. However, do NOT turn this into a list of abstracts, which summarize the paper, but do not put the work into the larger picture.

Strategy: do focus on the general portions of the papers you investigate. Do not get caught up in the details, e.g. proofs. The main ideas and assumptions are usually communicated in the first few pages of a paper. You will get more out of looking at a larger pool of papers and focus on the general approaches than on looking (in depth) at a smaller pool of papers, reading them "cover to cover". As you read the paper, consider the complexity of the routing scheme. How many messages will be sent, how does the algorithm scale as the number of nodes grows etc.

Deliverables:

A final report is to be written. The final report is due Tuesday of Final Week. This deadline is FIRM!

There is no limitation on the report size. However, the report should be:

- 1) professionally organized
- 2) typeset to a standard that would allow a submission to a conference or workshop (we will not submit it, but the quality of a submission is required). If you need a

template, use the IEEE template for publications, e.g. look at my publication list, there are a few downloadable pubs.

- 3) including proper references! If you are unsure of how you cite or give references, please talk to me, look at research papers, etc. Any work taken from sources that are not cited constitutes *plagiarism*. I will adopt a zero tolerance to plagiarism – please do not test me on this! You can include anybody's work, but you need to cite it properly!

Your Schedule:

1. March 8: A one page abstract, that should include:
 - a. a statement of your understanding of the assignment,
 - b. an outline to your approach e.g. how you will proceed
 - c. please email this (as pdf or rtf - no .doc format please) with the header:
"CS549 Project Proposal"

2. April 19: A progress report is due:
 - a. this should be the draft of the final report. I will use this to estimate how much progress you have made.
 - b. please email this (as pdf or rtf) with the header: **"CS549 Progress Report"**

3. April 29: Preliminary report is due:
 - a. this is not the final report, but it should be a good draft. Again, I will use this as a progress report.
 - b. please email this (as pdf or rtf) with the header: **"CS549 Preliminary Report"**

4. March 8: The final report is due:
 - a. There is no limitation on the report size. However, the report should be
 - i. professional organized
 - ii. typeset to a standard that would allow a submission to a conference or workshop
 - b. Use proper references! If you are unsure of how you cite or give references, please talk to me, look at research papers, etc. Any work taken from sources that are not cited constitutes *plagiarism*.
 - c. **Plagiarism**: I will adopt a zero tolerance to plagiarism – **please do not test me on this!** You can include anybodies work, but you need to cite it properly! Failure to do so constitutes plagiarism, which will be prosecuted!
 - d. Submission:
 - i. a hard-copy
 - ii. an electronic copy (pdf or rtf) with mail header: **"CS549 final project report"**