Bachelor Thesis Review

Faculty of Mathematics and Physics, Charles University

Thesis author	Tomáš Drozdík
Thesis title	Scalable addressing and routing protocol for ad-hoc networks
Year submitted	2020
Study program	Computer Science
Study branch	General Computer Science
Review author	Filip Kliber Reviewer
Department	Department of Distributed and Dependable Systems

Overall

	good	OK	poor	insufficient
Assignment difficulty	X			
Assignment fulfilled		X		
Total size *... text and code, overall workload*	X			

The goal of this thesis is to design a highly scalable decentralized network addressing and routing protocol for ad-hoc networks. This new protocol is then implemented in a network simulator and is thoroughly tested and benchmarked. The goals of the thesis have been fulfilled.

Thesis Text

	good	OK	poor	insufficient
Form *... language, typography, references*	X	X		
Structure *... context, goals, analysis, design, evaluation, level of detail*		X		
Problem analysis	X			
Developer documentation	X			
User Documentation	X			

Textual part of the thesis is well-written and well-structured. In the first chapter, author gives us insight into routing in dynamic networks. It contains overview of selected routing algorithms and protocols commonly used in traditional networks (e.g. the Internet) as well as (mobile) ad hoc networks (MANETs). Second chapter is dedicated to explanation of address assignment in dynamic networks. It gives an insight on the problems of assigning addresses in decentralized environemnt (e.g. how to handle duplicate addresses). Chapter two also included a detailed explanation of the DART protocol, as a routing protocol with non-IP address space. In the third chapter, author designed a new protocol — SARP, to tackle the problems with routing in MANETs. Fourth chapter consist of the implementation of the SARP protocol in a network simulation. Overall, the text is understandable, although some parts are exhaustive.

Thesis Code

	good	OK	poor	insufficient
Design *... architecture, algorithms, data structures, used technologies*	X			
Implementation *... naming conventions, formatting, comments, testing*		X		
Stability		X		

The implementation part of the thesis consists of the implementation of the SARP protocol in a network simulation to estimate parameters of the SARP protocol (e.g. how often a node should propagate an update) and to test and benchmark the properties of the SARP protocol. Results are also compared with basic distance-vector routing protocol.

The implementation looks good. The code is modern and mostly readable. The documentation allows for easy addition of new simulation scenarios. It also contains plotting scripts for the visualisation of the scenario outcome.

Author sucesfully showed that the SARP protocol improves scalability of routing in ad hoc networks by utilizing full address space and thus reducing the sizes of routing tables. There are however some parts of the SARP protocol, that author left for future research. Notably the lack of approch on how to bootstrap the network (self assignment of addresses in new network without any prior information) and the solution for detecting duplicite addresses (or routing groups) in the network. Overall, the work on the thesis is sufficient and as a reviewer I do recommend the thesis to be defended.

Overall grade Excellent

Award level thesis No

Date

Signature