UNIVERSITAT POLITÈCNICA DE CATALUNYA
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Report on the PhD dissertation submitted by Ing. Vladimír Veselý, entitled "A NEW DAWN OF NAMING, ADDRESSING AND ROUTING ON THE INTERNET".

Please find in the following lines my review on the PhD dissertation entitled "A NEW DAWN OF NAMING, ADDRESSING AND ROUTING ON THE INTERNET", submitted by Ing. Vladimír Veselý for consideration to obtain the PhD degree at the Faculty of Information Technology of the Brno University of Technology.

To better focus the review, answers to each of the suggested questions in the review request email are subsequently provided:

1. *Does dissertation contain current research topics?*

Yes, indeed. The scalability limitations of the current Internet routing model based on TCP/IP are still a critical issue to be solved, and the Locator/Id Separation Protocol (LISP) technology has recently emerged as an attractive solution to mitigate them (receiving the support from large companies like CISCO). In contrast, while LISP deployment can be seen coexisting on top of the current IP-based Internet, RINA appears as a clean-slate recursive network architecture built upon fundamental Inter-Process Communication (IPC) principles, which inherently solves most Internet limitations. Several European projects have been funded in the last years to investigate RINA as an alternative to TCP/IP (e.g., FP7 IRATI, FP7 PRISTINE, GEANT3+ IRINA, FIRE+ ARCFIRE), which highlights its scientific relevance and attractiveness.

2. *Does dissertation include original contribution beyond the state-of-the-art? Elaborate on novelty and impact.*

Regarding the LISP-related part of the thesis, it focuses on two of its scalability problems, namely, the site-based synchronization problem and the locator path liveness problem. Then, improvements to current LISP performance are proposed and evaluated through simulations using the OMNET++ simulation framework. As for the part related to RINA, the work reported in this thesis concentrates on a deep analysis of its architectural characteristics, mechanisms and policies, used later on to develop a fully-fledged RINA simulator based on OMNET++ (i.e., RINASim). To the best of my knowledge, no publicly available RINA simulator exists to date. Therefore, RINASim can be the trigger to many research studies on evaluating the features of RINA-based networks, while also helping to propose new policies and quantitatively testing their performance (e.g., QoS, routing, congestion control or authentication policies to be configured at RINA DIFs).

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3. *Have the core ideas been published at an appropriate level?*

Looking at "Section 7 - Bibliography", I can identify multiple conference and journal publications co-authored by the PhD candidate. These publications cover most of the open issues related to the LISP technology addressed in the dissertation, which gives further value to the proposals. Moreover, the PhD candidate has contributed to several conference papers and deliverables of the FP7 Project PRISTINE, reporting his work on the specification and development of the RINASim simulator based on OPNET++, a significant outcome of the project. To add a bit of criticism, I would have enjoyed seeing at least 1 publication in a JCR-ranked journal/magazine, e.g., reporting the whole RINASim-related work, although I also understand that it might be better prepared in the near future, once PRISTINE concludes and the final version of the simulator is eventually delivered.

I suggest adding a new section in the final version of the thesis with the list of publications co-authored by the PhD candidate, so as to help the reader better appreciate how the proposals have been accepted by the research community.

4. *Do candidate's achievements support granting the Ph.D. title?*

Yes, I think that the publications co-authored by the PhD candidate, together with the simulation software resulting from this thesis (e.g., RINASim), are arguments strong enough to grant the PhD title.

5. *Please, provide executive summary and clear statement whether you recommend thesis for public defense or not*

The present dissertation addresses two major scalability limitations of the LISP technology, namely, the site-based synchronization and locator path liveness problems, proposing and evaluating improvements to mitigate them. Furthermore, a very nice work has been done to develop a fully-fledged RINA simulator, fostering future research lines related to RINA-based networks. For all this, **I recommend this thesis for public defense.**

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Jordi Perelló Muntan
Barcelona, 14th March, 2016.