



Thesis Advisor Position

Thesis: Application of Software Components in Operating Systems Design
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The work of Martin Děcký revolves around building an experimental microkernel operating system prototype. In this, the work is not alone – starting with the famous example of Mach from the Carnegie Mellon University, microkernel operating system prototypes were being built for more than 30 years. Apart from the famous monolithic-vs-microkernel question (which does not seem to be very pertinent in mainstream operating systems these days), the prototypes helped influence many system design aspects we now take for granted – including the hypervisor technology that is essential for cloud computing.

One could also say that the era of operating system prototypes is fading – with the major architectural decisions mostly explored (and the juggernaut of legacy software making many fine architectural points mute), it may appear unlikely that a new prototype will bring an unexpected improvement in security, efficiency, flexibility or other important system property. Still, we can see that mainstream operating systems exhibit flaws that some research prototypes improved upon, and we must ask whether the benefits were indeed too trivial to deserve moving the discovered solutions from research to practice, or whether combinations of legacy factors are in fact holding us from having better operating systems.

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Martin is determined to prove that the latter is indeed the case. By developing, managing and promoting an experimental operating system prototype with emphasis on open design process, explicit component architecture and many other essential features, Martin contributes a platform that can already be used to perform more practical evaluation of certain program verification tools than what would have been possible otherwise. The very fact that the operating system project has found external contributors – including repeated support from the Google Summer of Code and European Space Agency Summer of Code programs – attests to the importance of the work Martin delivers.

The thesis itself also reflects the multifaceted nature of the problem at hand – rather than addressing a single, exactly defined issue, Martin deals with a broad spectrum of problems. This may make the thesis somewhat less satisfying to technically oriented readers – but for those of us who put emphasis on delivering actual, tangible results, there is always the running code to play with, which, again, contributes to the quality of the thesis.

Finally, I should add that Martin is very much a self-motivated and self-directed person. This makes my position somewhat special – where I do not disclaim responsibility for whatever guidance I managed to provide, I must emphasize that the successful achievements the thesis boasts are especially due to Martin persisting in a difficult research domain. I am glad to recommend that Martin Děcký be awarded the doctoral degree.

Petr Tůma

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