

Exjobb preliminary specification

Suggested title: **Continuous testing and verification of runtime [web] systems**

Adam Renberg, adamre@kth.se, May 4, 2012

Institute/School: School of Computer Science and Communication (CSC) at KTH
Company: Valtech

Supervisor, Valtech: Erland Ranvinge erland.ranvinge@valtech.se

Supervisor, KTH: Narges Khakpour khakpour@liacs.nl

Website: <http://tgwizard.github.com/thesis/>

Repository: <http://github.com/tgwizard/thesis/>

The suggested topic is continuous testing and verification of runtime systems. As suggested by both Erland and Narges, this is of great interest in both academic and industry circles.

The exjobb will be split in three parts:

- Background and state-of-the-art investigation
- Analysis of threats, systems and what can be done
- Implementation of "some of these ideas" (e.g. dynamic analysis)

The resulting "monitoring-system" will be tested on "a project" at Valtech. Since we can't intentionally crash/break existing commercial projects, it will probably be done in a testing environment.

Outline of exjobb, and initial brainstormed ideas

- investigate state-of-the-art
 - research
 - industry/commercial projects
- threat analysis - what can go wrong?
 - configuration
 - external dependencies
 - performance degradation
 - data dependencies
 - browser compatibility
 - more...
- system characteristics
 - is code thoroughly tested offline?
 - more...
- monitor system without modifying it (too much)
 - crawling and checking response time, comparing with previous times
 - blackbox testing
 - analyse bytecode
 - dynamic analysis of running code
 - exception catching
 - you can still test external dependencies (ping, services, api calls, etc.)
 - ui-tests
 - reading existing logs
 - more...
- monitoring when modifying (but not rewriting from scratch) is allowed
 - adding more logging
 - exception handling
 - code contracts
 - more...
- implement a few of these ideas (mostly in the not-so-much-modifying section)

Timeplan/Schedule An agile process...

- Start: **April**
- Specification done: **May 7**
- Final deadline: so that I can graduate in december 2012

Things to do

- Decide on a division of work/exjobb with erland and daniel.
- Find more ideas and papers related to this topic
- What are commercial projects doing?
- Utilize Valtech Live (the system-maintaining group at Valtech) to do threat analysis.
- Find a project at Valtech where the as-of-yet unspecified and very vague implementation could be tested.
- A more specific time plan, at least with a few milestone dates.
- Finalize the specification, and get it approved by KTH.