

Bachelor's/Master's Thesis

Linux Coleopterology

Background

In simple terms "coleopterology" denotes the study of bugs. With around 20 Million lines of code, the Linux kernel has become an incredibly complex system and, as such, has a high probability to contain numerous defects. At the same time, more and more systems in highly diverse application scenarios build upon the Linux kernel and are, therefore, affected by the consequences of these bugs. While a large variety of methods to alleviate the problem have been developed, both for complex software systems in general and specifically for the Linux kernel, the problem apparently persists, as the bug reports on the Linux kernel bug tracker and the crashes reported on kerneloops.org indicate.

In order to develop effective bug finding techniques and evaluate the effectiveness of existing techniques to detect bugs or mitigate their effects at runtime, a thorough understanding of their "nature" is required.

Objectives

The goal of this thesis is to analyze and classify previously found Linux bugs to gain a better understanding what typical Linux bugs look like and why they apparently escape common bug finding techniques used by developers. For this purpose, the Linux kernel bug tracker, git commit messages, and other available sources of information can be systematically crawled and analyzed to classify defects, for instance, by their location in the kernel source tree, the complexity of associated patches, the time the bug has resided in the kernel before it got fixed, and so on.

Prerequisites

Candidates should have fundamental knowledge of operating systems, e.g., from the OS course. Working knowledge with Linux or other OS kernel code is helpful, as is knowledge of web mining and git. The thesis will be written in English.

Duration/Start

Immediate

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Literature



Analysis



Implementation



Awesomeness

