

Master's Thesis

Analysis and Visualization of Linux Core Dumps

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When a process crashes in a Linux-based operating system, the kernel stores the process's memory on the hard disk. These generated files are called core dumps and can be used to debug the crashing application in a post mortem way.

The goal of this thesis is to provide an automated way of presenting the most important information stored in a Linux core dump. This includes, but is not limited to, general system information, thread information including stack traces of each thread, and a list of loaded libraries at the time the dump was generated. The tool must be integrated into the issue tracking system JIRA to automatically search and analyze Linux core dumps. The results of the analysis shall be presented in a web interface based on that of the Windows core dump analyzer SuperDump (<http://www.github.com/Dynatrace/superdump>). Additionally, the tool must maintain a database of the analysis results and must provide a summary about the most common scenarios that lead to a crash.

The thesis must also include a functional evaluation and a performance evaluation. The functional evaluation must prove that the tool can extract the required information based on predefined JIRA issues and must compare the tool's capabilities to existing tools such as gdb and libunwind. The performance evaluation must provide some intuition about the run-time and memory requirements of the developed tool

The progress of the project should be regularly discussed with the advisor. A time schedule and a milestone plan must be set up within the first 3 weeks. It should be continuously refined and monitored to make sure that the thesis will be completed in time. The final version of the thesis must be submitted not later than March 31, 2018.