

Obfuscation of names for heterogeneous applications

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- heterogeneous software system, security, obfuscation, naming

Description:

More and more software is being developed using multiple programming languages, models and/or formalisms. These heterogeneous systems[1] are applications of which several parts are realized with different programming languages, but also using different resource description languages (html, XML, etc.), and various configuration and construction tools (ant, grad, maven, ...). Web applications (eg JavaEE) or Android are examples of heterogeneous applications.

Obfuscation [2] is a classic security technique used to protect its source code, to complicate access to information, or to reduce the risks of intrusion. We transform – rewrite – the source code (usually) to make it unreadable by a human and difficult to exploit by automatic analyzes. One of the simplest techniques of obfuscation is to change the names to make the intention more difficult to understand [3].

Current name obfuscations benefit little from heterogeneity applications to increase the level of security obtained.

The purpose of this internship is to study the realization of obfuscation, not within a single-language source code, but in a large development environment by studying the references between names of the file system, the resources used and the source codes of the programs.

The approach taken in this internship is to abstract through a generic formal model the naming aspects of code and resources. This abstract naming pattern will be exploited to alter the namespace and improve the power of obfuscation.

This master research internship will focus on proposing operations on the generic naming model (represented as a graph) in order to realize obfuscations. These operations will have their correspondences in the real world (the development environment).

For this, the student must be able to:

- . To carry out a bibliographic work on the obfuscation [2,3,4] of name and the naming aspect specification [5];
- . Propose a generic formalism to specify aspects of naming;
- . Propose operations on the naming graph to perform obfuscations, as

well as their translation into the development space;
. Write an internship report in French or English, potentially co-publish a scientific article in English.

Context:

This subject is proposed by the PASS team and is part of its activities. PASS is a team of 6 permanent staff whose research topics are oriented towards the safe design of adaptive software systems and whose creed is that to master this design it is necessary to master the description of the system and of its development process.

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