Binary Compatibility of C++ Programs

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Abstract

C++ is one of the most popular multiparadigm programming languages supporting object-oriented, generic and functional programming elements. Contrary to other modern languages (C#, Java, Scala, etc.) C++ is fundamentally a value based programming language, i.e. objects and variables directly represent memory areas. Although this fact has a positive effect on both space and run-time efficiency, it has also negative consequences when binary compatibility is an issue. Such situations frequently occur when a library is upgraded, but the client code is not recompiled – a usual situations at large software systems.

In this paper we formalize binary compatibility mainly for C++, and discuss the violation scenarios. We implemented a prototype application which capable to detect possible violations of binary compatibility for various platforms. The tool was successfully tested with open source libraries.

Keywords: Software development, Binary compatibility, C++

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