

Integration of incremental parsing of build systems into software comprehension tools

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Abstract

Standalone code comprehension tools and similar features of integrated development environments (IDE) both aim to support the development and the maintenance of large (legacy) software. When applied to actively developed projects, it is essential to process the most recent revision of the source code in real time. Since a complete analysis of the codebase might take up significant time (even hours), the inclusion of incremental parsing is indispensable. However the utilized build system of a software project is tightly coupled with the source code: over the time not only the content of the source files can be amended, but translation units can be added or removed and the parameters of the existing build instructions might also change.

This paper intends to describe how the incremental update of the build system of a software facilitates the maintenance of the software workspace database in a code comprehension tool by completing the workflow of incremental parsing. We describe why including the build system in incremental parsing is relevant as well as the actual method of parsing build commands. We show that updating the build system is more cost-effective to a ratio than disposing of the existing build command database. The paper also compares the incremental parsing of build systems to that of actual source code.

As a case-study we realized this through CodeCompass, a standalone code comprehension tool developed by Ericsson Hungary and Eötvös Loránd University which already encompassed the incremental parsing of source code. [1] In order to test our method, we used the open-source LLVM project which is under continuous development and has a frequently changing build system.

[1] Fekete, A., Cserép, M., Incremental Parsing of Large Legacy C/C++ Software, 21th International Multiconference on Information Society (IS), Collaboration, Software and Services in Information Society (CSS), Vol. G (2018), 51–54.

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