

Relations of testability and quality parameters of SDL implementation at the early stage of protocol development life cycle

Anna Harmatné Medve

The protocols of distributed and embedded communication systems are getting more and more complex. Testing is the most expensive phase of protocol development life cycle. Testability of the software, as the quality index of development, is also a crucial cost reducing feature.

The idea of DFT – keeping testability in mind even during the defining phase: *Design For Testability* – concentrates on two main phases in software engineering researches: conceptual planning and testing. However, significant testability indexes can be accomplished even during implementation phase depending on its means. The quality index of development can be software-defined on the basis of ISO metrics in the case of wide-spread professional programming languages.

According to my research relations affecting testability can be defined between language units and features of the special domain in the field of domain specific languages. This contingency generally derives from the purposes of creating domain specific languages and the characteristics of language improvement. Applying relations affecting testability in the field of requirement specification, conceptual planning, and in the phase of implementation improves testability indexes. Various factors may have an effect on testing and applied test specification itself during the improvement of special systems.

In my presentation I outline my researches in connection with inserting the testability of communication protocols into the early stage of protocol development life cycle and implementation in SDL language. SDL-2000 offers new possibilities of handling the time problem and testability planning with the potentialities of new types and data definitions.

I demonstrate the development of Bluetooth short distance radio frequency system protocol package for connection establishing process in a case study. I demonstrate the improvement of certain functions of the process and the testability planning divided into life cycle periods. The case study perfectly demonstrates the assertion of Design For Testability idea by means of applying relations which I presented in the lecture with means of algebra.

I introduce new life cycle periods to the phases of development on applying relations between quality parameters of SDL implementation and protocol features affecting testability in the lecture and the case study.

SDL has spread widely in industry and research. Free and commercial versions of its graphical tools provide automatic code generating and test supply generating. It is spreading also in the field of improving real-time systems apart from the telecommunication applications.

Keywords: SDL, EFSM, protocol life-cycle, design for Testability (DFT), conformance test, validation.