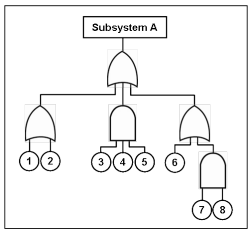
FG Betriebssysteme und Middleware
Dr. Peter Tröger
Masters project - summer term 2012

„Versatile Dependability Modeling“

Background



Component-based and state-based dependability modeling are established techniques for the reliability / availability assessment of a complex system design. For component-based modeling, well-known approaches are fault trees and reliability block diagrams (RBD). State-based modeling relies on a formal system behavior description, i.e. with petri nets or Markov chains.

Existing tools typically focus on maintainability planning issues, while the extensibility with new modeling concepts is not a primary focus.

Description

The Masters project „Versatile Dependability Modeling“ wants to investigate novel approaches for reliability modeling by the help of a new web-based modeling tool. The research part targets the question of how a useful reliability modeling with incomplete and imprecise system and component information can be made possible. The project work will be driven by the creation of the new dependability modeling tool. This application has to be realized as interactive web application for modeling tasks, based on latest JavaScript and HTML5 technologies for a sufficient user experience.

The resulting software stack needs to be flexible enough for a research-driven extension with new modeling constructs, simulation approaches or component reliability data sources.

Based on the number of students and the existing knowledge, the project may also include the scalable solving of state-based models through distributed computing (cloud technologies, cluster computing)

References

- Avižienis, A., Laprie, J.-C., Randell, B., and Landwehr, C., “Basic concepts and taxonomy of dependable and secure computing,” *IEEE Transactions on Dependable and Secure Computing (TDSC)*, vol. 1, Jan. 2004, pp. 11-33.
- Cheng, Y.L., “Uncertainties in fault tree analysis,” *Tamkang Journal of Science and Engineering*, vol. 3, 2000, pp. 23-30
- Johnson, A.M., Jr. and Malek, M., “Survey of software tools for evaluating reliability, availability, and serviceability,” *ACM Computing Surveys (CSUR)*, vol. 20, 1988, pp. 227-269.
- Distefano, S. and Puliafito, A., “Dependability Evaluation with Dynamic Reliability Block Diagrams and Dynamic Fault Trees,” *IEEE Trans. Dependable Secur. Comput.*, vol. 6, Jan. 2009, pp. 4-17.

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