Two Applications of PROMELA/spin

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1 Communications in Client/Server Models

Errors such as deadlock and race conditions are very common yet extremely difficult to debug in the communications design of client/server models based on remote procedure call and multi-threading. This paper presents an effective approach to detect these errors. It shows how to apply the specification and validation techniques in Protocol Engineering to discover those errors in the early stages of a client/server software development. The work is based on the protocol specification and validation tool PROMELA/SPIN. PROMELA is extended to a new language called PROMELA-C/S for additional expressive power of specifying client/server communications. A PROMELA-C/S translator then is built to convert PROMELA-C/S to PROMELA for running validation using SPIN.

2 Feature Interactons in Telecommunication Services

This paper presents a methodology we envision for detecting and resolving feature interactions. The methodology is based on a building block approach, in which features and their operating contexts are building blocks that can be composed in any combination to detect and resolve their interactions. This methodology is applicable to the phases in the software life cycle that address the creation of new features such as requirements, specification, and verification. By creating a well defined process for determining feature compatibility, with clearly defined steps and appropriate techniques/tools, it will then be possible to systematically model features, and detect and resolve interactions among features. The primary goal is to provide a support environment which feature designers can use to specify and verify the requirements of a feature, detect its possible interactions with other features, and finally verify the resolution of any detected interactions. A prototype environment is being built based on PROMELA/SPIN.

3 Available Publications

1. F. J. Lin and Yow-Jian Lin, "A Building Block Approach to Detecting and Resolving Feature Interactions," In Proc. of The 2nd International Workshop on Feature

Interactions in Telecommunication Systems, Amsterdam, The Netherlands, May 1994.

2. F. J. Lin "Specification and Validation of Communications in Client/Server Models," In Proc. of The International Conf. on Network Protocols, Boston, Massachusetts, October 1994.