2011 Ninth Working IEEE/IFIP Conference on Software Architecture

Architecture-Based Testing and System Validation

Workshop Summary

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***Abstract*— This paper summarizes the workshop on Architecture-Based Testing and System Validation which was organized in conjunction with the 9th Working IEEE/IFIP Conference on Software Architecture. The main goal of the workshop was to bring together researchers and practitioners both from the architecture design and software testing community to enable architecture-based software testing.**

Keywords-component; Software Architecture, Software Testing, System Validation, Architecture-Based Testing

I. WORKSHOP GOALS

The increased size and complexity of software systems has increased both the need for software architecture design and software analysis and testing. Software architecture forms one of the key artifacts in the entire software development life cycle since it embodies the earliest design decisions and includes the gross-level components that directly impact the subsequent analysis, design and implementation. A proper software architecture design is important to cope with complexity, enhance communication among stakeholders and support the software system qualities. To verify that the right concerns have been identified generally static analysis of formal architectural models are applied or a set of architecture analysis methods are adopted to analyze the qualities early on.

The main assumption and theme of the workshop is that software architecture descriptions can also facilitate the testing and analysis of software. Building on earlier activities [2][3] that were organized in this domain this workshop [1] will investigate the possible roles of software architecture in testing and analyzing complex systems. In short, architecture-based testing and system validation involves the use of architecture to involve better outcomes to the process of assuring that a delivered system satisfies its architectural design decisions. "Better outcomes" can mean shorter validation time, higher confidence results, or less expensive testing (for example, by using architectural analysis to eliminate the need for certain tests).

This workshop brought together researchers and practitioners to produce an emerging picture of the state of the practice in architecture-based testing and system validation, promising research approaches, and practical problems that could be solved by directed research. Papers were solicited dealing with topics in the following list:

- Using architecture to produce test artifacts aimed at testing code -- e.g., test plans, test cases, etc.
- Using analysis of architecture to make certain tests unnecessary
- Fault models associated with particular architecture styles or patterns
- Architectural design approaches that make systems more testable
- Testing implementations for conformance to architecture
- Using architectural arguments to shorten the testing for a new version of a fielded system
- Using architecture to for predictive analysis about a system
- Architectural viewpoints for testing
- Model-based testing of/with architecture.

II. WORKHOP ACTIVITIES

After a summary of the previous events, the workshop started start with an invited talk by John McGregor who provided an outline of architecture-based testing. Further, rather than a presentation-based workshop the workshop was organized with the focus on lively discussions. The workshop resulted in the following tangible outputs: (1) summary of existing concepts on ABT (2) list of existing problems in the state-of-the-practice (3) list of remaining open research problems, (4) possible solution directions (5) collaboration plan for future activities.

III. ACKNOWLEDGMENTS

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IV. REFERENCES

[1] ABT - Architecture-Based Testing Workshop. http://www.cs.bilkent.edu.tr/ABT-2011/

[2] Rosatea 2006 - The Role of Software Architecture for Testing and Analysis, http://www.di.univaq.it/muccini/Rosatea2006/

[3] Rosatea 2007 - The Role of Software Architecture for Testing and Analysis, http://www.di.univaq.it/muccini/Rosatea2007/

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