Checking interface interaction protocols using aspect-oriented programming

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Abstract: We propose an approach based on aspect-oriented programming to specify and to verify interaction protocols in the component interfaces of Java programs. First, based on method patterns of AspectJ we introduce a simple protocol specification language that specifies temporal orders of operations of an interface. We then develop an algorithm that takes a protocol specification and produces aspect code that will check for protocol conformance of programs that use the interface at runtime. Finally, we propose several extensions that enable the integration of our approach with static techniques and allow checking protocols over multiple components. ?? 2008 IEEE.

Index Keywords: Aspect-oriented programmings; AspectJ; Component interfaces; Interaction protocols; Interface interactions; Multiple components; Protocol specifications; SIMPLE protocols; Static techniques; Temporal orders; Computer software; Flow interactions; Java programming language; Software engineering; Specifications; Formal methods

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