

Securing Event-based Communication

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Abstract

Event-based communication is a major source of power and flexibility for today's applications. For example, in the context of a web browser, the dynamism of user experience is driven by events: fine-grain interaction of the user with the web application triggers events that are reactively handled by JavaScript code. This paper explores channels for leaking sensitive information through constructs in a reactive language. With the target of a general and realizable framework, we show how to prevent information leaks in a reactive setting with such features as new handler creation and hierarchical event structures. We gain flexibility from distinguishing between the security levels of message existence and content. A combination of flow-sensitive analysis and buffering output enables us to be permissive and at the same time offer a strong security guarantee: public output produced when handling an event is independent from sensitive input.