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Extending the AOP Joinpoint Model for Memory and Type Safety

Authors : Amjad Nusayr

Abstract : Software security is a general term used to any type of software architecture or model in which security aspects are incorporated in this architecture. These aspects are not part of the main logic of the underlying program. Software security can be achieved using a combination of approaches, including but not limited to secure software designs, third part component validation, and secure coding practices. Memory safety is one feature in software security where we ensure that any object in memory has a valid pointer or a reference with a valid type. Aspect-Oriented Programming (AOP) is a paradigm that is concerned with capturing the cross-cutting concerns in code development. AOP is generally used for common cross-cutting concerns like logging and DB transaction managing. In this paper, we introduce the concepts that enable AOP to be used for the purpose of memory and type safety. We also present ideas for extending AOP in software security practices.

Keywords : aspect oriented programming, programming languages, software security, memory and type safety
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