

A Domain Analysis of Resource and Requirements Monitoring: Towards a Comprehensive Model of the Software Monitoring Domain

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Abstract: This is a summary of an article (with the same title) we published in the Information and Software Technology Journal in 2019 describing a domain model we developed to structure and systematize the field of software monitoring as well as a reference architecture to support developing software monitoring approaches.

Keywords: Software monitoring; Requirements monitoring; Resource monitoring; Domain model; Reference architecture

1 Summary

Complex software systems need to be monitored as their full behavior only emerges at run-time, e.g., when interacting with other systems or their environment. Diverse software monitoring approaches [Ra19, Ra17] have been developed in diverse communities for various kinds of systems and purposes. They observe and check properties or quality attributes of software systems during operation. For instance, requirements monitoring approaches check at run-time whether a software system adheres to its requirements, while resource or performance monitoring approaches collect information about the consumption of computing resources by the monitored system. Many venues publish research on software monitoring, often using diverse terminology, and focusing on different monitoring aspects and phases. We provide a domain model to structure and systematize the field of software monitoring, starting with requirements and resource monitoring. Based on earlier efforts, we systematically analyzed 47 existing requirements and resource monitoring approaches to iteratively refine the domain model and also to develop a reference architecture for software monitoring approaches. Our domain model covers the key elements of monitoring approaches and allows analyzing their commonalities and differences. Together with the reference architecture, our domain model supports the development of integrated monitoring solutions.

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