

学术研究

用抽象质量类型构建高质量网构软件

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摘要 在开发基于因特网的软件系统(文中称为网构软件)时, 在开发过程的各个阶段都需要考虑软件系统的多种质量属性, 这样网构软件的质量才能在软件系统的规约和设计阶段进行推导和预测, 从而在部署和运行阶段进一步进行评估和验证。提出了一种新的抽象概念, 即抽象质量类型, 将软件实体的数据状态、相关的操作、质量属性以及保证质量得以实现的环境封装在一个统一的语法单元中, 从而为建模软件实体以及推导其功能和非功能属性提供了一种严格的手段。探讨了基于软件体系结构及软件交互过程的抽象质量类型的组合, 这为构建高质量网构软件提供了一定的形式化基础。最后, 还描述了一个系统原型来展示如何利用抽象质量类型构造网构软件, 并验证和提高网构软件系统的相关质量属性。

关键词 [构件](#) [软件质量](#) [抽象质量类型](#) [网构软件](#)

分类号

Using Abstract Quality Types to Construct High Quality Internetware

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Abstract

In the development of software systems on the Internet (referred to as Internetware), multiple quality properties should be considered along with the development process so that the quality of Internetware can be inferred and predicted at the specification and design stages and be evaluated and verified at the deployment and execution stages. A new abstraction notion, Abstract Quality Type (AQT), is put forward to encapsulate data types, associated operations, quality properties and the environment guaranteeing the qualities into an uniform syntactical unit, which provides rigorous ways to model software entities and to reason about the functional and non-functional properties. The composition of AQTs is also studied based on the software architecture and the process of interactions, which offers a solid foundation for constructing high quality Internetware. Finally, a prototype is described to illustrate how to construct Internetware by using AQTs as well as how to verify and improve a special kind of quality property of Internetware.

Key words [component](#) [software quality](#) [abstract quality type](#) [Internetware](#)

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