微服务平台中服务划分和选择策略研究与应用

摘 要

随着云平台业务规模的扩展，传统的单体服务框架的复杂性越来越高，可维护性越来越差，因此微服务架构成为研究的热点。当前的云平台中服务复用率低，代码冗余率高成为平台的主要问题，另一方面，目前的服务选择策略未能综合考虑平台性能特征以及任务特征，导致服务的执行效率降低。

为了提高平台中服务的复用率以及平台的执行效率，首先本文提出一种基于领域驱动设计思想的语义耦合的服务划分策略，该策略综合考虑了微服务平台中应用功能关联性大的特点以及微服务的划分原则，实现了高效的服务划分；其次本文提出一种细粒度的性能预测模型，该模型可以准确的预测每一个微服务的执行时间；然后，在性能预测模型的基础上，提出一种性能感知的服务路径选择策略，该策略通过初始化服务选择路径和动态的自适应更新得到最优的服务路径，提高了应用的执行效率；最后，通过实验验证了本文所提出的服务划分和服务选择方法，实验结果表明，本文设计的性能预测模型能够准确的预测服务执行时间，提出的方法能够有效提高平台服务的复用率，降低服务的执行时间，提高应用的执行效率。

关键词：微服务架构 服务划分 语义耦合 服务选择

RESEARCH AND APPLICATION ON SERVICE PARTITIONING AND SELECTION STRATEGY IN MICROSERVICE PLATFORM

ABSTRACT

With the expansion of the cloud platform business scale, the complexity of the traditional monolithic framework is getting higher and higher, and the maintainability is getting worse and worse. Therefore, the micro-service architecture has become a hot research topic. In the current cloud platform, the low service reuse rate and the high code redundancy rate have become a main problem. On the other hand, the current service selection strategies do not comprehensively consider the platform performance characteristics and task characteristics, so these strategies lead to the reduced service execution efficiency.

In order to improve the reuse rate of services in the platform and the efficiency of platform execution, Firstly, this paper proposes a semantic coupling service partitioning strategy based on domain-driven design ideas. The strategy considers the characteristics of application functions in the micro-service platform and the principle of partitioning of microservices. Secondly, this paper proposes a fine-grained performance prediction model, which can accurately predict the execution time of each microservice. Then, based on the performance prediction model, this paper proposes a performance-aware service path selection strategy, which obtains the optimal service path by initializing the service selection path and dynamic adaptive update, this strategy improves the execution efficiency of the application. Finally, we conduct extensive performance experiment for verifying the service partitioning and selection strategy. The experimental results show that the performance prediction model designed in this paper can accurately predict the service execution time. The proposed method can effectively improve the reuse rate of platform services, reduce the execution time of services, and improve the execution efficiency of applications.

KEY WORDS**:** microservice architecture service partitioning semantic coupling service selection