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学术研究

基于服务更新的网构软件可靠性模型研究

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摘要 网构软件是在开放、动态和多变的Internet环境下软件系统基本形态的一种抽象。这种新的软件系统，它的构建依赖于开放环境中各异构、自治的软件服务实体之间的有效协同。其可靠性不单取决于拥有自主性的软件服务实体本身，还取决于外部环境的动态变化，主要表现为开放环境下服务实体元素的更新，所以传统的软件可靠性的度量模型已不能适应这种新的软件形态。能否在网构软件形态下建立一个好的可靠性度量模型成为其中一个较为核心的问题。文章以服务更新过程中失效数（failure counts）为基础，将服务更新强度引入Musa-Okumoto（M-O）模型中，作为M-O模型在新的软件形态下的一个推广。最后讨论了网构软件退化的情形和退化条件，为开放环境下网构软件可靠性研究提供一种思路。

关键词 网构软件 服务更新 可靠性模型 开放环境

分类号

Research on Internetware Reliability Measurement Model Based on Service Update

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Abstract

Internetware is an abstract of software system basic paradigm under an open， dynamic and ever-changing Internet environment. This new software system is architected on an effective collaboration of heterogeneous and autonomous software service entities under an open environment. Its reliability depends not only on autonomous software entity itself， but also on dynamic changes of outside， such as changes of service entity elements under an open environment. The current reliability measurement model for traditional software is no longer suitable for this new software paradigm. It becomes a more urgent issue whether a good reliability measurement model can be built under internetware software paradigm. A concept of failure counts during service update process is brought forward. Service update intensity is applied into Musa-Okumoto model， which is one of the most widely used software reliability models， therefore this model is expanded under new software paradigm. Finally internetware deterioration and its condition are also discussed.

Key words internetware service update reliability model open environment

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