Software Development SRE Needs

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Abstract

Today’s software development environment requires tools and techniques for accurate, efficient evaluation of product reliability. To be successful, SRE must address the common, yet complex issues facing companies when assessing their product’s reliability, such as the large number of customer usage scenarios, limited reliability evaluation times, and comparisons with competing products.

1. Introduction

Software development companies must build reliable software to satisfy their customer’s needs. The required reliability varies depending on the type and use of the software and the specific customer requirements; however, assuring that the software meets its reliability requirements is often critical to its success. Such an assessment can be difficult, especially when dealing with large software development projects, a large and varied customer base, and possibly frequent revisions/updates. SRE practices must address the needs of these large and dynamic software development environments, providing methods and tools that accurately assess the reliability of the software in a timely, efficient manner.

2. Business Needs for SRE

Today’s software development environment requires tools and techniques for the accurate, efficient evaluation of product reliability. Accuracy is required to assure customer satisfaction as reliability can be a key software differentiator. Accuracy depends on several important factors: addressing the variety of customer usage scenarios and reliability needs, assessing reliability prior to release with limited runtimes, and evaluating reliability against competing products. Efficiency is required to assure the work can be done within available time, resources and budget.

Developing a software operational profile is greatly complicated in the case of mass-market products where the number of customer usage scenarios can be very large, almost infinite. Methods for developing the right set of (canonical) operational profiles in this environment are critical to meeting customer’s reliability expectation.

A fast-changing development environment is another factor that one must take into account. Assessing software reliability prior to release is more complicated when there are frequent deployments. For example, web based software deployments can be just weeks apart. In large and complex development projects, the multiplicity of components and dependencies means that the software is in almost constant flux. To address these situations, SRE tools and techniques are needed to gauge the failure distribution of the software even though there is only time to experience just a portion of this distribution (the early failures) due to the short release cycles or constant changes/additions before deployment. Looking at only the early failures, gives a distorted view of the overall reliability.

Once reliability is established, assess the results against the product’s competitors. This provides information on areas for improvement, allows product customers to evaluate their options, and provides results for product marketing. SRE techniques for developing and assessing software against reliability benchmarks, as is done for performance, can be very valuable and serve as a standard.

3. SRE Requirements

Addressing the key software development business needs for reliability requires new, enhanced SRE methodologies and tools. These tools must address the issues outlined above and provide an ability to map results to expected levels of customer satisfaction. This requires going beyond a simple mean time to failure or availability metric to address the key characteristics customers associate with reliable products.