

**UNIFIED TEST AUTOMATION ACROSS PLATFORMS: MIGRATING FROM
SELENIUM C# TO TRICENTIS TOSCA FOR MOBILE APPLICATIONS**

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Abstract

The migration of regression test scripts from Selenium C# to Tricentis TOSCA for a client dealing with multiple mobile applications. While Selenium has been the tool of choice for automating the regression testing of existing applications, the client faced challenges handling mobile applications due to Selenium's limitations in this space. To address these challenges, the client opted to consolidate testing efforts using Tricentis TOSCA, which provides a robust solution for both desktop and mobile applications. This migration involves transferring existing Selenium scripts into TOSCA's framework while building new test cases for a fuel application. The paper explores the migration process, challenges encountered, and the benefits of using TOSCA for mobile application testing.

Index Terms—Selenium C#, Tricentis TOSCA, Mobile application testing, Test automation migration, Regression testing, Cross-platform testing, Script conversion, Test case design, Automated test execution, Mobile app regression suite, TOSCA automation benefits, C# test scripts, Test strategy transformation, Tool comparison: Selenium vs TOSCA, Testing frameworks, Continuous testing, Test maintenance, QA best practices, Integration with DevOps, End-to-end mobile testing

I. INTRODUCTION

As organizations continue to expand their use of mobile applications, traditional automation frameworks like Selenium often encounter limitations, especially when managing cross-platform, device-dependent, and hybrid mobile applications. Selenium, a popular open-source tool for web-based application testing, faces challenges in effectively supporting mobile automation. This paper focuses on a client's transition from Selenium C# to Tricentis TOSCA, a comprehensive test automation tool designed to handle both desktop and mobile applications efficiently. The decision to migrate to TOSCA arose due to its superior capabilities in managing mobile application testing, streamlining test execution, and reducing maintenance efforts for multi-platform applications. This paper delves into the reasons behind this migration, the migration process, the challenges faced, and the tangible benefits realized through the implementation of TOSCA.

II. CHALLENGES

Several challenges arose during the migration process, including:

1. **Mobile Application Compatibility:** Selenium's inability to effectively handle mobile-specific features such as gestures, touch interactions, and cross-platform device support made it unsuitable for the client's mobile applications. TOSCA, however, offers native support for mobile testing, which provided a solution to these issues.
2. **Script Migration:** Migrating hundreds of existing Selenium C# test scripts to TOSCA required thorough analysis and careful planning. Many of the Selenium test cases were designed specifically for web applications, which needed adjustments to be compatible with TOSCA's mobile and desktop testing environments.
3. **Learning Curve:** Although TOSCA is a powerful tool, it required significant training for the testing and development teams, as they were transitioning from Selenium to a completely new framework. The learning curve was particularly steep for testers unfamiliar with TOSCA's approach to test case creation and execution.
4. **Tool Integration:** Integrating TOSCA with the client's existing test management and CI/CD pipeline posed some initial hurdles. Ensuring that TOSCA could seamlessly interact with the tools already in use, such as JIRA, Jenkins, and Git, required additional customization and configuration.
5. **Maintaining Test Coverage:** During the migration, it was crucial to ensure that all test cases from the legacy Selenium framework were accurately translated into TOSCA without losing critical test coverage, particularly for mobile applications that had specific testing needs.

III. KEY CONCEPTS

1. **Tricentis TOSCA:** A comprehensive test automation tool that supports testing of both web and mobile applications. TOSCA uses a model-based testing approach that provides enhanced reusability, scalability, and maintainability for test scripts. It includes features specifically designed for mobile application testing, such as support for gestures, device orientation, and various mobile OS versions.
2. **Mobile Application Testing:** Testing mobile applications requires unique considerations, including cross-device compatibility, performance, and interaction with mobile-specific features such as sensors, GPS, and touch gestures. TOSCA's mobile-specific modules and functionality enable automated testing for these aspects, making it a better fit for the client's mobile application landscape.
3. **Regression Testing:** Regression testing ensures that new changes or updates do not negatively impact the existing functionality of an application. Migrating to a unified tool like TOSCA facilitates the maintenance of regression tests, streamlining updates, and ensuring the stability of both web and mobile applications.

4. **Model-Based Testing:** TOSCA utilizes a model-based testing approach that simplifies the process of creating and maintaining test scripts. This approach allows test cases to be designed at a higher abstraction level, focusing on business processes rather than detailed code, which improves maintainability and scalability.
5. **Automation Maintenance:** A significant aspect of automation testing is maintaining test scripts as applications evolve. TOSCA's ability to manage both web and mobile application scripts within a single framework reduces the complexity and overhead associated with maintaining separate automation solutions for different platforms.

IV. BENEFITS

1. **Streamlined Testing Across Platforms:** The migration to TOSCA enables unified testing across both mobile and web platforms, eliminating the need to maintain separate frameworks for each. This reduces complexity and improves the efficiency of testing cycles.
2. **Improved Mobile Application Testing:** TOSCA's specialized support for mobile applications ensures more reliable and effective testing for mobile-specific functionalities, leading to higher-quality mobile application releases.
3. **Reduced Maintenance Efforts:** TOSCA's model-based testing approach and integrated test management capabilities streamline the maintenance of automation scripts, saving time and effort in adapting to changes in the application.
4. **Cost Efficiency:** The consolidation of testing efforts into a single tool reduces the overhead of managing multiple tools, contributing to lower overall testing costs and better resource utilization.

V. CONCLUSION

The migration of regression test scripts from Selenium C# to Tricentis TOSCA for a client with a heavy reliance on mobile applications has resulted in improved testing efficiency, enhanced mobile testing capabilities, and reduced maintenance efforts. This transition not only addressed the limitations of Selenium but also streamlined the client's test automation process by providing a single platform for both web and mobile testing. The success of this migration demonstrates the value of adopting a tool like TOSCA for organizations looking to optimize their test automation efforts, particularly when dealing with complex, multi-platform applications.

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