

IoT Testing for Home Automation Solution

A comprehensive QE strategy to automate the regression suite for the client's IoT home automation solution (smart locks) to ensure superior quality, stability, and fast release cycles.

Overview

QBurst delivered a robust Test Automation Framework (QTAF) to manage the critical QE needs of a complex IoT solution.

- **Automation Coverage:** Automated the regression suite for web, mobile, API, and firmware components, covering areas difficult to test manually.
- **Cycle Reduction:** Automation reduced the overall testing cycle by 40% per release, accelerating time-to-market.
- **Cost Savings:** Achieved substantial cost reductions by utilizing open-source tools like Selenium and maximizing reusable test scripts.



Client

Our client is a leading consumer products company and a member of the Russell 1000 Index. They offer a broad portfolio of market-leading brands that include products such as home appliances, residential locksets, and builders' hardware.

Challenges

- **IoT Complexity:** The testing scope involved ensuring seamless interaction between individual mobile, web applications, and physical IoT devices (firmware and door locks).
- **Lengthy Test Cycle:** The large number of scenarios and the frequency of releases led to a large, time-consuming manual testing cycle.
- **Security and Performance:** Required rigorous auditing and testing to ensure critical non-functional requirements, such as security and performance of the IoT environment, were met before launch.
- **Redundancy and Cost:** Generating test scripts for multiple applications (web, mobile, API) and multi-language support led to redundancy and high labor costs.

QBurst Solution: IoT QE Automation

QBurst implemented a comprehensive QE strategy centered on manual-to-automation transition using the QBurst Test Automation Framework (QTAF). After finalizing wireframes and documentation in TestLink, we defined a strategy where automation was executed at regular intervals to analyze application stability.

Key Solution Components

- **Automation Testing:** Performed automation testing across all layers: web (Selenium), API (REST Assured), and mobile (Appium), speeding up release cycles.
- **QTAF Implementation:** Used the QBurst Test Automation Framework (QTAF) to generate reusable test scripts across applications, eliminating redundancy.
- **CI/CD Integration:** Test automation scripts were integrated with the CI/CD pipeline. When a new build occurred, a subset of test automation was executed, and the build was rejected if it did not satisfy the test criteria.
- **Test Strategy:** Designed various test sets for build verification, smoke testing, and regression testing, ensuring thorough coverage of functional and non-functional requirements.

Technical Highlights

The implementation utilized a robust, open-source automation framework:

- **Core Automation Tools:** Leveraged Appium (for mobile) and Selenium 3 (for web) as the primary automation tools.
- **API Testing:** Used REST Assured for API testing and Winium for desktop elements.
- **Framework Tools:** Built the framework using Java, TestNG, and Eclipse, ensuring enterprise-grade stability.
- **Reporting:** Generated informative automated reports at the end of test sprints, providing detailed results and error notifications.
- **Non-Functional Testing:** Used QTAF to conduct performance testing, assessing the application's capacity and scalability.

Impact: Driving Quality with Reduced Time and Cost

- **Cycle Time Reduction:** Automation reduced the overall testing cycle by 40% per release, accelerating time-to-market.
- **Cost Savings:** Saved considerable costs by utilizing Selenium, an open-source tool, and maximizing reusable automation test scripts for multi-language applications.
- **Superior Quality:** Automation covered areas that were difficult to test manually, reducing errors and ensuring superior quality and stability of products.
- **Faster Releases:** The integration of automation scripts with the CI/CD pipeline ensured that releases were passed to QA quickly for complete functional and non-functional testing.