



AUTONOMOUS TESTING ON SAUCE
LABS CONTINUOUS TESTING CLOUD

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1. Artificial Intelligence in Software Testing

There are lots of inefficiencies and waste in the way software is tested. Agile and DevOps coupled with value stream management eliminate waste and focus on business value. Businesses know they must test continuously, yet the complexity of the application landscape and the manual effort required to create automation, and the flakiness in the existing automation, make continuous testing impossible. Though the tools are available, continuous testing requires armies of SDETs to be a reality, a luxury enterprises can't afford.

AutonomIQ's vision is Artificial Intelligence (AI) agents, bots, and embedded capabilities in tools will become enabling technologies for software development, testing and release teams to manage this complexity. At AutonomIQ we believe that AI — in particular machine learning and predictive and deep learning — will slowly but surely encapsulate the entire software development life cycle, starting with testing and scaling far beyond.

We envision the initial impact of AI to optimize the software testing lifecycle, before disrupting other parts of the life-cycle. The three areas in which AI will disrupt the software testing lifecycle are as follows –

1. First, AI will synthesize vast amounts of natural language requirements and descriptions to automatically generate test cases
2. Secondly, AI will determine the right test scripts to be generated autonomously to ensure the application can be tested for the right test cases
3. Finally, AI will process all the changes that are going on across the application landscape, and autonomously keep all the software testing assets in sync with those changes

Our end state vision for AI in software testing is a world where, AI agents will automatically learn code and predict software bugs before they occur, and automatically heal them if they are missed in the prediction process.

2. Key Testing Challenges with Continuous Testing

Though Sauce Labs users have the ability to continuously execute Selenium scripts from Sauce Lab's Continuous Testing Cloud, they must ask themselves if they have the people and processes in place to make continuous testing a reality, and we believe those that do are few and far between. As the business demands faster release cycles and complexity in applications continues to increase, application owners have no means of keeping up with the demands placed on them. They can only test automation scripts as fast as they can create them – a process we believe to be extremely inefficient today.

Enterprises using Sauce Labs must overcome the following hurdles if they want to realize the true benefit of continuous testing:

- a. **The SDET Shortage** – As the world of testing shifts towards automation, enterprises are struggling to keep up with the pace of innovation. To achieve continuous testing, companies must have the expertise to develop automation scripts, yet they frequently must look beyond their traditional pool of manual testers to do so. Looking to Software Engineers in Test, or SDETS, requires companies to convince otherwise talented software engineers to focus on testing instead of development and often pay a premium to achieve this, especially as the demand for software engineers outpaces the supply.
- b. **The Manual Process of Creating Selenium Scripts.** Once companies source the right people to create automation scripts, they must overcome the limitations of SDETS- the time it takes to develop scripts. Automation engineers can spend 4-5 hours writing a single test case, or approximately 500 lines of code a day. Though this is an improvement over manual testing, it is nowhere close to the velocity the business demands. To identify all the test scenarios, creating the testing assets, and finally executing them consumes at least 30-40% of delivery time, and usually results in significant downtime and low coverage.
- c. **Manage testing through constant changes.** As applications change across the development lifecycle, managing change and updating automation to avoid flaky tests is a constant struggle. Sauce Labs users are hampered by changes coming from multiple surfaces – internal, APIs, SaaS integrations, cloud infrastructure changes, and on and on. The most elite enterprise dev and testing teams are severely challenged by the intensity and frequency of change management. Updating a single script could take an automation engineer 2 hours, and that’s assuming they know exactly where to look.

3. Need a New Approach to Make Continuous Testing a Reality

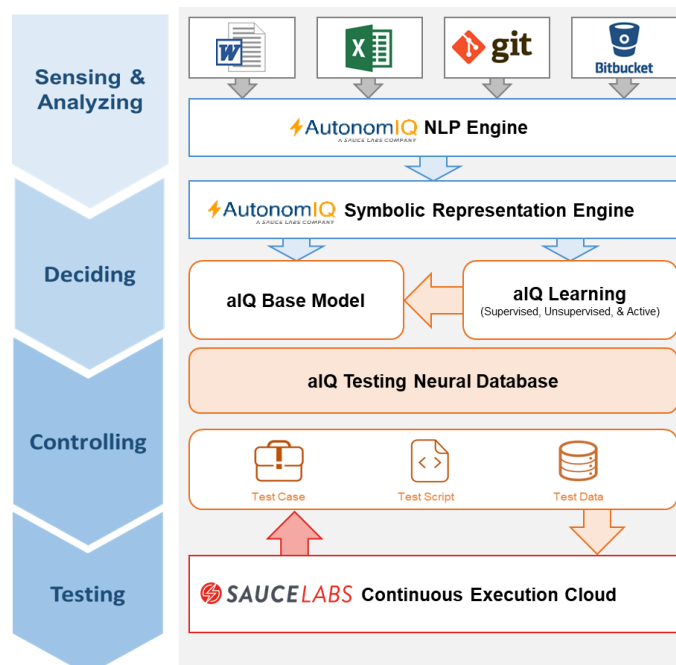
Current manual testing approaches and current test automation frameworks scalable aren't enough to achieve the benefits of the Sauce Labs Continuous Testing Cloud. Hiring SDETs and using modern CI/CD or DevOps approaches is only a partial solution because this just shifts many of the same software testing challenges to a different implementation and upgrade methodology. Teams constantly must battle testing process that isn't scalable, hard to maintain, and frequently unreliable.

Instead, teams need to solve the core problem – a reinvention of software testing to achieve the true benefits of continuous testing. We need software testing approach that can autonomously manage the testing lifecycle across complex business processes, by autonomously testing applications and continuously testing them through the development lifecycle of the project.

This new approach has to make software testing appear as if it were inherently integrated in to the implementation and upgrade cycle, span across silos, and instantly executed at scale and on-demand as soon as code commits occur. The approach must create and maintain all the automation needed for teams to continuously test.

4. Autonomous Testing On Sauce Labs Continuous Testing Cloud

AutonomIQ's Autonomous Testing Solution offers automation and agility at the click of a button so Sauce Labs users can get the full value from their Continuous Testing Cloud. Compared to current approaches to create automation scripts, the Autonomous Testing solution delivers unparalleled velocity, performs better, costs less to run and eliminates human error.



a. Autonomous Generation of Test Artifacts

AutonomIQ's Autonomous Testing Solution automatically generates all the test artifacts required for executing tests, including test scripts and test data, all without reworking existing artifacts. All the artifacts are generated at the time of code commit and integrated in to the Sauce Labs developer work-flow.

This reduces test analyst and test automation labor required to understand, validate, write, troubleshoot and tune the various testing artifacts and freeing testing resources to work on higher value tasks. Testers can spend their time focusing on testing new functionality and ensuring a seamless user experience, not recording test results to spreadsheets or writing scripts.

b. Autonomous Self-Healing of Test Artifacts

AutonomIQ's Autonomous Testing Solution autonomously maintains all test artifacts needed used in Sauce Labs implementations, eliminating the need to spend effort reworking automation each time a configuration changes and notifies user only if the test case fails.

The AI engine of AutonomIQ constantly gathers all the changes occurring in the application landscape for Sauce Labs environments and automatically modifies the right test artifacts required for executing tests., including test cases, scripts, and test data. All the artifacts are constantly synchronized with the changes occurring in the environment in real time, ensuring companies can spend their time building new services and not retesting working ones.

This reduces the amount of manual work and effort involved in detecting, correlating, analyzing and updating all the test artifacts and instead completes these tasks autonomously for you.

c. Sauce Labs Continuous Testing Cloud

The Sauce Labs Continuous Testing Cloud ensures that your websites and mobile apps work flawlessly on every browser, OS and device. It helps companies deliver flawless digital experiences to their customers by providing development and QA teams with instant access to the world's largest, instantly scalable cloud-based continuous testing platform - providing the coverage, scalability and analytics they need to deliver new features at the speed required to compete in the new economy

5. Conclusion – Leveling the Testing Playing Field for Truly Autonomous Testing

It is obvious that companies must continuously test their exponentially growing application landscape, all while managing the business's expectations and delivering value under budget. IT leaders face the imperative to transform their business through Artificial Intelligence, Machine Learning and do more with less.

AutonomIQ's Autonomous Testing Solution on Sauce Labs Continuous Testing Cloud is the only solution that enables enterprises leverage AI and machine learning in an effective manner to continuously test their applications while delivering value on time and under budget.

With Autonomous Testing from AutonomIQ, customers uniquely get the best domain specific Artificial intelligence algorithms and autonomous technology for software testing, all available out of the box and seamlessly integrated into Sauce Labs Continuous Testing Cloud. This combination provides the most intelligent, fastest, proven solution to allow the high velocity testing the business demands.