

THE ESSENTIAL GUIDE TO
**CONTINUOUS
TESTING**

saucelabs.com



CONTENTS

- 01 INTRODUCTION
- 02 WHY USER EXPERIENCE MATTERS
- 03 WHAT IS CONTINUOUS TESTING?
- 04 WHY SHOULD YOU CARE ABOUT CONTINUOUS TESTING?
- 05 6 BEST PRACTICES FOR SUCCESSFUL CONTINUOUS TESTING
- 06 MAKING CHANGE HAPPEN
- 07 SCALING UP YOUR TESTING IN THE CLOUD
- 08 CREATE A POSITIVE RIPPLE EFFECT WITH SAUCE LABS



01 INTRODUCTION

MAKE A REAL DIFFERENCE FOR YOUR USERS WITH CONTINUOUS TESTING

No matter the industry, every company is now in the business of developing applications and online experiences. To keep up with the competition, you need to stand out in all of the digital noise. For your app to succeed, it is critical that it delight your customers with a flawless experience, regardless of what device they use to access it. New features and updates need to be delivered quickly and frequently, but without compromising quality.

While development practices have dramatically changed to meet the high speed demands of today's digital economy, testing has often been left behind as an afterthought. However, this attitude is changing as organizations discover the power of positive experience, and the business impacts of negative reviews. Businesses of all sizes are moving towards Continuous Testing practices and as a result are seeing accelerated software delivery cycles, high quality digital experiences across all platforms, and most importantly happy and loyal customers.

To help your business make this transformation, we've created this essential guide to introduce you to the core concepts of Continuous Testing and how it can positively impact your bottom line.



02

WHY USER EXPERIENCE MATTERS

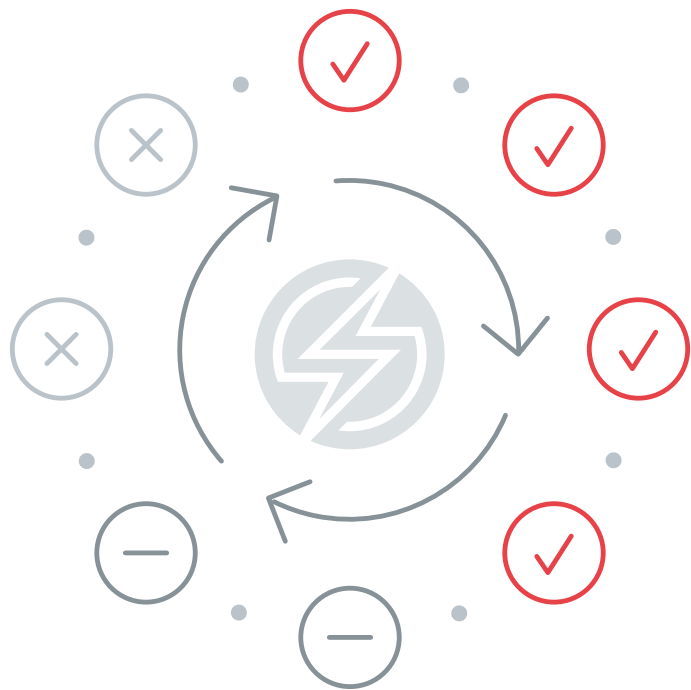
User experience is everything in today's always-on, connected world. That's why it's vital to ensure your applications are delivered quickly, available on every platform, and well tested.

Turn to the next page to discover why user experience matters, with real-life use cases we're sure you'll recognize.



CATCHING BUGS BEFORE IT'S TOO LATE

Let's say that you're about to launch a new product, app, or online service. The press release has been issued. Your customers are (hopefully) excited. Suddenly, during your final stage of QA and testing, a major glitch is identified. Much to the dismay of your leadership team, the bug delays your launch because it wasn't identified earlier in the development cycle. Ouch!



\$1,000,000

That's the revenue increase one major retailer saw over a comparable period, simply by adding one more browser/OS combination to their testing coverage.

KEEPING YOUR CUSTOMERS HAPPY

Perhaps you're in the middle of your company's busy season - maybe Black Friday or your January sale. It's all systems go. Then nothing. A bug or glitch in your app doesn't allow your customers to move to checkout, leaving them confused and frustrated with their buying experience. Want to know what they will do next? You guessed it; they'll abandon their shopping carts and go elsewhere. A failure to catch bugs before they deploy has directly affected your bottom line not just during this critical time, but in the months to come with the loss of loyal customers.

A SEAMLESS MOBILE EXPERIENCE

Like most of today's connected enterprises, your team has invested heavily in mobile and it's now a strategic imperative. But the mobile apps designed to delight your customers are being released with bugs because of the need to get to market quickly. Or you aren't able to keep up with the new features your competitors are releasing because you're still ironing out glitches that are found late in your development cycle. And don't forget there's the added pressure of ensuring that your app works across the wide range of devices your customers are using.

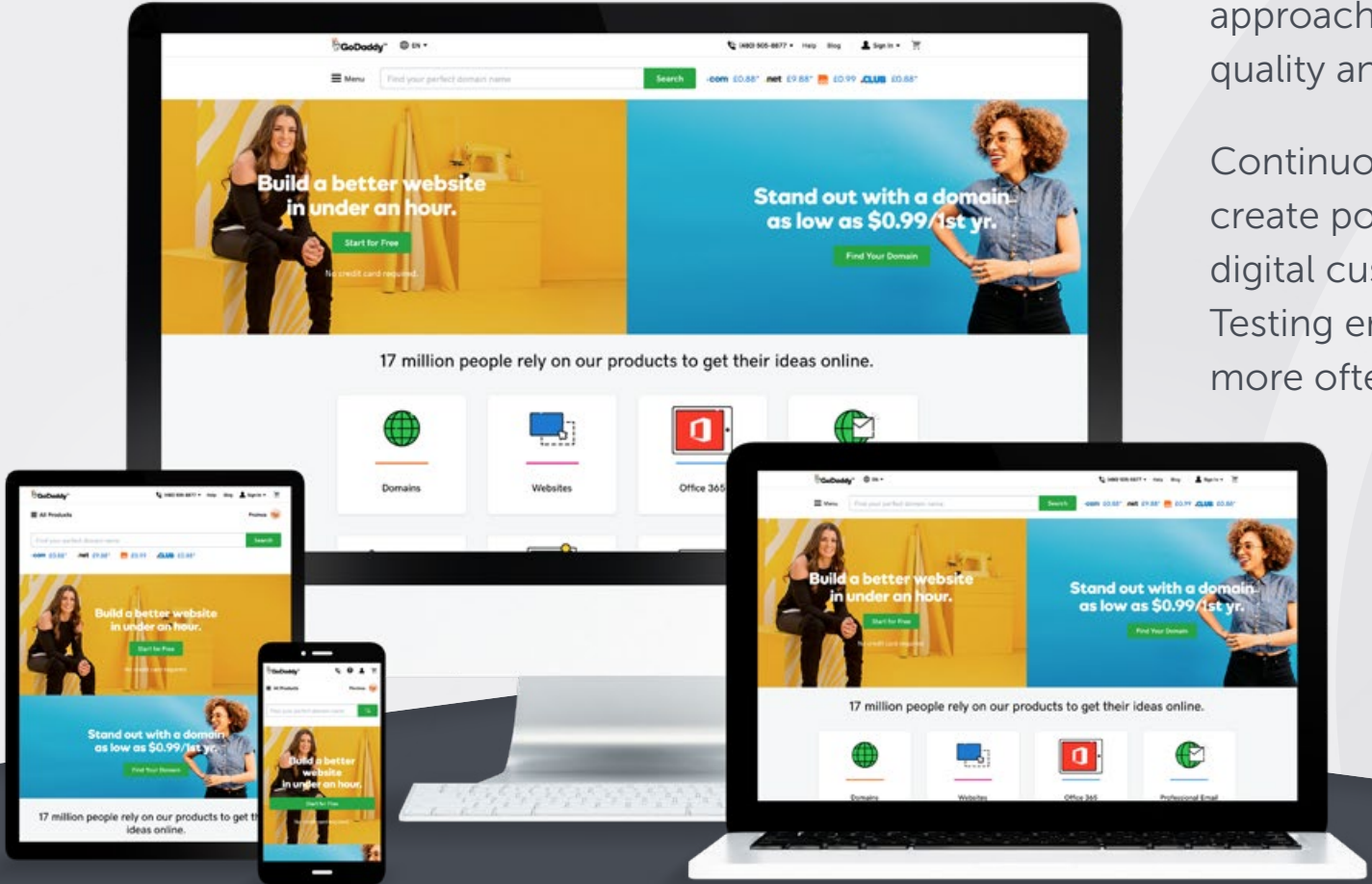


As we learned on the previous page, leaving your testing late in the development cycle can hit your business hard. That’s because it makes a big impact on the customer experience, and today’s consumers are incredibly fickle.

They’re not interested in waiting for a promised new app or service. They expect a seamless mobile or web experience. And they won’t tolerate an app that doesn’t live up to expectations, especially when your competitors are waiting in the wings to scoop them up.

With social media ensuring any failure goes viral in seconds, can you afford to ignore a testing approach that matches your need for velocity, quality and scalability?

Continuous Testing offers you the opportunity to create positive ripples that radiate out across your digital customer experience. How? With Continuous Testing ensuring your business tests earlier, more often and more thoroughly you’ll give your customers a seamless digital experience – turning them into loyal users and ambassadors for your brand.



Quality Counts

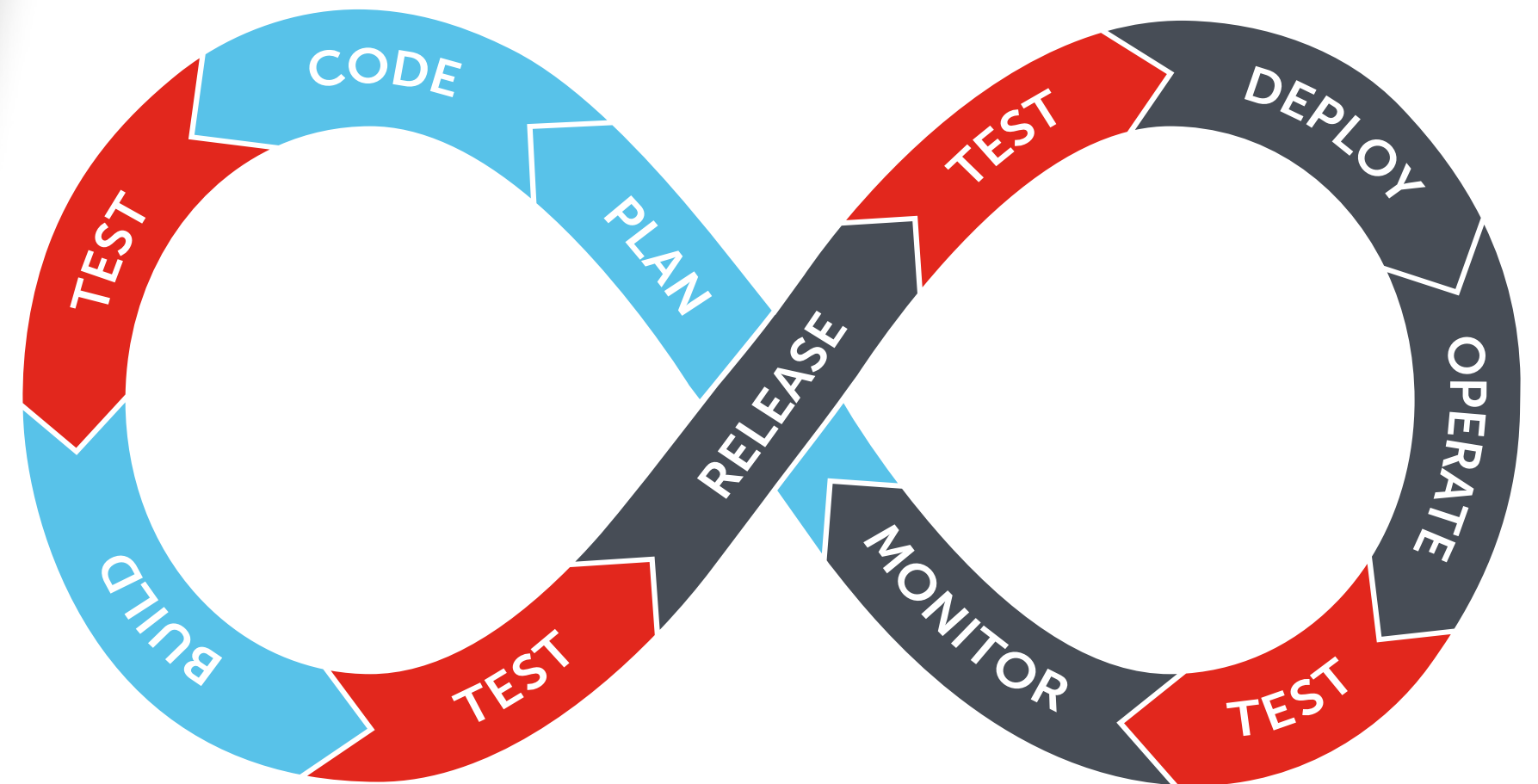
An app with a rating of **4.5 stars** in an app store will be downloaded, on average, **3.7x** more than an app with **3.5 stars**.



03

WHAT IS CONTINUOUS TESTING?

Continuous Testing is a best practice approach for automated testing that allows you to deliver quality software faster without compromising quality. By allowing you to test your apps at high speed and throughout the software lifecycle, Continuous Testing can help you avoid bottlenecks in your development process, all while keeping your users happy with flawless digital experiences.



UNDERSTANDING CONTINUOUS TESTING

You are responsible for creating digital experiences that drive growth for your business. As your organization strives to deliver apps that delight your customers, it is key to equip your teams with the practices and tools that will enable them to deliver quality software, more quickly.

As you create the optimum development and test environment to achieve this, there's a crucial ingredient to add to the mix – Continuous Testing. It's the secret sauce in today's development and QA pantry.

Continuous Testing transforms the way teams develop and deliver applications. It shifts testing from its traditional silo at the end of the development process, to involve developers who create the code, as well as QA teams at every stage of the software development lifecycle.

Automated testing allows teams to focus on what truly matters: building and releasing no-fail digital experiences as quickly and as efficiently as possible. **Continuous Testing** takes your automated testing practice to the next level, shifting QA to the left and establishing quality gates from start to finish in the software development cycle.

HOW DOES CONTINUOUS TESTING WORK?

With Continuous Testing, automated tests are performed throughout the software development cycle. It's more than just automated testing though: it's a best practice approach that applies the right level of automation at each stage in the development process.

So, while traditional legacy methods perform tests at the end of the development cycle, Continuous Testing occurs at multiple stages, including development, integration, pre-release, and in production. This results in more bugs caught earlier in the development pipeline, allowing your teams to improve quality without wasting time and money on fixing them later in the app's lifecycle.

Testing in this way ensures that bugs are caught and fixed far earlier in the development process, improving overall quality, while saving significant time and money.



04

WHY SHOULD YOU CARE ABOUT CONTINUOUS TESTING?

The disruptive power of digital in today's consumer-centric world has led to heightened customer expectations that Continuous Testing enables you to meet.



Digital experience is the new battleground for driving business growth. Customers increasingly expect to engage online, and over 50% of them are driving traffic directly from their mobile devices (Digital in 2017: Global Review).

As your business adapts to this demand for more ways to engage digitally, the importance of Continuous Testing as a strategic enabler is clear.

At the same time, the rise of cloud-native companies has created a new breed of nimble, fast-to-market competitors. This is driving interest in automated testing – and the best practice approach of Continuous Testing will ensure you'll become the guardian of a differentiating customer experience.

Continuous Testing keeps your business alive. It is the assurance of quality across all your digital customer touchpoints. And if digital experience is the heartbeat of your organization, Continuous Testing is its lifeblood.

By 2020 customer experience will overtake price and product as the key brand differentiator.

Customers 2020: A Progress Report (Walker)



WHY DO TESTERS CARE?

You're a test or quality engineer, and you're responsible for ensuring the code underpinning your organization's web and mobile apps is ready for your customers.

Continuous Testing meets your need for speed - you'll deliver releases faster and more reliably than ever. It ensures that testing fits seamlessly into your CI/CD pipeline and allows you to accelerate the development process without having to manage cumbersome infrastructure.

WHY DO DEVELOPERS CARE?

You're a developer with responsibility for the code that powers your organization's revenue generating websites and mobile apps. You are intent on improving current features and creating new ones to differentiate the business.

With Continuous Testing, you will deliver quality code within today's accelerated development cycles without the fear of breaking the build if a new feature doesn't work. Plus, with on demand test infrastructure built into your pipeline, you will have access to every environment to test against, without having to queue or wait to procure new devices whenever there's an update.



47%

of CEOs are experiencing pressure from the board of directors to make progress in digital.

Gartner 2017 CEO Survey: CIOs Must Scale Up Digital Business

WHY DO QA MANAGERS CARE?

QA Managers - you're a software QA manager or director of software quality. You're concerned with enabling your team to test more broadly without slowing down the development process. You're looking to switch to more modern testing methods, such as automation to support Agile.

Continuous Testing expedites test times to accelerate software development and release cycles, while maintaining quality, and without taking your resources away from building any infrastructure to test against.

WHY DO BUSINESS LEADERS CARE?

You're a business executive, or product owner/head of product in charge of digital experience to support business strategy. You're already championing a move from traditional waterfall development methods to Agile, including Continuous Integration or Continuous Delivery to remain competitive.

Continuous Testing is your opportunity to add significant value to the business with a shorter runway to every release and update, and assured application quality.



59%

of 25-34-year-olds
share poor customer
experiences online.

New Voice Media

05

6 BEST PRACTICES FOR SUCCESSFUL CONTINUOUS TESTING

We have identified six best practices for Successful Continuous Testing. We like to think of them as the essential ingredients for delivering quality digital experience at high velocity.



1

CULTURAL COMMITMENT TO QUALITY

Continuous Testing succeeds when everyone owns quality. No longer operating in their own siloes, developers and test automation architects must work together to ensure that the code is optimized for test automation.

Replacing traditional legacy testing methods with Continuous Testing best practices is a significant cultural shift. In fact, moving to a pipeline that constantly delivers high-quality, well-tested software is far more of a cultural and process change than a technical one – although, of course, there will be significant changes to technical practices.

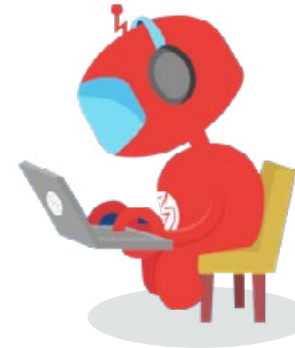
Non-technical roles, such as stakeholders, product owners, and users, must adjust their work habits and mindsets. New processes will have to be learned and accepted ([see page 18](#)).

2

TESTING AT EVERY STAGE OF THE DEVELOPMENT CYCLE

Testing early and often enables you to catch bugs sooner in the development cycle when it is much less expensive than fixing that same bug in production.

Use testing as a gate to each step of the process so that the code continues to operate as designed when new changes are introduced.



3

USING BEST-IN-BREED TOOLS TO BUILD OUT AUTOMATION

Leverage intelligent frameworks to write automated test scripts as part of the development process.

While manual testing still serves an important purpose (intelligent, creative exploratory and usability testing), it doesn't scale like automated testing, which provides accurate repetitive, parallel checks of expected behavior.

Open source tools, such as Selenium and Appium, enable you to scale your testing for web and mobile respectively.

4

TEST EXECUTION PLATFORM THAT PROVIDES YOU WITH COMPREHENSIVE COVERAGE

The broader your test execution platform, the better the customer experience. Ensure your digital experiences work for all your users with a test execution platform that includes virtually any combination of browser, OS and device.

Development and QA teams gain the coverage and flexibility they need to deliver a flawless user experience, and the ability to reproduce bugs in almost any environment as users report issues.

5

ABILITY TO SCALE UP AND DOWN YOUR TEST INFRASTRUCTURE INSTANTLY AS NEEDED

Scalability is critical, both for responding to seasonal peaks and as your team begins to automate more tests at multiple stages in the development cycle.

Implement parallel testing across various environments, rather than in serial order, and adopt a test execution platform that can scale seamlessly while staying up to date as new releases and devices come out.



6

VISIBILITY AND ANALYTICS

To know where you're going, you must be able to see where you've been. Analytics are critical to understanding how tests are performing and quickly identifying bottlenecks and quality issues.

Give your teams real-time visibility into coverage, test run times, failures and efficiency, so they can identify trends and make changes to code or practices to increase quality and speed releases.

By2020, DevOps initiatives will cause **50% of enterprises to implement continuous testing** using frameworks and open-source tools.

Gartner

06

MAKING CHANGE HAPPEN

Organizations will need to adjust their delivery processes and move away from traditional operating siloes to provide your customers with quality digital experiences faster with Continuous Testing.



THE SUCCESSFUL ADOPTION OF CONTINUOUS TESTING DEMANDS CHANGES IN PROCESS AND APPROACH

- ① Moving testing from one team to multiple teams. Continuous Testing succeeds when everyone owns quality. By enabling teams across your organization with training in testing best practices, along with access to the tools that let them execute those tests, you will see an improvement in coverage and, as a result, application quality. It is also important to keep in mind that as you increase the number of teams who are responsible for testing, you will need visibility into what their test coverage and results looks like so as to ensure your apps are up to standard.
- ② Transitioning from a few long tests to many short tests that run more frequently. Legacy testing methods often consist of just a handful of tests that were long and ran infrequently. But for Continuous Testing to work, teams will have to do the opposite – many short tests that run all of the time. To accomplish this, automation is critical, along with running tests in parallel. This allows for your tests to keep up with accelerated development practices.
- ③ Expanding test coverage from a few environments to hundreds of OS/Browser/device combinations. In the past, successful applications only worked in one or two environments, and had a lot of backend code. But today's apps have more front end code, and must be compatible with all of the environments your users could be running. It is critical that your teams have the strategy and infrastructure in place to perform these UI and functional tests across a comprehensive set of browsers, operating systems, and mobile devices.



07 SCALING UP YOUR TESTING IN THE CLOUD

Cloud-based Continuous Testing offers all the benefits you've come to expect of cloud services, including the ability to scale up and down as needed, to test continuously without having to look after infrastructure, and to stay up-to-date with no need to apply updates or perform maintenance.



WHY TEST IN THE CLOUD?

When you apply Continuous Testing in the cloud, you will:



DELIVER APPS FASTER

Always-on Continuous Testing enables your teams to develop, test and release faster, without compromising quality.



IMPROVE QUALITY

Instant access to every browser, operating system and mobile device ensures your app will work flawlessly for all your users.



IMPROVE EFFICIENCY

Test more frequently, test faster and get more reliable test results – all without the headache and costs of maintaining your own internal test grid or device lab.



POWER YOUR MOBILE STRATEGY

Continuous Testing in the cloud gives you the scale and access you need to test mobile applications on any device, from anywhere, ensuring a great mobile customer experience.



MEET CUSTOMER DEMANDS

In today's always-on, always connected world, the ability to get new apps into the hands of your customers ahead of your competition is a vital differentiator – but only if they are bug-free.

08

CREATE A POSITIVE RIPPLE EFFECT WITH SAUCE LABS

The Sauce Labs Continuous Testing Cloud ensures that your websites and mobile apps work flawlessly on every browser, operating system, and device. Our award-winning platform gives you the coverage, scalability and analytics your teams need to deliver quality software, faster.

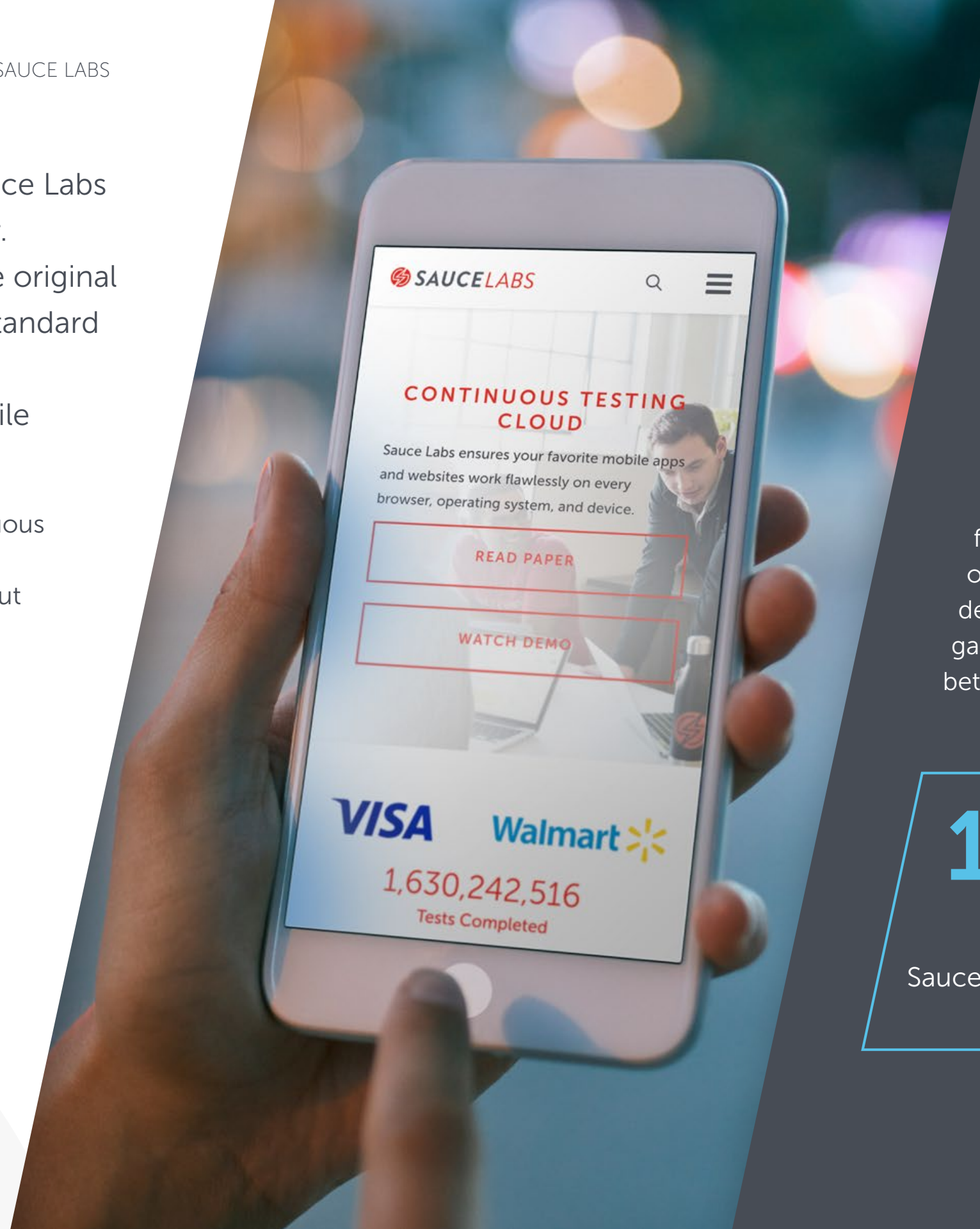


In the world of Continuous Testing, Sauce Labs is both a pioneer and an industry leader. Our co-founder Jason Huggins was the original creator of Selenium, the open source standard for automated web testing. Sauce Labs also leads the Appium project, the mobile equivalent of Selenium.

We're the creator of the world's largest Continuous Testing Cloud for web and mobile applications. But we don't rest on our laurels and dream about past successes.

We're still innovating as we find new ways to help our customers accelerate software development cycles and improve application quality. We enable them to deploy with confidence across hundreds of browser/OS platforms, including Windows, Linux, iOS, Android and Mac OS, on our virtual machines and emulators/simulators, as well as on real physical devices.

We have the experience, support and services you need to transform your world with Continuous Testing.



We've optimized our platform for Continuous Integration, Continuous Delivery and DevOps, and we've built it to meet the most stringent security requirements.

That's not all – we also like to share the sauce in our bottle. That's why we support the continued success of open source tools by providing our service for free for these projects. By helping the open source community we are enabling developers and testers around the world to gain access to the tools they need to create better digital experiences for their users.

1.5 Billion +

That's how many tests have run on the Sauce Labs Continuous Testing cloud to date.

WE GO FURTHER, WE RUN FASTER, AND WE ACHIEVE MORE FOR OUR CUSTOMERS

Here's what cloud-based Continuous Testing of web and mobile applications with Sauce Labs looks like:



CONTINUOUS TESTING CLOUD

Easily scale to speed up test cycles and boost capacity without the hassle of managing your own infrastructure. Run tests in parallel to accelerate your development process.



CROSS BROWSER TESTING

Manual and automated testing on multiple OS/browser combinations instantly available in the cloud. We are fast to market with beta and new browser versions, so you can ensure your apps work as designed on release.



MOBILE TESTING

Test your mobile apps across iOS and Android real devices, emulators and simulators on our public cloud, or on dedicated devices in a private cloud. Run automated tests to accelerate your releases and perform manual spot checking to isolate issues quickly. Access hundreds of different devices without the hassles of procurement or maintenance.



LIVE TESTING

Access a live remote session on desktop and mobile devices. Manually take control of a virtual browser, mobile emulator or simulator, or a real physical device, for example if you need to clear a popup that's blocking your test, or 'breakpoint' the test to stop automation and diagnose issues.



TEST SECURELY

Each VM is destroyed after every run, giving you assurance that your data is never exposed to future test sessions. Mobile devices are cleaned between tests and, for ultimate mobile security, you can test in a private cloud. Our secure tunnelling technology Sauce Connect™ Proxy gives you a firewall behind which to test staged apps.



"Being able to run our tests in parallel on Sauce Labs across all of our browsers means that we can just push our code out with way more confidence than if we were to push it out without those tests in place."

Brian Jordan, Software Engineer, Code.org

MAKE YOUR RIPPLE EFFECT A GOOD ONE

Continuous Testing is an essential resource for helping businesses remain competitive and innovative.

By implementing Continuous Testing practices with Sauce Labs, you can delight your customers by releasing new features at the speed of awesome.

Isn't it time you led the transformation of your business with Sauce Labs?

Find out how you can test your world with our free trial.



saucelabs.com