WHITE PAPER

TESTING TRENDS IN 2015: A SURVEY OF SOFTWARE PROFESSIONALS

Today's online environments have created a dramatic new set of challenges for the software professionals responsible for the quality of web and mobile applications. As these applications are accessed on growing numbers of different device and browser types, development teams must find ways to identify and fix a huge range of environment-specific issues. How are development teams balancing complex user environments with limited testing resources? Are teams adopting new testing technologies like cloud-based services and simulated environments? Have modern development approaches made a difference?

The following report, sponsored by Sauce Labs, is based on a survey of 504 technology professionals responsible for the quality of web and mobile applications. The goal of the survey, conducted in January 2015, was to understand current trends in testing online environments.

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EXECUTIVE SUMMARY

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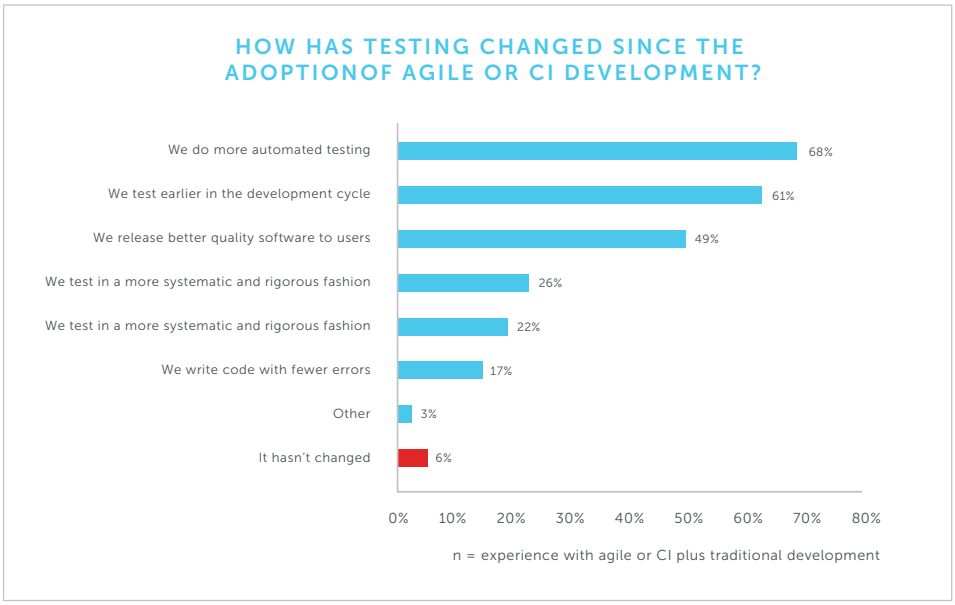
  - 94% say adopting CI or other agile methodologies have changed the way they test
  - 69% do more automated testing
  - 61% test earlier in the development cycle
  - CI and agile development teams do more of all types of testing – with the exception of manual testing
- Mobile testing creates unique challenges
  - Mobile testing embraces both web applications used in mobile browsers (89%) as well as native or hybrid
  - No standard approach for testing diverse mobile environments
    - › 29% use only simulators or emulators
    - › 37% use only real devices
    - › 34% use a combination of simulators and real devices
- Cross browser testing remains vital
  - 80% say cross browser testing is "very important"
  - 43% test only the most recent version of each browser
  - 76% do cross browser testing across mobile and desktop browsers
  - 79% say testing more types or versions of browsers would increase quality
- Other trends impacting testing
  - 43% run unit or functional tests for web and mobile in the cloud
  - Only 45% have fully ended support for Windows XP

DETAILED FINDINGS: MODERN DEVELOPMENT APPROACHES

Modern development approaches have changed testing

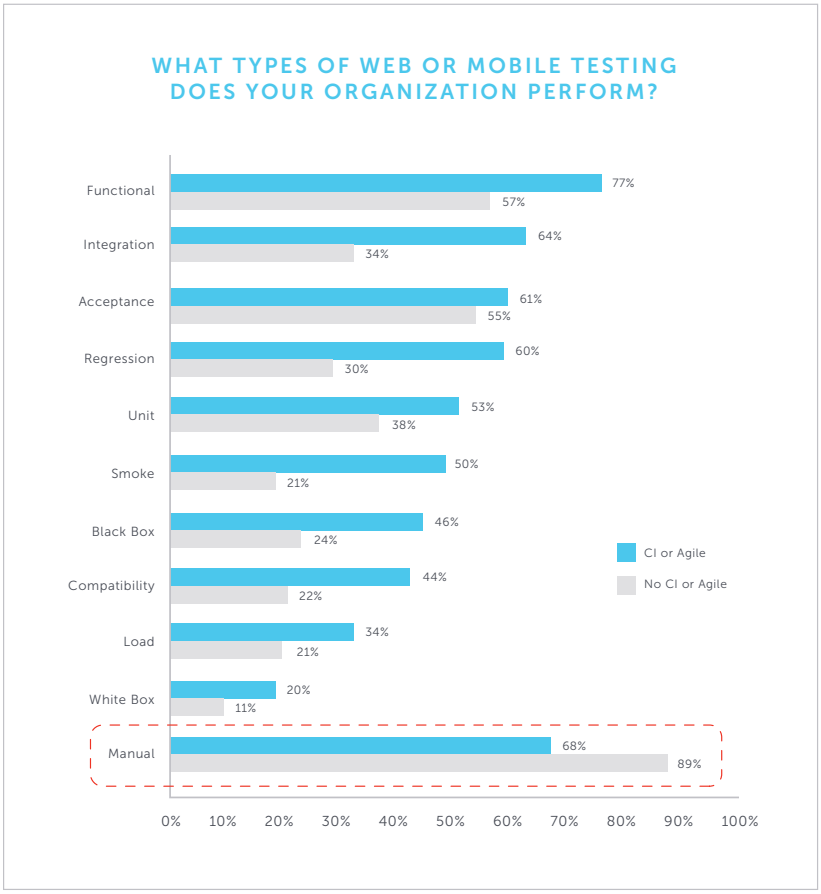
Testing has been a key focus area for modern agile development approaches such as Continuous Integration (CI). To understand the real-life impact, we asked survey participants with experience in both modern and traditional development to compare their experiences and tell us if testing had changed. The overwhelming majority, 94%, reported that testing was different in agile and CI environments, with the main differences being an increase in the level of automated testing (69%), and testing earlier in the development cycle (61%).

However, there is clearly still work to be done. Almost half (49%) say they release better quality software to users, which while a good number, certainly has room for improvement. Few participants reported changes in more fundamental development processes. Only 17% reported that their teams were writing code with fewer errors. And while a commonly vaunted benefit of modern development approaches is the ability to prototype and get user feedback faster, only 22% reported this result.

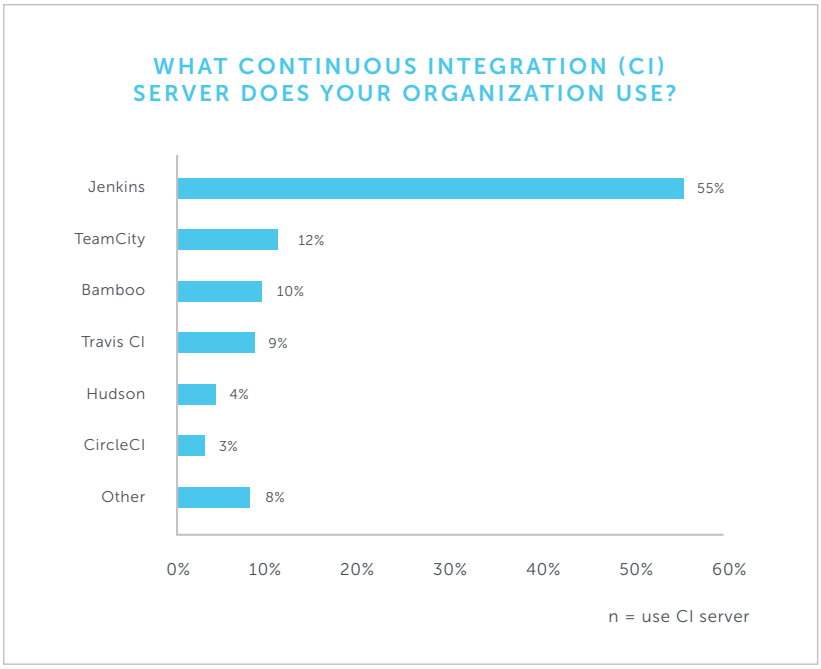


To understand further the impact of modern development approaches, we compared the way different groups of participants answered questions. Interestingly, when asked what types of testing was done, those who had adopted agile or CI reported doing more of almost every kind of testing. The biggest differences were in integration testing (64% compared to 34%), regression testing (60% compared to 30%) and smoke testing (50% vs 21%).

The only exception to CI and agile doing more testing was manual testing. More of those using traditional development approaches did manual testing (89%) compared to those employing agile or CI (68%).



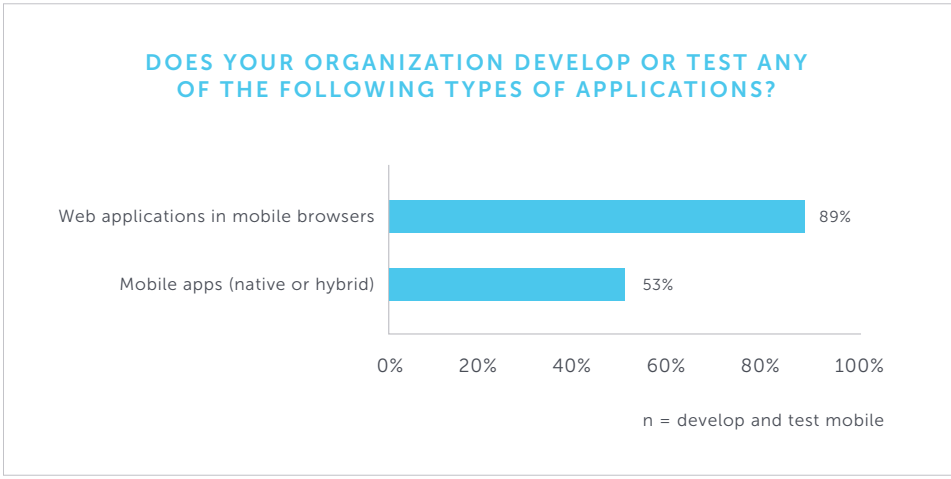
Out of curiosity, we did ask those who had adopted CI what server they used. Participants who had adopted CI reported use of a CI server (81%). Among those, Jenkins was the clear leader with more than half (55%) reporting use.



DETAILED FINDINGS: MOBILE TESTING

Web applications and native apps both tested on mobile

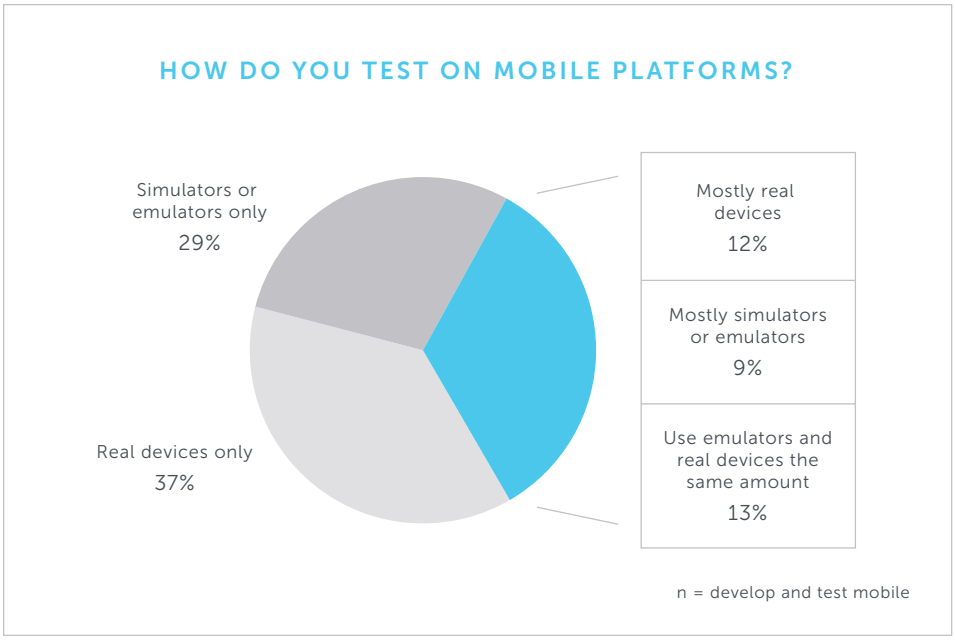
In many discussions of mobile testing, the focus is on native apps. Testing native apps has a slight advantage as the apps are usually delivered through app stores and at least the operating system of the user environment is known. However, the actual testing being done on mobile is not exclusive to the apps built specifically for iPhones, iPads, or Android. Many |development teams that are testing in mobile environments are testing standard web applications being used in mobile environments.



No standard approach is used to test mobile platforms

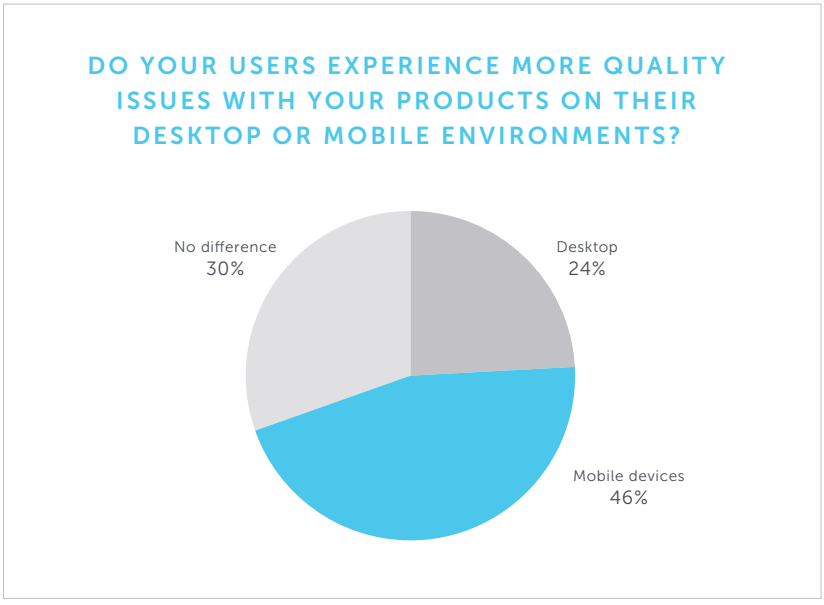
One approach to test across the range of device environments without requiring development teams to purchase a wide number of devices and physically test each of them is to use an emulator. These simulators and emulators are definitely in use, but they are still not the norm.

In our survey, we found a fairly even split between those who use only simulators or emulators for mobile testing (29%), those who used only real mobile devices (37%), and those who use a combination of both approaches. Within the group who used a combination, we found another fairly even split between those who use mostly real devices (12%), those who use mostly simulators (9%), and those who used each a similar amount (13%).
No approach can be described as the standard for mobile testing.



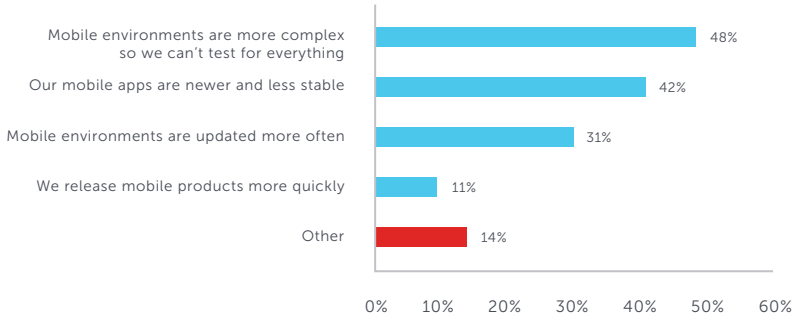
Mobile environments have more issues

Among survey participants who indicated they tested both web and mobile, we asked which environment had more quality issues. The most common answer was mobile (46%) with only 24% saying desktop was more problematic for users.



We asked the users who reported mobile devices as being more problematic why that was. The most common response was the complexity of mobile environments (48%) followed by the explanation that mobile is newer and therefore less stable (42%). The participants who took the time to write in "Other" answers cited higher user expectations and lack of devices for testing as other issues impacting mobile quality.

WHY ARE CUSTOMERS MORE LIKELY TO REPORT BUGS IN A MOBILE ENVIRONMENT?



n = develop and test both web and mobile, users have more issues on mobile

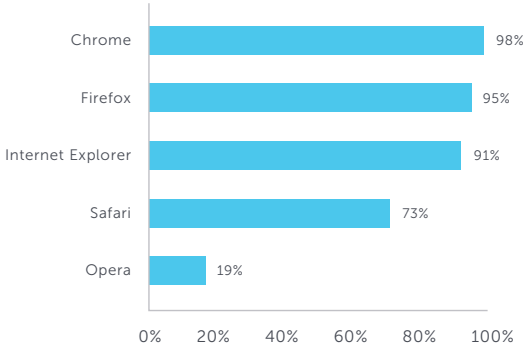
DETAILED FINDINGS: CROSS BROWSER TESTING

Complex browser environments continue to be a challenge

The browser landscape has changed dramatically over the past few years. Chrome has taken the lead and Safari use has increased. At the same time Internet Explorer and Firefox have both declined in percentage of users. What has not changed is the challenges this varied browser environment creates for delivering quality software.

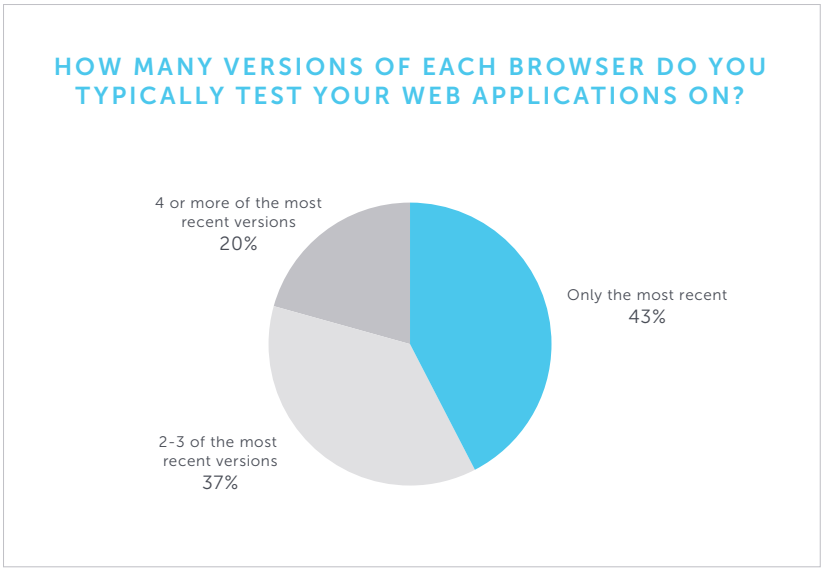
The wide range of browsers in which an end user can access an application, each with their own possible problems, has been the bane of development teams as long as there have been web applications. This is certainly not getting easier with time. Over 90% of participants report testing on each of the "Big 3" web browsers – Chrome, Firefox, and Internet Explorer – with Safari coming a close fourth being tested by 73% of web application teams.

WHAT TYPES OF BROWSERS DO YOU TEST YOUR WEB APPLICATIONS ON?



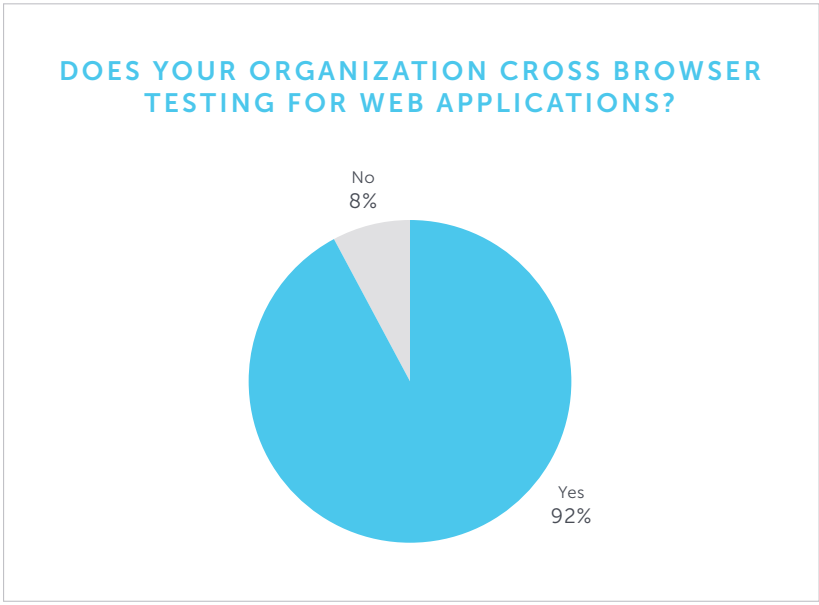
n = develop and test web applications

Of course the problem doesn't end by testing 3 or 4 browser types. Each of these browsers has many versions actively in use, and testing strategies must balance coverage of all environments with available testing resources. Unfortunately, many web teams (43%) are only able to test the most recent versions of each browser. Only a few (20%) are able to do the difficult task of testing 4 or more versions of each browser.



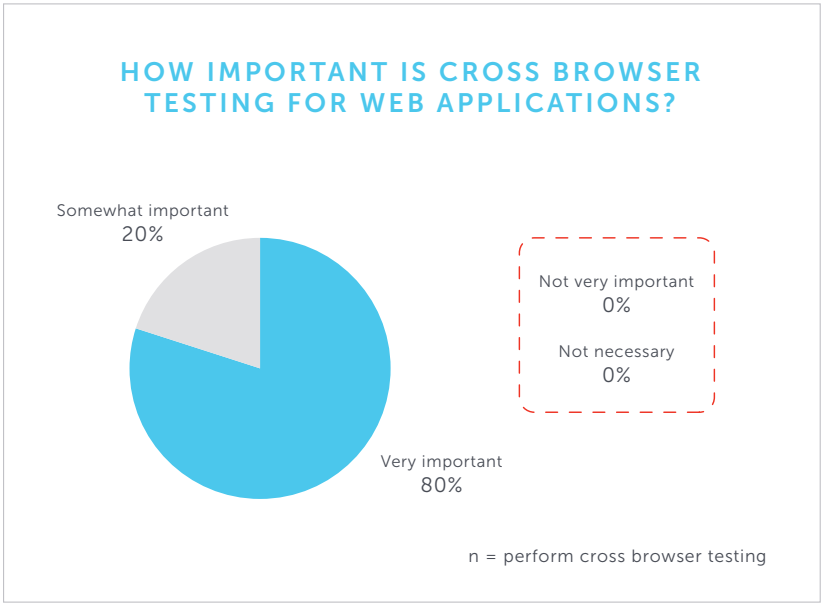
Cross browser testing remains vital to quality web applications

With this range of browser types and versions, it is not surprising that cross browser testing remains the norm. The vast majority of software teams (92%) do cross browser testing for their web applications.



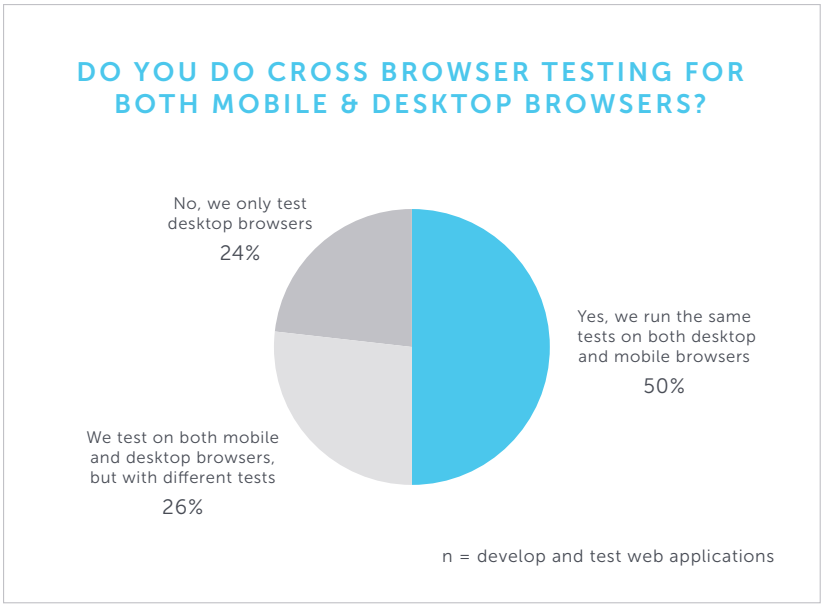
This testing effort is vital. Most development teams, 80%, describe their cross browser testing as "very important". All of the remaining 20% say cross

browser testing is "somewhat important." Amazingly, among our hundreds of survey participants, none described their cross browser testing as "not necessary" or even "not very important!



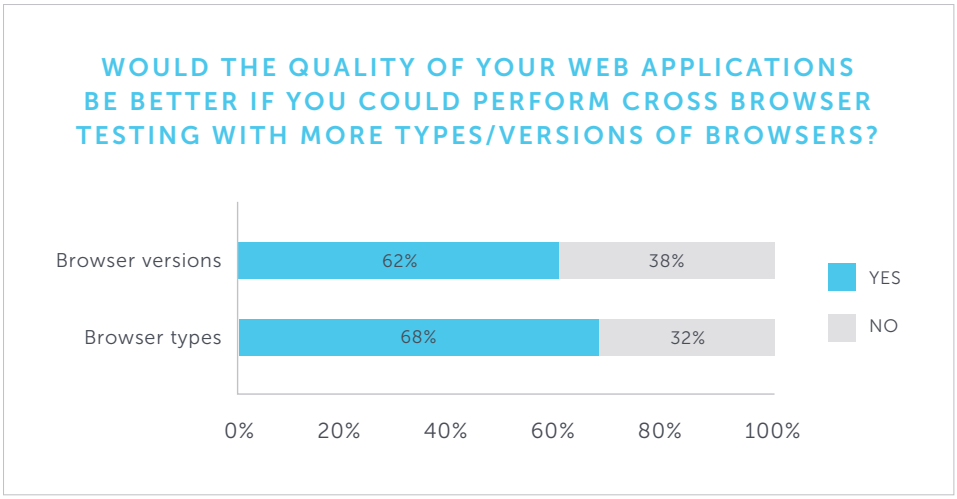
Cross browser testing also done across device types

One of the most fascinating changes to cross browser testing in recent years is the wide range of devices on which any web application can be accessed. Even if developers don't deliver a mobile-specific version of their web application, it does not stop users with tablets or smartphones from trying to use them. As a result, most development teams (76%) report that they test their web applications on both mobile and desktop browsers. Fortunately, half of participants (50%) are able to leverage their testing efforts and use the same tests that they have developed for desktop browsers for mobile environments.



More cross browser testing would increase quality

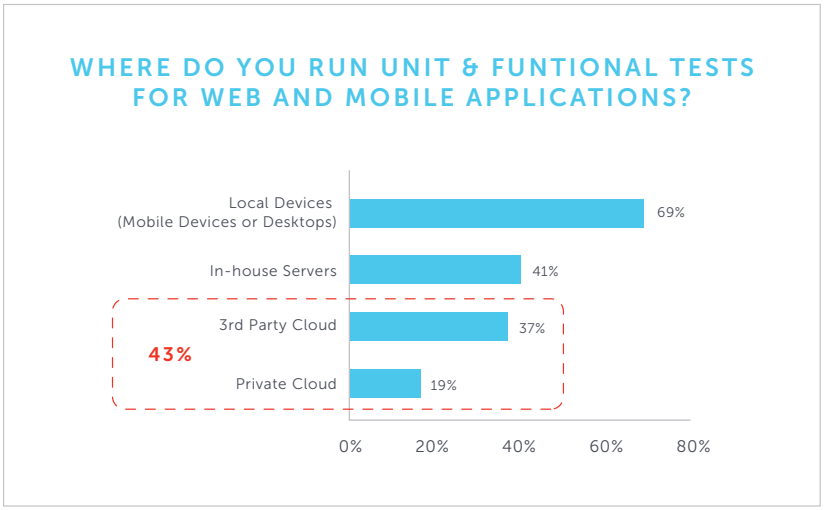
Development and testing professionals recognize that the complexity of online environments impacts quality. They understand that the more types and versions of browsers they can test, the higher quality web applications they can deliver to their users. Most participants (62%) say testing more browser versions would increase quality. In addition, most participants (68%) agree that testing more browser types would increase quality. When combined, 79% say that more cross browser testing – of either more browser versions or browser types – would increase web application quality.



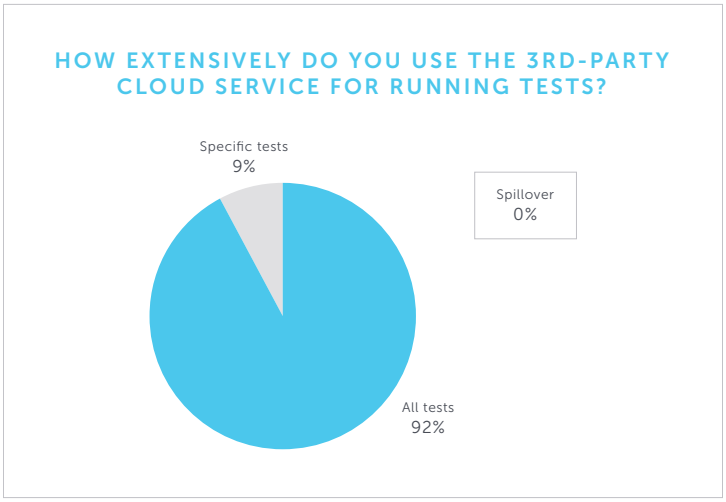
DETAILED FINDINGS: CLOUD, XP, AND MORE

Cloud testing gains traction

Cloud has impacted every area of technology, and testing is no exception. Web and mobile testers have embraced cloud. Close to half (43%) now run unit and functional tests for their web and mobile applications in the cloud. This includes 3rd-party cloud (37%) or private cloud (19%), and in a few cases both.

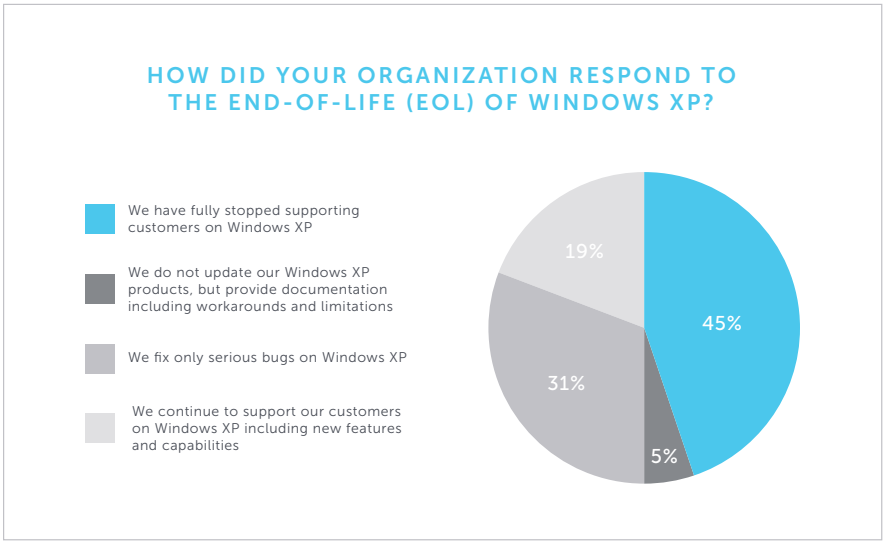


Once cloud is embraced, it is typically used to run all tests (91%). Only a few (9%) reported using 3rd-party cloud for running just a few, specific types of tests. Interestingly, the often cited strategy of using cloud to increase capacity only when needed is not happening with web and mobile testing. None of our survey participants indicated that they used 3rd-party clouds for spillover testing.

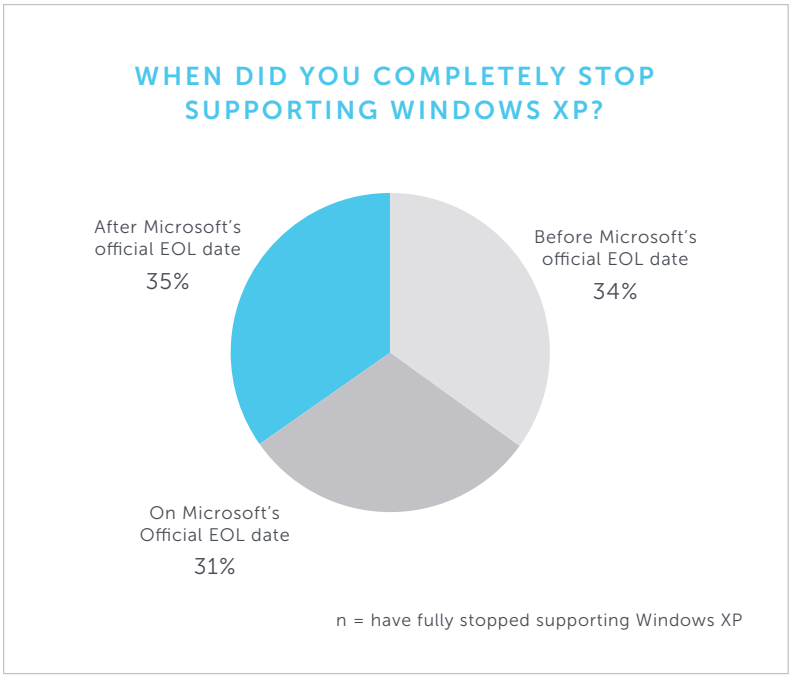


Windows XP still haunting many development teams

The end-of-life of Windows XP took a long time to come, but on April 8th, 2014, Microsoft officially stopped supporting the operating system 12 years after its initial release. However, even with significant lead times and serious implications for continuing to use Windows XP, many development teams still have to contend with this operating system. Among development teams that have ever supported Windows XP, less than half (45%) have been able to completely walk away from the operating system and have fully stopped supporting customers. Surprisingly, a non-trivial number of development teams (19%) continue to deliver new features and capabilities for this old operating system!

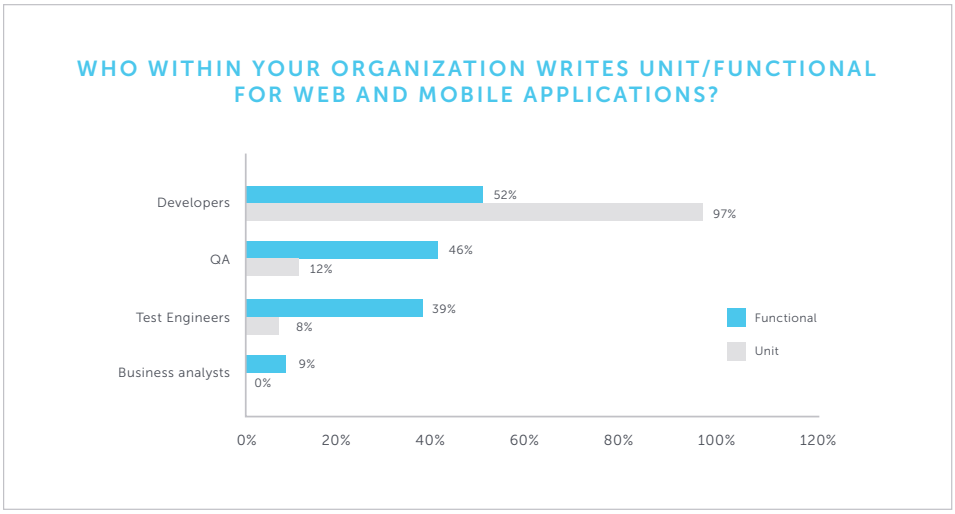


Even among those that have stopped supporting Windows XP, few were able to walk away from the operating system early. Only 34% stopped supporting Windows XP before the official EOL date.



Developers do testing

We ask who did functional testing and who did unit testing. Unsurprisingly, developers are most likely to do unit testing (97%) but they are also most likely to do functional testing (52%).

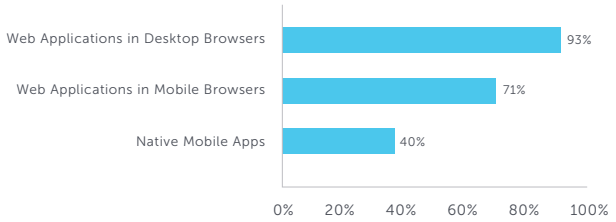


SURVEY METHODOLOGY AND PARTICIPANT DEMOGRAPHICS

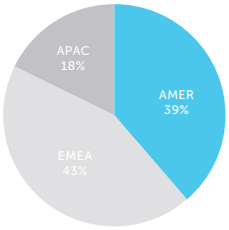
In January 2015, a global database of technology professionals responsible for testing web and mobile applications was emailed an invitation to participate in a Web survey on the topic of testing trends. A total of 504 individuals

completed the survey. Participants included a variety of roles, company sizes, industries and regions. A copy of this report was offered as an incentive for participation.

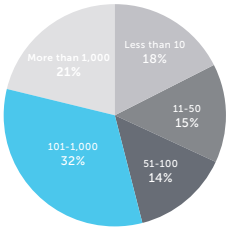
TYPE OF APPLICATIONS TESTED



REGION



NUMBER OF EMPLOYEES



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Sauce Labs ensures the world's leading apps and websites work flawlessly on every browser, OS and device. Its award-winning Continuous Testing Cloud provides development and quality teams with instant access to the test coverage, scalability, and analytics they need to deliver a flawless digital experience. Sauce Labs is a privately held company funded by Toba Capital, Salesforce Ventures, Centerview Capital Technology, IVP and Adams Street Partners. For more information, please visit saucelabs.com.

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