TESTING TRENDS IN 2017:
A SURVEY OF SOFTWARE PROFESSIONALS

January 2017

dimensional research

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Introduction

Throughout the history of software development, change has been constant. New technologies, methodologies, and tools constantly evolve to help development teams build better software. However, one thing that has not changed is the pressure on these teams to release high quality software under very tight timelines. Testing remains key to achieving this goal.

This research investigates trends in testing with modern development teams. What are teams doing to adopt new development approaches including agile, Continuous Integration, Continuous Delivery and DevOps? What is the role of cloud? What is going well and where is there room to improve?

This report, sponsored by Sauce Labs, is based on a survey of 732 technology professionals responsible for the development and quality of web and mobile applications. The goal of this global survey was to understand current trends in software testing. To allow for trend analysis, certain questions were repeated from prior surveys conducted with the same audience each year at this time for the past two years.
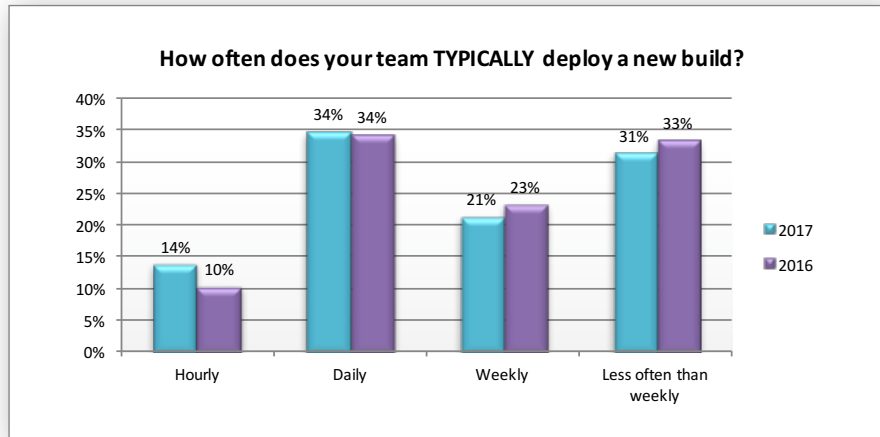
Executive Summary

- **Deployment times are faster, but software teams want to be even faster**
  - 28% want to deploy hourly (up from 18% in 2016)
  - However, only 14% deploy hourly (up from 10% in 2016)
  - The gap between desired hourly deployment time and actual hourly deployment time has widened in the past year from 8% to 14%
- **Still ample room for testing to improve**
  - 74% fix bugs within a few working days, up only slightly from 71% in 2016
  - Only 1 in 4 report that their tests are written each time new code is checked in
  - While 87% report using some form of test automation, there are still a sizeable number of respondents (42%) who report they're mostly or entirely manual with their testing
  - Some good news for automation with 32% being mostly or entirely automated with their testing, up from 26% in 2016
- **Decrease in breadth of cross-browser testing**
  - Only Chrome and Edge show an increase in testing vs. prior years, while testing on all other browsers has decreased
  - 49% report testing on only the most recent browser version, compared to 27% in 2016
- **Other trends: Cloud, DevOps, agile and more**
  - 52% are using public or private cloud for testing, up from 43% in 2015
  - Use of cloud for spillover testing (19%, up from 0%) and specific types of tests (54%, up from 9%) increases dramatically
  - Only 10% have fully embraced DevOps although 73% have started down the path and an additional 15% are considering it
  - 89% have adopted agile in some form but only 32% consider themselves fully agile

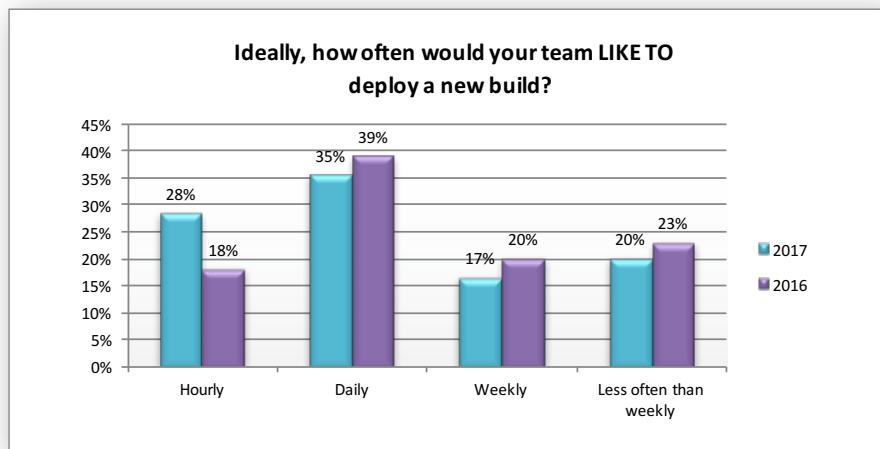dimensional research

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Detailed Findings: Deployment times are faster, but software teams want to be even faster
Desire for faster deployment changing more quickly than ability to deploy

One of the real software development success stories of the past year is a notable increase in the time it takes to deploy a new build. When development professionals were asked about how long it typically takes their team to deploy a new build, we see a clear shift in answers this year compared to one year ago. More teams are deploying faster, with 14% reporting hourly, up from only 10% last year. At the other end of the spectrum, few teams are deploying weekly (21%, down from 23% last year) or even less frequently (31%, down from 33% last year).

How often does your team TYPICALLY deploy a new build?

	2017	2016
Hourly	14%	10%
Daily	34%	34%
Weekly	21%	23%
Less often than weekly	31%	33%

However, this isn't the end of the story. On the flip side, we also see an increase in the desires of development teams to deploy even more quickly. When asked a similar question about their ideal deployment times, 28% reported that they would like to deploy hourly, a sizeable increase over the 18% that reported the same in the past year.
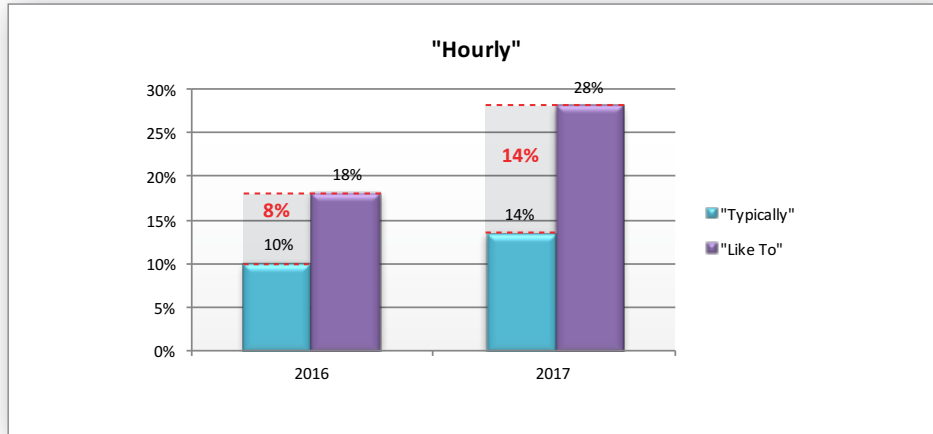
Ideally, how often would your team LIKE TO deploy a new build?

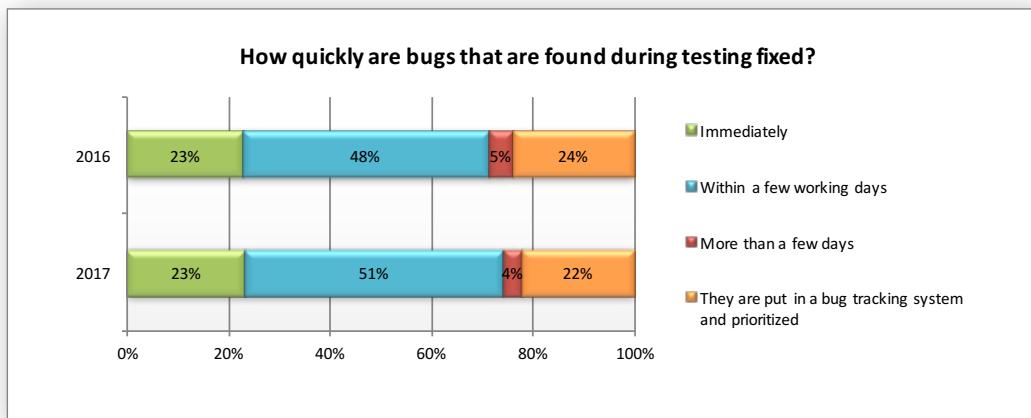|	2017	2016
Hourly	28%	18%
Daily	35%	39%
Weekly	17%	20%
Less often than weekly	20%	23%

What is most striking with these two trends is how much more quickly the desire to deploy hourly is growing compared to the actual increase in ability to deploy that quickly. The gap between how quickly teams deploy and how quickly they want to deploy is actually growing in spite of the progress made in increasing the speed to deploy. Last year only 8% were not deploying as fast as they wanted to, but that gap has increased to 14% this year!

"Hourly"

		2016		2017

- "Typically" 2016: 10%, "Like To" 2016: 18%, gap 8%
- "Typically" 2017: 14%, "Like To" 2017: 28%, gap 14%

Detailed Findings: Still ample room for testing to improve
Disappointing lack of progress in the speed of fixing bugs

One of the disappointing areas in the past year has been the lack of movement in the speed in fixing bugs once they have been identified. No progress was made at all in the number of development teams that can fix bugs immediately once they are identified, which stayed flat at 23% in both years, and only minor progress (51%, up from 48% last year) was made in those who can fix bugs within a few working days after they are identified. This is clearly an area where more work can be done by testing and development teams, since the benefits of fixing bugs immediately are well established.

How quickly are bugs that are found during testing fixed?

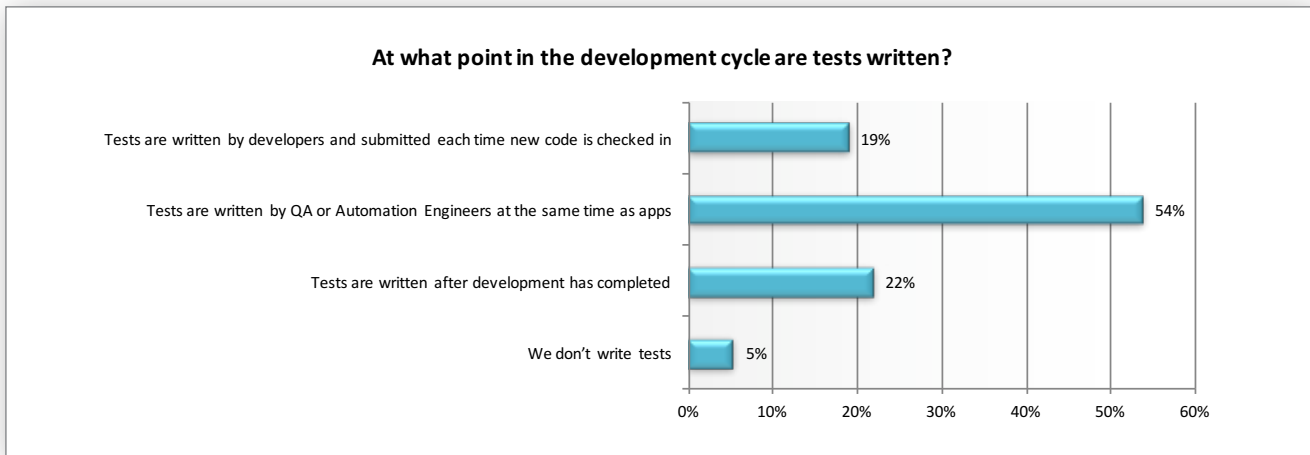| Year	Immediately	Within a few working days	More than a few days	They are put in a bug tracking system and prioritized
2016	23%	48%	5%	24%
2017	23%	51%	4%	22%

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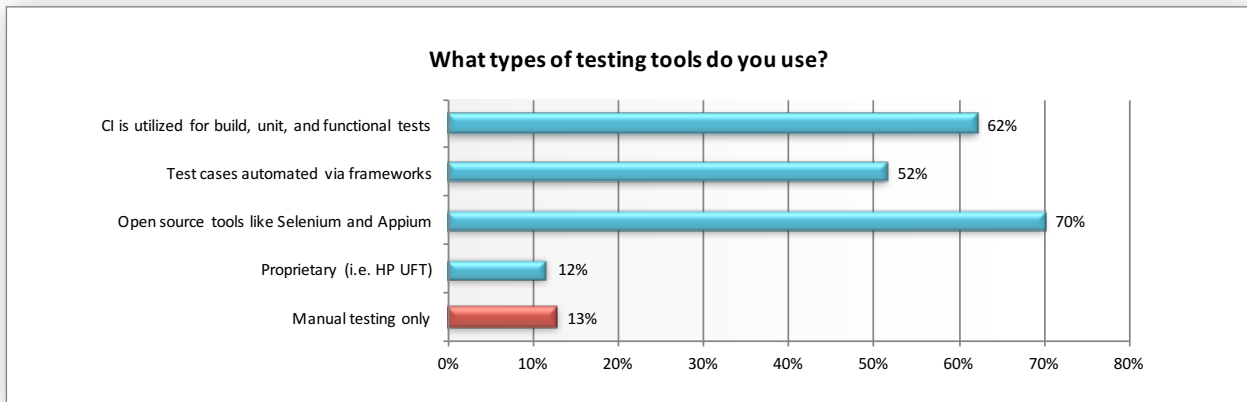
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Still not the norm to write tests whenever code is checked in

One of the ways that this could be improved is to do a better job of writing tests alongside the code when it is checked in. This is another well-established best practice that has strong impact on the quality of code, but less than 1 in 5 software development teams (19%) do this. The good news is that the old-fashioned method of writing tests only after development is done ("waterfall") is no longer common, with only 22% reporting that they still follow this legacy approach to writing tests.

At what point in the development cycle are tests written?

Category	Percent
Tests are written by developers and submitted each time new code is checked in	19%
Tests are written by QA or Automation Engineers at the same time as apps	54%
Tests are written after development has completed	22%
We don't write tests	5%

Test automation increased in 2017

Another piece of good news out of this survey is that most development teams (87%) have adopted some level of test automation. The actual type of tools varies widely. Open source tools like Selenium and Appium are most popular (70%), but also very common are organizations that are using CI (62%), and automating via frameworks (52%). Only 12% reported that they remain invested in proprietary testing tools like HP UFT.

What types of testing tools do you use?

Category	Percent
CI is utilized for build, unit, and functional tests	62%
Test cases automated via frameworks	52%
Open source tools like Selenium and Appium	70%
Proprietary (i.e. HP UFT)	12%
Manual testing only	13%

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However, for all that automation tools are in use, there is still a need to expand the use of these tools. More development teams characterize their testing efforts as manual than automated. In this year's survey, 42% cited their testing efforts as "mostly" or "entirely" manual, many more than the 32% that said they were "mostly" or "entirely" automated.

While there remains room for improvement, there is good news that progress is being made in this area. The number of development teams whose testing is "mostly" or "entirely" automated is up to almost 1 in 3 (32%), from only 1 in 4 (26%) last year.
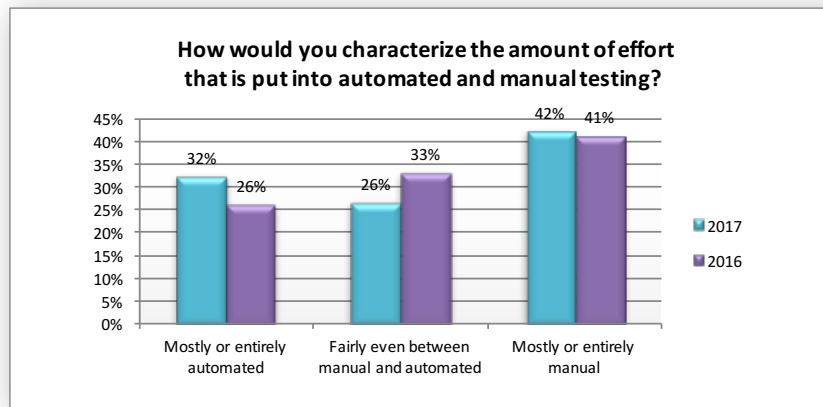
Detailed Findings: Breadth of browser testing decreases
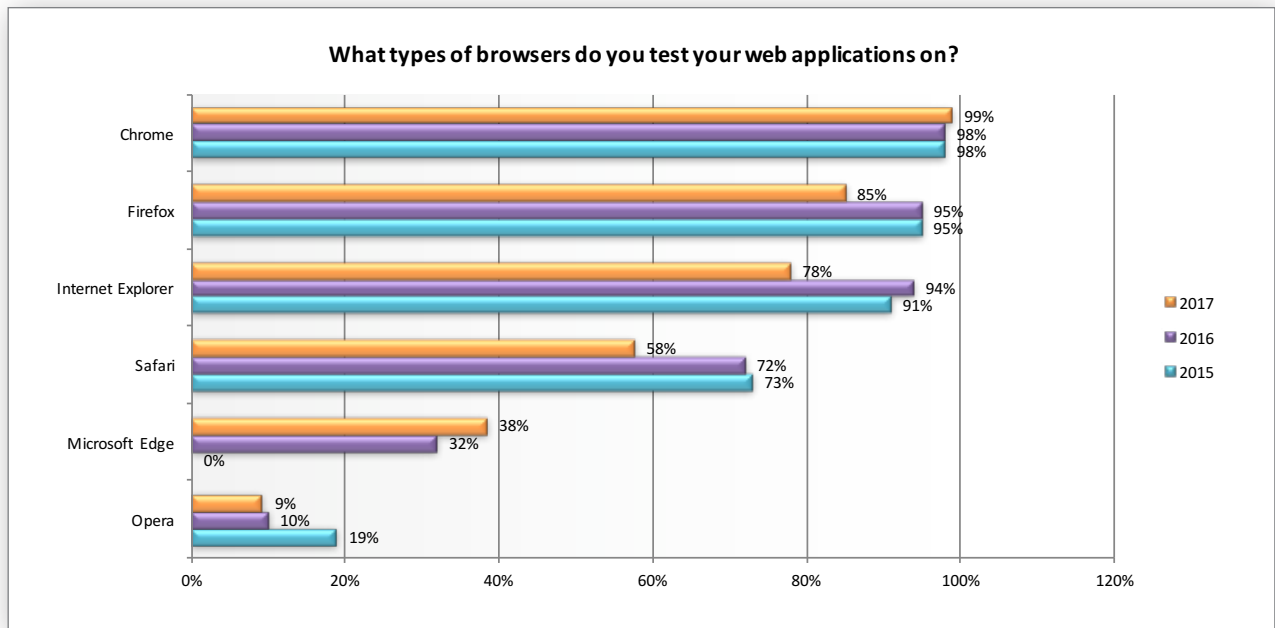### Testing for many browser types decreases

A clear trend can be observed by looking at browser testing over the last three years. The breadth of types of browser tested has recently taken a notable drop. Chrome remained the top browser tested against with 99% of software teams testing against this browser, which remains consistent with the 98% who reported testing against Chrome in prior years. Microsoft Edge also saw an increase in the numbers testing in the browser (38%, up from 32% last year). All other browsers saw a notable decrease in the number of software teams testing in these environments including Firefox (85%, down from 95% in the past two years), Internet Explorer (85%, down from 94% the previous year), and even Safari (58%, down from 72% last year).
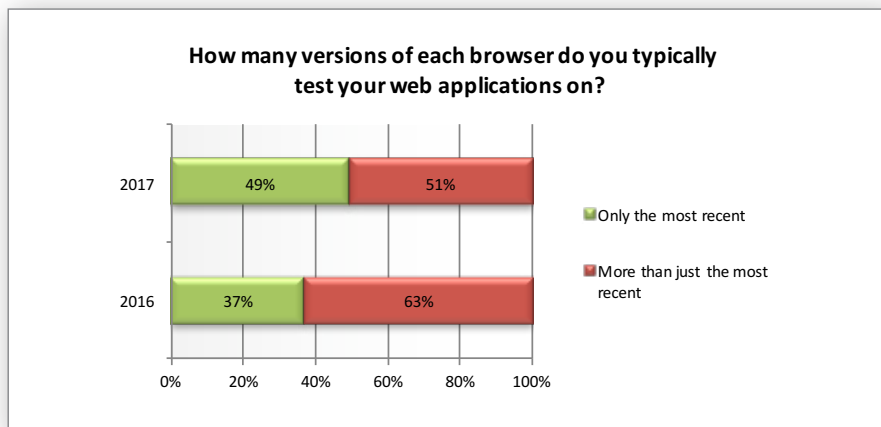
While this research cannot say why this decrease in testing across browser types is happening, it is an important trend for development teams to be aware of. For some teams, this decrease may be a natural outcome of the consolidation of browsers on mobile devices. In this case there is no cause for concern as their users simply aren't using those browsers. However, if this is an indication of less cross-browser testing even though user use of browsers have not changed, this is a potential area of alarm. Any reduction in types of browsers tested has the potential to create quality issues that will alienate users.

What types of browsers do you test your web applications on?

Browser	2017	2016	2015
Chrome	99%	98%	98%
Firefox	85%	95%	95%
Internet Explorer	78%	94%	91%
Safari	58%	72%	73%
Microsoft Edge	38%	32%	0%
Opera	9%	10%	19%

Increase in testing only the most recent browser version

A decrease was also seen in the number of versions of the browsers that are tested. Last year 2 in 3 (63%) reported that they tested in more than just the most recent browser. This number dropped substantially to just half (51%) in the past year.

How many versions of each browser do you typically test your web applications on?

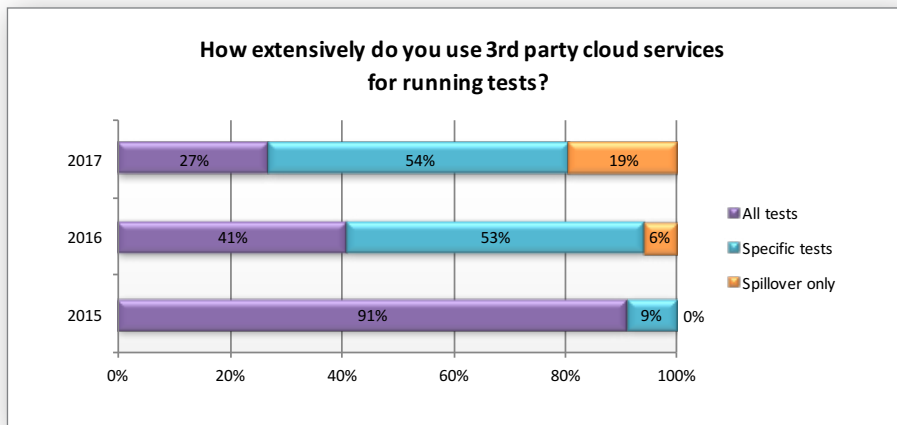|	Only the most recent	More than just the most recent
2017	49%	51%
2016	37%	63%

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Detailed Findings: Other trends: Cloud, DevOps, and More
Use of cloud for testing becoming more common

The use of public or private cloud environments for testing increased again in the past year, passing the important milestone of over half of development teams (52%) now using cloud for testing.

Use Public or Private Cloud for Testing

Year	Percentage
2015	43%
2016	45%
2017	52%
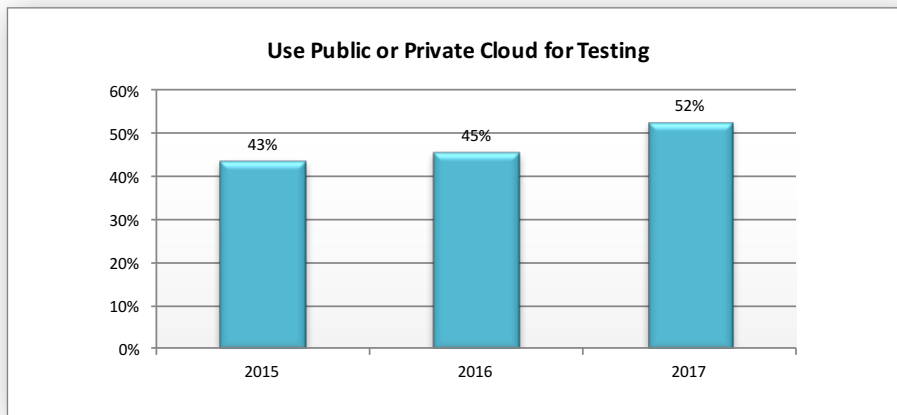
In the past few years, the way development teams use cloud services for testing has changed dramatically. Teams are becoming more efficient and prescriptive when it comes to how they are using 3rd party cloud services for testing. In the first year of this study, most respondents (91%) reported that they used cloud services for all tests, but as cloud-based service offerings have matured and development processes have evolved, there has been a significant increase in the number or respondents who now report using 3rd party cloud services for specific tests. More than half (54%) are using cloud services for running specific tests, up dramatically from 9% in 2015. A similar trend is seen with spillover tests, which didn't account for any cloud-based testing in 2015 but is now almost a fifth (19%). This increased focus may be reflective of the sophistication and maturation of the software development teams that are fully embracing healthy DevOps and Continuous Delivery practices.

How extensively do you use 3rd party cloud services for running tests?

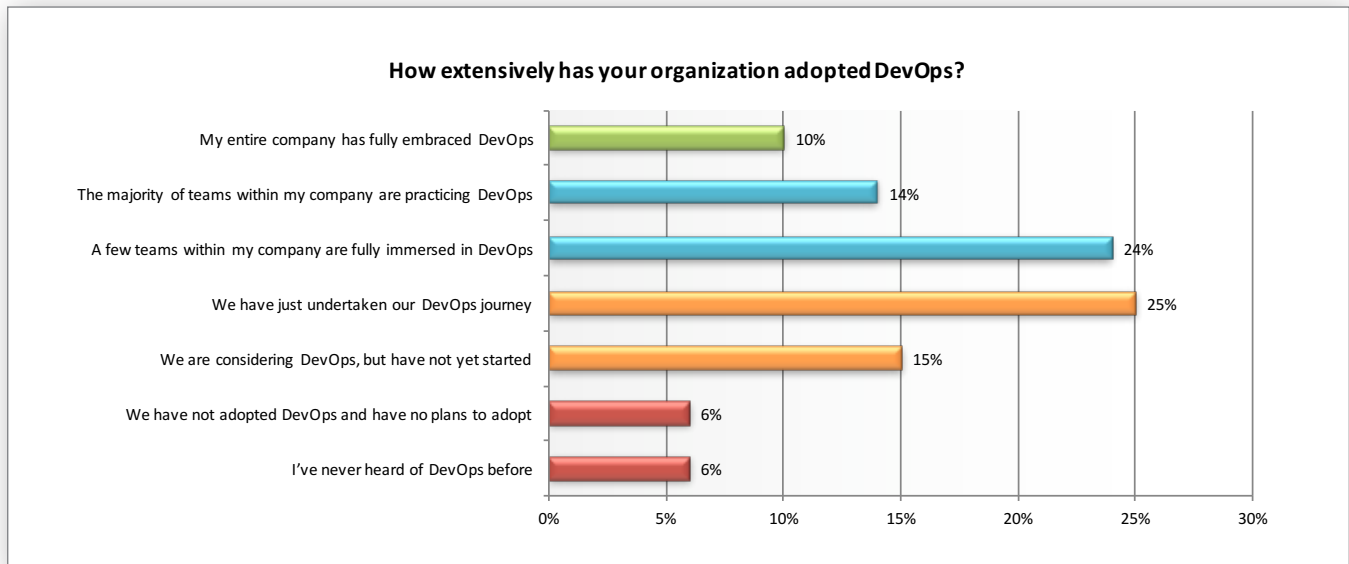| Year	All tests	Specific tests	Spillover only
2017	27%	54%	19%
2016	41%	53%	6%
2015	91%	9%	0%

DevOps widely adopted, although most are just starting

A new area of investigation was introduced for this year's survey – DevOps. Our goal was to investigate adoption of DevOps, and set a baseline to measure future growth. To ensure consistent answers, survey participants were given this definition of DevOps before being asked about adoption:

> Wikipedia defines DevOps as "a culture, movement or practice that emphasizes the collaboration and communication of both software developers and other IT professionals while automating the process of software delivery and infrastructure changes. It aims at establishing a culture and environment where building, testing, and releasing software can happen rapidly, frequently, and more reliably.

DevOps is being broadly adopted across all types of organizations, with 88% either adopting now or considering it and only a few having no plans to adopt DevOps (6%) or having not even considered it (6%).

However, most are still in process with their DevOps journey. Only 10% have fully embraced DevOps across their entire company. More (15%) are still considering DevOps. The largest group has either just started with DevOps (25%) or have only a few teams that are fully immersed (24%).
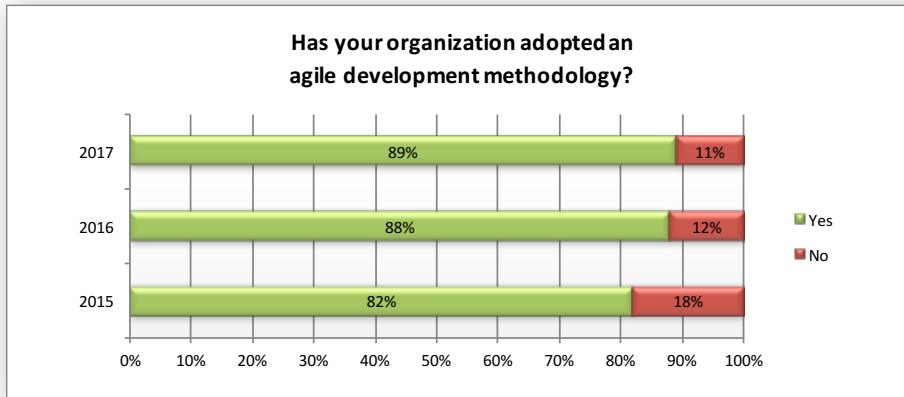
How extensively has your organization adopted DevOps?

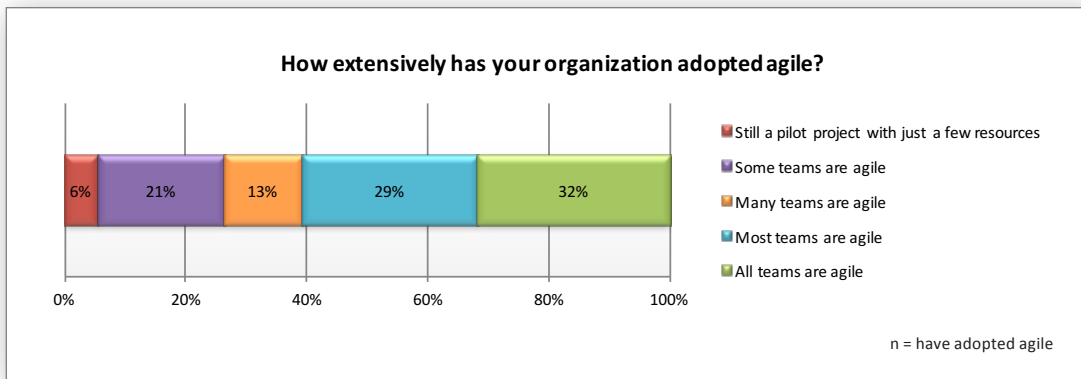| Category	Percentage
My entire company has fully embraced DevOps	10%
The majority of teams within my company are practicing DevOps	14%
A few teams within my company are fully immersed in DevOps	24%
We have just undertaken our DevOps journey	25%
We are considering DevOps, but have not yet started	15%
We have not adopted DevOps and have no plans to adopt	6%
I've never heard of DevOps before	6%

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Agile adoption continues to grow, but many are still in process

Agile development methods, already adopted by the majority of software development teams, remained firmly entrenched, with 89% reporting adoption, up from 88% last year and 82% two years ago.

Has your organization adopted an agile development methodology?

Year	Yes	No
2017	89%	11%
2016	88%	12%
2015	82%	18%

However, adoption of agile is also a journey. Adoption should not be interpreted that all development teams in an organization are following agile processes. In fact, only 1 in 3 (32%) report that all teams in their company are agile.

How extensively has your organization adopted agile?

- Still a pilot project with just a few resources: 6%
- Some teams are agile: 21%
- Many teams are agile: 13%
- Most teams are agile: 29%
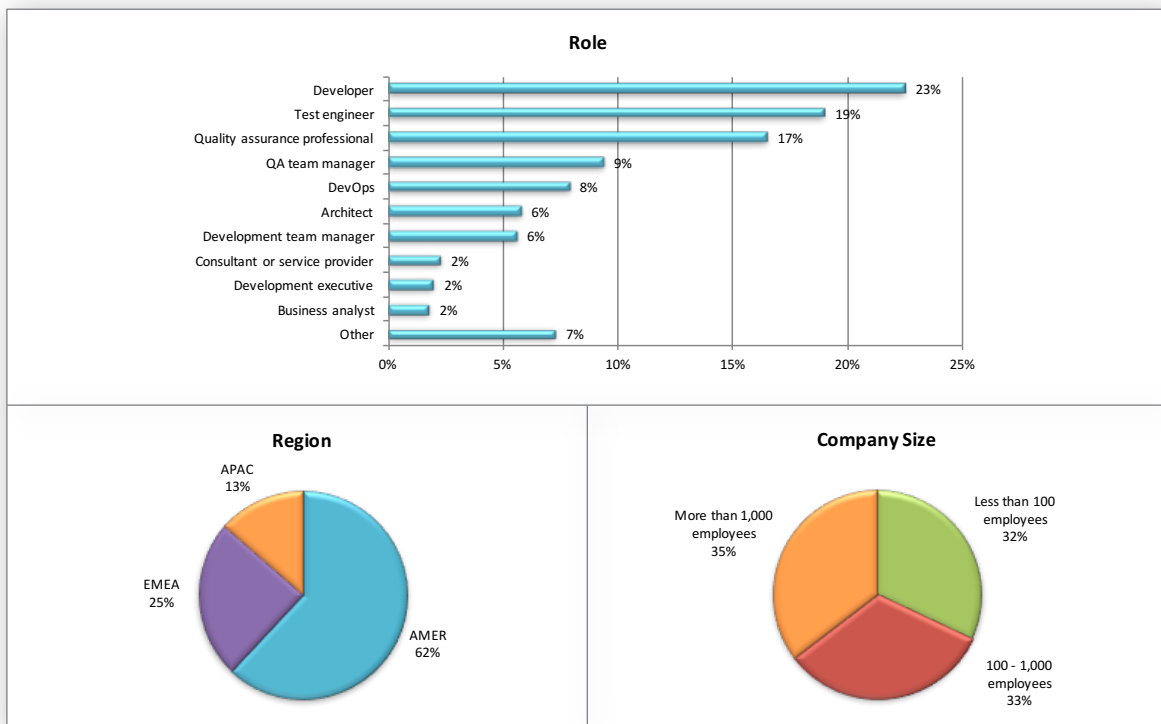- All teams are agile: 32%

n = have adopted agile

Adoption of Continuous Integration (CI) continues to increase

The adoption of Continuous Integration (CI) also continues to increase. During the two years since we first asked this question in our testing trends survey the number of development organizations practicing CI has increased from 70% to 78%. In this year's survey, Europeans reported a particularly strong adoption of CI, with 82% saying that they were practicing CI.

Does your development organization practice Continuous Integration (CI)?

Year	Yes	No
2017	78%	22%
2016	77%	23%
2015	70%	30%
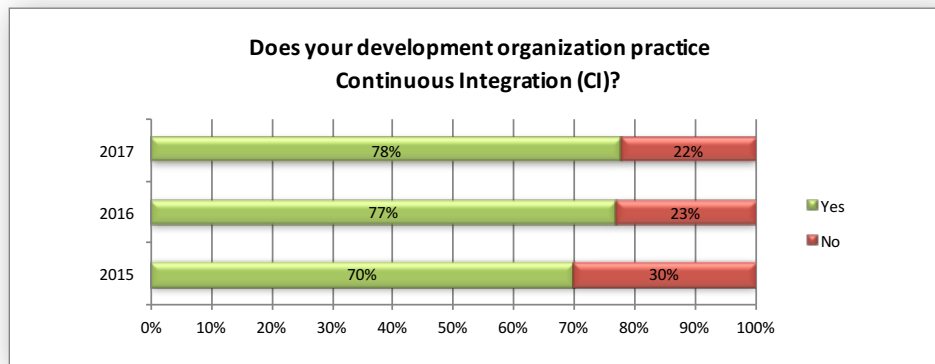
Survey Methodology and Participant Demographics

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 732 individuals participated in 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. To allow for trend analysis, certain questions were repeated from similar surveys conducted to the same audience in early 2016 and early 2015.

Role

Role	Percentage
Developer	23%
Test engineer	19%
Quality assurance professional	17%
QA team manager	9%
DevOps	8%
Architect	6%
Development team manager	6%
Consultant or service provider	2%
Development executive	2%
Business analyst	2%
Other	7%

Region

- APAC 13%
- EMEA 25%
- AMER 62%

Company Size

- More than 1,000 employees 35%
- Less than 100 employees 32%
- 100 - 1,000 employees 33%

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About Sauce Labs

Sauce Labs provides the world's largest cloud-based platform for the automated testing of web and mobile applications. Its award-winning service eliminates the time and expense of maintaining an in-house testing infrastructure, freeing development teams of any size to innovate and release better software, faster.

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 https://saucelabs.com.