



# PERFORMANCE TESTING FOR AGILE AND DEVOPS

How to release high-performance  
software quickly





**PerformanceLab**  
Software testing company





**Many development teams are beginning to adopt agile methodologies in order to overcome the barriers of traditional methods and release high-quality software on time**



Performance testing is an important part of creating software, because it makes it possible to assess the speed of operations, ascertain the permissible number of simultaneously active users or simultaneous transactions, and determine how the volume of data affects the performance of an IT solution. In traditional software development models using the waterfall method, such as the V-model, performance testing is planned after development is complete and, preferably, after functional testing is finished. Performance testing projects are technically complex. They often require expenses on infrastructure and can take several months. Moreover, a large part of the time is taken by preparatory work, such as setting up the test environment, developing load scripts and emulators, and preparing test data.

In practice, software development using traditional methods ends on time in less than 30% of cases, so performance testing is frequently canceled to minimize delays to releasing the software. This often leads to application failure under load, slow execution times, and the operations department's inability to predict the system's behavior in the future when the load and volume of data will grow.

Many development teams are beginning to adopt agile methodologies in order to overcome the barriers of traditional methods and release high-quality software on time. Agile makes it possible to significantly shorten development cycles – now they are counted in weeks or even days.

As a result, many organizations and independent development teams are wondering what to do with performance testing, which looks awkward and contradicts the idea of short cycles. As in traditional models, this is often the reason why performance testing is not performed and the reason things end with the same negative results.

Performance Lab offers a performance testing solution for agile and DevOps projects, which ensures the rapid release of software with high performance. You no longer need to wait months to receive performance test results. Our solution integrates into cycles of continuous software integration and delivery, allowing engineers receive constant feedback and optimize software performance during current sprints.

## Business advantages

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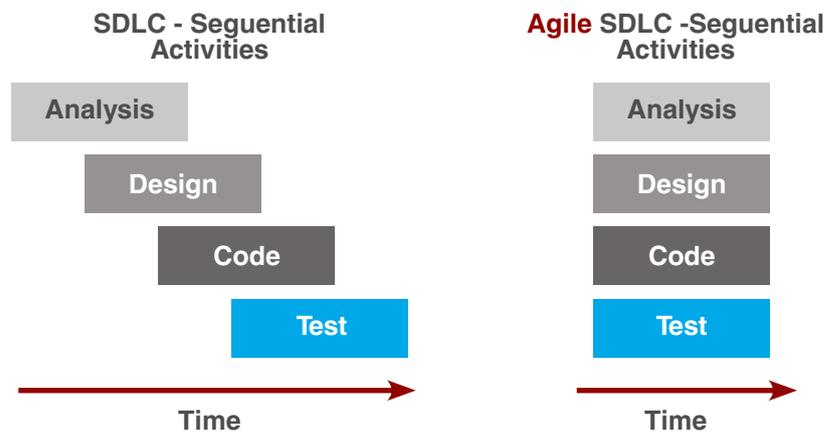


Agile and DevOps techniques help businesses beat the competition by being able to quickly bring products to market. But Performance Lab's solution guarantees these products will have the required performance characteristics.

If in the waterfall method performance testing is performed at the end of the cycle, then in agile it is

shifted to the early stages of the life cycle, including analysis and design. This is a good practice, since system performance depends directly on architecture and design quality.

The figure shows the difference between waterfall software development and agile development.



Performance Lab's solution ensures that applications and IT systems will have high performance under continuous integration and delivery processes and can:

- Provide precise information about an IT system's maximum performance and about
  - the number of simultaneous users (operations, transactions) a system can handle
  - the load conditions under which the responsiveness of critical business processes decreases
  - the load conditions under which an IT service becomes unavailable

- Measure the execution time of critical operations under various load conditions.
- Locate the bottlenecks limiting an IT system's performance.
- Compare different versions of an IT system, or different hardware/software configurations.
- Find out an IT system is prepared for a period of high sales, online advertising, or new branch openings.
- Learn the maximum database size that an IT system can handle.

## Performance Lab's solution

Our services will help integrate management of an IT system's performance into the software development process. A basic tenet of DevOps is to continuously present working software to users. Agile teams rely on continuous integration.

Performance Lab's solution uses the continuous integration system for its own purposes. Agile teams use three types of builds: CI-builds, nightly builds (or weekend builds) and builds at the end of sprints and releases.

**CI-builds** are run several times per day, so all code checks should be performed quickly. As a rule, developers run unit tests during CI-builds. Performance Lab's solution makes it possible to set up performance unit-testing using special tools such as JUnitPerf. This lets you monitor the realization of performance stories by measuring the time required for code to execute and running it in parallel for several users.

**Nightly builds** give more time for software verification, since they do not hinder the work of the development team. Integration tests and automated regressions tests are usually run automatically at night. Performance Lab's solution makes it possible to add load testing using LoadRunner or JMeter to nightly builds. Despite the fact that software features are often incomplete during nightly builds and thus the load profile is not exact, such tests are undoubtedly useful, because they can reveal numerous problems that only become apparent when the system is under load. For example, memory leaks and database locking.

### **Builds at the end of sprints**

of final release builds differ from nightly builds in that they are not launched automatically, but rather when the team decides to perform final testing. Performance Lab's solution enables comprehensive load testing of the final release. At this point, the system's features are complete, so performance engineers can work with a highly accurate load profile and repeatedly fine-tuned load scripts that ensure excellent test coverage. Using Performance Lab's solution makes it possible to completely finish load testing the IT system as soon as development is done, without taking any extra time, as happens under development models based on the waterfall method. With Performance Lab's solution, performance monitoring tools (based on NeuronR or other solutions), which are fine-tuned during development, can be used to monitor your IT system's performance during commercial use.



**Performance Lab's solution uses the continuous integration system for its own purposes**

# Getting started with performance testing

**Performance Lab  
will augment your team  
with the performance  
test experts it lacks**



If you've decided to invite us to perform performance testing, we will propose a two-stage plan.

## **Stage 1. Configure the environment.**

Performance Lab's solution works in a continuous integration paradigm. Therefore, we begin our work by analyzing your environment of automated tools that support continuous integration/delivery. If your environment is not yet set up, we'll configure it from the ground up and train your employees how to work in it. If you already have a continuous integration/delivery environment, we'll add the technical resources needed to manage the performance of your IT systems under development, e.g. JUnitPerf, JMeter, tools for static and dynamic code analysis, etc.

## **Stage 2. Provide specialists.**

At the heart of the DevOps philosophy is this rule: developers, testers, and operations specialists are members of one team that is aimed at continuously presenting high-quality products to end users. Thus, through outstaffing, Performance Lab will augment your team with the performance test experts it lacks. Performance Lab can also optionally provide trained release managers to effectively coordinate the DevOps process.

## Why Performance Lab?

Performance Lab is a widely recognized leader in performance testing. Our patented “PLUS” technology has no counterpart in Russia and supports testing not only systems using well-known protocols but also systems with proprietary protocols, systems with asynchronous calls, systems with complex and encrypted protocols, enterprise service buses, and web services.

When working with us you can be certain that:

- Leading international performance testing practices will be utilized in your project.
- Performance problems and bottlenecks will be located and described.
- You will receive realistic recommendations for optimization that will let you increase performance (in our experience, it is not uncommon for our recommendations to boost an IT system’s performance by more than 100-fold).
- The risks of degraded performance, bugs, and failures in your IT system will be minimized.



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## About Performance Lab

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**PERFORMANCE LAB** is global company specializing in software testing and quality assurance. We are among the world's top-30 QA companies.

Since 2008 we have worked in the financial and government sectors, retail, and telecommunications, helping our clients achieve substantially higher quality in their mission-critical IT systems. In 2014 our annual sales exceeded 10 million dollars.

Performance Lab has been recognized in the field of IT and telecommunications by the "Indeks Liderstva 2013" [Leadership Index 2013] russian employer ranking. This means that more than 300 of our employees in Moscow and Izhevsk gave us a high rating. We are proud to be one this list with companies such as IBM, Microsoft, Yandex, and MTS.

We perform the large number independent testing projects worldwide, thanks to our huge Center of Excellence, which is always growing. Our customers are industry leaders, such as Illumina, Splunk, MTS, VimpelCom, VTB and VTB-24, Alfa-Bank, Raiffeisenbank, Leto Bank, Rosbank, X5 Retail Group, M-Video, El Dorado, Lenta, and major government organizations, e.g. Pension Fund of the Russian Federation, Moscow City IT Department, and many other organizations.



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