

Case study: Government

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The Moscow Information Technology Department (MITD) is the functional body of the Moscow's executive office responsible for creating and operating the city's information systems, supplying computer hardware to budget-funded institutions, developing tools for government transparency, and moving city and municipal services to the Internet. It operates pursuant to the "Information City" State Program for 2012-2018 and handles a budget of roughly \$1 billion annually, one of the largest

for metropolitan cities across the world.

The Russian Federation has two types of certification for primary school students: the Unified State Examination (EGE), which serves as both a final exam from school and an entrance exam for institutions of higher learning) and the State Final Certification (GIA), an analog of the EGE for 9th grade). EGE and GIA results for Moscow students are officially provided on the Moscow government services portal.

Challenge

Because more than 115,000 students are expected to take the final examination in 2015, the Moscow IT Department faced a challenge – to ensure adequate throughput and responsiveness for the government service to provide EGE and GIA results. The problem is that, by law, the test results are published on the portal all at the same time, so 115,000 students and their parents and relatives begin to simultaneously log on to the portal to check their exam results.

Note that in addition to providing the EGE and GIA results the Moscow portal hosts more than 70 other government services for Moscow city residents. The portal's daily traffic usually exceeds 100,000 visitors.

Considering all of this, it became clear that the load on the portal could reach 500,000 users per day following the publication of the results. Accordingly, MITD specialists had to figure out whether the portal could handle the expected load, and if not, take appropriate measures.

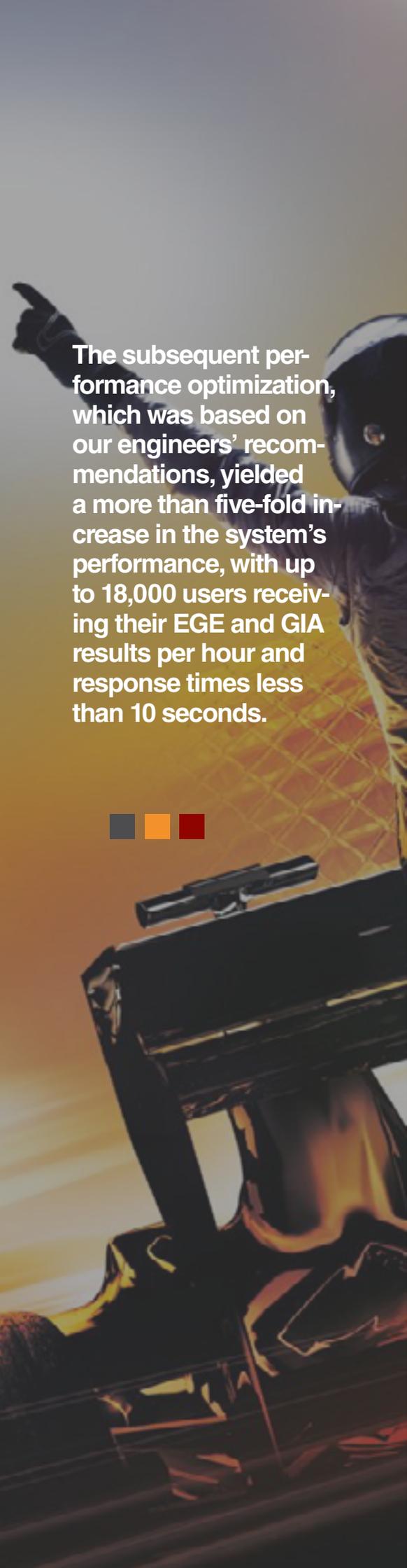
Solution

Performance Lab was hired to perform a load testing project, having been MITD's reliable partner in software testing and quality assurance for several years.

Using JMeter, Performance Lab engineers created a load on the portal via HTTP. The load was created by emulating the actions of users who had come to the portal to view their exam results. We also emulated the actions of other users using the portal's other services. Gradually increasing the load (the number of virtual users) made it possible to identify the portal's maximum throughput and discover performance-limiting bottlenecks.

The work was conducted on the production environment at night, when the actual load on the Moscow government services portal is at a minimum. Accordingly, before testing began, Performance Lab engineers had developed tools to prepare and delete the test data.

Architecturally, five different IT systems were involved in the process of providing the EGE and GIA results. The systems use different technologies and have different performance capabilities. That's



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why each system's role in the performance of the overall process was considered when collecting and analyzing performance metrics.

Over the course of the project Performance Lab performance engineers found a number of bottlenecks in the IT systems and proposed ways to overcome them to the customer.

Customer benefits

The subsequent performance optimization, which was based on our engineers' recommendations, yielded a more than five-fold

increase in the system's performance, with up to 18,000 users receiving their EGE and GIA results per hour and response times less than 10 seconds. It was also determined that a further increase in the number of users would not lead to system failure but would increase response times.

These results were confirmed during the state certification process for primary school students during the spring-summer 2015. The Moscow Government noted the quality of our work and the IT Department's gratitude.

