PerformanceLab
Software testing company

LOAD TESTING FOR CALL CENTERS

Emulation of thousands of phone calls to analyze how call centers work under load.


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Performance Lab offers an innovative solution for load testing IVR technology and call center platforms

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Modern call centers are intricately organized systems, operating 24 hours a day and capable of processing tens of millions of phone calls per month. The loyalty and growth of the customer base often depends on a call center's effectiveness. As a result, the performance requirements for call centers are constantly growing. Organizations are striving to raise the level of customer service by reducing the time spent in a queue waiting to be connected to an agent (Average Speed of Answer, ASA), reducing the percentage of calls ended by customers while waiting (Abandon Rate), and improving the quality of communications link.

Until recently, there was no reliable technical solution for the challenge of testing a call center's performance by emulating real phone calls.

Performance Lab offers an innovative solution for load testing IVR technology and call center platforms. It can emulate inbound and outbound calls and customer- and operator operations, interact with an interactive voice menu, and measure line quality.

Business advantages

Performance Lab's solution for load testing IVR technology and call center platforms can:

- detect problems that customers experience when the call center is under load
- analyze a wide spectrum of application and infrastructural parameters under various load conditions
- locate performance bottlenecks in every architectural level
- measure the call center's scalability
- create load both from within and from without the call center's LAN.

Performance Lab's solution makes it possible to develop load scripts to emulate the behavior of the call center's customers

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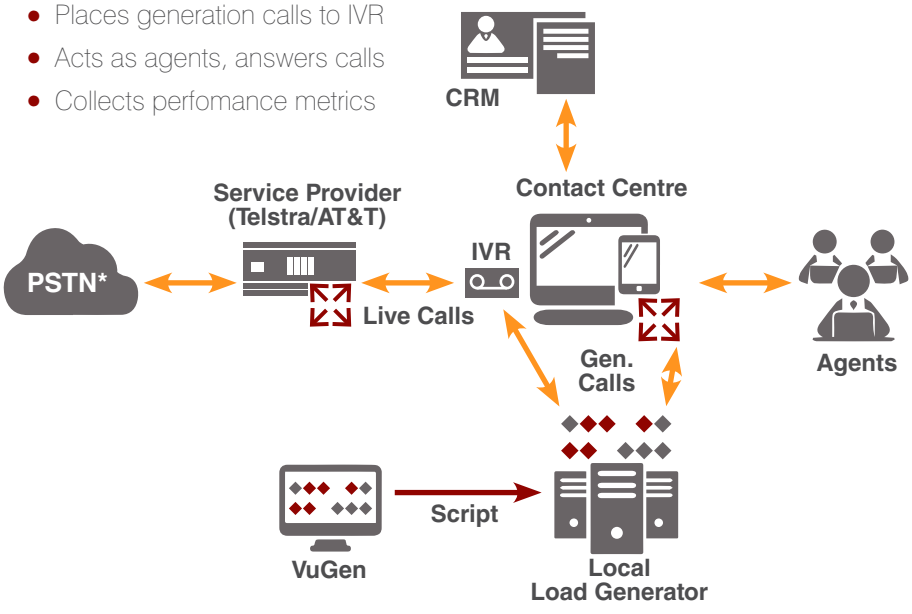
Performance Lab's solution

Performance Lab's solution makes it possible to develop load scripts to emulate the behavior of the call center's customers (calls, web activity, email, instant messaging, screen sharing), using ordinary load testing tools, such as Load-Runner and JMeter and Data

Synergy Voice technology from our partner, the Australian company Data Synergy. After these scripts are written and the parameters are set, they are used to general a load that corresponds to the required number of customers.

- Places generation calls to IVR
- Acts as agents, answers calls
- Collects perfomance metrics



The figure shows the solution's architecture with use of LoadRunner.

* PSTN (Publicly Switched Telephony Network)

When the testing strategy is created special attention is given to defining the load profile

The solution can:

1. General inbound and outbound voice traffic over SIP channels

2. Emulate the complex algorithms of voice services

3. Emulate audio and video streams

4. Measure the quality of the voice connection (delay, distortion, packet loss, PESQ)

When emulating phone calls, the following features are available

- phone calls
- call pick-up
- call hold
- call transfer (including voice mail)
- call park
- call forwarding
- conference call
- tone dialing.

Getting started

If you've decided to hire us for performance testing work, we propose the following four-stage plan.

Stage 1: Develop a testing strategy

Performance Lab specialists create a testing methodology after analyzing the technical documentation and business processes configured in the call center's IVR system and platforms, and interviewing the customer's specialists. We will do the following:

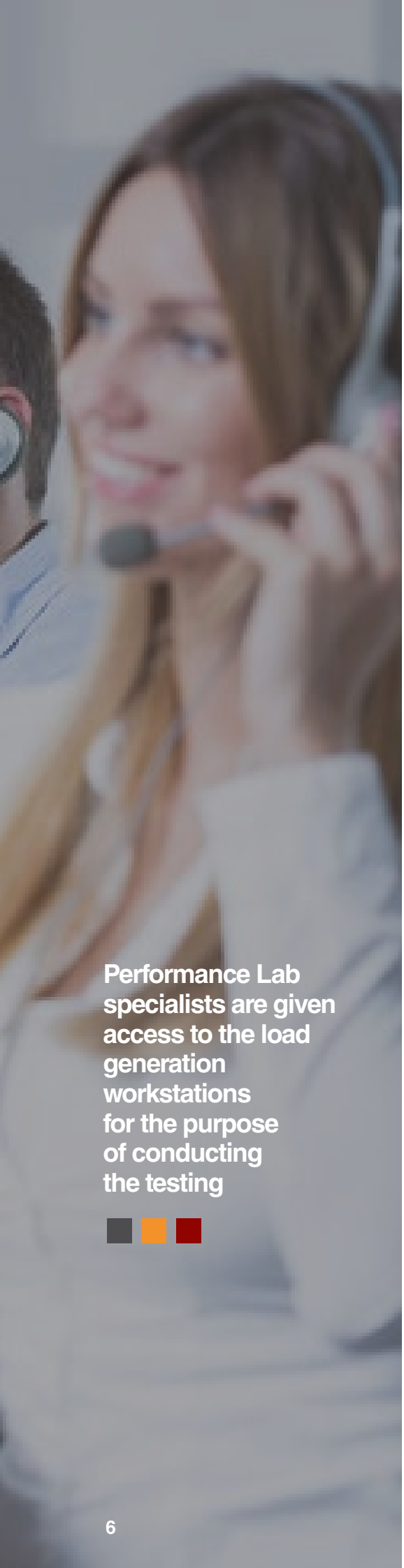
- collect and analyze statistics on the production environment,
- determine how to generate the load and where to place the load generators,
- negotiate the performance requirements,
- define business processes and load scenarios,
- outline the interaction with external systems.

The finished testing strategy is sent to the customer for approval.

Define the load profile

When the testing strategy is created special attention is given to defining the load profile.

A load profile is a set of operations with specified intensity levels. These operations may be determined based on statistical data or an analysis of the system requirements. Several load profiles are usually selected, each differing in its set of operations or the intensity level of the operations. Proper load testing requires choosing the operations that will put the greatest load on the system.



Performance Lab specialists are given access to the load generation workstations for the purpose of conducting the testing

Stage 2: Develop performance testing tools

This is the most difficult stage from a technical standpoint. Performance Lab engineers develop and debug the performance testing tools.

Creating a test model consists of the following stages:

- develop load scripts and load scenarios,
- develop emulators for external systems (if necessary),
- create scripts to generate/anonymize the database (if necessary),
- prepare test data,
- customize monitoring tools and conduct trial tests.

During this stage Performance Lab offers its customers the opportunity to use its proprietary "PLUS" technology, which can significantly reduce costs and improve the quality of work by utilizing ready-made performance testing tools such as Data Synergy Voice, a SOAP/REST-based ISO-8583 processing emulator, SOAP-based loan broker emulator, WebSphere log parser, MS SQL database anonymizer, and a test data generator for Visa and Mastercard clearing.

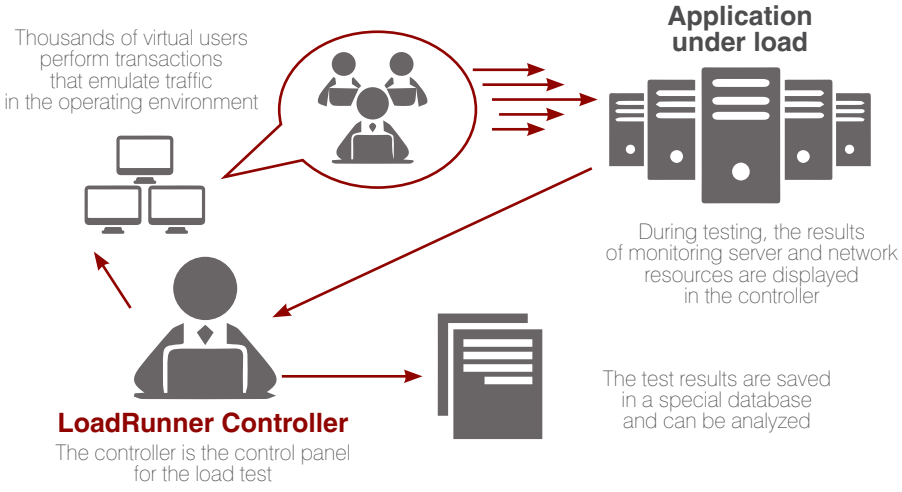
Stage 3: Conduct the tests

Performance Lab specialists are given access to the load generation workstations for the purpose of conducting the testing.

During this stage, we do the following:

- run the tests in accordance with the approved load scenarios,
- process the results,
- assess the validity of the tests performed.

HOW LOADRUNNER WORKS



Performance Lab offers services to set up a maintenance process

Stage 4: Perform systems analysis and prepare the report

The test results are analyzed by Performance Lab specialists in order to generate conclusions and recommendations.

We do the following:

- analyze performance bottlenecks,
- prepare recommendations to optimize the system's code, architecture, and infrastructure, or to develop appropriate organizational rules,
- prepare a report with the test results, a list of detected problems, and our recommendations.

Stage 5: Maintain the solution

During this stage we analyze changes to the tested system in order to keep the performance testing solution up-to-date.

Performance Lab offers services to set up a maintenance process, which may include both comprehensive support of the created solution as well as training the customer's employees.

Why Performance Lab?

Performance Lab is a widely recognized leader in performance testing. Our solution for load testing call centers and IVR systems is unique, innovative, and has no peer in the world.

Performance Lab emphasizes not only a project's technical aspects but also how well it is managed. The Performance Lab project office employs the PRINCE2 project management methodology in order to guarantee our customers achieve the project's objectives on time, on budget, and with excellent quality.

When working with us you can be certain that:

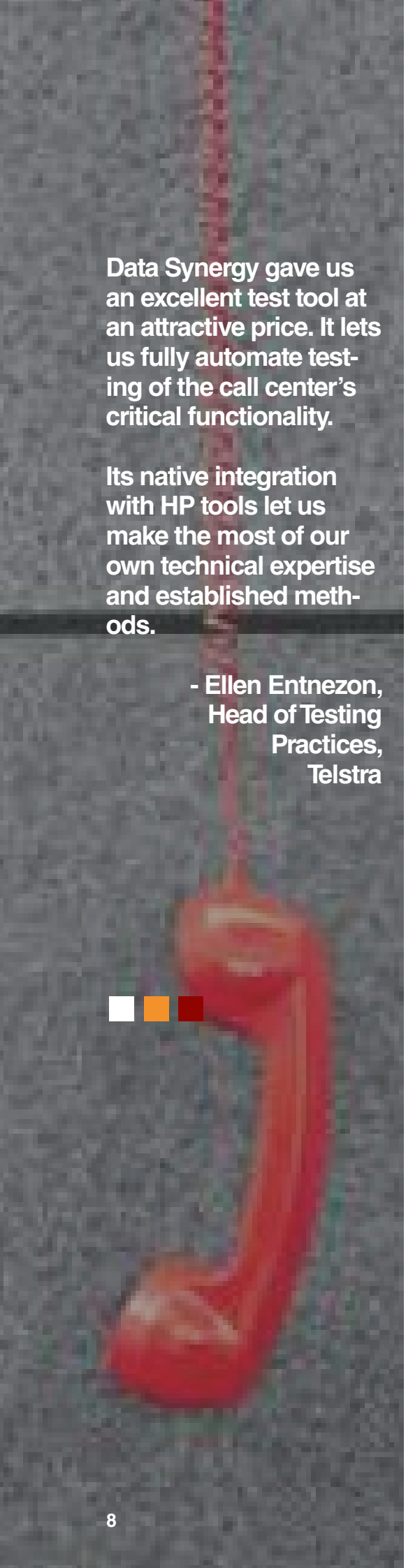
- Leading international performance testing practices will be utilized in your project.
- Performance problems and bottlenecks will be located and described.
- You will receive realistic recommendations for optimization that will let you increase performance (in our experience, it is not uncommon for 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.
- The project's objectives will be achieved right on time.

Case Study: A project for Coca-Cola Amatil

Data Synergy gave us an excellent test tool at an attractive price. It lets us fully automate testing of the call center's critical functionality.

Its native integration with HP tools let us make the most of our own technical expertise and established methods.

- Ellen Entnezon, Head of Testing Practices, Telstra



Coca-Cola Amatil (CCA) is one of the largest producers of non-alcoholic beverages in the Asian-Pacific region and is one of the world's top five producers of Coca-Cola products. CCA operates in 5 countries in the region (Australia, New Zealand, Indonesia, Papua New Guinea, Fiji, and Samoa) and employs more than 13,000 people. The CCA Group encompasses a market of 270 million consumers and works with more than 740,000 dealers.

CCA's National Customer Service Center, with 300 operator stations, is located in Saint Leonards (a northern suburb of Sydney) and provides services 24x7, 365 days a year. More than 75% of customers regularly interact with the Service Center, which processes several millions of requests each year and a critical part of CCA's business.

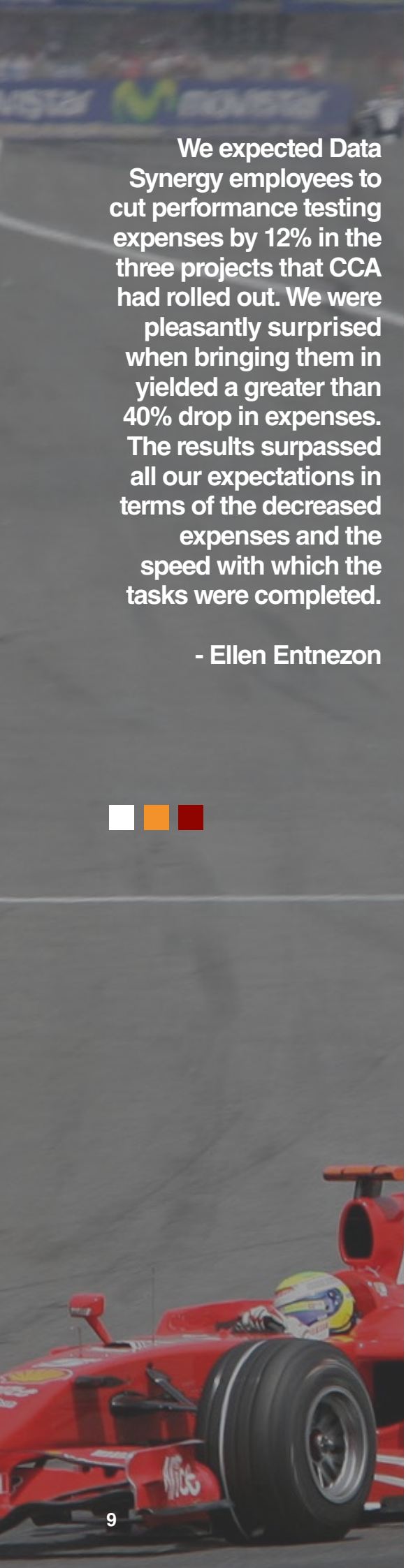
Telstra is a leader in the Australian telecommunications and information services market, having 16.7 million mobile users, 7.3 million landline users, and 3.1 million broadband subscribers. Telstra is a successful player in the systems integration market. By managing call centers with a total capacity of 20,000+ operator stations that interact with more than 100 million requests, and by virtue of owning one of Australia's largest integrated call centers, the company is rightly considered an expert in this field in the APAC region.

Telstra was chosen a main contractor in a project to modernize the infrastructure of and improve the performance of Coca-Cola Amatil's National Customer Service Center.

Purposes of the project

When Data Synergy joined the project to handle automating performance testing, Telstra specialists had already deployed three concurrent programs to modernize CCA's call center. Tight deadlines and the inability to influence the work schedule imposed serious limitations on the subcontractors. Moreover, the approved technical requirements for the test environment, such as emulation of a specific number of simultaneous outbound call campaigns, had already become a barrier for a number of Data Synergy's competitors.

Thus, for Data Synergy it was extremely important to implement the project with a "mistakes are not an option" mindset.



We expected Data Synergy employees to cut performance testing expenses by 12% in the three projects that CCA had rolled out. We were pleasantly surprised when bringing them in yielded a greater than 40% drop in expenses. The results surpassed all our expectations in terms of the decreased expenses and the speed with which the tasks were completed.

- Ellen Entnezon

Solution

Over the course of seven days the test scripts, based on the Data Synergy Telephony Platform, were written and a full cycle of load testing and performance testing of the call center was complete. Upon conclusion of the testing, a detailed report of the results was presented.

What Data Synergy's produced, which is fully integrated into HP's LoadRunner and Performance Center, successfully coped with the challenge of emulating the inbound and outbound calls of the call center's real agents. The versatile integration with the customer's CISCO UCCE platform made it possible to measure the most important performance metrics. Another critical requirement besides connection quality was minimizing the time an agent spends in "Ready" mode before handling the next call.
The test scenarios included an emulation of 160 agents with Cisco Agent Desktop, handling inbound and outbound calls as part of various campaigns. The virtual agents were emulated on a computer with a dual core 3.2 GHz CPU, Windows 7, and 4 GB RAM.

Results

The primary purposes of testing the system and internal processes at peak load were achieved, ensuring stable performance and consistent KPIs during periods of peak load. Unlike the competitors' solutions, Data Synergy's product guaranteed full-fledged emulation of inbound calls as part of marketing campaigns and revealed the full picture of an uninterrupted testing cycle.

It is especially notable that the testing was performed without any changes to the customer's infrastructure, did not require the involvement of extra personnel with special programming skills, and cut overall expenses on "performance testing" by more than 25% of the budgeted amount.

Besides a significant reduction in operating expenses, Data Synergy's solution also provided flexible features that will allow scaling up testing in the future.

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About Performance Lab

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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