

# DevOps

Proof of expertise

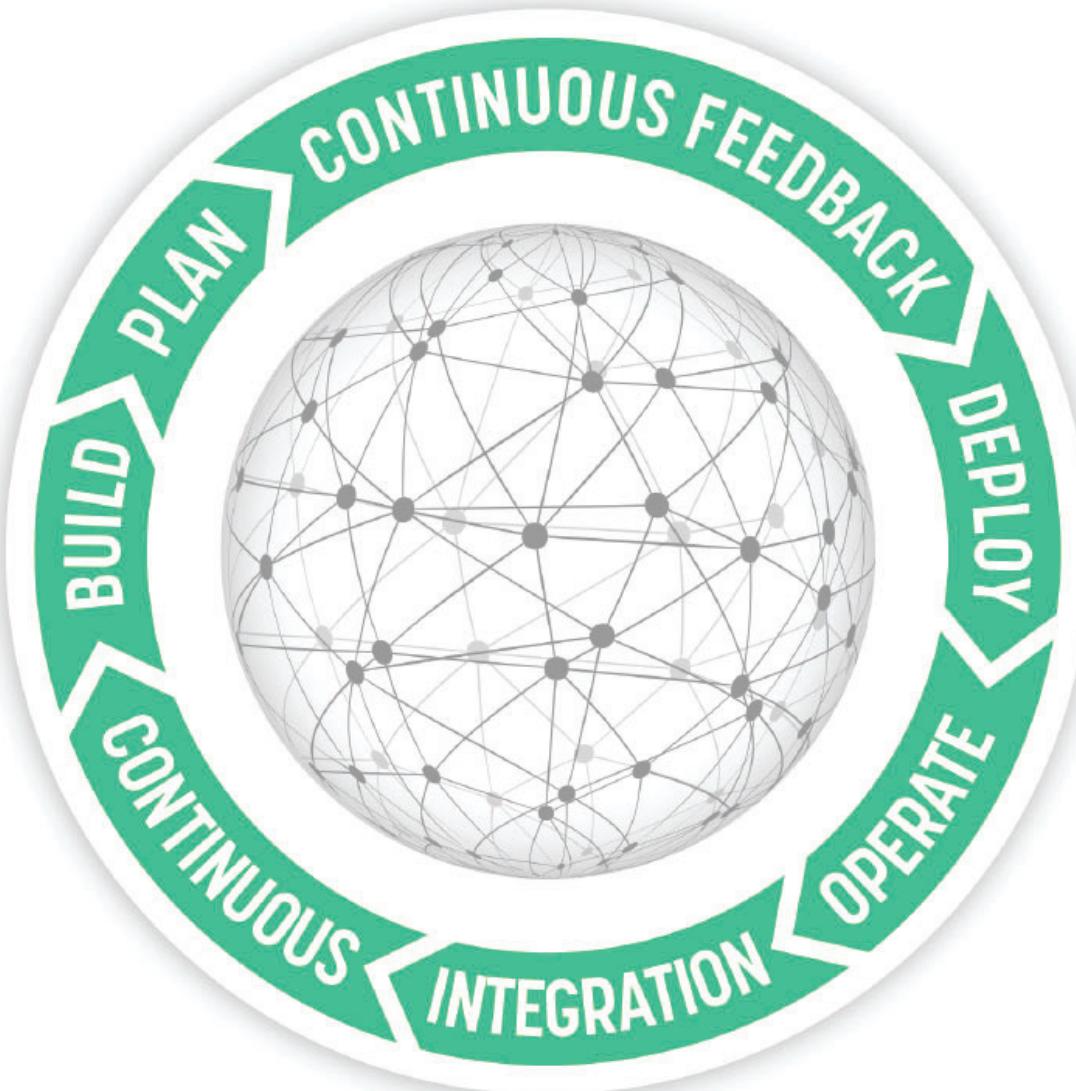
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# Introduction

The implementation of DevOps brings numerous advantages – it has a positive effect on team members and speeds up product delivery while maintaining its high quality. Also, it can boost your market competitiveness. Additionally, DevOps implementation leads to better mutual collaboration and improved communication. This especially goes for development, operations, and business teams.

DevOps focuses on constant testing and delivery. If you had to describe DevOps in one word, this word would be continuous. With principles of continuous development, testing, integration, implementation, and continuous tracking during the lifecycle, the lines between development and operations are blurred and everyone is responsible for overall application performance. Through this paper we will present several projects in which we have used DevOps principles and tools to achieve better results.



# DevOps Principles for Accelerated Business Growth

In this case, we participated in the implementation of DevOps principles in several areas.

Our client is a part of an international group as an important financial transaction processor and provider of cutting-edge services and solutions for banking solutions. It is an international company in every sense of the word. The international character is reflected in the clients, employees, and locations in which it operates, making every effort to provide its customers with services and solutions that meet their specific needs, local specificities, cultural specificities, and regional complexities.

The growing team includes more than 500 professionals, whose knowledge, creativity, and enthusiasm help to deliver quality services and bring value to clients.

Our client uses a wide range of technology when developing their services and, as an enterprise organization, they systemize departments to maximize the efficiency of the system itself.

Software development is organized in departments, such as architecture, development, build management, application management, testing, data warehouse, etc.



# Responsibilities

To reach new demanding markets, our client had to deliver additional functionalities in the planned timeframe and had to significantly increase the throughput, security, and reliability of each internal process.

Therefore, we jointly identified the improvement targets.

- The efficiency of financial processing in every possible way (enhancement, caching, parallelization, etc.)
- The business process has to be automated at every possible step
- The parallelization of the entire distributed solution has to be achieved by automatic instantiation
- Compliance with GDPR
- Encryption of sensitive data
- Anonymization of data

We have been hired to significantly expand the existing development team, implement DevOps principles, and expand the client's testing team. The goal was to implement and increase the degree of automation of the core application development cycle and the development of event-driven systems for developer support.



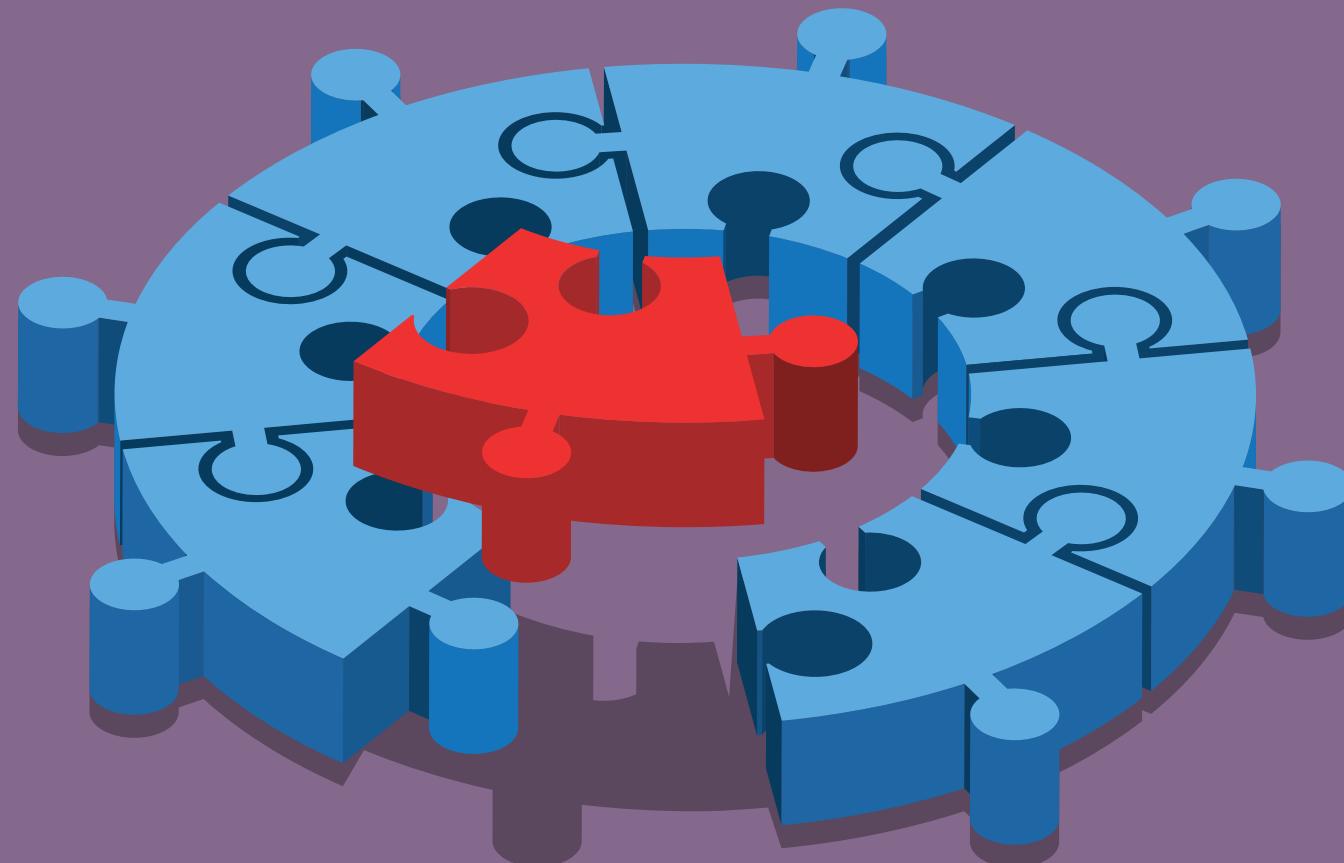
# Solution

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Serengeti participated in the implementation of DevOps principles in the following areas:

- Built a CI/CD pipeline of the distributed system using Microsoft TFS and/or Jenkins
- 'Zero downtime' production upgrade of the core application
- Deployment destination-dependent config transformations implementation
- Encrypting sensitive parts of configuration files
- Versioning the master database, tracking model changes and data in the database, and automating the rollback of models and data in the database
- Automating the setup of an unattended installation of a distributed application's new instance on a set of servers with a clean OS (one click)

- Event-driven integration of high-level business planning and estimation, operational monitoring, and developer workflow – covering all three sides of the client application triangle. Tasks are automatically propagated, synchronized and closed using the Web API and REST interfaces of several applications used



# Result

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Encouraged by the opportunity to capture a large part of the European market, our client decided to rely on Serengeti, who became a reliable partner and improved existing software solutions, raised the level of automation, and made a significant contribution to achieving the final goal.

An additional contribution was also achieved through the stabilization of existing teams through teamwork and through a proactive and assertive approach, supported by transparent and joint mastering of project phases.

The expertise and abilities of the engaged engineers together with the approach cultivated in Serengeti permanently ensures a high-quality long-term partnership with the client.

The client's decision to expand its teams with Serengeti's Team Extension Model and Serengeti experts has enabled them to realize their plans, expand into new highly demanding markets, and grow their business.

A very successful collaboration from the start and a proactive, consulting approach by Serengeti engineers has enabled the collaboration to be expanded to .NET development, automated testing, application management, and business analysis.

During the initial collaboration, Serengeti worked on the development of existing applications and the implementation of DevOps. After getting acquainted with the specifics of user requirements and expectations, the cooperation extended to fixed-price projects where Serengeti takes care of the development process of new applications.



# DevOps Implementation for Improved Business Agility

In this case, our client is a Swiss-based company. They produce robust pagers, design secure networking, and develop innovative software solutions.

Their products and solutions support every step of the alarms chain, ranging from emergency calls, coordination in control centres, to networks and pager alerts.

Serengeti maintains the entire infrastructure of the client's development department. At the same time, we are upgrading and migrating the existing infrastructure to new hardware and software. We also implement automation and continuous integration upgrades within the development department.



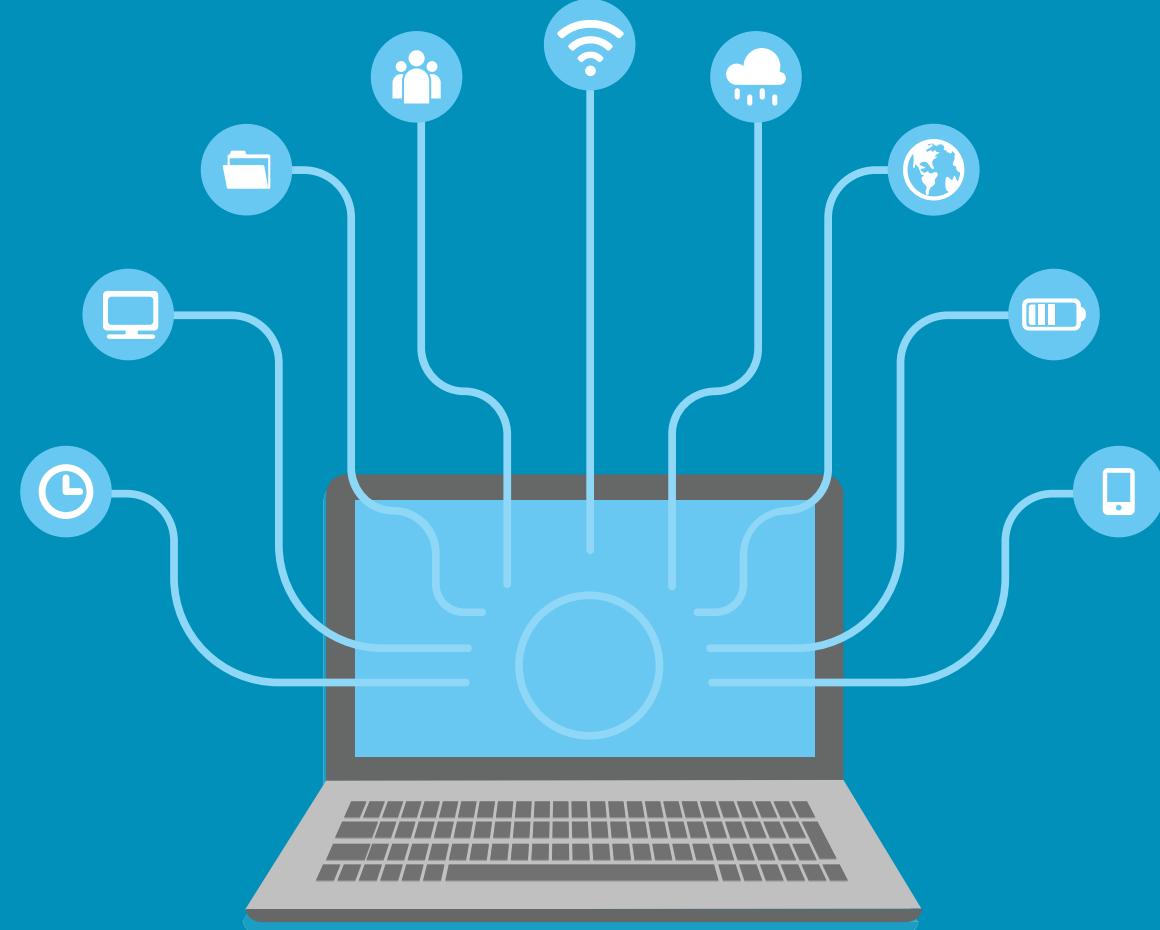
# Challenge

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Our client has a large in-house development department, but they realized that they do not have enough available engineers, Linux, DevOps principles and tools knowledge for successful migration.

In conversation with Serengeti, they realised that our engineers could take over the migration process completely. The biggest challenge was migrating the old infrastructure to a new one, integrating newer technologies for system monitoring, continuous integration, and upgrading all software solutions to the latest versions.

Furthermore, moving to newer virtualization technologies, such as Docker, was a big challenge.



# Solution

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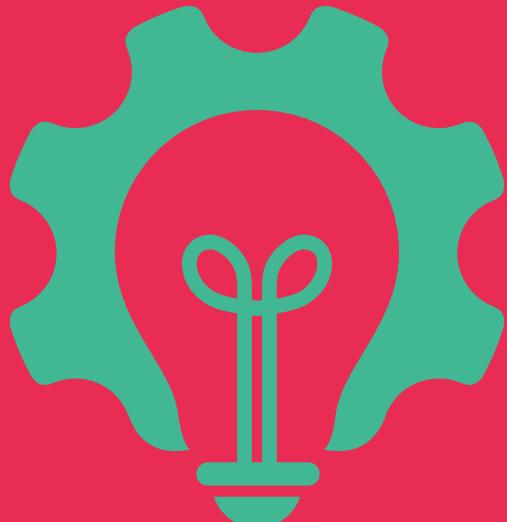
Serengeti is proficient in DevOps implementation – both in Linux and Windows environments. Our client decided to engage the Serengeti team to design and implement the entire DevOps system. Implementation is an ongoing process. In the first phase of onsite work, the client's engineers worked together with Serengeti engineers. That way trust and good communication channels were established, which are the basis of successful long-distance cooperation.

At first, our client was a bit sceptical of how efficient Serengeti engineers would be in regard to working at a remote location. However, because of the good preparation and proven engagement model, moving to a remote location was smooth and the team quickly achieved full productivity.

Serengeti engineers in Zagreb work as a part of the client's team: assignments are created by the client and then in sprint planning, tasks are explained to all team members.

Engineers select tasks on a weekly basis, depending on the specific business priorities in agreement with the client's team and also depending on delivery deadlines for new versions of software developed within all development teams.

Communication with our colleagues was regular and informal – on a daily and weekly basis to discuss what has been done over the past week and what the priorities for the following week are. This way, the work of Serengeti engineers is maximally effective and synchronized with the client's changing requirements.



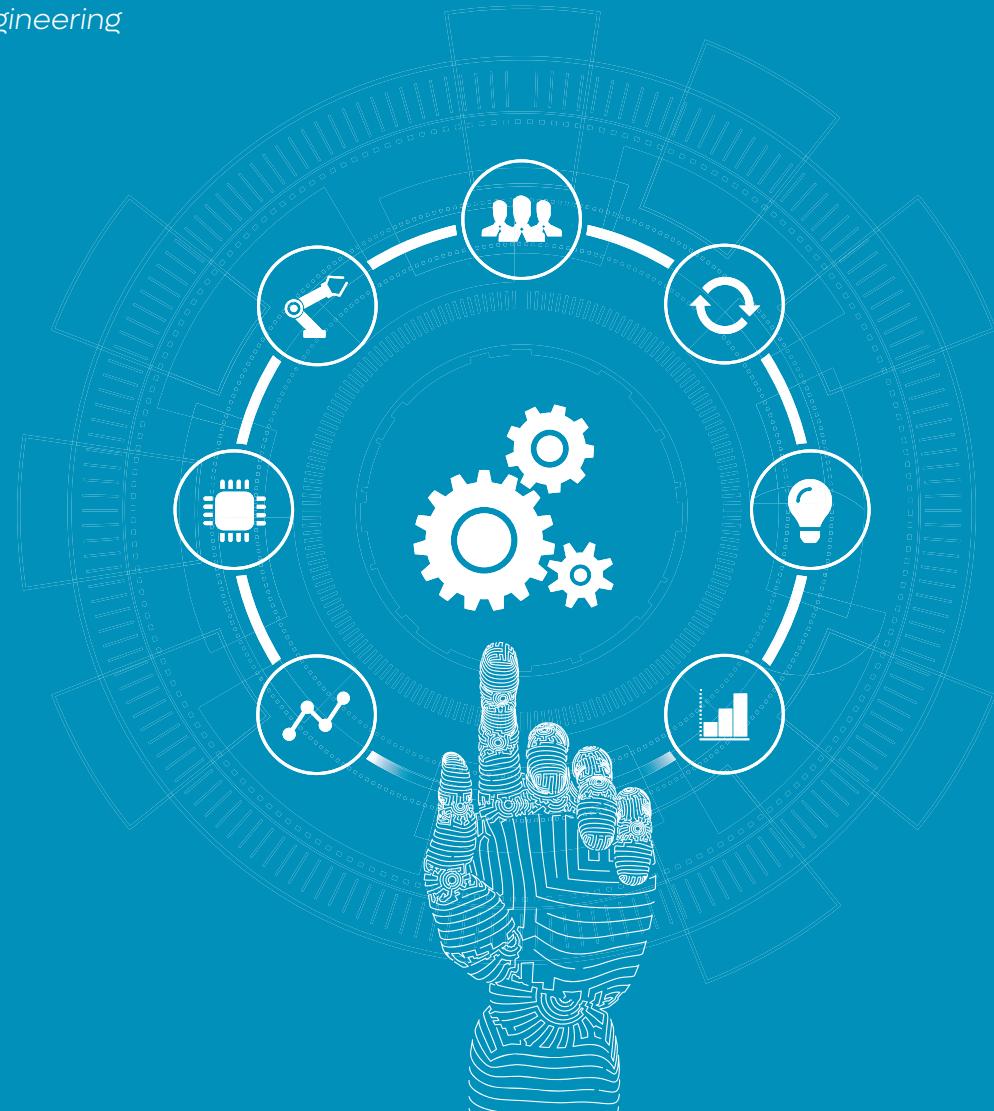
# Result

The client, in cooperation with Serengeti, has stabilized the existing infrastructure, and migration to the new infrastructure is underway. The long-term partnership was established. Successful cooperation in the field of existing infrastructure maintenance has also been extended to the DevOps area thanks to the proactive consultative approach of Serengeti. In this approach, Serengeti, after being well acquainted with the business and the needs of the user, proactively suggests areas in which the overall development process can be improved.

The most valuable result of this co-operation is that the user has a long-term partner to maintain, automate, and improve development department systems. Serengeti uses its broad DevOps knowledge to consult the customer on how to apply modern technologies such as automation, cloud solutions, new virtualization technologies, and CI/CD technologies.

**"Serengeti has proven to be reliable partner with deep expertise in the DevOps area. They helped us to modernise our development process and speed up testing and delivery of new releases."**

*Clients Head of Software Engineering*



# DevOps Competency List

Throughout several different projects, our experience-based DevOps competencies have grown. Our expertise in DevOps principles implementation is based on following technologies:

## a. Azure DevOps (former TFS)



### I Creating CI/CD pipelines using MS TFS / Azure DevOps

1.The CI/CD pipeline performs a large set of automated activities, enabling high throughput while reducing time to delivery.

### II Enable Zero Downtime HA distributed application automated deployment

1.Performing automated application upgrades without outage, with automatic archive and auto rollback in case of problems with new version.

### III TFS / Azure DevOps process configuration and Work items customization and maintenance

1.Creating and customizing workflow states, transitions and fields. Implementing a workflow monitoring system and advanced feedback features.

### IV Configuration files security and transformation implementation.

1.Final versions of configs are destination-dependent. We have enabled configuration transformations that are forward-oriented. Implemented partial or full configuration data encryption.

### V Updating MS TFS / Azure DevOps versions.

1.Performing complex upgrade procedures.

### VI Integration with JIRA

1.Integrating JIRA and TFS / Azure DevOps work item workflows.

### VII Automated tests triggering and monitoring.

1.Implemented automated test pipeline with decision gate reporting.



# DevOps Competency List

## b. PowerShell



### I General scripting.

1. Creating advanced PowerShell scripts to automate tasks and integrate systems.

## II Automated setup

1. Automated setup and unattended installation or upgrade of any or multiple client application to new environments (on-demand) with remote execution.

## c. .NET-based system integration



### I Event-driven integration hub

1. Exploitation of multiple system integration capabilities through SOAP or REST APIs, plugins or a DB approach.

## d. Docker



### I DB model and data changes versioning solution implemented with up-to-date containerized DB.

1. Enabled test DB containerization with tight coupling through a DB version control system.

## e. Visual Studio



### I Advanced remote debugging

1. Performing advanced remote application debugging regardless of the deployed version.

## f. NuGet



### I NuGet packages creation and usage.

1. Building new or using existing NuGet packages. Established NuGet development pipeline and repository.

## g. Nexus



### I Nexus NuGet repository

1. Establishing Nexus NuGet repository with multi-branch support.

## II Nexus Docker image repository

1. Establishing Docker image repository using Nexus.

# Who are we?

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An international nearshoring and offshoring software development and consulting company. With our unique Team Extension Model, we help companies with each stage of the development lifecycle, not only with development but also with consulting services. Technical consulting in different domains like Architecture Design, Automated Testing, DevOps and SCRUM was recognized in 300+ projects across different industries such as finance, logistics, hospitality, industrial manufacturing, healthcare, energy, and retail.

Serengeti d.o.o.  
Ulica Pile I. br. 1  
HR – 10000 Zagreb, Croatia  
[sales@serengetitech.com](mailto:sales@serengetitech.com)  
[serengetitech.com](http://serengetitech.com)

