



PaaSword

Although enterprises recognize the compelling economic and operational benefits of running applications and services in the Cloud, security and data privacy concerns are the main barriers in Cloud adoption. The EU research & innovation project PaaSword is addressing these challenges since Jan 1st 2015.

AT A GLANCE

Project title:

PaaSword - A Holistic Data Privacy and Security by Design Platform-as-a Service Framework Introducing Distributed Encrypted Persistence in Cloud-based Applications

Project coordinator

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Partners from:

CAS Software AG (Germany), SICS Swedish ICT AB (Sweden), Karlsruhe Institute of Technology (Germany), Institute of Communications and Computer Systems (Greece), INTRASOFT INTERNATIONAL SA (Luxembourg), South East European Research Centre (Greece), SixSq Sàrl (Switzerland), UBITECH (Greece), SIEMENS SRL (Romania) and SingularLogic Cyprus Ltd (Cyprus)

Duration: 01.01.2015-31.12.2017

Total cost: 4.461.513 €

EC Contribution: 3.984.575 €

Programme: ICT-07-2014

Further information:

<http://paasword.eu>

Context and motivation

In order to unlock valuable business benefits of Cloud Computing, security and data privacy concerns as main barriers in cloud adoption must be effectively addressed in a holistic way. PaaSword aims at fortifying the **trust** of individuals and corporate customers in cloud services and increasing the adoption rate of cloud-based solutions. The focus is on safeguarding both **corporate** and **personal data** for cloud infrastructures and storage services. The project is addressing the current major **data security challenges**, posed by the Cloud Security Alliance, and provides essential knowledge to organizations that wish to securely migrate to the cloud.

Challenge

Current cloud applications and storage volumes often leave information at risk to theft, unauthorized exposure or malicious manipulation. The most critical target is the data persistency layer and the database itself. To remedy this problem, PaaSword introduces a **holistic data privacy and security by design framework** with main aim to protect users' sensitive data stored in the cloud. The framework is based on a searchable encryption scheme enhanced with sophisticated context-aware access control mechanisms. An innovative approach for key management

maximizes customers' control over their data. Thus, PaaSword leverages **security** and **trust** of cloud infrastructures and services and ensures **protection, privacy** and **integrity** of the data stored in the cloud.

Solution

PaaSword extends the Cloud Security Alliance's cloud security principles by capitalizing on recent innovations in virtual database middleware technologies that introduce a scalable secure cloud database abstraction layer with **sophisticated data distribution and encryption methods**. The implementation of enterprise security governance in cloud environments is supported by a novel approach towards **context-aware access control mechanisms** that incorporate dynamically changing contextual information into access control policies and context-dependent access rights to data stored in the cloud. Finally, PaaSword supports developers of cloud applications through **code annotation techniques** that allow specifying an appropriate level of protection for the application's data. **Applicability, usability, effectiveness** and **value** of the PaaSword concepts are proven through their integration in industrial, real-life services and applications.

EXPECTED RESULTS:

- PaaSword framework
- Reference architecture
- Searchable encryption scheme for secure queries
- Policy access & context-aware security models
- Policy enforcement middleware
- IDE plug-in
- PaaSword demonstrators

Expected impact

PaaSword directly addresses one of the most critical issues with security of cloud technologies. It **maximizes the trust** of individuals and corporate customers in cloud applications and services, as well as enhances the ability of the European software and Cloud Computing industry to deliver them. PaaSword is expected to enable European enterprises to **unlock** valuable business, economic and operational **benefits** of migrating to the cloud. It aims to attract new groups of customers and thus unlock significant economic growth and impact. Thus, PaaSword will **accelerate** the **adoption** of Cloud Computing and further improve the competitive position of cloud providers. **Five demonstrators** will prove PaaSword's potential in PaaS, Public sector, Logistics chain, CRM and ERP related use cases.

