

EU-FUNDED RESEARCH TO CREATE SECURE-BY-DESIGN ARCHITECTURES

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Project URL:

<http://www.sharcs-project.eu/>

The Horizon 2020 SHARCS project aims at designing, building and demonstrating secure-by-design system architectures that deliver end-to-end security for their users. The new technologies developed will be directly usable in applications and services that require end-to-end security. Tremendous technological achievements such as Medical IoT, Smart Cars, Smarter Cities, Smarter Grids etc. have led society as a whole and individual citizens to rely ever more on critical systems which sense and control the physical environment. Such “Cyber Physical Systems” (CPS) use a blend of embedded devices and traditional computing systems, and a variety of communication channels. The adoption of CPS necessitates revisiting of the security stack to ensure that the new generation of

devices and services encompass the lessons learned as part of the ICT cybersecurity battles of the last decades.

To address the pervasive security problems, the SHARCS project will push security mechanisms down the system stack, from software to hardware. Hardware security mechanisms have the advantage of being hard, if not impossible, to be bypassed by attackers. The primary reason for this is that hardware is not typically modifiable as is the case with software. Also, hardware security mechanisms, in most cases, have the advantage of being more efficient in terms of performance, simplicity, and power usage. SHARCS will also implement a series of bottom-up design and implementation concepts to explore the entire system stack, and the interactions between the various components. Some of the challenges that will be addressed by SHARCS include: how to utilize the new functionality, how maintain backwards compatibility with legacy applications, and how to handle the interactions between different administrative domains (e.g., one that has high security requirements and one with low security expectations). SHARCS also investigates how to dynamically recover from errors and how to minimize the burden on software developers and users.

It received EU funding of €3.1 million over three years (1/1/2015 to 31/12/2018).

The main objectives of the SHARCS project are the following:

1. Extend existing hardware and software platforms towards developing secure-by-design enabling technologies.
2. Leverage hardware technology features present in today's processors and embedded devices to facilitate software-layer security.
3. Build methods and tools for providing maximum possible security-by-design guarantees for legacy systems.
4. Evaluate acceptance, effectiveness and platform independence of SHARCS technologies and processes.
5. Create high impact in the security and trustworthiness of ICT systems by:
 - Producing new technologies and tools for security-by-design;
 - Bringing the SHARCS outcomes to market via partnerships with industry;
 - Developing recommendations for EU regulators for a minimal set of requirements (hardware and software) for devices used in critical applications;
 - Forming a standardization proposal for security-by-design technologies;
 - Communicating and disseminating SHARCS results broadly and effectively to industry, academia and the general public.

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