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EXCEED – TRUSTED AND FLEXIBLE SYSTEM-ON-CHIP FOR EUROPEAN DEFENCE APPLICATIONS

EXCEED stands for trustEd and fleXible system-on-Chip for EuropEan Defence applications.
The project aims at paving the way for a trusted European supply chain of reconfigurable, flexible and trustable programmable system-on-a-chip family targeting a number of ruggedized and secure defence applications such as for radio frequency (RF) sensors and signal processing arrays, flexible radios, secure positioning and navigation, UAV data links, military networks, flexible cryptography engines, dismounted soldier, guidance and mission critical controllers. The security of the System-on-chip architecture is studied in detail to cope with Classified information and defence specificities as well as country-specific requirements, through protection, personalisation and life-cycle management. The project also focuses on System Development Tools. The secure chip is fabricated in a trusted environment in Europe. The demonstrator chip will be a mid-scale member of the family.
The consortium encompasses a total of 19 participants from 6 EU countries and Norway. The project, which has a duration of 36 months, starting 1st of November 2020, will receive an EU grant of roughly €12 million.

Participating Members

Consortia/Organization

STMicroelectronics Grenoble 2 SAS | Antmicro SP. Z.O.O ArianeGroup SAS | Elettronica S.p.A | DEKRA Testing and Certification S.A.U. | Fraunhofer Gesellschaft zur Foerderung der Angewandten Forschung e.v. | GMV AEROSPACE AND DEFENCE SA | Indra Sistemas SA | Integrated Systems Development SA | Kongsberg Defence & Aerospace AS | Leonardo Società per Azioni | MBDA France SAS | NanoXplore | Safran Electronics & Defense| SENER Aeroespacial S.A. | Thales SIX GTS FRANCE SAS | Ayming | Synelixis Lyseis Pliroforikis Automatismou & Tilepikoinonion Anonimi Etairia | Thales DIS Design Services SAS

Objectives

The rationale of EXCEED is to propose technical solutions to avoid constraints brought by non-EU countries' domination in digital reprogrammable SoC/SiPs for Defence applications by designing a European FPGA based System on Chip family suited for European Defence requirements in 2025 and beyond.
To achieve it, the project will:

» Develop a first prototype and get it tested by OEMs (Original Equipment Manufacturers).

» Define a comprehensive set of requirements and specifications for SoC/SiP devices and related supply chain that considers the military specificities about operating environment, content protection, compliance with EU and National classified information and the various mission profiles.

» Develop synergies and supply chains with other European critical sectors such as Space, Aeronautics and Industrial.

» Assess the gaps to be fulfilled to overcome the dependence on non-EU technology providers and propose a roadmap for the creation of a trusted European supply chain.

Work Strands

A first part of the EXCEED project will focus on security requirements as well as technical requirements. The target is to ensure that the security requirements of such a SoC or SiP are met all along its life from creation to field usage: military users need to be sure that these components can be trusted for use in security systems, communication equipment and encryption systems without restrictions.
The users' (OEMs) needs and experiences are the background to provide a baseline for architecture analysis, system developments tools and technology development. The collection of requirements will guarantee the definition as well as the maintenance of the roadmap towards a trusted European supply chain for secure high performance digital SoC/SiP.
The major objective of the system development tools work package is to identify the global software tool chain required to use efficiently complex SoC/SiP devices through the list of mandatory/highly desirable/optional features. Another objective is to test/evaluate/improve current solutions, to develop some virtual model required for the SoC simulation phase and to define associated roadmaps for missing tools.
The aim of technology development is to develop the underlying technology bricks necessary to create value and sovereignty in European defence electronics. The development technology is based on 28nm FDSOI technology.
Finally, the functional evaluation will assess the performances of this first version of the SoC compared with the identified requirements.

Way Ahead

The project is targeting the following impacts:

» Ensure secure and autonomous availability of high performance and trustable (re)configurable SoC/SiPs to military end-users.

» Contribute to strengthening the European microelectronics industry and help improve its global position through the implementation of innovative technologies along a new European manufacturing value chain.

» Improved competitiveness of the end-user industry in and beyond the defence sector.

» And finally, demonstrate the potential of EU-funded research in support of EU critical defence technologies, in particular in the domain of (re)configurable SoC/SiPs.

Link to TBBs, CapTechs, and other links

- OSRA TBB 51 - The protection of military communications and information systems (CapTech Cyber)
- OSRA TBB 43 – System-On-Chip (CapTech Components)
- OSRA TBB 45 – Defence critical technologies supply chain (CapTech Components)
- OSRA TBB 41 - ADC and DAC (CapTech Components)

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