

Project Achievements



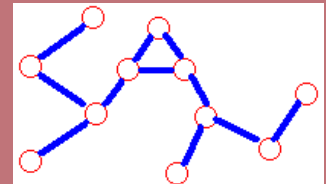
Survivable Ad Hoc Networks for 4G and beyond

SAN project run from November 1st 2011 to October 31st 2015 and aimed at developing a 4G broadband mobile wireless communication system endowed with a wide range of ad-hoc and relaying/mesh capabilities. SAN provided a solution based on rapidly deployable, self-configurable mobile wireless network with no need of fixed infrastructures, external control /management systems. SAN developed a robust and cost-efficient solution for rescue teams and first responders'

organizations in a variety of scenarios when other communication networks are unavailable due to disaster, military actions, etc.

Main focus

Today, the telecommunication infrastructures are usually not properly protected against unexpected events/crisis situations. During earthquakes, several base stations may collapse, the remaining net-



SAN

Project ID: CP8-5

Start Date: 1 November 2011

Closure date: 31 October 2015

Partners:

Airbus DS SAS, France

Commissariat à l'Energie Atomique et aux énergies alternatives (CEA-LETI), France

C2TECH (C Tech Bilisim Tek. Tic. Ve San. A.S.), Turkey

Green Communication, France

IITP RAS, Romania

INDRA Sistemas (SA), Spain

Mobilicom Ltd, Israel

Montimage, France

Smart Com, Slovenia

TTI Norte, S.L., Spain

UPE-MLV (LIGM Lab), France

Co-ordinator:

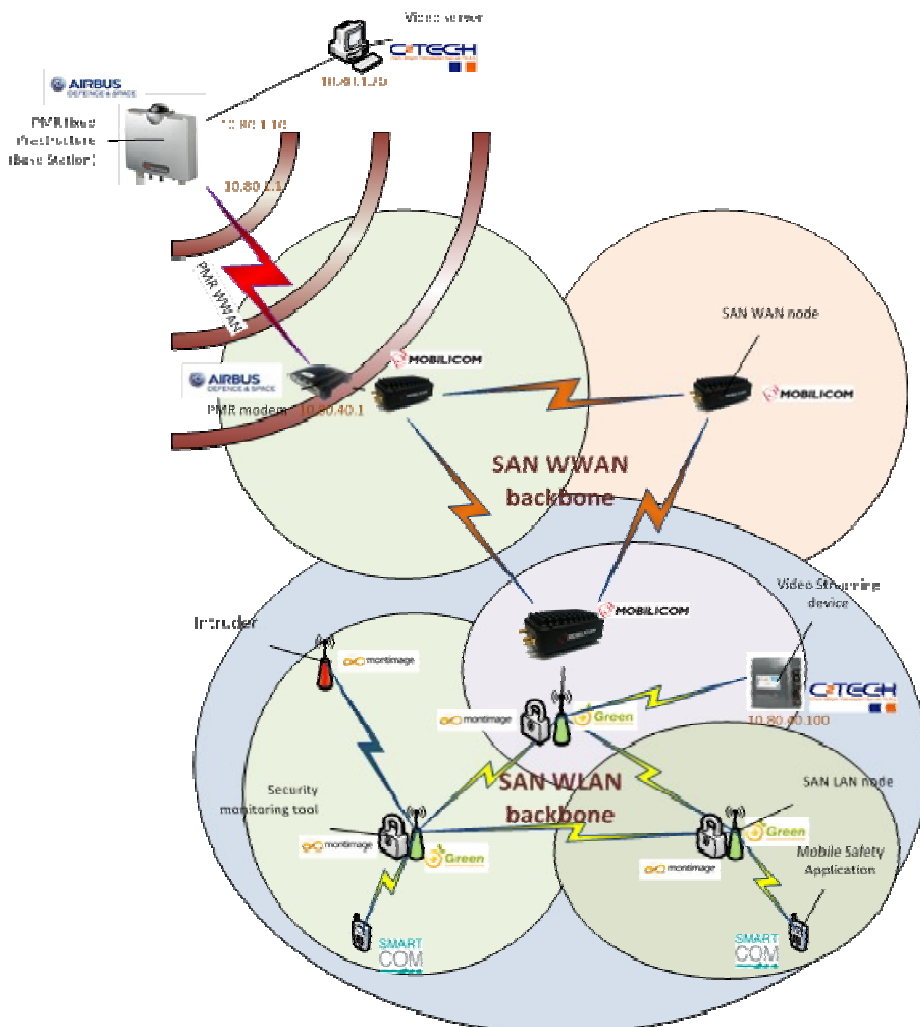
Serge Delmas

Airbus DS SAS

E-Mail: serge.delmas@airbus.com

Project Website

www.celticplus.eu/project-san/



work is overloaded, and therefore in practical situations the network seems to stop working. Therefore, it is essential to invest into the R&D of solutions which enable people to communicate in such situations. SAN focused on the development of survival ad hoc Network for 4G relying on the dynamic networking paradigms enabling people to communicate in a secure manner even if the fixed network infrastructure does not work at all.

SAN resolves several fundamental shortcomings of modern wireless communication systems:

- ◆ Inability of direct communication between user equipments even when the link quality between them would allow transmission at high bit rates
- ◆ Need in complex radio planning to guarantee system performance,
- ◆ Need in cumbersome fixed infrastructure to connect nodes and base stations, and thus inability of rapid deployment required in many scenarios (disasters, military actions, etc.)

Approach

SAN project encompassed the whole LTE stack from bottom to top to end up with the integration of all these techniques in a demonstrator and the assessment of its performance:

- ◆ PHY level methods and algorithms for radio interface control, e.g. dynamic frequency allocation without prior planning, interference mitigation, efficient link adaptation and spectrum utilization, etc.
- ◆ Medium Access Control (MAC) level mechanisms, e.g. ad-hoc mobile relay mechanisms, robust and energy efficient advertising of link topology, link layer self-* capabilities in dynamic environment.
- ◆ Network and upper layer techniques, e.g. real-time topology discovery with optimized overhead, robust mesh routing in dynamic topology, multicasting and broadcasting in dynamic environment.
- ◆ An integrated SAN prototype system, for demonstration and evaluation purposes.

Achieved results

SAN project was a CELTIC project that received public funding from el Ministerio de Industria, Turismo y Comercio (Spain), the Ministry of Economic Development and Technology, Tubitak, the Ministry of Economy of Israël and the Direction Générale des Entreprises (France) and ended up with:

- ◆ 2 new products prototypes
- ◆ 9 improved products
- ◆ 13 new recruited employees

- ◆ 9 prototypes and field trials
- ◆ 5 contributions to standards
- ◆ 9 deposited patents

Impact

The potential commercial application of the developed technology is foreseen in just a few years after successful project completion. SAN technologies are already ripe, competitive and able to augment pre-4G and 4G systems with their unique features of autonomous operation, dynamic topology support, etc. Thus, with SAN technologies available to them industrial partners are in a very good competitive position in the mobile communications market, which yields new revenues and new jobs both, for project partners and for respective national economies.

About Celtic

Celtic is a European research and development programme, designed to strengthen Europe's competitiveness in telecommunications through short and medium term collaborative R&D projects. Celtic is currently the only European R&D programme fully dedicated to end-to-end telecommunication solutions.

Timeframe: 8 years, from 2004 to 2011

Clusterbudget: in the range of 1 billion euro, shared between governments and private participants

Participants: small, medium and large companies from telecommunications industry, universities, research institutes, and local authorities from all 35 Eureka countries.

Celtic Office

c/o Eurescom, Wieblinger Weg 19/4,
69123 Heidelberg, Germany

Phone: +49 6221 989 405, e-mail:
office@celtic-initiative.org

www.celtic-initiative.org

