

Large Scale Integrated Project



***A holistic approach towards the development of
the first responder of the future***

Prof. Maurizio Casoni

THEME

Objective:

SEC-2009.4.2.1: First Responder of the future

Duration of the project:

48 months (starting July 1st 2010)

Budget:

The total requested grant is €8,790,044.00 while the overall foreseen budget of the ESPONDER project is €12,922,363.40

ESPONDER: list of participants

- | | |
|---------------------------------------------------------|----------|
| 1. EXODUS S.A. (coordinator) | (Greece) |
| 2. University of Modena and Reggio Emilia | (Italy) |
| 3. CrisisPlan BV | (NL) |
| 4. PROSYST Software GmbH | (D) |
| 5. Immersion S.A. | (F) |
| 6. Rose Vision | (SP) |
| 7. Telcordia Poland Sp. z o.o. | (POL) |
| 8. Centre Suisse d'Electronique et de Microtechnique SA | (CH) |
| 9. SMARTEX | (I) |
| 10. Technische Univesität Dresden | (D) |
| 11. YellowMap | (D) |
| 12. PANOU S.A. | (GR) |
| 13. Telcordia Taiwan | (TAIW) |
| 14. Institute for Information Industry | (TAIW) |
| 15. Centre d'Essais et de Recherche de l'Entente | (F) |

Introduction

Natural disasters, CBRN (Chemical, Biological, Radiological, Nuclear) and terrorist attacks using explosives can cause massive destruction, high mortality and many casualties not only in urban areas but also in critical infrastructures, usually, without warning; this is particularly true for earthquakes.

Earthquakes involve more than 30% of the total fatalities from natural disasters the last 20 years. On average, about 7 lethal earthquakes were occurring each year in the 20th century.

Terrorist attacks especially in high-rise buildings (e.g. telecom hotels, airports) can be responsible for a large number of entrapped people. The 9/11 event was such a case.

Entrapment is also the result of collapsed structures due to accidental or deliberate explosions (e.g. collapsed mines, technical failures, confined spaces).

Disaster impacts are high in Critical Infrastructures for a number of reasons; CIs are positioned over large regions, are overpopulated, have very tall and extended building blocks with complicated street patterns

Abstract

The *ESPONDER* is a suite of real-time data-centric technologies which will provide actionable information and communication support to first responders that act during abnormal events (crises) occurring in critical infrastructures.

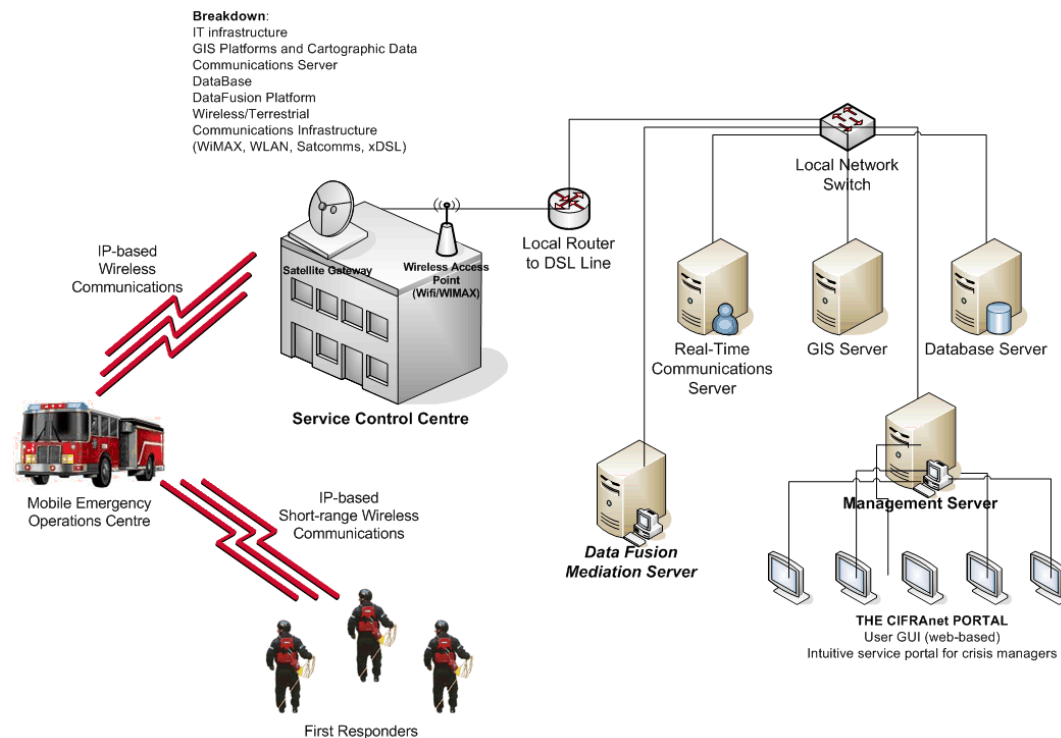
This information will enable improved control and management, resulting in real time synchronization between forces on the ground (police, rescue, firefighters) and out-of-theater command and control centers (C&C).

The key concept behind all envisaged work of the ESPONDER project is the facilitation of effective first responder work through the employment of advanced and revolutionary ICT systems, applications, services and concepts

ESPONDER High level view

ESPONDER's main objective is to research, develop and demonstrate the capabilities of a framework and congruent prototype that will enhance the effectiveness of operations of first responders operating in Critical Infrastructures

The Emergency Operations Control Centre, the Mobile Emergency Operations Control Centre and the First Responder Unit



The First Responder Unit

- **FRU Wearable Computer**
- **Integrated Navigation and Positioning Module**
- **Outdoor:** GPS/DGPS, **Indoor:** LPS, microwaves, ultrasonic and/or laser)
- **Communications Component**
BT, Wifi, 3G, Mobile WiMax, LTE, GSM
- **Application Specific Sensors**
measure physiological parameters in real-time
- **Textile Integration**
FRU local network for unobtrusive operations

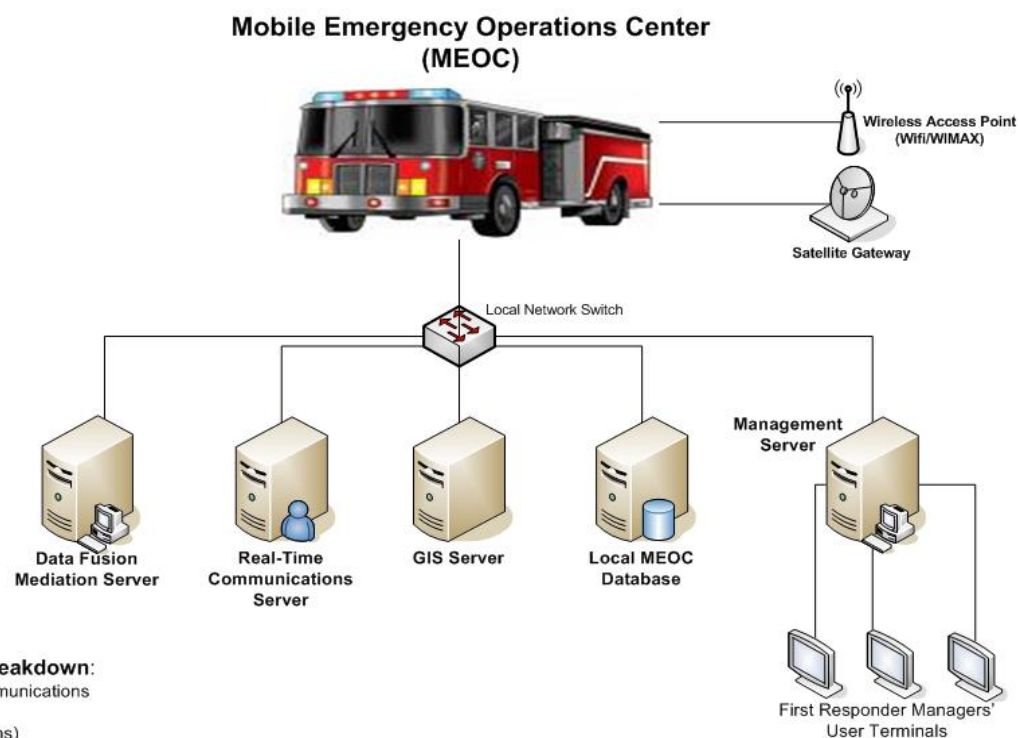


The eSPONDER helmet and wearable user terminal

The system consists of a helmet mounted microphone and ear speaker assembly that easily snaps onto the user's fire helmet.



The E-SPONDER MEOC components



E-sponder MEOC Breakdown:

IT infrastructure and Communications
Infrastructure
(WiMAX, WLAN, Satcomms)
GIS Platform and Cartographic Data
Communications Server
Local MEOC Data-Base
Data Fusion Mediation Server
Management Server
First Responder Managers' User Terminals
E-SPONDER Portal

The eSPONDER EOC

- **Data Fusion and Mediation**

Portal and Back-Office Applications

- **Real-time Communications Server**

Wifi, 3G/UMTS, WiMax, VHF, UHF, Tetra, Satellite

- **3-D GIS platform**

Static geographic and environmental information

- **Emergency Response Planning - Execution**

Overall command of processes and resources



The eSPONDER EOC
Sharing a common operational picture.



eSPONDER in practice

- 2 Major Pilot Events
- 3 Simulated Scenarios covering end-to-end activity of first response work
- Simulated events cover both normal and abnormal types of crisis
- Total of 150 First Responders participating
- eSPONDER-based Training to involved personnel



WP No1	Work package title	Type of activity	Lead partic. No.	Lead partic. Short name	Person months	Start month	End month
WP1	Management	MGT	1	EXO	58	0	47
WP2	User Requirements	RTD	15	CEREN	46	0	7
WP3	Dissemination and Exploitation	OTHER	15	CEREN	70	0	47
WP4	Training and knowledge transfer	RTD	3	CPLAN	73	1	47
WP5	Logistics of First Responder Operations	RTD	6	ROSE	56.5	1	36
WP6	Standardisation Issues	RTD	6	ROSE	42	6	47
WP7	System Architecture	RTD	4	PROS	94	4	14
WP8	Development of the FRU	RTD	8	CSEM	212	12	34
WP9	FRU Component Validation and Integration	RTD	8	CSEM	84	26	34
WP10	Development of the MEOC	RTD	12	PANOU	105	14	25
WP11	Development of the EOC	RTD	7	TARC-PL	109	14	25
WP12	Overall System Integration	RTD	1	EXO	65	29	38
WP13	Pilot Demonstrations	DEM	3	CPLAN	107	38	48
	TOTAL				1121.5		

WP7: System Architecture

This is a work-package of fundamental significance to the project because the overall architecture of the E-SPONDER platform has to be defined. All issues from application down to physical layer have to be taken into account, keeping in mind to define secure, robust and resilient solutions, suitable for the above defined scenarios.

T7.1 Design of the FRU

T7.2 Design of the MEOC

T7.3 Design of the EOC

T7.5 Communication Security and Interoperability

For any further information, please contact

Project Coordinator:

Dimitris Vassiliadis

dvas@exodus.gr

Tel.: +30.210-7450321

or

Prof. Maurizio Casoni

maurizio.casoni@unimore.it