

Wireless DEployable Network System

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WIDENS



Project overview



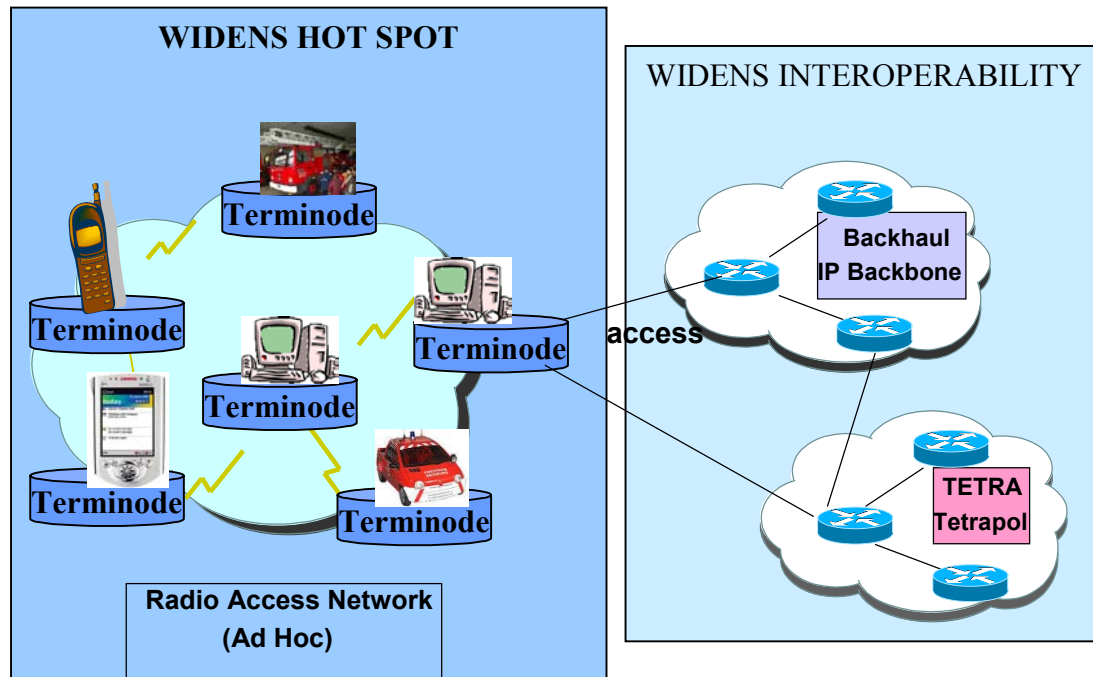
■ WIDENS is a European funded cooperative R&D project addressing future public safety, emergency and disaster communications requirements.

- Thales Communications
- University of Antwerp
- Universitat Politecnica de Catalunya
- EADS
- EURECOM
- Helsinki University of Technology
- Telefónica I+D
- Multitel

Project leader
System design
Ad hoc routing
Security
Ad hoc MAC/PHY platform
Dissemination
Trial and data application
Video application

WIDENS goal

- Purpose : design, prototype and validate a vertically integrated **rapidly deployable and scalable communication system** for future public safety, emergency and disaster applications.



- Focus : **single hot spot**, optimised for **high bit rate** throughput (2

Main objectives



■ *System study :*

*Propose a system for an easily deployable **IP network in the absence of infrastructure***

Design a scalable, reconfigurable, reliable and secure system

- taking the best of current WLAN standards (WiFi, H/2)

- introducing ad-hoc adaptations and security features

*Dissemination to **MESA (Mobility for Emergency and Safety Applications)** transatlantic initiative between TIA and ETSI*

■ *Experimentation with **Real Time PC based platform** demonstrating :*

A set of ad-hoc and security features

A set of enhanced services

- Audio/video real time communication

- Data exchange and replication

Technical approach

- To design, develop and prototype a **dynamic network of terminodes**

- A **terminode** is a versatile homogeneous communication node:
 - ***both the functionalities of present handset terminals and of IP routers.***
 - **A relay node** to extend the coverage area.
 - support **advanced relaying features**, up to the IP layer.
 - **End user terminal** when it runs an application
 - All distributed applications based on the suite of internet protocols over **TCP or UDP are supported on a larger scale**
 - **Gateway** toward a backhaul Network or other terminals

 - ***PHY, MAC & NETWORK more closely integrated.***
 - **global optimisation** of the system deployment capabilities, scalability and overall efficiency.
 - Each versatile terminode is able **to play the best role depending on its relative position within the network and the requested services.**

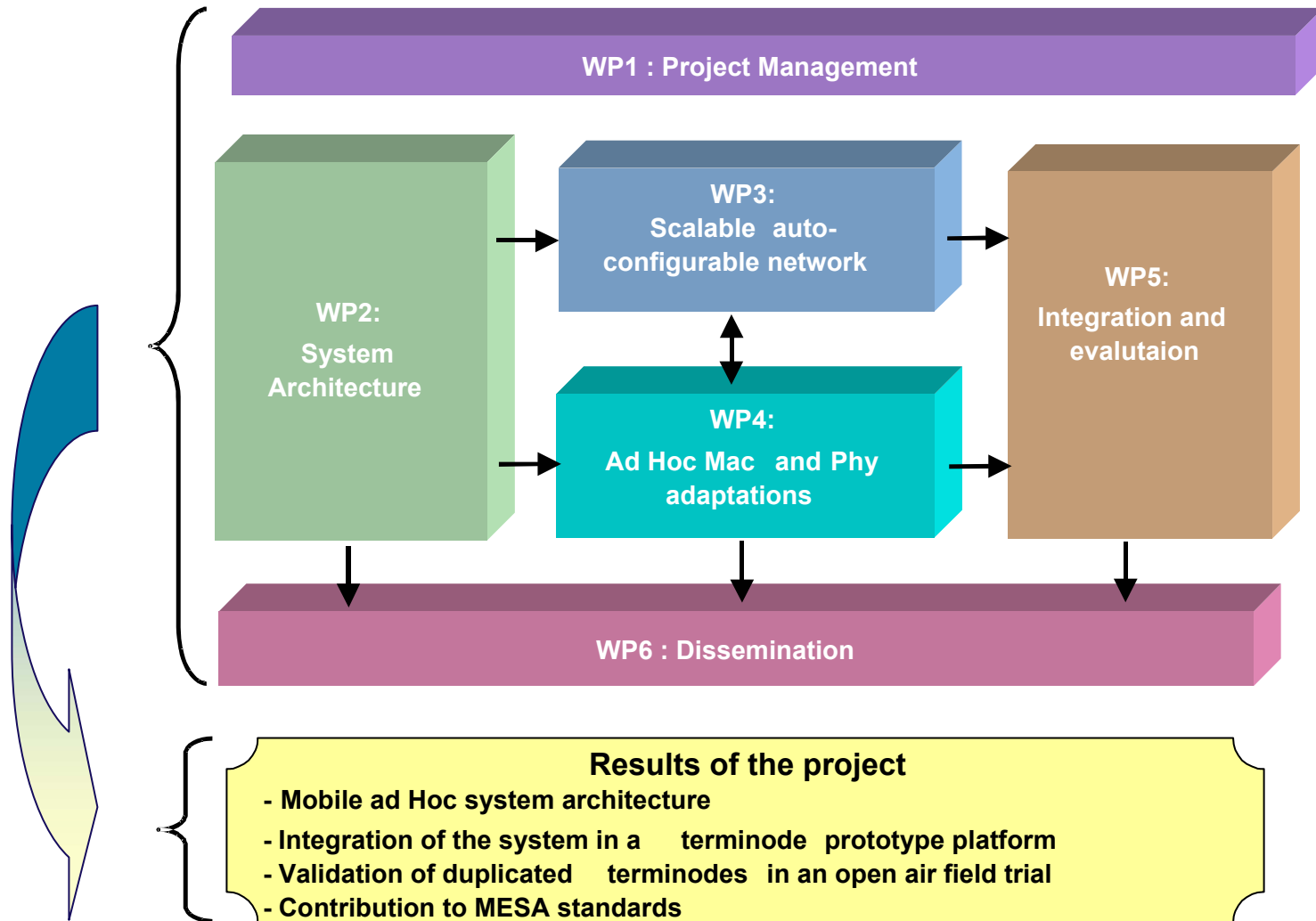
Partners



- Thales Communications (France)
- University of Antwerp (Belgium)
- Universitat Politecnica de Catalunya (Spain)
- EADS (France)
- EURECOM (France)
- Helsinki University of Technology (Finland)
- Telefónica I+D (Spain)
- Multitel (Belgium)

Partner	Profile	Role	WP lead	Country
THC	I	Project leader	WP1, WP3	F
UoA	Univ	System design	WP2	B
UPC	Univ	Ad hoc routing		E
EADS	I	Security		F
EUR	R&D centre	Ad hoc MAC/PHY platform	WP4	F
HUT	Univ	Dissemination	WP6	Fin
TID	I	Trial and data application	WP5	E
MULT	SME	Video application		B

Project organisation



- Reviewing and adapting the proposed ad hoc IP routing protocols (*in the IETF Mobile Ad hoc network -MANET- group*)
- Providing Quality of Service to the network, especially in the case of several hops in a heterogeneous and dynamic environment
- Analysing and defining a security policy framework
- MAC and network layer optimization for supporting the ad hoc mode

Focus of the project



■ the MAC/IP interface:

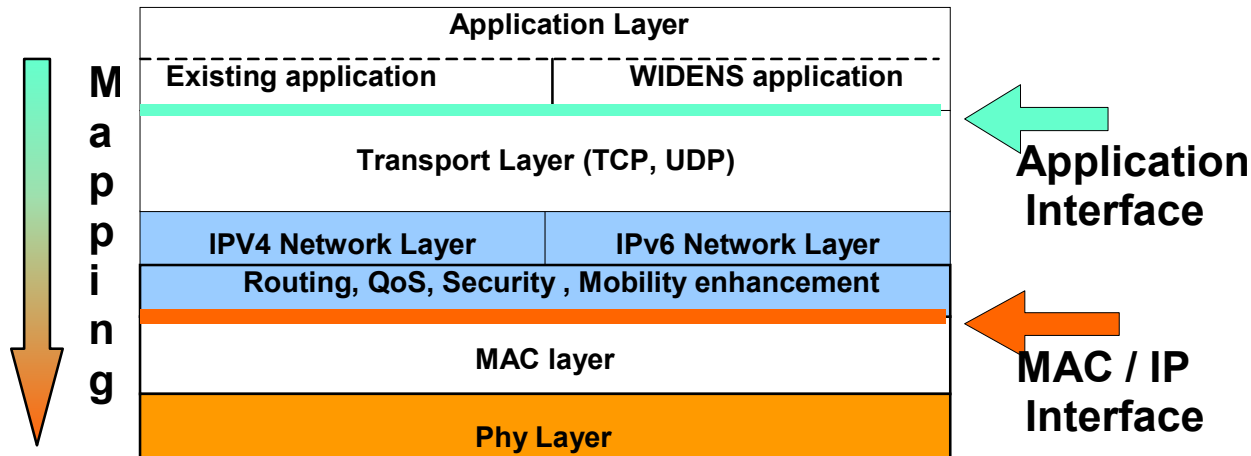
□ *tight connection between MAC and IP features is the key for allowing at the same time :*

- **optimised communication links** (for radio interface, relaying, security and QoS)
- **interoperability** of the solution with other systems at the IP layer.

■ the application interface:

□ *an Application Programming Interface (API) will allow the applications running on the terminodes to take advantage of the new features offered by the system.*

- **Added value** for emergency services



Prototyping



- a common real time platform, demonstrating integrated PHY, MAC and NETWORK layer functionality of the terminode.
- PC based implementation with optimisation on target Intel processor
- wide-band RF front-end
- Validation of ad hoc features and performances and communication services on a platform of four terminodes

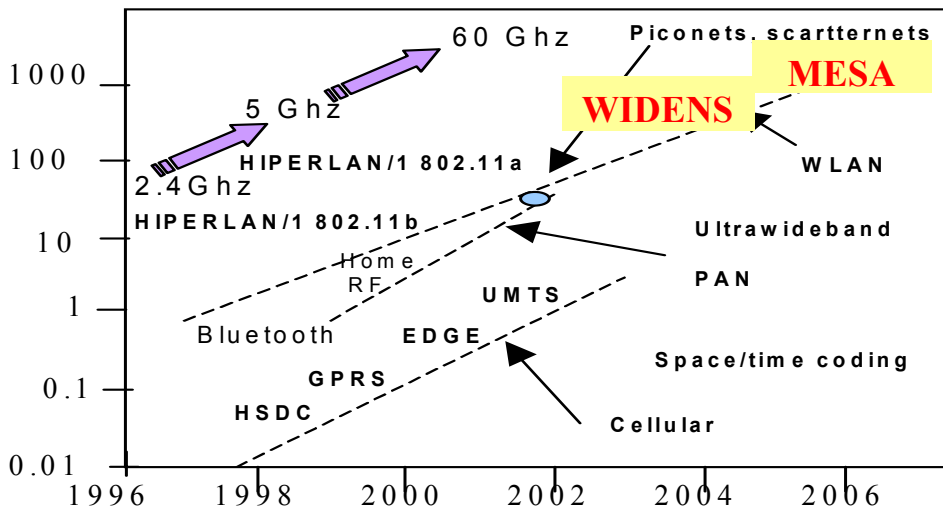
■ The prototype will furthermore support new **added value applications for Emergency services** (police, fire workers,...), including:

- *Voice communication.*
- *Access from a terminal to replicated information from one Emergency Service (for example, a Fire Department).*
- *Video streaming among nodes and connection to the control room.*

■ The work produced by the project will be contributed to the MESA standardisation activities.

• *To elaborate a joint specification of Mobile Broadband Technology to be deployed for public safety and emergency.*

• *The knowledge provided by a hands on experimentation on ad hoc networking on the WIDENS real time platform will strengthen the position of Europe in MESA.*



- ***North America - decisions have been made to allocate*** bandwidth for broadband public-safety applications. the FCC liberated 50 MHz of spectrum at 4940-4950 MHz for broadband services in support public safety on February 14, 2002
- ***In Europe - no final decisions as to bandwidth allocation*** have been made so far. It must be taken into account that it is unlikely that the 4940-4990 MHz frequency band will be available in all European countries.
- ***WIDENS will contribute to the European effort for bandwidth allocation through technical evaluations of required throughput and range***

Contact point



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Thank you !