



D8.1 – DISSEMINATION AND STANDARDISATION REPORT

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Abstract:

This document reports all the dissemination, exploitation and standardization activities realized during the first 6 months of the MONET project.

Dissemination activities include the realization of the project's website, the participation at international conferences, the publication in journals and books, the distribution of brochures and leaflets, and the organization of workshops.

Exploitation activities foresee the distribution of project information to potential users, target industry and potential customers, as well as utilization and learning of knowledge in the academic context.

Standardization activities are focused on the interaction with standardization bodies for which the work proposed in MONET is relevant.

¹ Nature of deliverable: **R** = Report; **P** = Prototype; **D** = Demonstrator; **O** = Other

² Dissemination level: **PU** = Public; **PP** = Restricted to other programme participants (including the Commission Services); **RE** = Restricted to a group specified by the consortium (including the Commission Services); **CO** = Confidential, only for members of the consortium (including the Commission Services).

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Executive Summary

This document reports all the dissemination, exploitation and standardisation activities realized during the first 6 months of the MONET project, from January 2010 to June 2010. This corresponds to the activities of WP8 of the project.

This document includes:

- A dissemination plan.
- A description of MONET Logo and Website, illustrating its features.
- A report on the organization of workshops, seminars and the participation to conferences and other dissemination events.
- A description of publicity materials and initiatives (brochures, leaflets, etc.) carried out during the period of interest.
- A report on the publications of research papers.
- Exploitation and standardisation plans and activities.



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List of Acronyms

Acronym	Meaning
ACM	Association for Computing Machinery
AENA	Aeropuertos Españoles y Navegación Aérea
AIAA	American Institute of Aeronautics and Astronautics
AMR	Adaptive Multirate
ANBP	Associação Nacional de Bombeiros Profissionais
ANPC	Autoridade Nacional de Protecção Civil
ATC	Ancillary Terrestrial Component
BPM	Business Process Management
DGA	Delegation Generale pour l'Armement
DoD	Department of Defense
ETP	European Technology Platform
ETSI	European Telecommunications Standards Institute
GPPQ	Gabinete de Promoção do 7º Programa-Quadro de I&DT
IEEE	Institute of Electrical and Electronic Engineers
IET	Institution of Engineering and Technology
IETF	The Internet Engineering Task Force
IFAC	International Federation of Automatic Control
I.LI.TEC	Independent Life Technologies
ISI	Integrated Satellite Initiative
ITU-T	International Telecommunication Union – Telecommunication Standardization Bureau
MAC	Medium Access Control
MANET	Mobile Ad-hoc Networks
MDP	Markov Decision Process
MELPe	Mixed-Excitation Linear Predictive enhanced
MESA	Mobility for Emergency and Safety Applications
MONET	Mechanisms for Optimization of hybrid ad-hoc networks and satellite NETworks
NCP	National Contact Point
PSC	Public Safety Communication forum
PSP	Polícia de Segurança Pública
QoE	Quality of Experience
QoS	Quality of Service
RL	Reinforcement Learning
SAMUR	Servicio de Asistencia Municipal de Urgencia y Rescate
SIAM	Society for Industrial and Applied Mathematics
SME	Small and Medium Enterprise
TEDS	TETRA Enhanced Data Service
TETRA	TERrestrial Trunked Radio
UME	Unidad Militar de Emergencias

Table 1 – List of acronyms.



1 Introduction

This document corresponds to the first report on the dissemination, exploitation and standardisation activities conducted in the context of the MONET project. This report covers the first 6 months of the project (from January 2010 to June 2010).

MONET is an FP7 European project centred on hybrid MANET-Satellite networks. Such a typology of network is a natural evolution of considering the problem of providing local and remote connectivity in a highly mobile, dynamic and often remote environment. MONET will study the challenges of such composite networks with particular focus on the following:

- Optimising network resources and link availability;
- Providing Quality of Service (QoS) and Quality of Experience (QoE);
- Minimizing costs and energy.

In the context of the MONET workplan, work package WP8 includes all the activities that aim to provide external visibility to MONET project results, including scientific, technical, commercial and industrial points of view, as well as standardization. Exploitation activities are also part of WP8.

This document reports the dissemination and exploitation activities conducted from January 2010 to June 2010, in the context of WP8. It is organized in the following manner: Section 2 summarizes the structure and the different activities planned for WP8. Section 3 introduces a dissemination plan that can be developed during the duration of the project. Section 4 reports the MONET logo and website realized in the period of interest. Section 5 addresses the organization of workshops, seminars and the participation to conferences and other dissemination events. Section 6 reports on publicity materials and initiatives (brochures, leaflets, etc.). Section 7 discusses publications of research papers. Sections 8 and 9 report on initial activities dedicated to exploitation of MONET results and standardisation. Finally, a conclusion section ends this report.

2 WP8 Structure

WP8 – Dissemination, Exploitation and Standards aims at:

- Ensuring an efficient dissemination of the project objectives and results to the stakeholders that are considered critical to the project: stakeholders are the project partners but also the target audiences outside the project; e.g., emergency services, public safety authorities, communities, municipalities, satellite operators and devices/terminals manufacturers.
- Define an exploitation strategy for the project and pursue exploitation activities (e.g. business case, productization, etc.)
- Interface with standardization groups.

Work Package 8 is split into three tasks: Task 8.1, Task 8.2 and Task 8.3.

Regarding Task 8.1, the following activities are planned:

- Development of a dissemination strategy to stimulate project awareness among market and stakeholders.



- Exchange of information with end-users and other projects and initiatives (including EU projects).
- Creation of a website: build, maintain and update a Web Platform, to store and access the knowledge on the project in a user friendly and easily accessible way.
- Publication of the results (electronic based and paper-based dissemination) – Prepare promotional literature to support the marketing strategy, including a project leaflet, articles, newsletters, conference papers, etc.
- Participation in conferences, seminars and workshops

Task 8.2 is dedicated to activities that target the exploitation of project results and future business opportunities for the partners. The related activities include the development of a business case for MONET, the management of project and partners IPR, a focused and targeted dissemination of the project to specific end-users and potential customers, the development of a product development / research roadmap and the establishment of a plan for using and disseminating the foreground knowledge gained by the project

Task 8.3 is responsible for the monitoring of the project's activities concerning their relation and potential compliance with existing standards or on-going work in standards. The following activities are foreseen:

- Interact with relevant standardisation groups
- Provide inputs to them and monitor the project work to ensure we follow the same directions

3 Dissemination Plan

This section introduces the dissemination plan of MONET project, describing the general actions and strategies to be undertaken in order to ensure an efficient dissemination of project results.

The MONET dissemination policy will be naturally oriented towards the natural end-users of the project results (i.e. public administrations in rural regions, public safety and emergency relief authorities as well as companies with field workforces in isolated areas). These include fire services, forest services, civil protection, humanitarian relief organisations, local municipalities, quarrying companies, building companies and of course the civil and political authorities responsible for decision making. Other groups will also be considered and targeted. These include communication equipment developers and potential partners and customers (e.g. governments, telecommunications operators and wireless providers). In this context, an end-users workshop has been carried out in the period of interest, as described in Section 5.1.1 of this document.

A MONET website, already developed, will be used to boost information flow between all entities with an interest in the project: the Commission, industrial companies, universities, technological centres, standardization bodies, etc. It will also be used to disseminate relevant information to targeted parties, including policy makers. A detailed description is available at Section 4.2 of this document.

A set of publicity activities (as the realization of MONET logo, brochure, leaflets, other MONET branded materials) will be carried out in order to aid and promote instant public

recognition. Some of them have been currently realized, as shown in Section 4.1 and Section 6.

Other dissemination activities foreseen include:

- Presentations at different events targeted to relevant interested parties, for example:
 - AIAA International Communication Satellite Systems Conference and Exhibit;
 - The European PSC (Public Safety Communication) Forum;
 - FP7 ICT Infodays (at European and national levels);
 - International conference on Wireless Networks - ICWN (Worldcomp – every year);
 - Conferences on communications (e.g. IEEE international conference on communications, IEEE Globecom, IEEE Infocom, FP7 ICT Mobile & Communication Summit);
 - Conferences on optimization and control-theory (e.g., IEEE Conference on Decision and Control, IEEE Conference on Control Applications, IFAC World congress, ...);
 - Ad-hoc – NOW (conference held every year);
 - ISI European Technology Platform organized events;
- Presentations and meetings with advisory board candidates or members;
- Writing articles, publications to scientific communications, and optimization and control journals and magazines such as Elsevier's Ad-hoc Networks International Journal, Elsevier's Computer Communications Journal, International Journal of Parallel, emergent and Distributed Systems, Wiley's International Journal of Satellite Communications and Networking, Springer's Journal Mobile Networks and Applications, IEEE/ACM Transactions on Networking, IEEE Transactions on Wireless Communications, IEEE Communications Magazine, IEEE Wireless communications magazine, IET Communications, IEEE Transactions on Communications, IEEE Journal on Selected Areas on Communications (JSAC), IEEE Transaction on Automatic Control, International journals of satellite communications and networks, Computer Networks (Elsevier), Automatica (Elsevier), Control Engineering Practice (Elsevier), SIAM Journal on Optimization, SIAM Journal on Control and Optimization, European Journal of Control (Lavoisier), and the International Journal of Control (Taylor & Francis).

Section 7 shows publications related to MONET that have been carried out during the period of interest and Section 5 illustrates the conferences/workshops/seminars organized to disseminate project concept and preliminary results.

Finally, MONET will also disseminate knowledge directly to the relevant European Technology Platforms, contributing to updates in their strategic research agendas (ISI and e-Mobility). These activities will be instrumental in increasing the awareness of opportunities and advantages raised by MONET (both its use and research).

4 MONET Logo and Website

4.1 MONET Logo

The MONET Logo is a primary technique which is of a vital importance to aid and promote instant public recognition. The logo has been created with the aim of giving an immediate sense of what the project will develop during its duration. In fact, it appears immediately to the reader the principal objective of MONET: to develop optimization methods and techniques in order to integrate terrestrial networks (often isolated one from the other and spontaneously generated) with satellite links, providing end to end connectivity. The following figure shows the MONET logo:



Figure 1 – MONET Logo

4.2 MONET Website

The MONET website, through which general information on MONET is made available, plays a major role in the dissemination of the project activities and results. It has been realized as a google site and is available both at the url: <http://www.ict-monet.eu> and at the url <http://sites.google.com/a/tekever.com/monet/>. The website of MONET has been launched in May of 2010, and its homepage is presented in Figure 2.

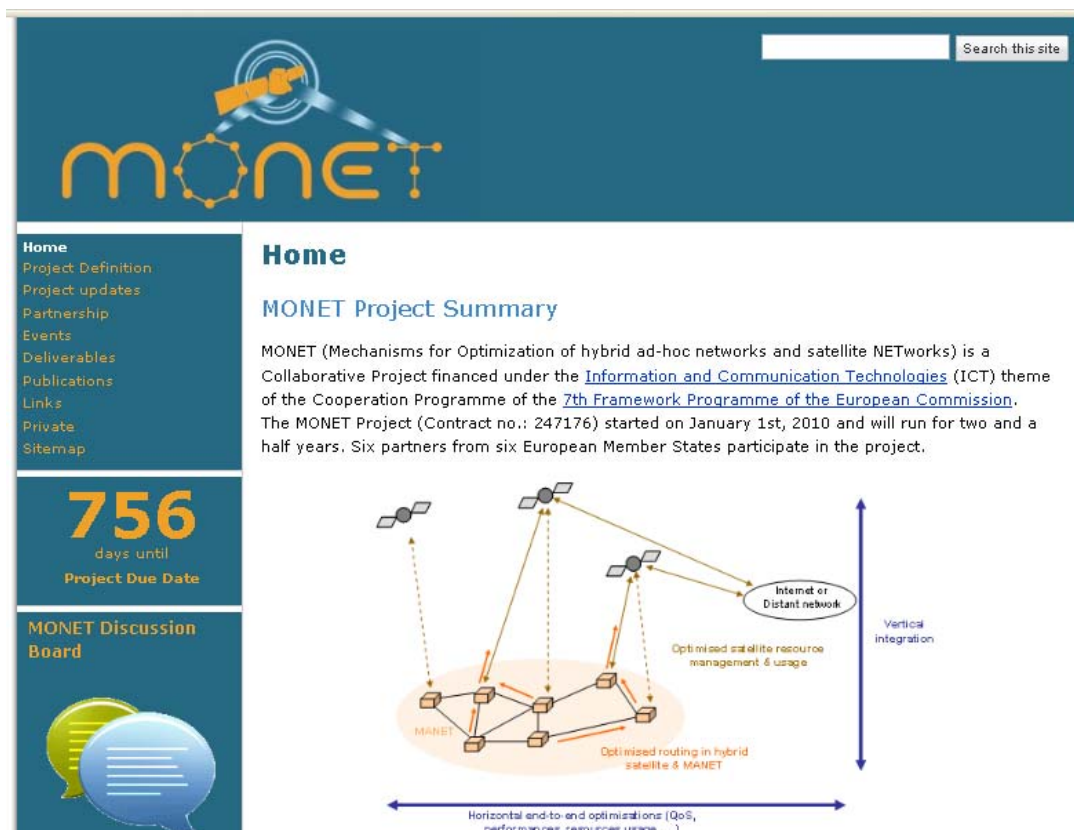
The image shows a screenshot of the MONET website homepage. At the top, there is a dark blue header with the MONET logo on the left and a search bar on the right. Below the header, the main content area is divided into two columns. The left column contains a navigation menu with links like "Home", "Project Definition", "Project updates", "Partnership", "Events", "Deliverables", "Publications", "Links", "Private", and "Sitemap". Below the menu, there is a large orange number "756" with the text "days until Project Due Date". Further down is a "MONET Discussion Board" section with a speech bubble icon. The right column features a "Home" section with the heading "MONET Project Summary". Below this, there is a paragraph of text describing the project. At the bottom of the right column, there is a diagram illustrating the network architecture. The diagram shows a central network of nodes labeled "MANET" connected to several satellites. Arrows indicate connections between the satellites and an "Internet or Distant network". A vertical double-headed arrow on the right side of the diagram is labeled "Vertical integration". A horizontal double-headed arrow at the bottom of the diagram is labeled "Horizontal end-to-end optimizations (QoS, performances, resources usage, ...)".

Figure 2 – MONET website homepage.



The website (Figure 2) includes the following sections, as it is visible in the list situated in the right side of the homepage:

- **Home:** section reporting MONET Project Summary providing the main concept and general information about the project.
- **Project Definition:** section illustrating the objectives and the expected results of the project. It reports the Work Breakdown Structure (WBS) of MONET as well.
- **Project Updates:** section containing the latest news about the MONET project and related issues (e.g. events, main results, ...).
- **Partnership:** section with detailed information on each partner of the MONET consortium (brief description and fields of interest, contacts and links to official member homepages).
- **Events:** section containing the list all the MONET related events, such as scheduled events related to MONET and events which MONET partners will attend and/or organize (basically meetings open to public, or dissemination events).
- **Deliverables:** section reporting the list of all MONET public deliverables.
- **Publications:** section containing the list of MONET publications (e.g. white papers, papers, presentations).
- **Links:** section with links to other projects, entities, organizations, news, etc. that are relevant for MONET.
- **Private:** the link of the SVN private server, used by the partners to share documents and speed up the generation of documents, papers and deliverables. Such a repository is hosted by UoR-CRAT in one of its servers at the following url: <svn://labreti30.ing.uniroma1.it/monet-private> or, in case of firewall restrictions, at the url: <https://labreti30.ing.uniroma1.it/svn/monet-private>.
- **Sitemap:** the map of the MONET website, listing the whole structure of the site.

Both the MONET logo and the website have been the object of MONET deliverable D8.2, delivered at month 6 of the project.

5 Organization and participation to events

This section provides a list of events organized in the context of MONET project and a list of conferences and other dissemination activities to which MONET partners have participated in the period of interest. Section 5.1 illustrates events which have been organized by MONET project to disseminate results. Section 5.2 shows conferences to which MONET partners have participated and other dissemination activities.

5.1 Organization of Events

5.1.1 End users Workshop

The end users Workshop was held in Madrid, the 7th of June 2010, in the ISDEFE offices. The primary objective of the Workshop has been to organize a meeting between MONET



partners and end users of MONET results, in order to gather information about MONET functional requirements, architecture, implementation and demonstration features. In a dissemination perspective, it gave the opportunity to illustrate project concepts to external entities as end users, in order to diffuse them and to encourage a future usage of MONET results.

The Workshop has been focused especially on:

- Presentation of MONET Questionnaires Results:
 - Scenario 1: Public Safety – Forest Fire
 - Scenario 2: Public Safety – Mountain Rescue in a Remote Area
 - Scenario 3: Border control – Coastal Monitorino
 - Scenario 4: Ground Traffic Management in Airport
 - Common Operational Requirements for all Scenarios
 - Operational Requirements beyond MONET (for further developments)
- Presentation of MONET Technical Requirements
- MONET High Level Architecture

The complete Workshop agenda can be found on the MONET website in the Events section. Representatives from the end-user community adhered enthusiastically to the initiative, with representatives of the Madrid local police, Madrid civil protection and SAMUR (Madrid medical emergency services) attending and contributing to the workshop.

5.2 Conferences and other dissemination activities

5.2.1 Future Networks and Mobile Summit

MONET partners participated to Future Networks and Mobile Summit 2010 with the intent of showing the MONET project concept and preliminary architecture in the form of a scientific paper. Future Network and Mobile Summit 2010 takes place in the Historical City of Florence, 16 - 18 June 2010. The link of such an international meeting is the following: <http://www.futurenetworksummit.eu/2010/> .

In the context of convergence, the 19th Future Network and Mobile Summit will address the challenges of building the Future Internet, based on mobile, wireless and fixed broadband communications infrastructures, among which ad-hoc network and satellite networks represent technologies of crucial importance. In addition it gave the opportunity to inform European academic, research, institutional and industrial stakeholder about the MONET project and concept, by generating relationships to increase visibility and potential connections among entities.

5.2.2 Second Level Master in Engineering of the Emergency

University of Rome has showed the concepts and the objective of MONET project on the occasion of the Second Level Master in Engineering of the Emergency, whose web page is: <http://w3.uniroma1.it/masteremergenza>. It has been carried out in Rome, at University of Rome "Sapienza", during years 2009-2010

Such a master allows attendees to express at their best their professional skills in case of emergency situations and promotes study and research activities. In this context, MONET project has been presented as well as its concept and objectives in order to show how an integrate telecommunication infrastructure is able to manage emergency situations, by aiding rescuers and assistance teams in their actions.

Partners and sponsors of the Master included: “Comitato per le Tecnologie Sostenibili per lo Sviluppo Umano”, “Corpo Nazionale dei Vigili del Fuoco”, “Arma dei Carabinieri”, “Dipartimento della Protezione Civile Italiano”, “Fondazione Antonio Ruberti”, “I.LI.TEC.”, “Istituto Superiore di Sanità”, “Movimondo”, “Unicef”.

5.2.3 Integrated Satellite Initiative (ISI) General Assembly

ISI is a ETP (European Technological Platform) dealing on Satcom. Several dissemination activities were prepared for the General Assembly held in Toulouse on April 2010. A dossier has been prepared and submitted to the ISI R&D working group to get the MONET project endorsed by the ETP, which is now the case. A presentation has been prepared by Astrium and ISDEFE to disseminate the project to the general assembly and the presentation itself has been performed by ISDEFE. Several members of MONET project (Astrium, ISDEFE, UoR, UNIS) attended the General Assembly.

5.2.4 Spanish Public Safety Authorities

ISDEFE has presented the overall scope and objectives of MONET project to some of the most relevant Public Safety Bodies in Spain, in order to get their interest and collaboration in the project. In fact, some of them take part of the MONET Advisory Board. To get this goal, some dissemination activities including personal interviews have been achieved with some of the highest level representatives of different safety bodies.

In detail, the following Spanish Public Safety Authorities at national and local level have been informed about the concept and the objectives of MONET project and contacted:

1. Spanish Ministry of Interior General Directorate of Emergencies and Civil Protection.



Last 9th September 2009, Isdefe was invited by the Spanish Ministry of Interior to present them the current activities and projects running in the area of Public Safety. As a part of this session, called “Crisis Management and Emergencies”, a specific slot was assigned to MONET project where the scope and objectives were presented.

<http://www.proteccioncivil.org/es/index.html>

2. Spanish Military Unit for Emergencies (UME).



Several presentations about MONET were carried out with UME in order to involve them first during MONET proposal submission phase and after during the beginning of the project phase to collect their impressions and view about the objectives planned. Their interest about the project was showed during one presentation held last 17 February 2009 in UME HQ.

<http://www.mde.es/ume/>

3. Spanish Civil Guard.



At National level, Spanish Civil Guard (Communications Department) was contacted in order to obtain from them their ideas and suggestions about MONET functional and operational requirements. For this, one presentation was carried out by Isdefe last 17 March 2010. During this presentation they preferred acting as observer for this project as they would prefer to include this idea within a larger project that involves other technologies. One of the missions of Civil Guard is to deal with Spanish Borders Surveillance, and our interest where to involve them to define the Border Control Scenario.

<http://www.guardiacivil.org>

4. Madrid General Directorate Civil Protection and Emergencies

This body was contacted during the preparation phase of MONET proposal where they showed their interest participating as Advisory Board along the project. Dissemination activities were carried out within the following areas:

a) Fire Brigade



One personal interview was held last 12 April 2010 with a Fire Brigade representative (Head of Unit) with double finality: a) explaining to them more in detail technical aspects of the project b) collect valuable information for the definition of Forest Fire Scenario. During this session, a specific MONET presentation was carried out.

<http://www.munimadrid.es/bomberos>

b) SAMUR



In line with Fire Brigade, the same procedure was followed with SAMUR representatives in order to collect inputs for Public Safety scenarios and to explain more in detail technical aspects of the project.

<http://www.munimadrid.es/samur>

5. Madrid Police



Dissemination activities were carried out with Madrid Urban Police in order to inform them about MONET project. MONET brochure and specific information about the project was sent to some key representatives of this Unit. The involvement achieved from them for MONET project is as observers.

<http://www.munimadrid.es/policia>

6. AENA



Two personal interviews were done to AENA personnel. The first interview took place last 14th April 2010 with two experts in Airport Systems in order to inform them about MONET project and to gather information about current technologies used in communications within the airport, needs and possible MONET requirements. The second one was held on 14th June 2010 with operations control manager of Barajas airport in order to obtain information about operational procedures, current positioning systems and communications used for airport control, maintenance, emergency operations and so on.

<http://www.aena.es>

5.2.5 Mountain Rescue Association of Slovenia

URSZR has presented the overall scope and objectives of MONET project to most of the members and leadership of the Mountain Rescue Association in Slovenia (www.grzs.si). Mr. Darko Bernik, an active mountain rescuer and expert in telecommunication has been nominated as a MONET User Advisory board member. We keep close contact with them and plan to actively cooperate in testing of MONET results.

5.2.6 17th Days of Slovene Informatics

Two URSZR members of MONET project group have participated in the most important annual event in Slovenia in the field of informatics, 17th Days of Slovene informatics which took place in Portoroz, Slovenia, from 14th to 16th April, <http://www.dsi2010.si>. One presentation was selected to be presented in the conference. The cooperation of URSZR in one of the previous FP6 project was presented and MONET project with its aims and objectives as another challenge for URSZR as well. The presentation was very well accepted and won a special praise for good results from the leader of the panel. Important issue was also the cooperation of governmental organisation in FP7 project.

5.2.7 Public Safety Communication Forum

One URSZR member of MONET has been invited to present the URSZR information-communication system among which also the partnership in MONET project was presented and very well accepted. The Public Safety Communication Forum took place in Vienna, Austria from 16th to 17th of June 2010 (<http://www.psc-europe.eu/index.php?id=320>).

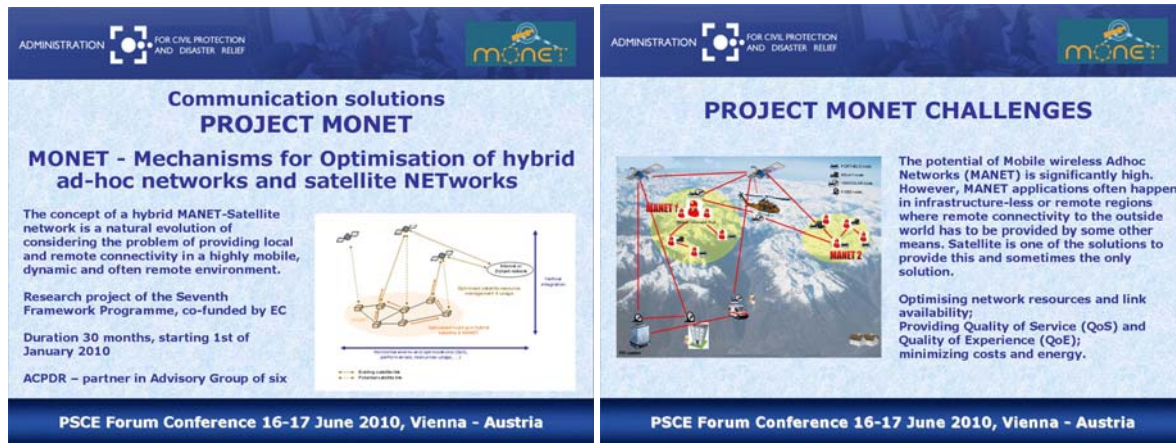


Figure 3 – PSC Europe Vienna, MONET Presentation.

One person from ASTRION Monet project team was also participating to the PSCE forum. He is in charge of the working group on Satellite (SHAPRS working group standing for Satellite and HAPS for emergency and Public Safety communications) and although no presentation on MONET was carried out (done by URSZR as mentioned below), they were discussion on MONET hybrid architectures.

5.2.8 Presentation to the French DGA

ASTRIUM has presented to the French DGA delegate the concept, objectives and foreseen activities of MONET project. This presentation took place the 9th of June 2010, in Paris (France). The French DoD shows a great interest for such advanced communication project, which appeared to be in line with military requirements – providing that military specific constraints can be taken into account (not in the scope of MONET) Further discussions are foreseen with others members of the French DoD.

5.2.9 Portuguese Public Safety Authorities

TEKEVER has presented and discussed the MONET project with a number of Portuguese public safety authorities, namely:

- The National Authority for Civil Protection (ANPC) – a meeting was held with the director of Information Systems (Mr. Giuseppe Cornaglia) and the person responsible for the use of satellite communication terminals as well as TETRA terminals. ANPC has expressed their interest in following the project and will make an effort to contribute whenever possible, given personnel constraints. Mr. Cornaglia has agreed to join the end-user advisory group.
- The National Association of Professional Firemen (ANBP) – MONET was presented to the association which found the project interesting. They will try to contribute whenever possible given their operational constraints.
- The Portuguese Public Safety Police (PSP) – TEKEVER presented the MONET project and objectives to the Projects Office. Initial feedback was quite positive and the Projects Office is awaiting the official feedback from the operational departments in order to actively contribute to the project.

5.2.10 Portuguese 7th Framework Programme Support Office

TEKEVER has also made a presentation of MONET, its objectives, challenges and expected results to the Portuguese FP7 Support Office (GPPQ) and National Contact Points (NCP)

which have declared they will support the consortium in mentioning the project in contacts with other entities and will inform the consortium, through TEKEVER, of possible events for dissemination at the national level.

6 Publicity Materials and Activities

This section covers the production of dissemination materials, as brochures and leaflets, related to the MONET project.

6.1 *MONET Brochure*

The MONET brochure is a 6 pages brochure realized early in the project in order to produce an initial awareness of MONET concepts. In particular it contains:

- An introduction section on MONET concept and motivation.
- The challenges that MONET will face.
- The objectives to be accomplished by MONET project.
- The main expected results.

The following figure shows the graphical structure of the MONET brochure.



Figure 4 – MONET project brochure

6.2 MONET Leaflet

The MONET leaflet is a 2 pages leaflet briefly describing the MONET project: it contains the consortium structure, the main project concepts, the MONET objectives and principal use case scenarios. Figure 5 shows the MONET leaflet:

Coastal Monitoring



The Fixed Command Post and the Back Office are connected by a satellite link. Terrestrial, aerial and maritime mobile units carry portable MONET nodes.

Ground Traffic Management In Airport



Ground handling vehicles are nodes which form a MANET. A satellite link is used as a relay between two MANETS.

MONET Consortium

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CENTRO DE INVESTIGACION EN AUTOMATON AND TELECOMUNICACIONES (I)
UNIVERSITY OF SURREY (UK)
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EADS ASTERION (FR)
ADMINISTRACION FEDERAL DE PROTECCION Y ASISTENCIA EN DESASTRES (SI)
REPUBLICA DE SLOVENIA MINISTERIO DE DEFENSA



Seventh Framework Programme
THEME: ICT-2009.1.1
The Network of the Future

Small or medium-scale
focused research project

MONET
Mechanisms for Optimization
of hybrid ad-hoc networks
and satellite NETWORKS

Grant agreement no.: 247176



Contacts

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Project Website:
<http://sites.google.com/a/tekever.com/monet/>

MONET

The potential of Mobile wireless Ad hoc Networks (MANET) is significantly high. However, MANET applications often happen in infrastructure-less or remote regions where remote connectivity to the outside world has to be provided by some other means. Satellite is one of the solutions to provide this and sometimes the only solution. Current expectations dictate that satellite will be seen not only as a component of an alternative routing path but also as part of a unique (really integrated) system.



Hybrid MANET-satellite network and MONET concepts
The concept of a hybrid MANET-Satellite network is therefore a natural evolution

of considering the problem of providing local and remote connectivity in a highly mobile, dynamic and often remote environment. These composite networks raise significant challenges such as: optimising network resources and link availability; providing Quality of Service (QoS) and Quality of Experience (QoE); minimizing costs and energy.

The EC FP7 project MONET will address these issues by considering the end-to-end optimization of resource management in a hybrid network, taking into account its impact on both the MANET and satellite segments.

Objectives

MONET established the following objectives:

- To develop a complete understanding of the complexity underlying the dynamic heterogeneous environment;
- To optimize the use of satellite access links in a MANET through changes in topology and resources used;
- To provide seamless broadband services to everyone at any time by optimized algorithms;
- To overcome performance bottlenecks to enable a more pervasive and optimized network structure.

Scenarios

Forest Fire Scenario



Emergency bodies involved: fire brigades, police, medical services

Mountain Rescue Scenario



Mountain rescuers will carry positioning equipment, body sensors, video cameras, connected to a wearable MONET node with wireless wideband communication.

Figure 5 – MONET project leaflet.

6.3 Other dissemination materials

Furthermore, especially on the occasion of the end users Madrid Workshop (refer to section 5.1), a MONET-branded document folder, a MONET-branded block notes and a MONET-branded pen have been designed and distributed to participants.

7 Publications

This section covers a number of dissemination activities, including papers accepted for publication in journals and conferences with peer reviewing, papers submitted for conferences and journals with peer reviewing, dissemination publications in more general journals.

7.1 Accepted Papers

The following scientific papers have been accepted for publication in scientific conferences with peer reviewing:

- A. Oliveira, Z. Sun, M. Monier, P. Boutry, D. Gimenez, A. Pietrabissa, K. B. Juros, “*On Optimizing Hybrid Ad-hoc and Satellite Networks – the MONET Approach*”, Future Networks & Mobile Summit, Florence, 2010.
 - ABSTRACT: The potential of Mobile wireless Ad hoc Networks (MANET) is significantly high. However, MANET applications often happen in infrastructure-less or remote regions where remote connectivity to the outside world has to be provided by some other means. Satellite is one of the solutions to provide this and sometimes the only solution. Current expectations dictate that satellite will be seen not only as a component of an alternative routing path but also as part of a unique (really integrated) system. The concept of a hybrid MANET-Satellite network is therefore a natural evolution of considering the problem of providing local and remote connectivity in a highly mobile, dynamic and often remote environment. These composite networks raise significant challenges such as: optimising network resources and link availability; providing Quality of Service (QoS) and Quality of Experience (QoE); minimizing costs and energy. The EC FP7 project MONET will address precisely these issues by considering the end-to-end optimization of resource management in a hybrid network, taking into account its impact on both the MANET and satellite segments.
- A. Pietrabissa, F. Delli Priscoli, “*MDP Call Control in Variable Capacity Communication Networks*”, accepted by the 18th Mediterranean Conference on Control and Automation, April 2010
 - ABSTRACT: This paper defines a theoretical framework based on Markov Decision Processes (MDP) to deal with call control algorithms in links with variable capacity supporting multiple classes of service. The variable capacity problem, which arises in wireless network scenarios, is addressed by incorporating the link model into the MDP formulation and by introducing, beside the standard call admission policy, a call dropping policy. The proposed approach is capable of controlling class- level quality of service in terms of both blocking and dropping probabilities. The resulting MDP is scalable with respect to the number of link states in the link model.
- A. Pietrabissa, “*Reinforcement Learning Call Control in Variable Capacity Links*”, accepted by the 18th Mediterranean Conference on Control and Automation, April 2010.
 - ABSTRACT: This paper defines a Reinforcement Learning (RL) approach to call control algorithms in links with variable capacity supporting multiple classes of service. The novelties of the document are the following: i) the problem is modeled as a constrained Markov Decision Process (MDP); ii) the constrained MDP is solved via a RL algorithm by using the Lagrangian approach and state aggregation. The proposed approach is capable of controlling class-level quality of service in terms of both blocking and dropping probabilities. Numerical simulations show the effectiveness of the approach.

7.2 Submitted Papers

The following scientific papers have been submitted but not yet evaluated and accepted for publication in scientific conferences and journals:

- An article written by Boštjan Tavčar, head of Sector for Informatics and Telecommunication at URSZR, has been submitted to the Nineteenth International Electrotechnical and Computer Science Conference – ERK 2010 (<http://www.ieee.si/erk10/>), which will be held on September 20-22, 2010 in Portoroz, Slovenia. The title of the proposed article is: “*Model to calculate the distance of co-channel cells*”. The described model will be used in calculating the co-channel interferences and will be used in MONET testing.

8 Exploitation

Task 8.2: Exploitation will start at the 18th month. For such a reason and taking into consideration that the project is still at an early stage, no explicit exploitation activities have been performed at the delivery time of this document. In this sense, this section of this preliminary report corresponds to an exploitation plan than to already accomplished exploitation activities.

The partners have identified the main areas of the project where exploitation of results can be envisaged. MONET results can be exploited along the following pathways:

- **Products:** The results of MONET will lead to the development of new products. This applies typically to the industrial and SME partners.
- **Services:** MONET field tests will have the potential to be exploited as a basis to develop innovative services to the users in the hybrid MANET-satellite scenario.
- **Consultancy:** Through MONET, each partner will acquire skills in the area of optimization of resources in hybrid networks. It will be natural for all partners to exploit these skills in the preparation and execution of future projects.

Section 8.1 introduces the exploitation activities planned by industrial and SME partners, Section 8.2 illustrates the exploitation plans of academic partners and Section 8.3 lists the exploitation activities of institutional partners.

8.1 Industrial and SME Partners

8.1.1 TEKEVER

TEKEVER takes advantage from MONET work in the following fashion:

- In the field of MAC and routing protocols for mobile ad-hoc-satellite networks and cross-layer and inter-node info exchange mechanisms, the objective is to develop more competitive products with higher quality specifications and to increase market share in mass market communications and public safety. The use and further research are focused on application in TEKEVER communications products (e.g. ad-hoc nodes). Synergies with other product lines (multi-channel BPM) are foreseen.
- In the context of connectivity recovery mechanisms and properties and characteristics of hybrid mobile-satellite networks, the exploitations is centred on the increasing of expertise in this field as well as the involvement in other applied research initiatives.

8.1.2 ISDEFE

ISDEFE exploits MONET results and work in the following fields with the following benefits:

- MANET Network capability: the aim is to develop continued research on integration of these kinds of networks within emergency communication networks, with the benefit of produce advanced research and knowledge transfer, especially focused on emergency bodies needs.
- Satellite communications in conjunction with MANET networks: the objective is to develop continued research on the integration of MANET networks and satellite networks to fulfil final users' requirements, with the benefit of providing emergency users with new emerging hybrid communication network to work in a more efficient way.
- Integration of legacy terminals with MANET networks: the object is to develop continued research on the integration on MANET networks and satellite networks with legacy terminals such as TETRA and TETRA release 2 (incl. TEDS, AMR, RMO, MELPe), with the benefit of providing emergency users with a new network model, where their terminals (TETRA) can be integrated in a seamless way.
- Behaviour of this kind of technology to meet emergency operations in real life: the aim is a disaster relief and scientific exploration, with the benefit of providing emergency users with a fully operational network, where parameters such as availability, confidentiality and reliability meet their expectations.

8.1.3 ASTR

ASTR exploits MONET results and work in the following fields with the following benefits:

- Hybrid satellite-wireless architecture: the aim is to develop synergies with other programs based on hybrid satellite-wireless architecture network and to perform arguments for the definition of future communication systems which include a satellite segment. In this aspect, MONET will improve competitiveness of ASTR versus US industry in the field of hybrid networks associating terrestrial component to a space segment. The ATC (Ancillary Terrestrial Component) approach developed by Terrestrial satellite operator in the US being a typical example of such a concept.
- Optimization studies on MANET: the aim is to use the knowledge acquired in continued research and synergies with other research activities related to satellite link optimizations. This will increase expertise in the field as well as can be the basis of a further industrial partnership and help to re-enforce the technical innovation content in future products.
- Test performances and field exercises results: the objective is to define a future communication system and the promotion of added-value of satellite segments in hybrid architecture. The outcome from the test bed validation and the measured performance will help ASTR to write the specification and assess the performance of future hybrid systems, for instance to optimize the role of satellite within the next generation of commercial communication networks.
- Participation in the MONET demonstration: the objective is to demonstrate the result of the MONET research to end users. The involvement and/or invitation of end users

provides at least two kinds of valuable feedback: on the one hand, it helps to better fit future products to user needs, and on the other hand enables the creation of new collaborative partnerships between industry and end users.

8.2 Academic Partners

8.2.1 UoR-CRAT

UoR-CRAT takes advantage from the work in MONET project to increase knowledge and developing innovative approaches in the following fields:

- Resource management in satellite networks, covering advanced features of next-generation satellite systems
- Resource management in MANET networks, covering advanced cross-layer interactions
- Research on resource management in heterogeneous networks, especially in the field of hybrid satellite-mobile networks, covering advanced optimization and control-theoretic approaches.

In addition, all relevant RTD activities can give opportunities of new didactic and teaching activities, using the results (i) as basis of Master degree and PhD theses, (ii) to update the programs of courses, (iii) to organize seminars at the University of Rome and in companies.

8.2.2 UNIS

University of Surrey exploits the work in the MONET project in the following fashion:

- To advance research and knowledge transfer by means of Industrial and post-graduate (PG) research, in the field of satellite interworking and Quality of Service.
- In the context of satellite communication, further research is centred on a global information infrastructure, with the aim of supporting future network evolutions.
- In what concerns satellite networks architecture and satellite-MANET internetworking, research is focused on network operators for global coverage, providing services to remote and rural regions.

8.3 Institutional Partners

8.3.1 URSZR

URSZR takes advantage from the work developed in the MONET project and the achieved results by leveraging participation in other collaborative initiatives and forums addressing emergency communications. The main benefit will be to better and completely understand the own needs and to discuss with industrial partners as equal. In addition, a potential participation in the definition of custom solutions is foreseen as an exploitation result.

9 Standardization

Task 8.3: Standardisation will start at Month 6 and will last up to the end of the project. Since such a task has started very close to the delivery time of this document, the following section contains prevalently the standardisation plan foreseen by project partners and some preliminary standardisation activities carried out in the period of interest.

Organizations such as IETF, ETSI, ITU-T and MESA are of particular importance to the work considered in MONET and the partners will interact with the relevant working groups or committees to provide contributions. Table 2 summarises MONET contributions to standardisations efforts.

Relevant Standardisation Body	MONET Contributions	Partners Involved
IETF: <ul style="list-style-type: none"> IP performance Metrics (ippm) MANET WG 	Potential contributions to protocols (reactive and proactive); End-to-end QoS and IP over satellites; MANET architectures	TEK, UNIS
ETSI: <ul style="list-style-type: none"> TC TISPAN: WG2, WG4, WG8 TC-SES/BSM TC-SES/SatEC Cooperative ad-hoc network 	Inter-working and interoperability with existing networks; Routing; Contribute with needs and aspirations for network management; IP over satellite	TEK, UNIS, ASTR
ITU-T <ul style="list-style-type: none"> ITU-T SG 13 – “NGN” ITU-T SG 12 – “Performance, QoS and QoE 	Architecture, evolution and convergence of next generation networks including planning, implementation scenarios and deployment models; IP QoS, interoperability and implications for NGN.	UNIS
MESA <ul style="list-style-type: none"> TSG-SYS 	Potential contributions to the MESA specifications and system reference models and architectures; knowledge on broadband satellite constellations interconnection.	TEK, ASTR

Table 2 – MONET contributions to standards

In what concerns already developed activities, UNIS attended the ETSI Combined Satellite Broadband Multimedia (BSM) and the Mobile Satellite Subsystems (MSS) meeting on 25-27 May 2010 in Cambridge UK. UNIS submitted an overview MONET presentation, which was registered as SESBSM(10)0016 document. The presentation was well received and generated good interest by ETSI members such as Hughes and Thales Alenia Space. The future plans are to contribute the MONET finalised satellite architecture and solutions to BSM and the MSS groups.

TEKEVER has not established formal contacts with standardisation groups, but has prepared presentation material and established an internal plan and agenda for contacting the relevant groups, namely MESA, ETSI and IETF.



Conclusions

This report presented the initial activities developed in the context of MONET work package WP8. Since the project is still at an early stage, the report includes both already executed activities and some of the plans for the remainder of the project.

The objectives of the WP8 activities are to ensure the dissemination of the project results to a wide reaching audience, in order to make external stakeholders and the community in general more aware of the results achieved by MONET, as well as to encourage the academy and the industry to refine and use them.

Another objective of WP8 is to create adequate conditions for extensive exploitation of MONET results, during and after project execution.

In this first reported period the following activities were carried out:

- Dissemination Plan.
- Development of the MONET website, featuring a public website.
- Submission of papers to peer-reviewed conferences, based on MONET research work.
- Organization of workshop, targeting the end users of MONET.
- Dissemination of MONET concept in conferences and seminars.
- Preparation of dissemination material (MONET brochure, leaflet, pen, block notes, ...).
- Preliminary exploitation plan
- Standardisation plan and activities

As the research work takes place, the number and the impact of dissemination activities are naturally expected to increase. Nevertheless, in order to establish the presence of MONET as a leading technical project on its field, in the next period we plan to pay special attention to increasing the number of scientific publications, the number of organized events and the participation on other joint liaison and concertation activities, such as concertation meetings and other specialized events.



References

FP7-ICT MONET (Mechanisms for Optimization of hybrid ad-hoc networks and satellite NETWORKS) collaborative project financed under grant agreement n. 247176 and started on January 1st, 2010.

MONET project website, <http://www.ict-monet.eu>.

Google sites, <http://sites.google.com/>.

IETF, The Internet Engineering Task Force, <http://www.ietf.org/>.

ETSI, European Telecommunications Standards Institute, www.etsi.org/.

ITU-T, International Telecommunication Union – Telecommunication Standardization Bureau, <http://www.itu.int/ITU-T/>.

MESA, Mobility for Emergency and Safety Applications, <http://www.projectmesa.org/>.