

# OPTIMIX project



Presentation for 1<sup>st</sup> FP7 Networked  
Media concertation meeting  
Algarve, Portugal, April 2008

# Project overview (1)



- Project profession of faith:

OPTIMIX project proposes to study innovative solutions enabling enhanced video streaming in a point to multi-point context for an IP based wireless heterogeneous system, based on cross layer adaptation of the whole transmission chain

# Project overview (2)



- Approach in three major steps
  - consider innovative techniques to improve the efficiency of scalable video codecs when used in a wireless multi user environment with respect to robustness, efficient compression and intelligent use of scalability schemes.
  - ➔ design of novel controlling strategies in the scope of P->MP scenarios, with necessary aggregation of multiple feedbacks and the overall optimisation criteria in a multi user context
  - develop cross-layer mechanisms to enable the communication between application world and transmission world through the use of enhanced transport and network protocols
  - validate the overall system with respect to end to end quality optimization, and innovative techniques developed in all the fields of interest of the project will be evaluated. Efficient bandwidth use, real time constraints, robustness and video quality will be amongst the major evaluation criteria

# Project overview (3)



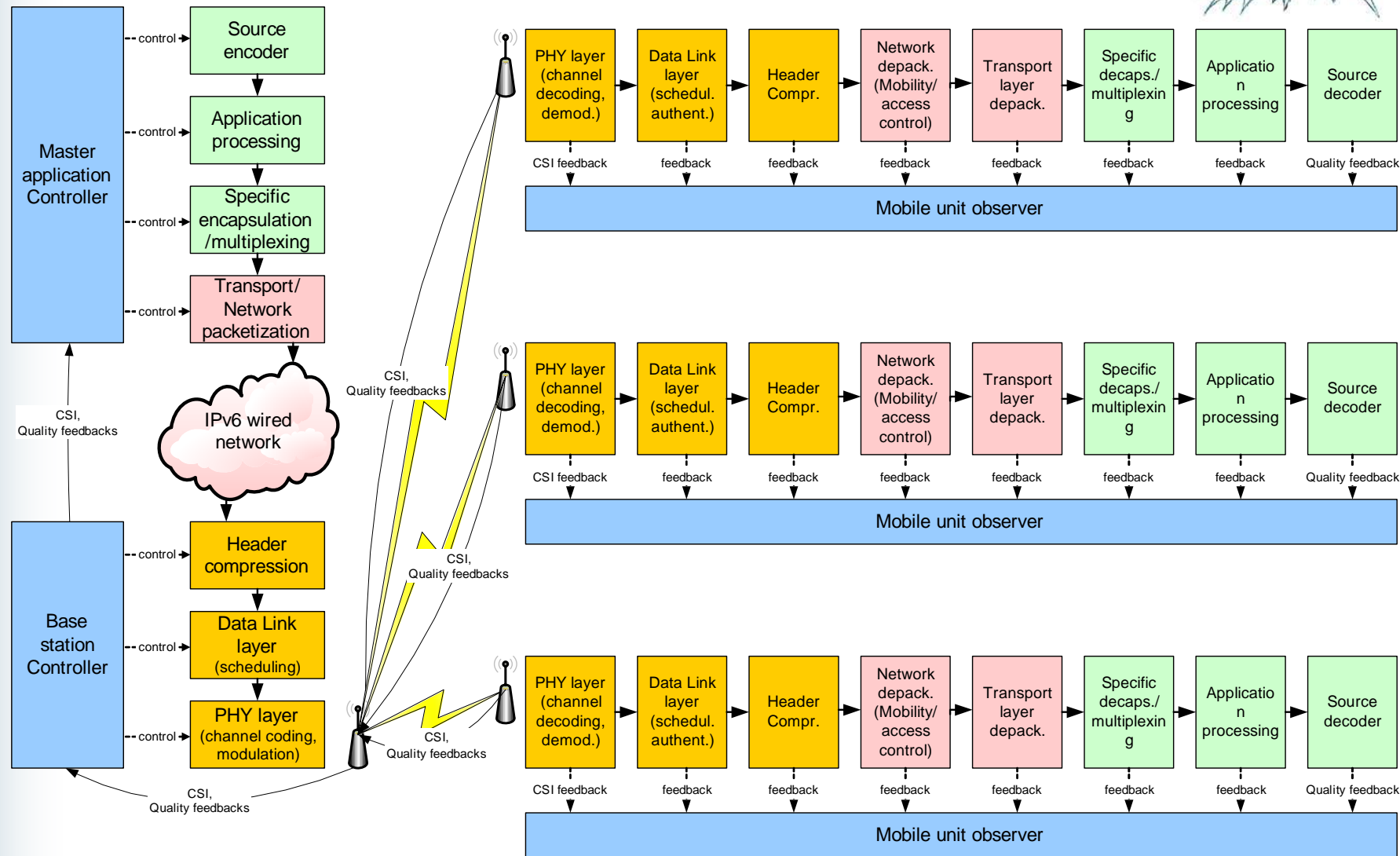
- This translates in the following work/research topics:
  - Sophisticated multimedia source coding schemes
    - Low complexity
    - new standards
  - State-of-the art channel coding schemes
    - Turbo, LDPC based ...
  - Advanced modulations
    - MIMO solutions, turbo detection and demodulation
    - EXIT chart optimisation
  - Cross-layer techniques
    - Intelligent controllers to drive the transmission
    - Collect of feedback and functioning info to make decisions
    - Learning algorithms for efficient adaptation

# Project overview (4)



- This translates in the following work/research topics:
  - IP
    - ROHC compression
    - Traffic engineering : MPLS ...
  - Multicasting
    - dealing with feedback aggregation
  - MAC layer
    - Scheduling optimisation
    - Innovations and adaptation for JSCC/D schemes
  - Overall
    - Making sure end-to-end optimisation is achievable : allowing X-Layer communication in a transparent way for the considered network and in-the-middle appliances

# Project overview (5)



The considered transmission chain

# Contractual commitments (1)



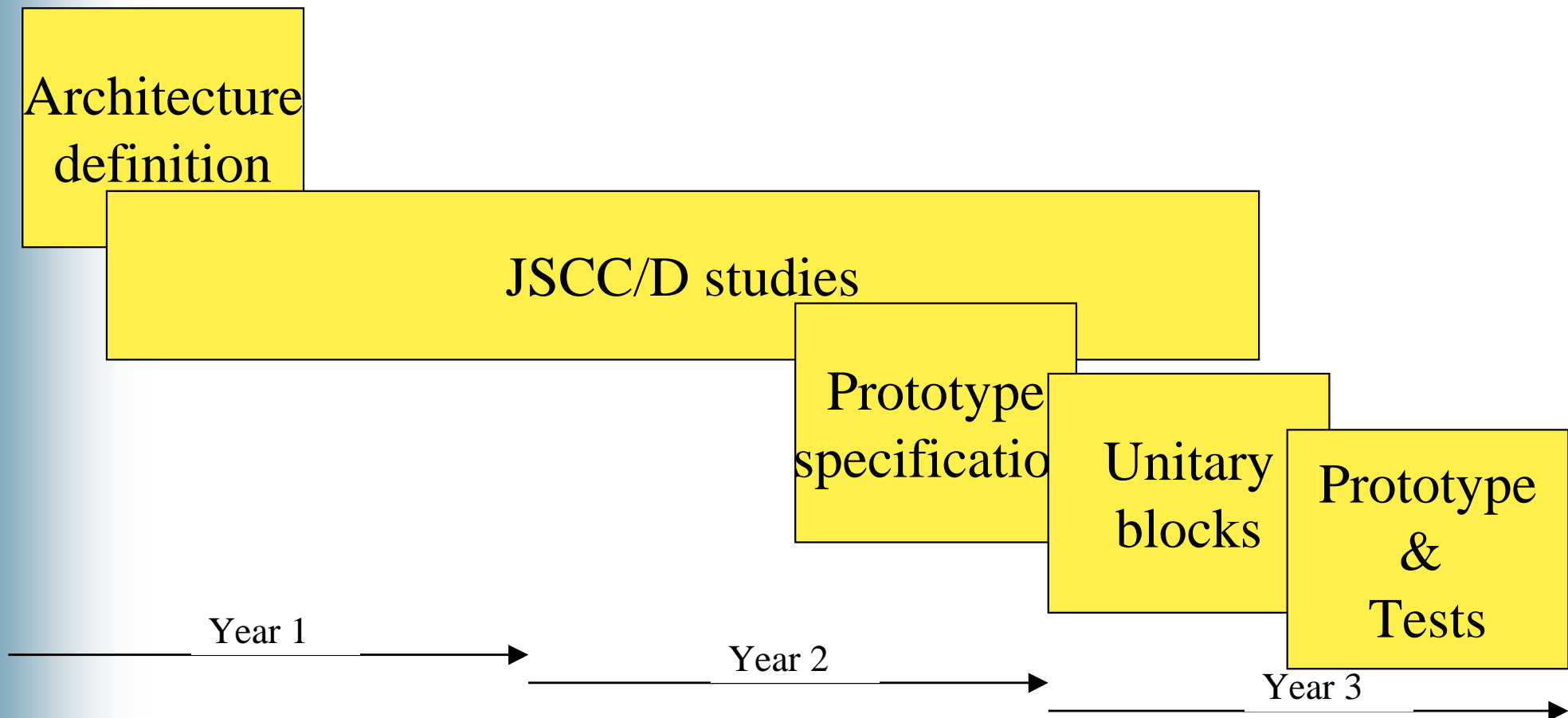
- Contractual commitments
  - Work-Packages

<b>WP</b>	<b>Title</b>	<b>Managed by</b>
WP1	Requirements and exploitation	SIEMENS
WP2	Coding and modulation	THALES
WP3	Transmission over the network	VTT
WP4	System evaluation and demonstration	NXP
WP5	Management activities	THALES

# Contractual commitments (2)



- Contractual commitments
  - Roadmap





# Contractual commitments (3)



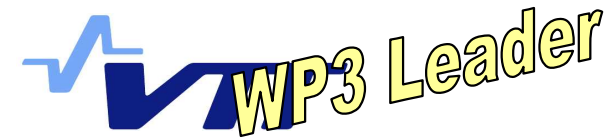
## ■ Contractual commitments : Deliverables list

Deliverables (D) and milestones (M) Indicate title or short explanation	Responsible	Type / Dissemination	Due date
D1.1 : Project web site and ftp site setting up	BME	R / PU	M2
D1.2 : OPTIMIX Requirements document	THALES	R / PP	M2
D1.3 : OPTIMIX Specifications	THALES	R / RE puis PP	M5 puis M9
D1.4 : Intermediate report on dissemination and standardisation activities	SIEMENS/BME	R / PU	M17
D1.5 : Final report on dissemination and standardisation activities	SIEMENS/BME	R / PU	M35
D2.1a : Preliminary scalable video source behaviour and sensitivity model	SIEMENS	R / RE puis PU	M10 puis M14
D2.1b : Intermediate evaluation and performance of source channel (de)coding schemes	SIEMENS	R / RE puis PU	M22 puis M26
D2.1c : Final evaluation and performance of source channel (de)coding schemes	SIEMENS	R / RE puis PU	M29 puis M33
D2.2a : Preliminary scalable channel coding and scalable modulation behaviour and model	SOTON-ECS	R / RE puis PU	M10 puis M14
D2.2b : Intermediate evaluation and comparison of channel coding /decoding and modulation schemes	SOTON-ECS	R / RE puis PU	M22 puis M26
D2.2c : Final evaluation and comparison of channel coding /decoding schemes	SOTON-ECS	R / RE puis PU	M29 puis M33
D2.3a : Preliminary scheme of JSCC/D controller for point to multipoint communication and optimization criteria	CNIT	R / RE puis PU	M10 puis M14
D2.3b : Intermediate JSCC controller design	CNIT	R / RE puis PU	M22 puis M26
D2.3c : JSCC controller: final design and algorithmic optimisation	CNIT	R / RE puis PU	M29 puis M33
D2-3 : Candidate schemes for demonstration design and description	THALES/VTT	R / RE	M17
D3.1a : Specification and preliminary design of transport and network layer protocols and mechanisms	BME/CEFRIEL	R / RE puis PU	M10 puis M14
D3.1b : Refinement of specification, intermediate design and analysis of transport and network layer protocols a	BME/CEFRIEL	R / RE puis PU	M22 puis M26
D3.1c : Final specification of transport and network layer protocols and mechanism, simulation results analysis	BME/CEFRIEL	R / RE puis PU	M29 puis M33
D3.2a : Specification and preliminary design of Network Architecture	CEFRIEL	R / RE puis PU	M10 puis M14
D3.2b : Intermediate design and functional/performance analysis of Network Architecture	CEFRIEL	R / RE puis PU	M22 puis M26
D3.2c : Final specifications, design and analysis of Network Architecture	CEFRIEL	R / RE puis PU	M29 puis M33
D3.3a : Specification and preliminary design of Data Link Layer	VTT	R / RE puis PU	M10 puis M14
D3.3b : Intermediate design and functional/performance analysis of Data Link Layer	VTT	R / RE puis PU	M22 puis M26
D3.3c : Final specifications, design and analysis of Data Link Layer	VTT	R / RE puis PU	M29 puis M33
D4.1a : Evaluation criteria	BME/NXP	R / CO	M23
D4.1.b : Functional and interfaces specification	BME/NXP	R / CO	M23
D4.1c : Test-bed specification	BME/NXP	R / CO	M23
D4.2 : Test-bed and Demos	NXP	D / CO	M31
D4.3 : Experiments and Tests results	THALES/NXP	R / PU	M35
D5.1x : Project meeting minutes	THALES	R / RE	every four months
D5.2 : First year project progress report	THALES	R / RE	M11
D5.3 : Second year project progress report	THALES	R / RE	M23
D5.4 : Third year project progress report	THALES	R / RE	M35

# People and partnership (1)



- Eight partners over 6 countries



# People and partnership (2)

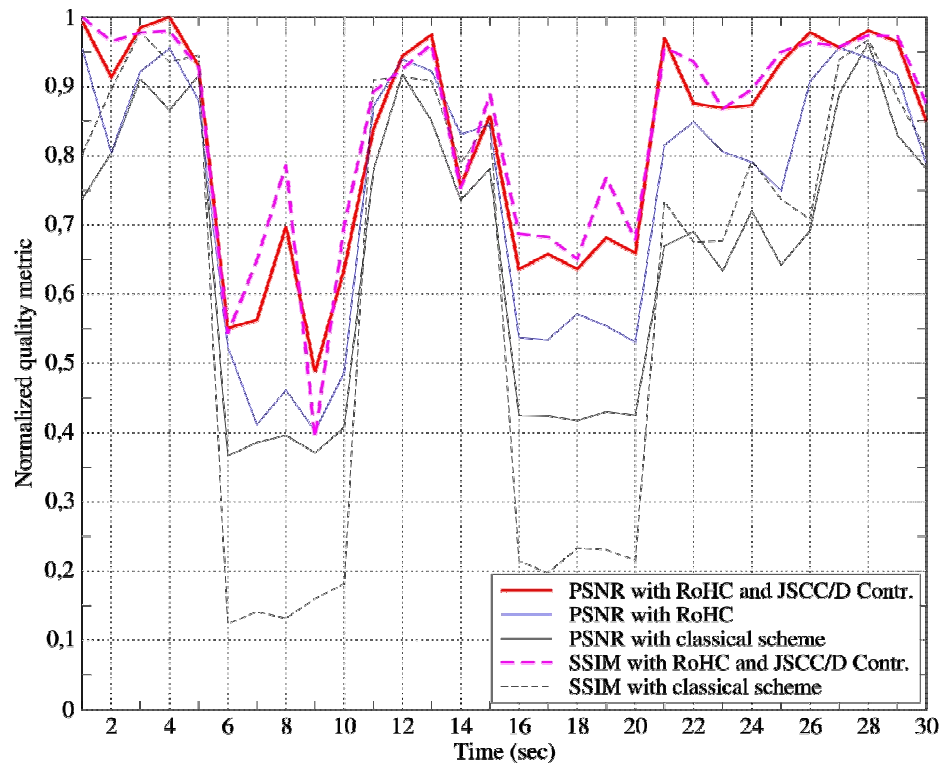


- Already foreseen inter-project relations
  - Planned participation to cluster 'Media Delivery Platforms'
  - Possible follow-up of cluster 'User Centric Media'
  - 22 public deliverables
  - Participation to ICT 2008
  
- Volunteering to communicate with interested people/projects
  - Open technical topics for collaboration :
    - cross-layer design over IPv6 and Header Compression
    - optimisation techniques for joint source and channel coding (UEP, ..)
    - video coding optimisation (H.264 AVC & SVC)
    - channel coding optimisation (LDPC, turbo codes, OFDM, ...)
    - point to multipoint architectures (and feedbacks)

# A glimpse on expected results



- In point to point context, FP6 IST PHOENIX:  
[IEEE Comm. Mag. Jan. 07]



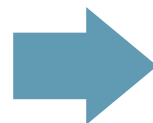
Original



No JSCC/D



JSCC/D



**Average PSNR Gain = 5 dB**

Soon more informations on:  
<http://www.ict-optimix.eu>



Questions ? → [contact@ict-optimix.eu](mailto:contact@ict-optimix.eu)