

OPTIMIX project



Presentation for 5th FP7
Networked Media concertation meeting

Roberta Fracchia



The OPTIMIX project

- **The study:** innovative solutions enabling
 - enhanced video streaming based on cross layer adaptation off the whole transmission chain
 - in a point to multi-point context
 - IP based wireless heterogeneous system,
- **The goal:** increasing PQoS for the end user in a point to multi-point multimedia transmission context
- **The approach:**
 - improve the **efficiency of scalable video codecs** in a wireless multi user environment
 - novel **controlling strategies** in the scope of P->MP scenarios, with **aggregation of multiple feedbacks**
 - **cross-layer mechanisms** to enable the communication between application world and transmission world



Partners and roles

THALES

- Project Coordinator
- WP2 leader: Coding and modulation
- Integrator of the joint simulator
- Integrator of real-time demonstrator

SIEMENS

- WP1 leader: dissemination and exploitation
- MPEG standardization
- Realization of H264/SVC real-time codec

VTT

- WP3 leader: Transmission over the network

comsis

- WP4 leader: Real-time demonstration
- Realization of modified IEEE 802.11n boards

■ WP2 contributors

cnit consorzio nazionale
interuniversitario
per le telecomunicazioni

Kingston University London
UNIVERSITY OF
Southampton

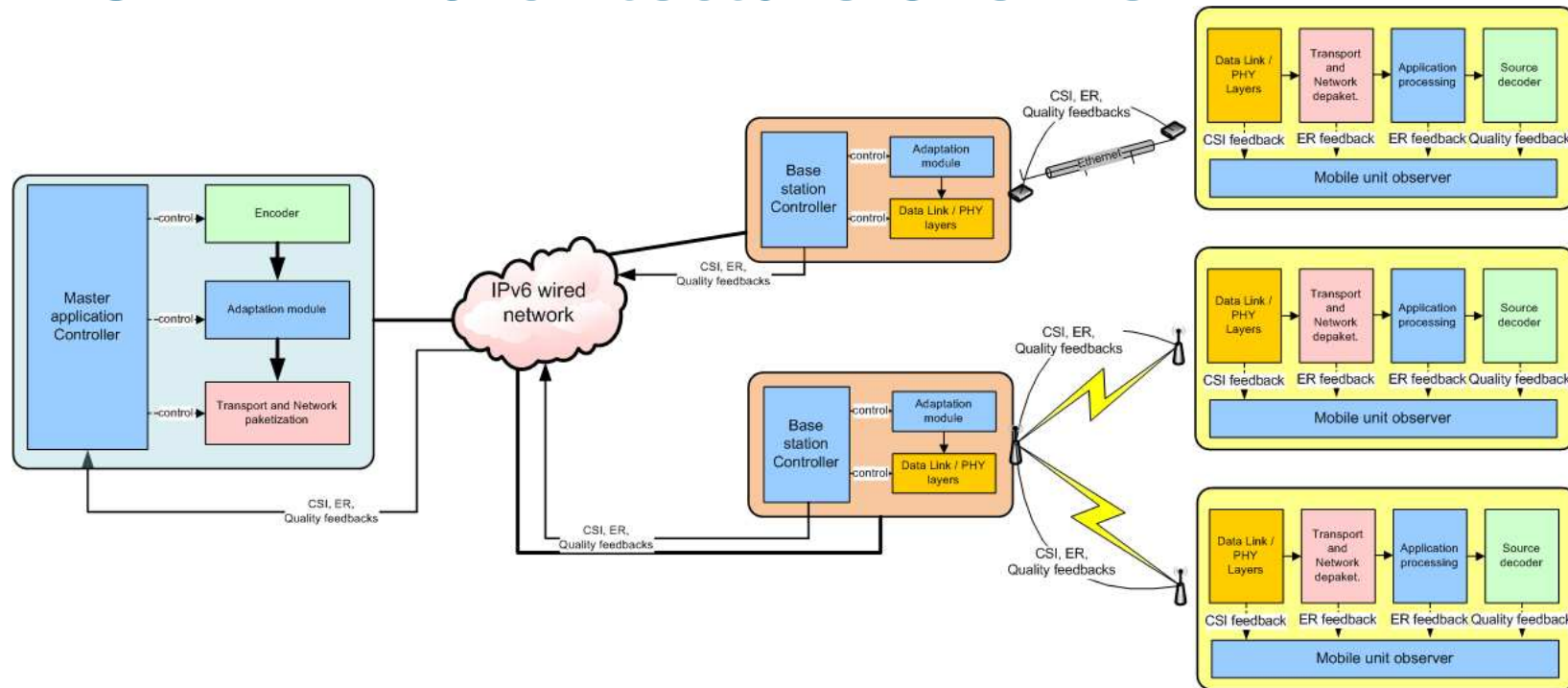
■ WP3 contributors



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CEFRIEL
FORGING INNOVATION POLITECNICO

OPTIMIX architecture overview



Application controller: selects source coding parameters (e.g. quantization parameters, frame rate,..) according to video source characteristics and the state of (wireless) network

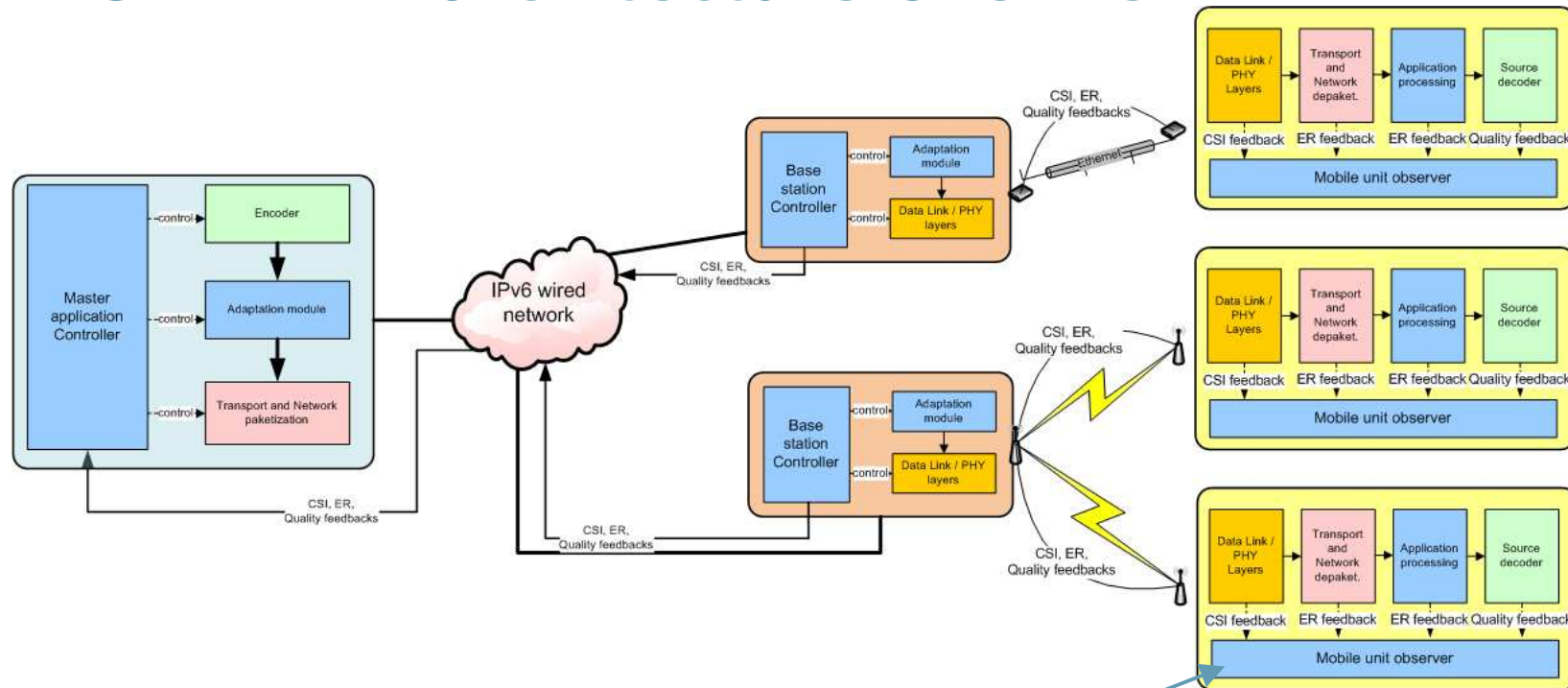
Adaptation module: performs further adaptation of the stream to the wireless transmission. Used when the encoded stream does not fit the wireless channel conditions (e.g., because no available pre-coded stream responds to the criteria fixed by the application controller) or to adapt a scalable stream to the transmission quality of a particular wireless cell.

BS controller: schedules the radio transmissions and adaptively allocates available resources

Mobile Observer: collects cross-layer information from different layers of the system

OPTIMIX : Optimisation of Multimedia over wireless IP links via X-layer design

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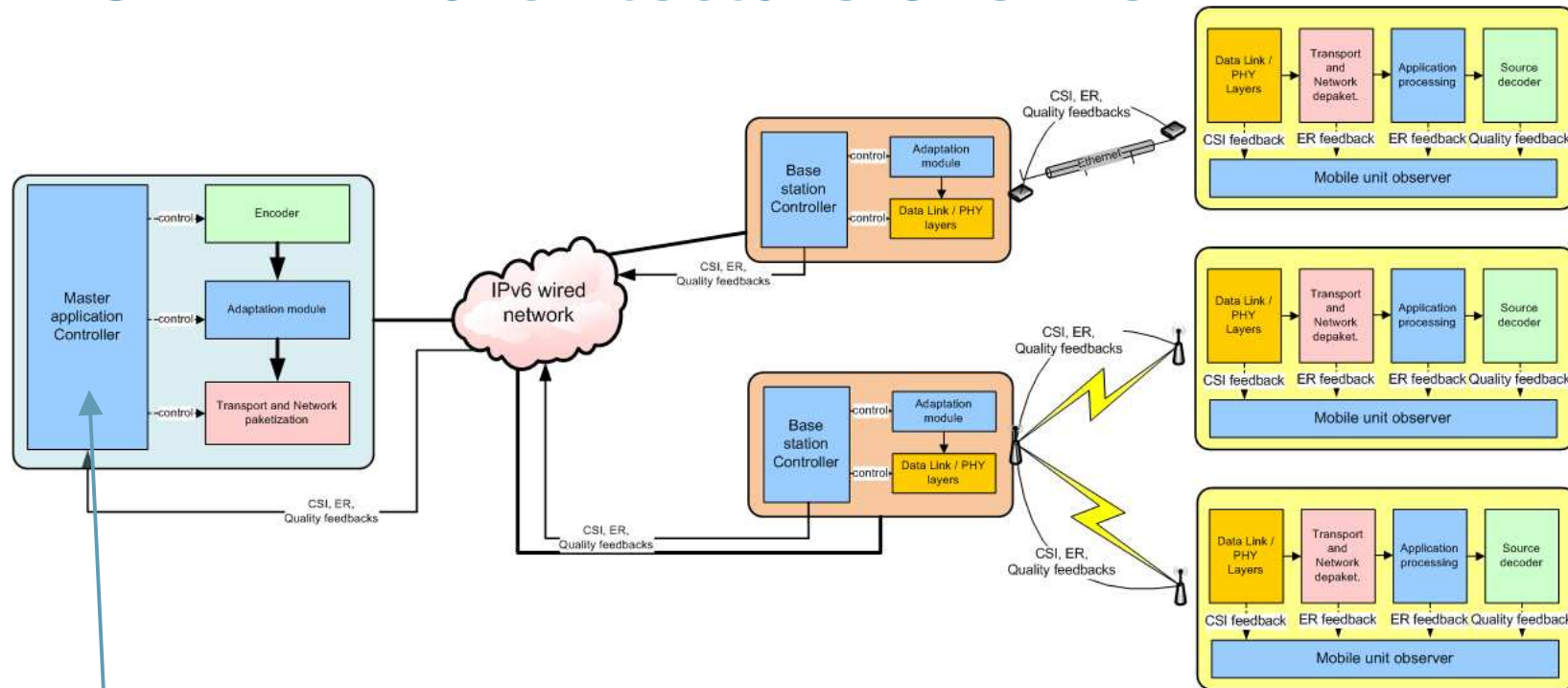
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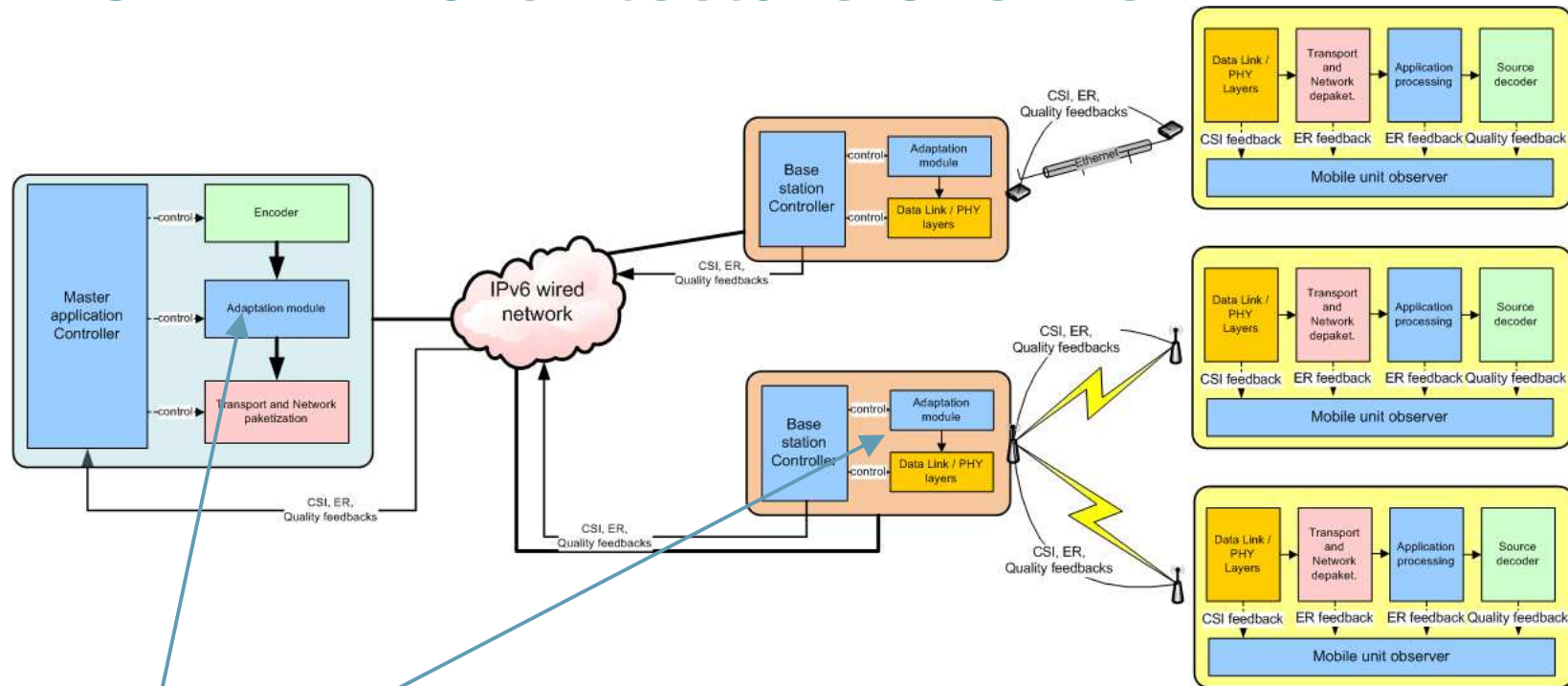
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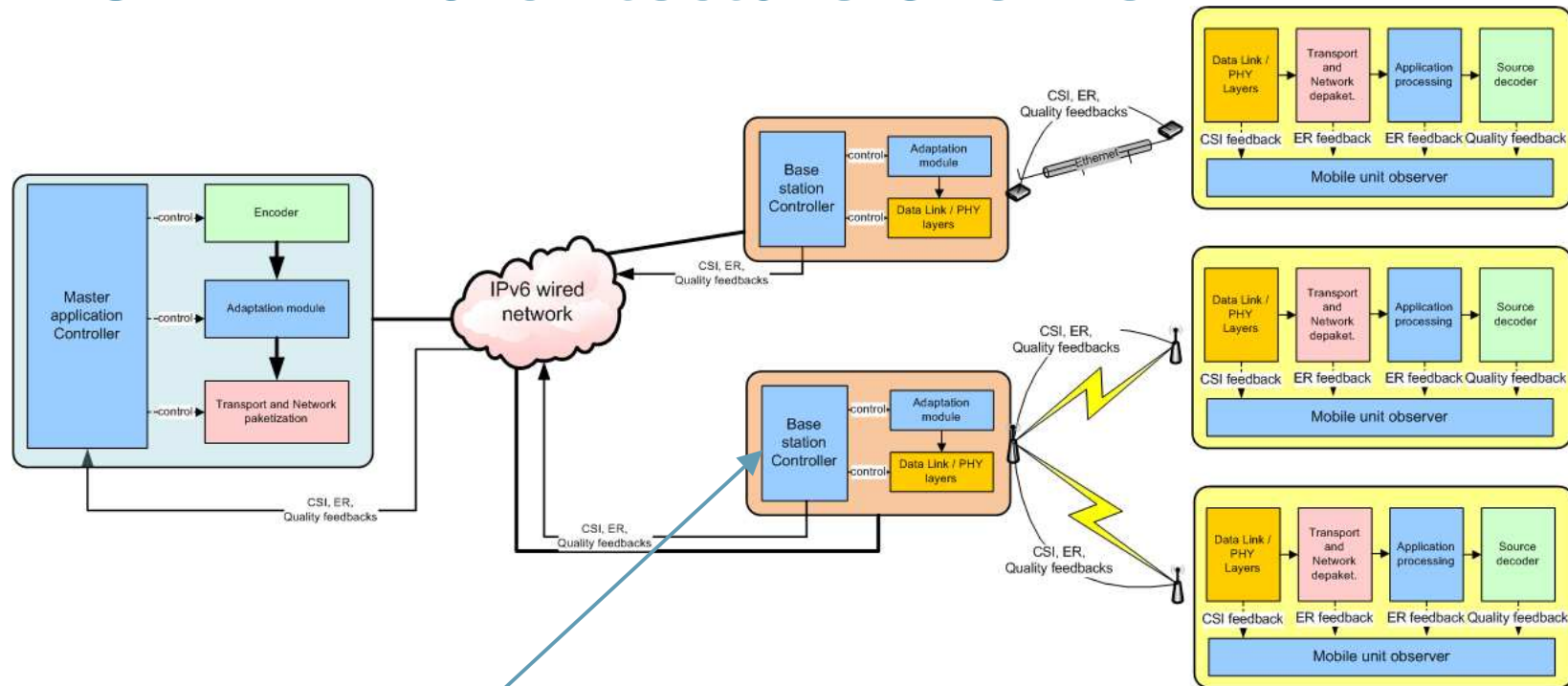
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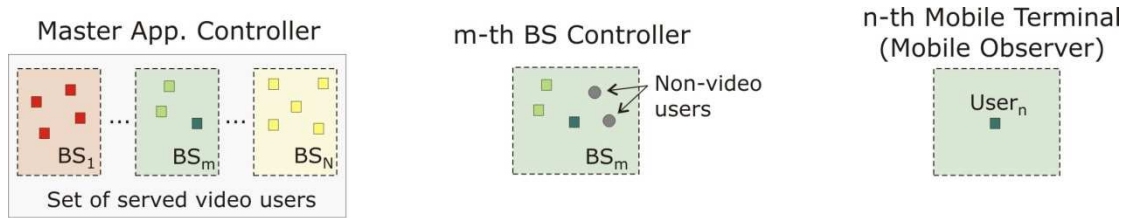
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Interactions between the main controlling units

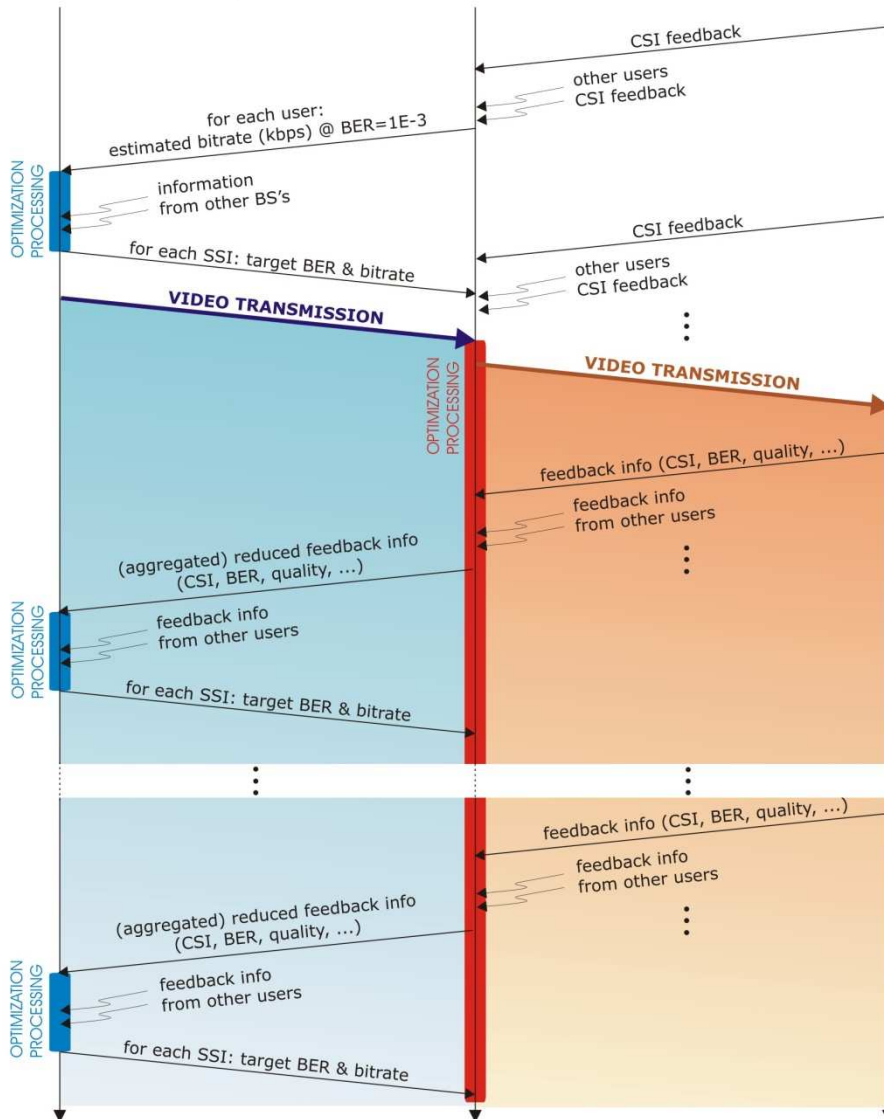
General joint adaptation problem split into sub-problems addressed by distinct cooperative controlling modules:

Master App. Controller

- good knowledge of video source and distortion models
- limited knowledge of CSI, NSI and other significant feedback figures
- main driver of all the adaptation task (fixing requirements and setting parameters)

BS Controller

- good knowledge of CSI and other feedback figures
- (downlink) radio resource manager
- fast link adaptation
- opportunistic multi-user scheduling





<http://www.ict-optimix.eu>



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