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SAILOR

Satellite Integrated UMTS Emulator

http://galileo.cs.telespazio.it/sailor

Bergeggi, October 28, 2004

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Presentations organization

TELESPAZIO:
Management, general technical issues, dissemination and system architecture

UNIVERSITY OF ROME:
Cellular planning tool and call admission control and multicast

UNIVERSITY OF AACHEN:
Protocol simulator and dynamic simulator

SIEMENS AUSTRIA:
Fully IP core network experiment

EUTELIS:
Market analysis

Presentations organization

ASCOM:

Access Network resource optimization experiment

UNIVERSITY OF L'AQUILA:
Access Network Multicast Algorithms experiment

ERICSSON:
Radio Access Support Node

INTEGRA SYS:
Integration

SPACE ENGINEERING:
Physical layer

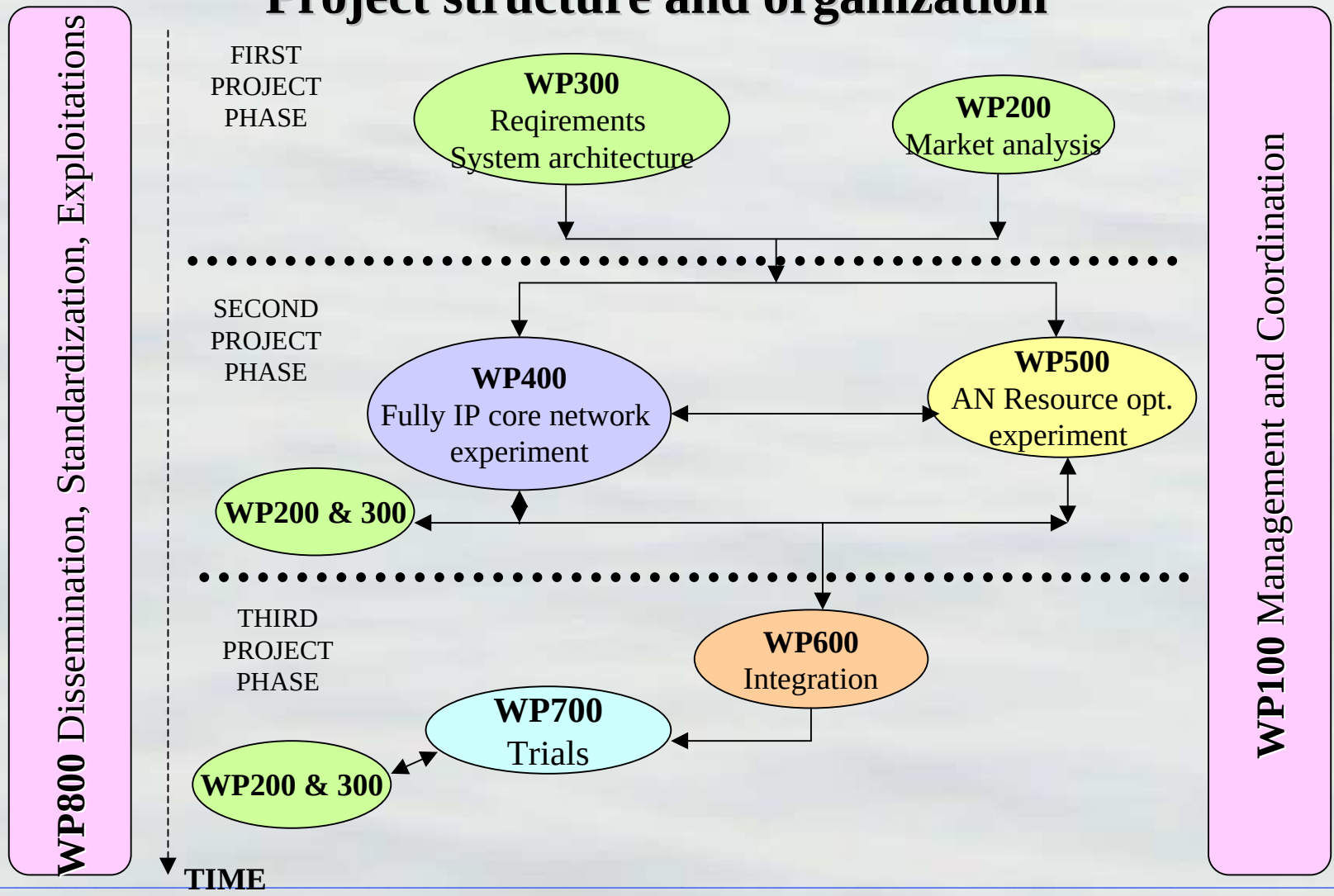
Objectives

- Identification of the most suitable service mix via market analysis in an integrated T-S-UMTS network

- Service demonstration over the integrated T-S-UMTS network, implementing Access Network Resource Optimisation experiment and Fully IP Based Core Network experiment

- Development of concepts relevant to technologies and systems beyond 3G:
  - fully IP UMTS Core Network overcoming the standard 3G Core Network based on traditional GGSN and SGSN
  - Implementation of innovative multicast procedures and services for the integrated T-S-UMTS network
  - Inter-working between the Cellular Planning tool and the Connection Admission Control procedures aiming at optimising the radio resource exploitation

Project structure and organization

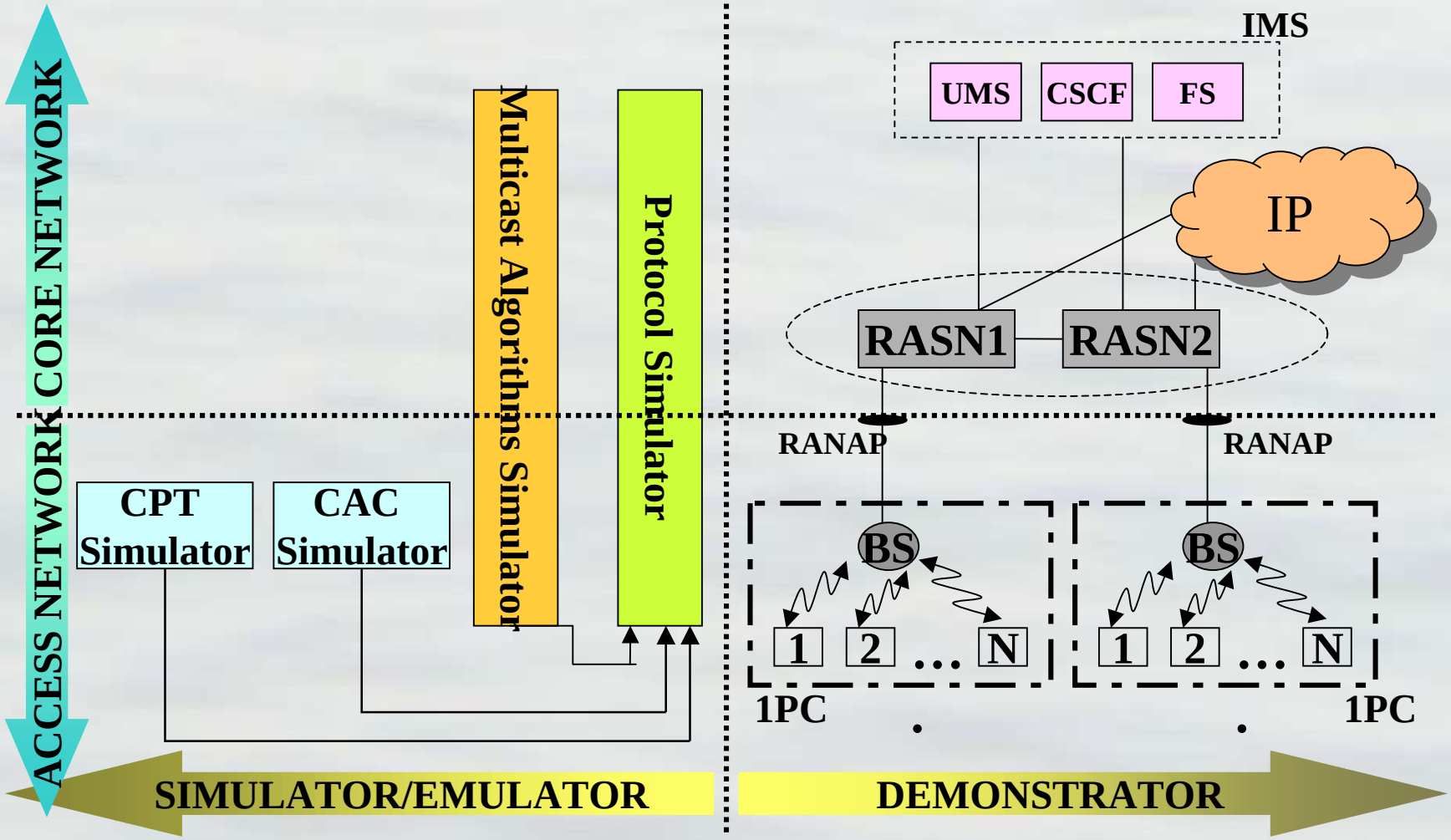


Performed activities

- The performed activities were firstly focused to analyze the requirements in order define a reference model and a Simulation/Demonstration architecture able to perform the two foreseen experiments:
  - Fully IP based CN experiment
  - AN experiment

Moreover the software specification and implementation of the elements of the demonstrator/simulator suitable to perform those experiments was performed and the relevant integration started.

SAILOR architecture



Activities description (1/6)

- The overall architecture for SAILOR demonstrator and relevant elements was defined and implemented. The main characteristics of the experiments were identified in order to arrive to a definition of the entities developed inside the demonstrator.
- The experiment is organized in two main sections:

  a)simulator

  b)emulator.
- In both a core network and a access network are developed for the terrestrial and the satellite parts.

Activities description (2/6)

- The simulator has the purpose to test mainly the algorithms and the functionalities of the system while the real time protocol aspects are considered in the emulator section.
- The simulator will take into consideration a large population of users and access points, while the emulator will consider a subset of them.
- The main blocks developed in the Simulator are described in the following slides:

Activities description (3/6) – Simulator blocks

- CPT (Cellular Planning Tool) that determines the optimal cellular layout in a satellite integrated UMTS in terms of coverage capability merged to capacity optimization.
- DANS (Dynamic Access Network Simulator) that will allow to dynamically handle the active links between node Bs and Mobile terminals. This element is used as tool for the implementation of the CPT and also in conjunction with CAC and ANPS.
- CAC (Connection Admission Control) implemented to verify the possibility of the network to serve as mach as users as possible considering their bandwidth and QoS requirements, exploiting as much as possible the available capacity.

Activities description (4/6) – Simulator blocks

- MAS (Multicast Algorithms Simulator) to verify the capability and the efficiency of multicast services provision applied to the considered network especially for the satellite section. This part is developed both for the Core Network (IP network+RASN) and for the Access Network..

- ANPS (Access Network Protocol Simulator) to perform investigations about the possible impacts, at protocol level, of the above implemented functionalities applied to a real time system.

Activities description (5/6) – Simulator blocks

- Concerning the emulator section the most innovative part is the RASN (Radio Access Support Node) that allows to apply a new concept of Core Network without the classical SGSN and GGSN and using the IP Network as UMTS Switching network.
- The Physical layer will be emulated via a suitable software that will emulate both satellite and terrestrial links considering the the satellite presence and the relevant link effects.
- The emulator shall be able to demonstrate the feasibility/advantages/drawbacks of a unified SIP based NAS (Non Access Stratum) protocol for the provision of real time services in the PS domain.

Activities description (6/6)

- A market analysis was performed in order to identify the most suitable services and the relevant interest of the customers in relationship with the characteristics of them.

- Inside the market analysis task an evaluation of traffic forecasts was performed in order to evaluate the users distributions in terms of numbers of terminals and areas of interest. This evaluation is also used as reference to implement the Cellular Planning Tool inside the simulator section.

Dissemination activities (1/3)

Produced reports and documents 1/2:

- A paper entitled “SAILOR project general architecture: simulation and emulation of an integrated T/S-UMTS system based on an innovative fully IP core network” was submitted to the IST Mobile Summit 2003 conference.
- A paper about Cellular Planning Toll, for COST273 meeting (May 2003) was performed
- A paper entitled “SAILOR project general architecture: simulation and emulation of an integrated T/S-UMTS system based on an innovative fully IP core network” was submitted to the ASMS Task Force conference.
- The paper entitled “SAILOR project general architecture: simulation and emulation of an integrated T/S-UMTS system based on an innovative fully IP core network” submitted to the ASMS Task Force conference was accepted.
- Preparation of presentation material for paper and poster sessions of the First International Conference on Advanced Satellite Mobile Systems planned for 10-11 July 2003, at ESRIN, in Frascati (Italy)

Dissemination activities (2/3)

Produced reports and documents 2/2:

- Preparation of a paper on CAC issues, to be presented at a major international conference or review
- The paper entitled “SAILOR project general architecture: simulation and emulation of an integrated T/S-UMTS system based on an innovative fully IP core network” submitted to the ASMS Task Force conference was accepted.
- Material for paper and poster sessions of the First International Conference on Advanced Satellite Mobile Systems planned for 10 -11 July 2003, at ESRIN, in Frascati (Italy)
- A paper entitled “Mobility Management for multicast se ssions in UMTS and Beyond System” was submitted to the IEEE Communications Magazine

Dissemination activities (3/3)

- Three papers submitted to IST Mobile Summit 2004

  - "A SIP based concept for NAS signalling in combination with an all-IP core network architecture"
  - "Performance analysis of UMTS protocol over satellite-integrated network"
  - "Optimised utilisation of the AN Radio Resource in S-UMTS - SAILOR strategy"

- Two contributions were delivered as input for ETSI, ITU and 3GPP one relevant to the Multicast Alghoritms applied in SAILOR and another to the Cellular Planning Tool developed.

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Thank You !!!