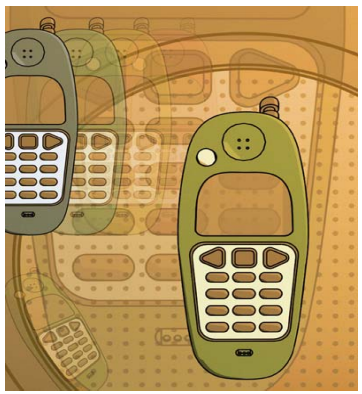
End-to-End Reconfigurability (E^2R)
E^2R – SDRF Workshop



Dr. Didier Bourse

Mr. Karim El-Khazen

20.04.04 - RegTP

http://www.e2r.motlabs.com

This presentation has been elaborated in the framework of the EU FP6 funded project E^2R, which is part of a linked group of projects within the Wireless World Initiative WWI. This publication/presentation reflects solely the author's views. The Commission/Community is not liable for any use of the information contained therein.

E²R IP Presentation Outline

E²R Workshop Presentation Outline

- ✓ E²R IP in a Nutshell
- ✓ E²R IP Technical Research
- ✓ E²R – SDRF Liaison Agreement
- ✓ E²R – SDRF Workshop Organization
- ✓ E²R – Key Points

E²R IP In a Nutshell (1/13)

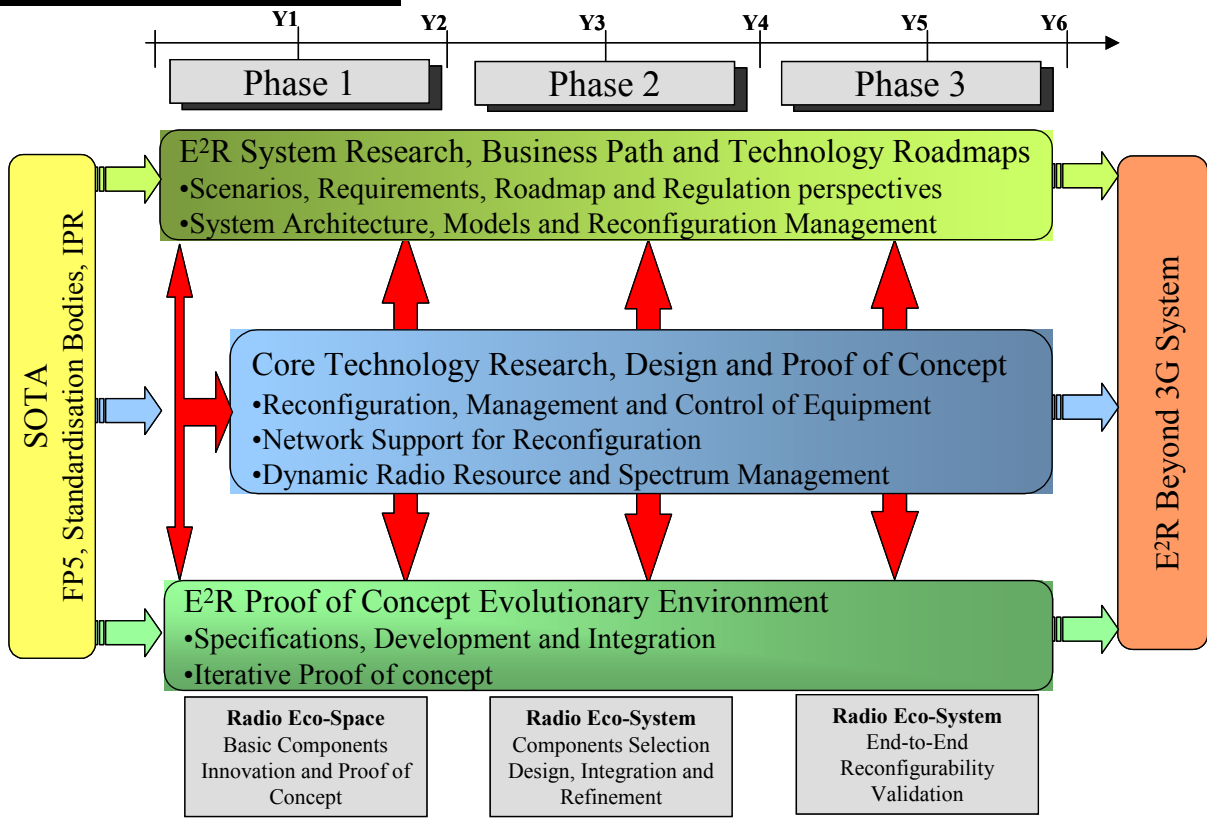
E²R Project Objective

- ✓ The key objective of the E²R project is to devise, develop and trial architectural design of reconfigurable devices and supporting system functions to offer an expanded set of operational choices to the users, application and service providers, operators, regulators in the context of heterogeneous Mobile Radio Systems
- ✓ Innovative Research, development and proof of concept will be sought in an end-to-end aspect, stretching from user device all the way up to Internet protocol, and services, and in reconfigurability support, intrinsic functionalities such as management and control, download support, spectrum, regulatory framework and business models

E²R IP In a Nutshell (2/13)

E²R Project Key Figures and Structuring

- ✓ **Budget (φ1)**
  - 16.2 MEuros
- ✓ **EU Budget (φ1)**
  - 8.9 MEuros
- ✓ **Resources (φ1)**
  - 1308 PM (~ 55 PY/Y)
- ✓ **Consortium (φ1)**
  - 28 Organizations 10 Countries
- ✓ **Start (φ1)**
  - 01.01.04



- ✓ **Contractual Outcomes: 44 Deliverables and 77 Milestones**

E²R IP In a Nutshell (3/13)

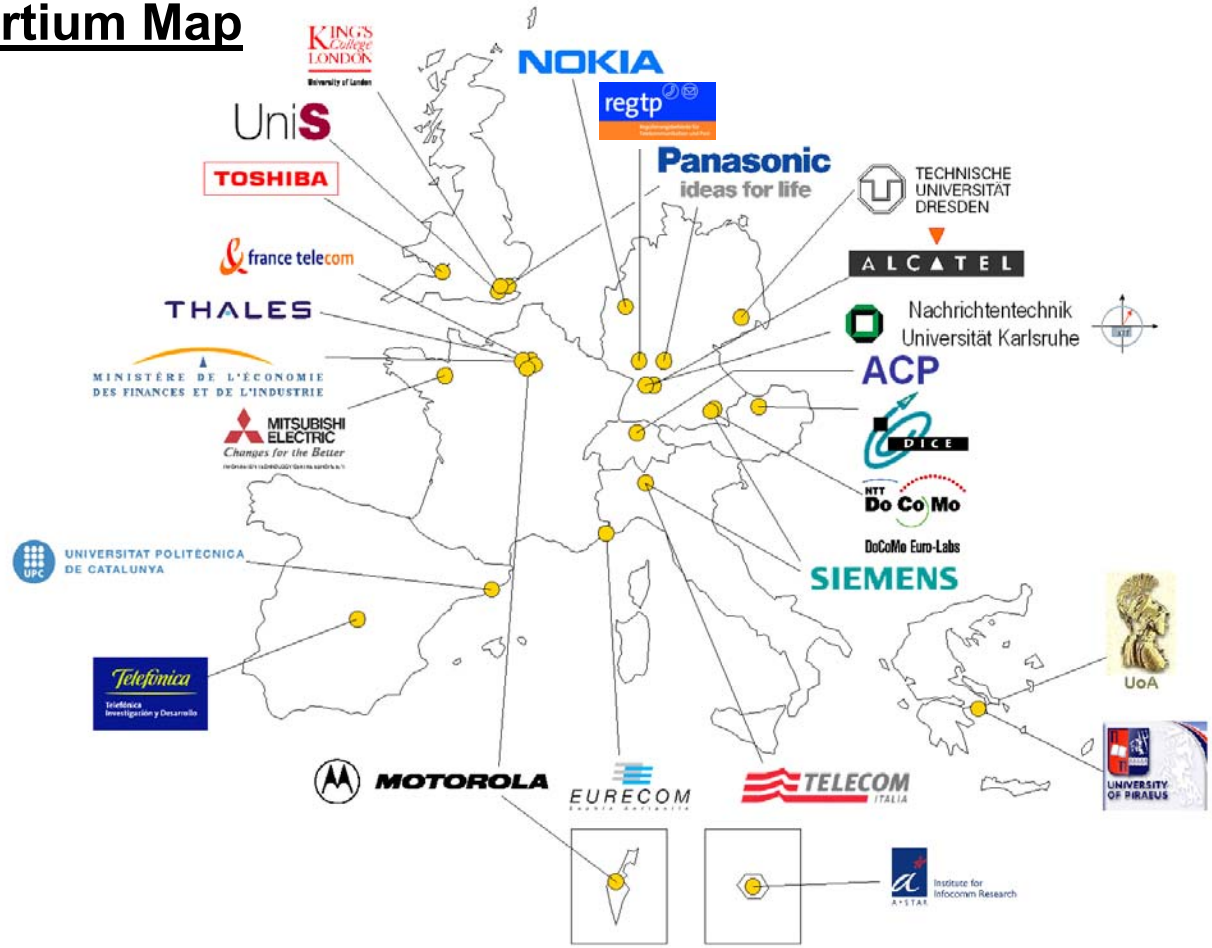
E²R IP Consortium Partners

- ✓ **Manufacturers (12)**: Motorola (FR/ISR), Siemens (GE/IT), Alcatel (GE), Nokia (GE), Panasonic (GE/UK), Thales Communications (FR), Mitsubishi Electric (FR), Toshiba (UK), DICE (AUS)
- ✓ **Academics (9)**: UoAthens (GR), King's College London (UK), UoSurrey (UK), UoDresden (GE), Eurecom (FR), UoKarlsruhe (GE), UoPiraeus (GR), UPC (SP), I2R (SING)
- ✓ **Operators (4)**: DoCoMo Eurolab (GE), TILab (IT), Telefonica (SP), FTR&D/Orange (FR)
- ✓ **Regulators (2*)**: RegTP (GE), DiGITIP (FR)
- ✓ **SME (1)**: ACP (CH)

(*) E²R will involve Contribution of OFCOM (UK)

E²R IP In a Nutshell (4/13)

E²R Consortium Map



E²R IP In a Nutshell (5/13)

E²R IP Heritage of Partners

FP5 →

Project	Partners involved	E²R related Themes
TRUST	*Siemens, Motorola, Panasonic, FTR&D, KCL, Toshiba, TID*	• Technology and system/network research • Functional architectures • System support concepts, enabling technologies and standardisation • Joint Radio Resource Management • System modelling, simulation & feasibility
SCOUT	*Siemens, Motorola, DoCoMo, FTR&D, KCL, Panasonic, Toshiba, RegTP, TID*	• Concepts for software repositories and their management • Load sharing in networks and reconfiguration management of mobile equipment • Joint Radio Resource Management (JRRM) Flexible Spectrum Allocation (FSA) schemes
MOBIVAS	*Thales, UoAthens*	• Reconfiguration management & deployment • Distributed middleware platform (prototype)
MuMoR	*Nokia, UoSurrey*	• Mechanisms for multimode radios
OverDRiVE	*Motorola, UoSurrey, FT*	• Efficient use of available radio spectrum
ARROWS	*Telecom Italia Lab, UPC*	• Efficient usage of the radio interface
MOBYDICK	*Motorola, Eurecom, I2R*	• IPv6-based mobility-enabled end-to-end QoS architecture
CREDO	*Motorola, Thales*	• Terminal and Network Management in Composite Radio Systems • Experimentation with GPRS, WLAN and DVB-T
CAST	*Panasonic*	• Reconfigurable architectures and advanced software technology

→ FP6 E²R

E²R IP In a Nutshell (6/13)

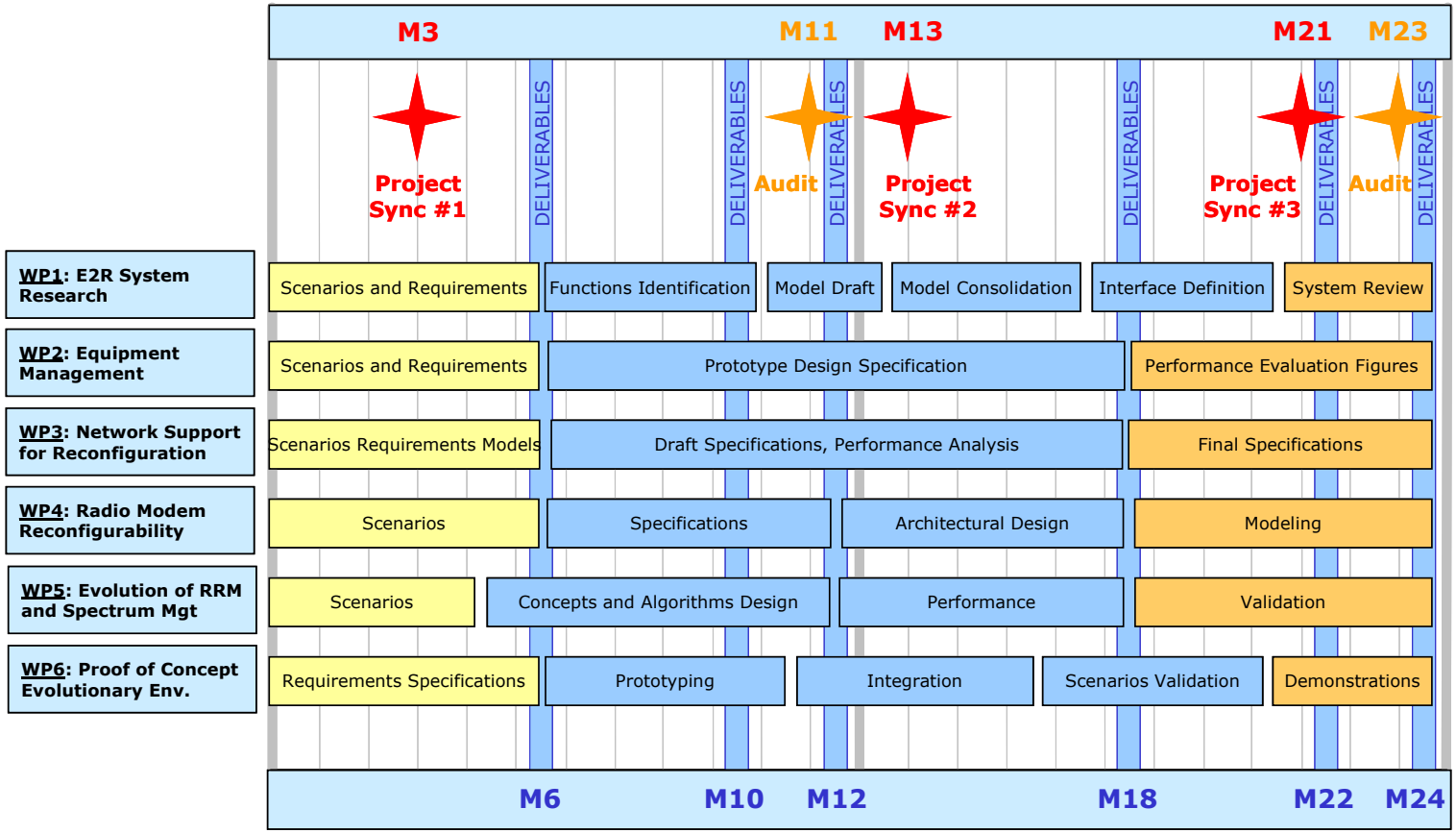
E²R Project Structuring

- ✓ **WP1**: **E²R System Research** aims to build and develop the system research for end-to-end reconfigurability, aggregating the technical, business and regulatory visions from the different actors of the project across the project WPs
- ✓ **WP2**: **Equipment Management** addresses the reconfiguration issues related to equipment which are capable of being reconfigured securely, reliably and seamlessly
- ✓ **WP3**: **Network Support for Reconfiguration** concentrates on the support of reconfigurability of network entities and terminals by network functions for secure download, reconfiguration management and validation
- ✓ **WP4**: **Radio Modem Reconfigurability** focuses on the development of local configuration control concepts and mechanisms for the physical layer resources, reconfiguration strategies and the development of the reconfigurable physical resources
- ✓ **WP5**: **Evolution of Radio Resource and Spectrum Management** aims at developing the mechanisms for dynamic allocation of radio resources, combining reconfigurable technology and support structures with novel resource management techniques
- ✓ **WP6**: **E²R Proof of Concept Evolutionary Environment** aims at developing and validating an experimental proof of concept environment capable of demonstrating E²R features in an all-IP heterogeneous network architecture

This presentation has been elaborated in the framework of the EU FP6 funded project E²R, which is part of a linked group of projects within the Wireless World Initiative WWI. This publication/presentation reflects solely the author's views. The Commission/Community is not liable for any use of the information contained therein.

E²R IP In a Nutshell (7/13)

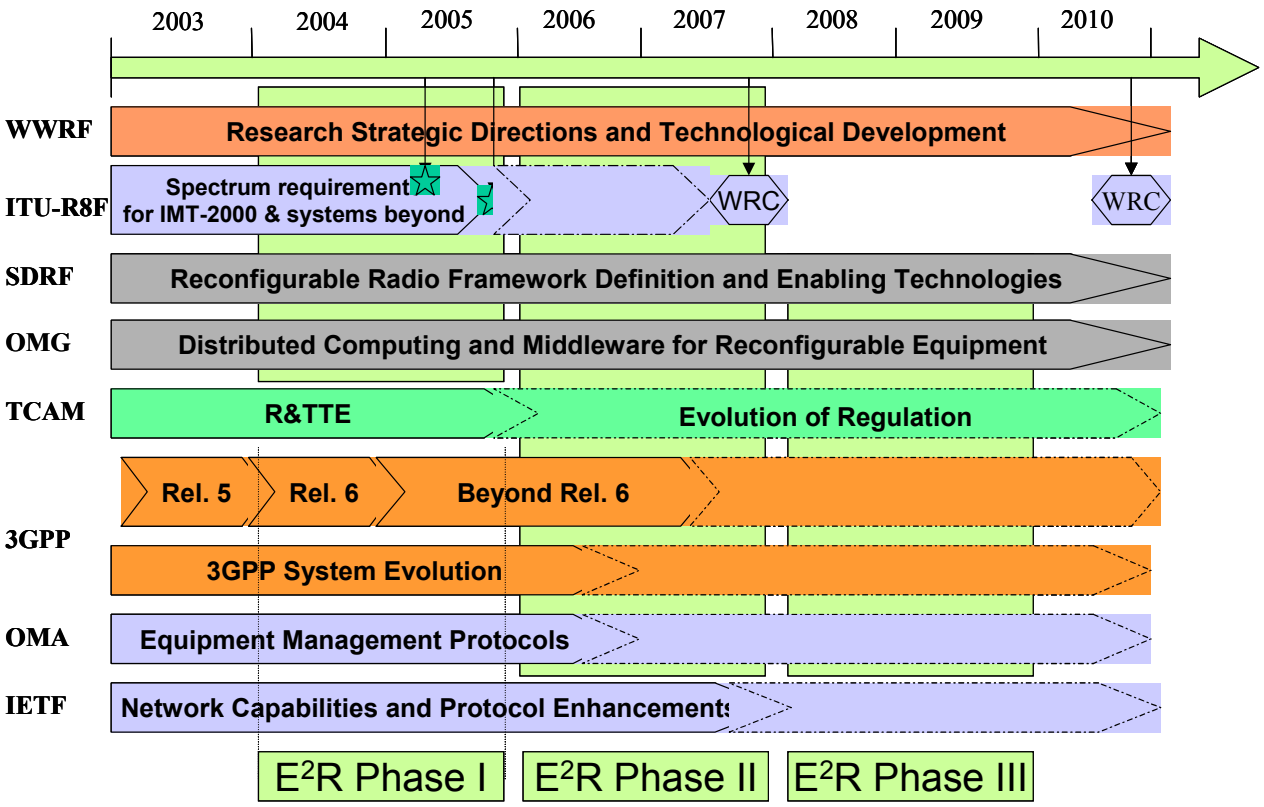
E²R Deliverables and Milestones



This presentation has been elaborated in the framework of the EU FP6 funded project E²R, which is part of a linked group of projects within the Wireless World Initiative WWI. This publication/presentation reflects solely the author's views. The Commission/Community is not liable for any use of the information contained therein.

E²R IP In a Nutshell (8/13)

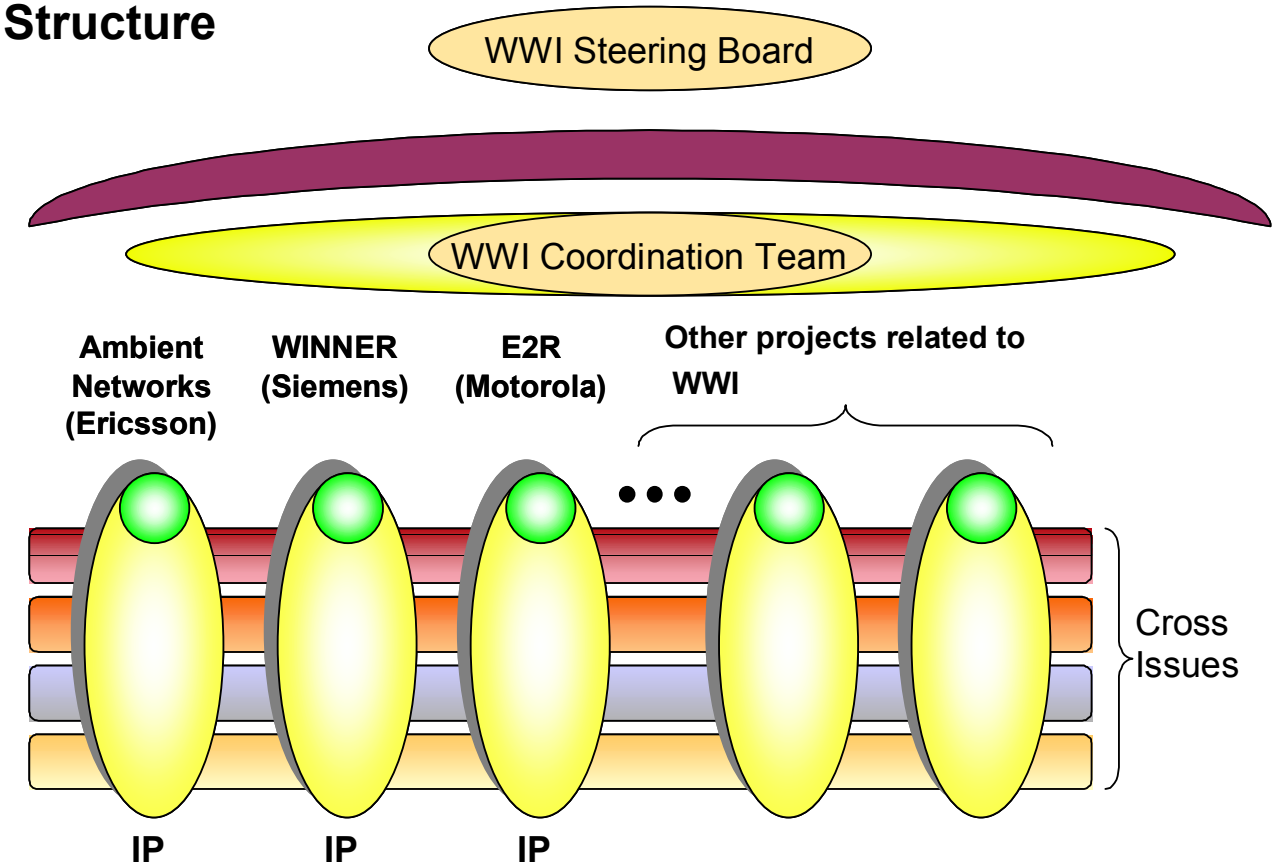
E²R Project Standard / Regulation Contribution



E²R IP In a Nutshell (9/13)

WWI – Wireless World Initiative

- ✓ **WWI Structure**



E²R IP In a Nutshell (10/13)

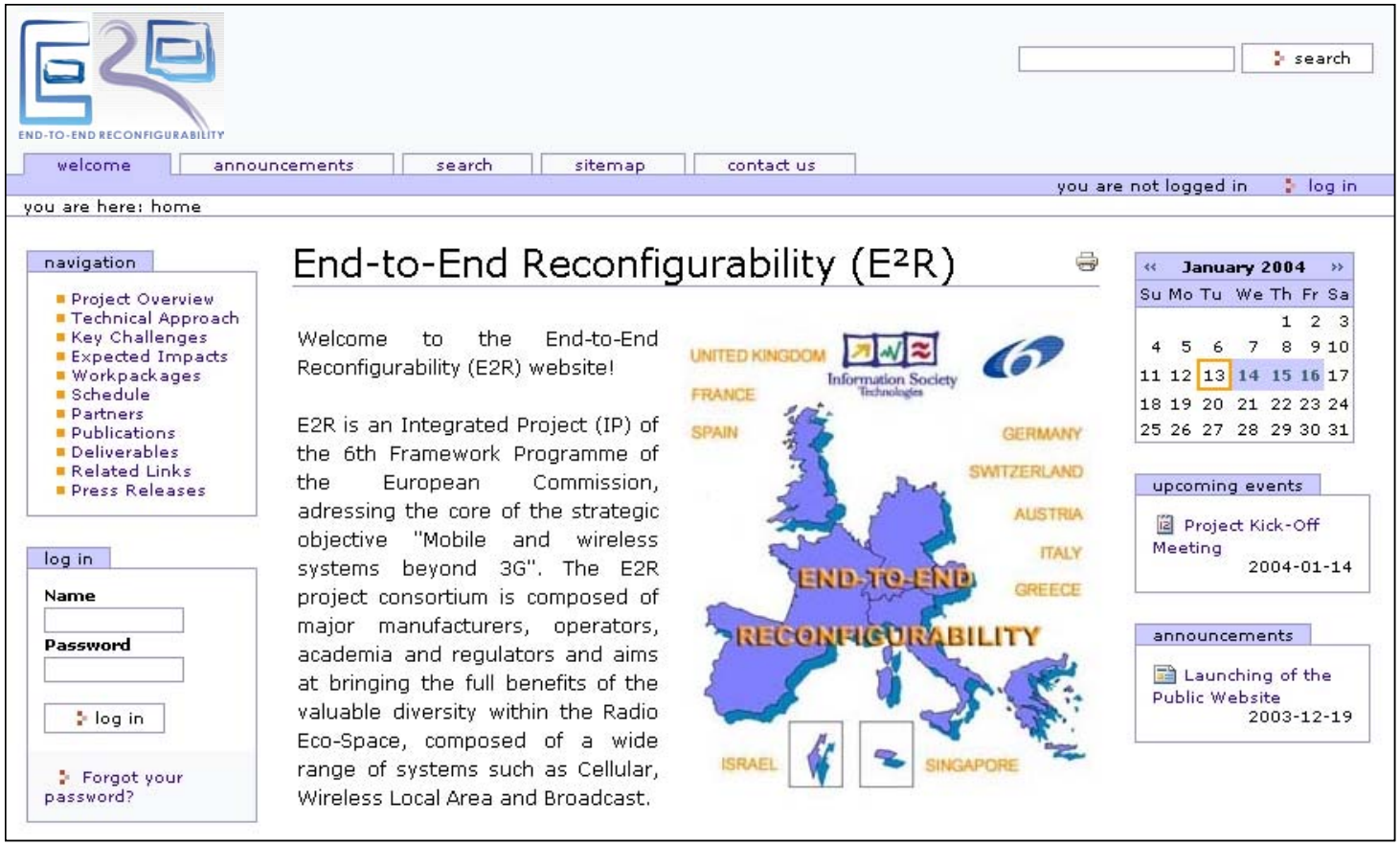
E²R Progress Highlights

- ✓ E²R Start on 01.01.04
- ✓ E²R Kick-Off in Paris on 14-16.01 (75 Participants)
- ✓ Development of the overall Management Framework
- ✓ Design and Development Monitoring of the Project Management Web-based Platform
- ✓ Coordination and Management of the Project Progress
- ✓ Contribution to the WWI Coordination Team Actions
- ✓ Development of external Interactions towards EU Commission
- ✓ Development of the Project Liaisons, Communication and Dissemination

➡ Setting-Up of Liaison Agreement with SDRF

E²R IP In a Nutshell (11/13)

E²R Web Site (www.e2r.motlabs.com)



This presentation has been elaborated in the framework of the EU FP6 funded project E²R, which is part of a linked group of projects within the Wireless World Initiative WWI. This publication/presentation reflects solely the author's views. The Commission/Community is not liable for any use of the information contained therein.

E²R IP In a Nutshell (12/13)

E²R Public Web Site - Dissemination

END-TO-END RECONFIGURABILITY

search

welcome | announcements | search | sitemap | contact us

you are not logged in | log in

you are here: home » publications » conference papers

navigation

- Project Overview
- Technical Approach
- Key Challenges
- Expected Impacts
- Workpackages
- Schedule
- Partners
- Publications
  - **Conference Papers**
  - Journal Papers
  - Presentations
- Deliverables
- Related Links
- Press Releases
- Partner News

log in

Name

Password

log in

About the SSL security on this site

Conference Papers

- Didier Bourse, Soodesh Buljore, Antoine Delautre, Thomas Wiebke, Markus Dillinger, Jorg Brakensiek, Klaus Moessner, Karim El-Khazen, Nancy Alonistioti, "The End-to-End Reconfigurability (E2R) Research", Wireless World Research Forum (WWRF), 10th Meeting, WG6 (27-28.10.2003) [Download as PDF]
- Antoine Delautre, Didier Bourse, Soodesh Buljore, Nancy Alonistioti, Klaus Moessner, "System Research, Business Path and Technology Roadmaps of End-to-End Reconfigurability", Wireless World Research Forum (WWRF), 10th Meeting, WG6 (27-28.10.2003) [Download as PDF]
- Klaus Moessner, David Grandblaise, Nicolas Motte, Fatih Capar, Eiman Mohyeldin, Jijun Luo, "Techno-Economic Implications of End-to-end Reconfigurable (E2R) Systems", Wireless World Research Forum (WWRF), 10th Meeting, WG6 (27-28.10.2003) [Download as PDF]
- Karim El-Khazen, Dominique Nussbaum, Nikos Houssos, Antoine Delautre, "Proof of Concept Evolutionary Environment of End-to-End Reconfigurability", Wireless World Research Forum (WWRF), 10th Meeting, WG6 (27-28.10.2003) [Download as PDF]
- Markus Dillinger, Eiman Mohyeldin, Panagiotis Demestichas, George Dimitrakopoulos, Jijun Luo, Nikolas Olaziregi, Nancy Alonistioti "Dynamic Network Planning and Functional Components supporting End to End Reconfiguration (E2R)", Wireless World Research Forum (WWRF), 10th Meeting, WG6 (27-28.10.2003) [Download as PDF]
- Jörg Brakensiek, Mohsen Darianian, Siegfried Walter, Craig Dolwin, Mirsad Halimic, Linus Maurer, Apostolos Kountouris, "Reconfigurable Physical Layer Architecture supporting End to End Reconfiguration (E2R)", Wireless World Research Forum (WWRF), 10th Meeting, WG6 (27-28.10.2003) [Download as PDF]
- Apostolos Kountouris, Thomas Wiebke, Panagiotis Demestichas, George Dimitrakopoulos, "Equipment Management Concepts in Reconfigurable Networks", Wireless World Research Forum (WWRF), 10th Meeting, WG6 (27-28.10.2003) [Download as PDF]
- Didier Bourse, Soodesh Buljore, Antoine Delautre, Thomas Wiebke, Markus Dillinger, Jorg Brakensiek, Klaus Moessner, Karim El-Khazen, Nancy Alonistioti, "The End-to-End

March 2004

Su	Mo	Tu	We	Th	Fr	Sa
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

announcements

- Eurecom in 3GSM World Congress 2004 2004-02-23
- Launching of the Consortium Domain 2004-02-04
- Launching of the Public Website 2003-12-19

E²R IP In a Nutshell (13/13)

E²R Public Web Site – Partners News

END-TO-END RECONFIGURABILITY

search

welcome | announcements | search | sitemap | contact us

you are not logged in log in

you are here: home » partner news

navigation

- Project Overview
- Technical Approach
- Key Challenges
- Expected Impacts
- Workpackages
- Schedule
- Partners
- Publications
- Deliverables
- Related Links
- Press Releases
- **Partner News**

log in

Name

Password

log in

About the SSL security on this site

Partner News

posted: 2004-02-23

Eurecom in 3GSM World Congress 2004

Eurecom will be present in the 3GSM (23-26.02). In the stand of SIRADEL, Eurecom will show for the first time the hardware that will be used for E2R. The shown prototype is a PC based software radio platform designed to test applications, services and technologies relying on a UMTS/TDD like air-radio interface. The demonstration consists of transmitting and receiving data from a base station to a mobile terminal and vice versa. The transmitted data may be any sort of digital data, like a digital video or audio stream. The transmitted data will be visualized or listened to at the receiver. In this way the attending visitor can gain a good insight of a UMTS/TDD transceiver, as well as of the services that could be implemented among those that the operators will propose from now to the year 2007-2009.

« March 2004 »

Su	Mo	Tu	We	Th	Fr	Sa
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

announcements

- Eurecom in 3GSM World Congress 2004 2004-02-23
- Launching of the Consortium Domain 2004-02-04
- Launching of the Public Website 2003-12-19

Copyright Motorola Labs 2003
Information on this site is subject to a disclaimer notice
End to End Reconfigurability (E2R) project site is best viewed with Netscape Navigator 6.x or Internet Explorer 6.x and above.
Powered by Plone

E²R IP Technical Research (1/25)

Objectives of the End-to-End Reconfigurability Research

- ✓ **Bring the full benefits of the valuable diversity within the Radio Eco-Space, composed of a wide range of systems such as Cellular, Wireless Local Area and Broadcast**

- ✓ **Offer an expanded set of operational choices to the users, applications and service providers, operators, regulators in the context of heterogeneous mobile radio systems, by providing increased flexibility in personal communications, improved mobility, expanded opportunities for new services and applications and more efficient use of deployed infrastructure and spectrum occupancy**

E²R IP Technical Research (2/25)

Key Challenges of the End-to-End Reconfigurability Research

- ✓ Transforming embedded flexibility into end-to-end reconfigurability
  - ✓ Flexible protocol stacks (on the terminal, access network entities, and associated procedures/protocols) of one given air interface (vertical) or several air interfaces (horizontal) which are partly or fully defined in software that can be downloaded, reconfigured and executed
- ✓ Capturing the newly enabled functionalities into sizeable benefits
  - ✓ The corresponding optimization of resources (spectrum, radio systems and equipment) and reconfiguration functions (discovery, negotiations, control and triggering)
- ✓ Finding right balance between integrated versus distributed approaches
  - ✓ The reconfigurability functions, architectures and intelligence that may be either integrated -logically or physically- in one equipment, or distributed depending on the requirements, constraints and availability of enabling technologies

This presentation has been elaborated in the framework of the EU FP6 funded project E²R, which is part of a linked group of projects within the Wireless World Initiative WWI. This publication/presentation reflects solely the author's views. The Commission/Community is not liable for any use of the information contained therein.

E²R IP Technical Research (3/25)

E²R Rationale and Benefits

- ✓ **Operators**: **scalable and reconfigurable infrastructure** that optimises resource usage. New applications and technologies offered more efficiently. High return on investment, **reduction of CAPEX** and **OPEX** costs
- ✓ **Service & Application Providers**: **open flexible platforms** and associated execution environments. Deployment of enhanced features in reduced TTM
- ✓ **Users**: **integrated telecommunication environment**. Variety of services and applications at affordable prices. Ability to use **reconfigurable equipments** to reach required services at times and places when / where they need them
- ✓ **Manufacturers**: **wider markets** by offering customised solutions. Development of "**plug and play**" technology will ease migration to new standards, protocols and applications unknown as for today. Customer support facilitated as well
- ✓ **Regulators**: **consolidated framework** wherein the wireless environment should evolve. **Easier access**, **better spectrum management**, follow-up of ethical and technological rules

This presentation has been elaborated in the framework of the EU FP6 funded project E²R, which is part of a linked group of projects within the Wireless World Initiative WWI. This publication/presentation reflects solely the author's views. The Commission/Community is not liable for any use of the information contained therein.

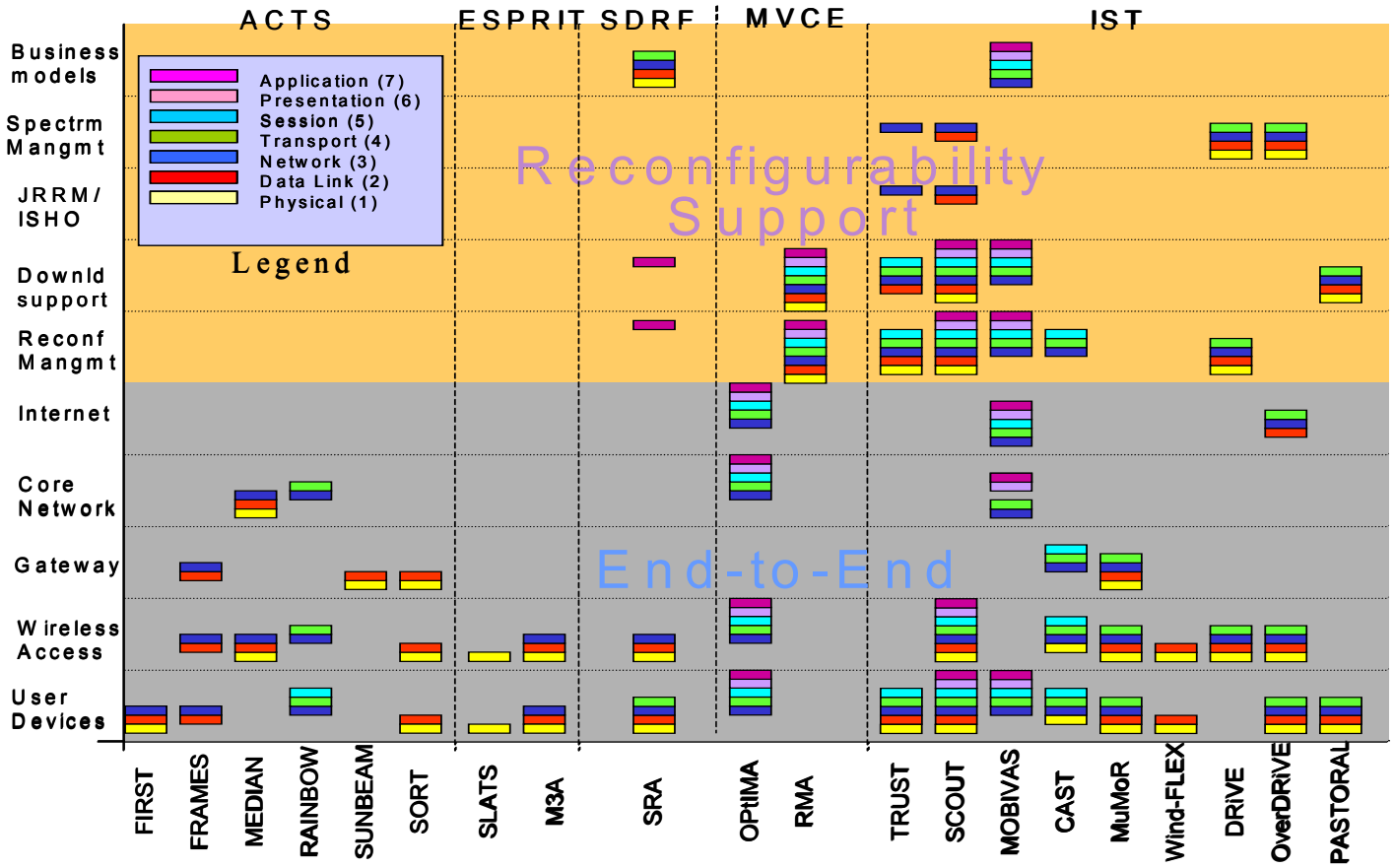
E²R IP Technical Research (4/25)

E²R State-Of-The-Art

- ✓ **Very strong heritage in reconfigurability** gained through former European-funded research projects of FP5 (TRUST, SCOUT, MOBIVAS and CAST…)
- ✓ **FP5 projects concentrate on technical aspects** such as terminals, value-added service provision, enabling technologies, applications, reconfigurable devices, network provisions, security, proof of concept of reconfigurability…
- ✓ **End-to-end reconfigurability wireless system vision** is fairly new and the work carried out so far has not induced any significant breakthrough

E²R IP Technical Research (5/25)

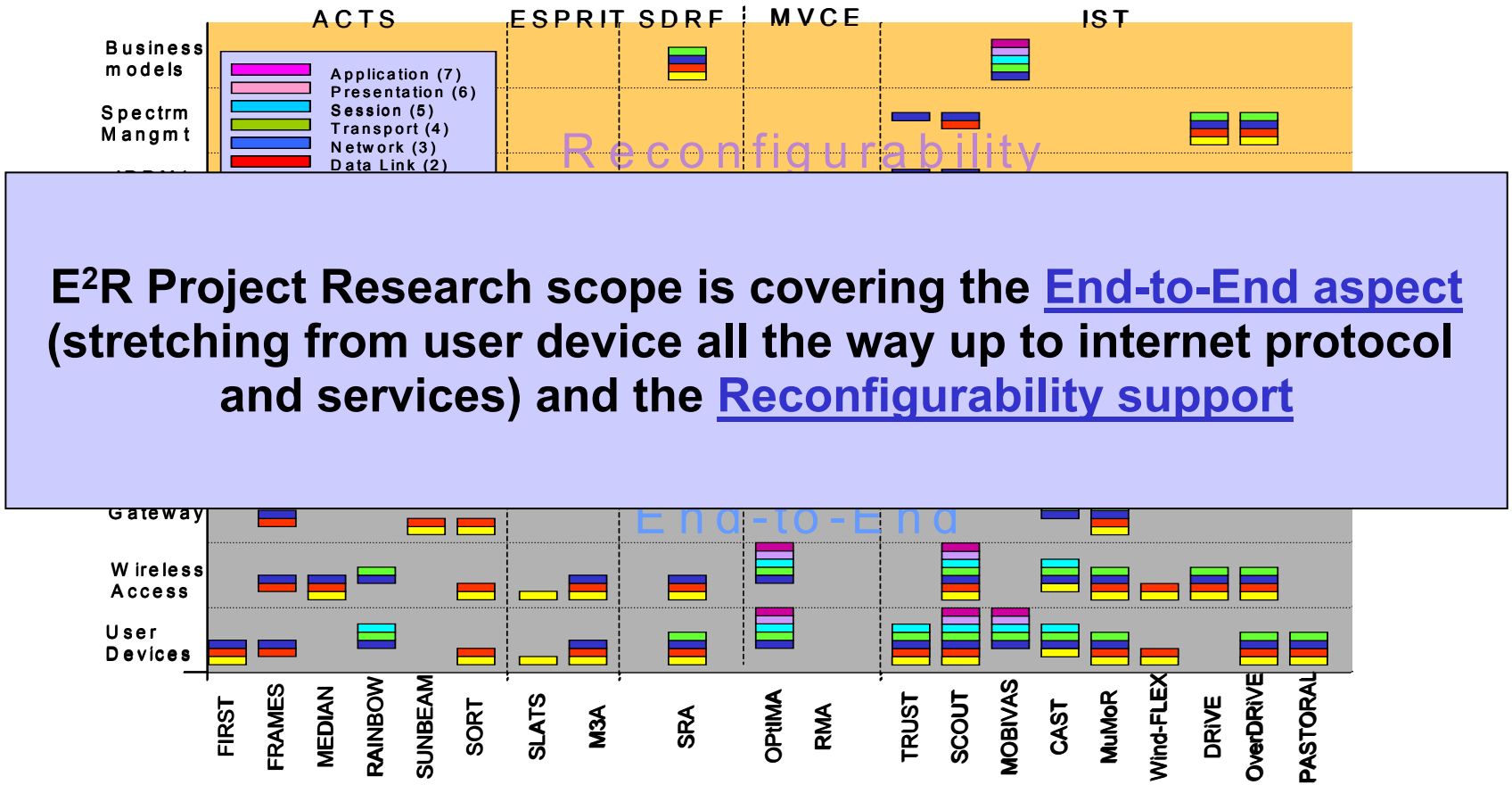
Global Perspective of Reconfigurability – SOTA Research



This presentation has been elaborated in the framework of the EU FP6 funded project E²R, which is part of a linked group of projects within the Wireless World Initiative WWI. This publication/presentation reflects solely the author's views. The Commission/Community is not liable for any use of the information contained therein.

E²R IP Technical Research (6/25)

Global Perspective of Reconfigurability – SOTA Research



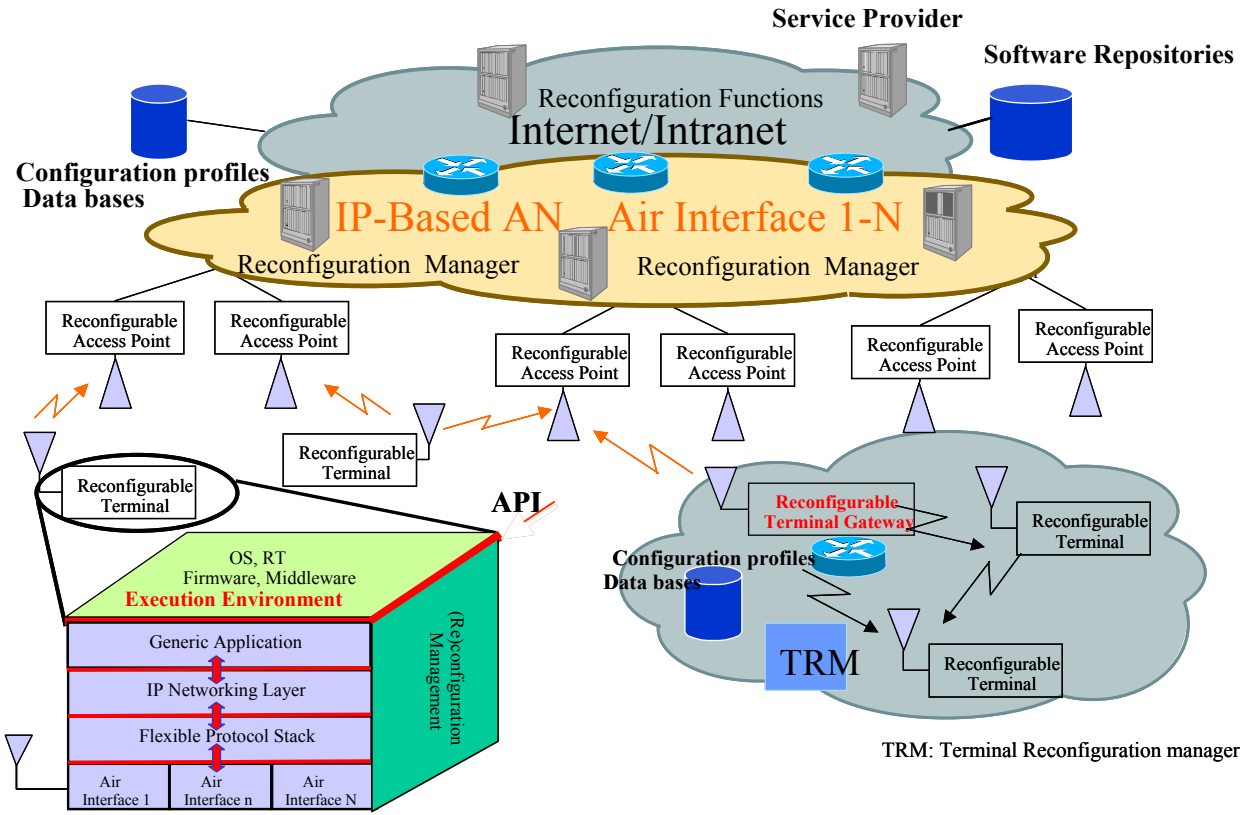
E²R Project Research scope is covering the End-to-End aspect (stretching from user device all the way up to internet protocol and services) and the Reconfigurability support

This presentation has been elaborated in the framework of the EU FP6 funded project E²R, which is part of a linked group of projects within the Wireless World Initiative WWI. This publication/presentation reflects solely the author's views. The Commission/Community is not liable for any use of the information contained therein.

E²R IP Technical Research (7/25)

End-to-End Reconfigurability (E²R) Project – Architectural Perspective

- ✓ Expected topology corresponding to the transition from multi-mode to smart reconfigurable equipments and related reconfiguration support



E²R Project Architectural Vision of the Beyond 3G System

This presentation has been elaborated in the framework of the EU FP6 funded project E²R, which is part of a linked group of projects within the Wireless World Initiative WWI. This publication/presentation reflects solely the author's views. The Commission/Community is not liable for any use of the information contained therein.

E²R IP Technical Research (8/25)

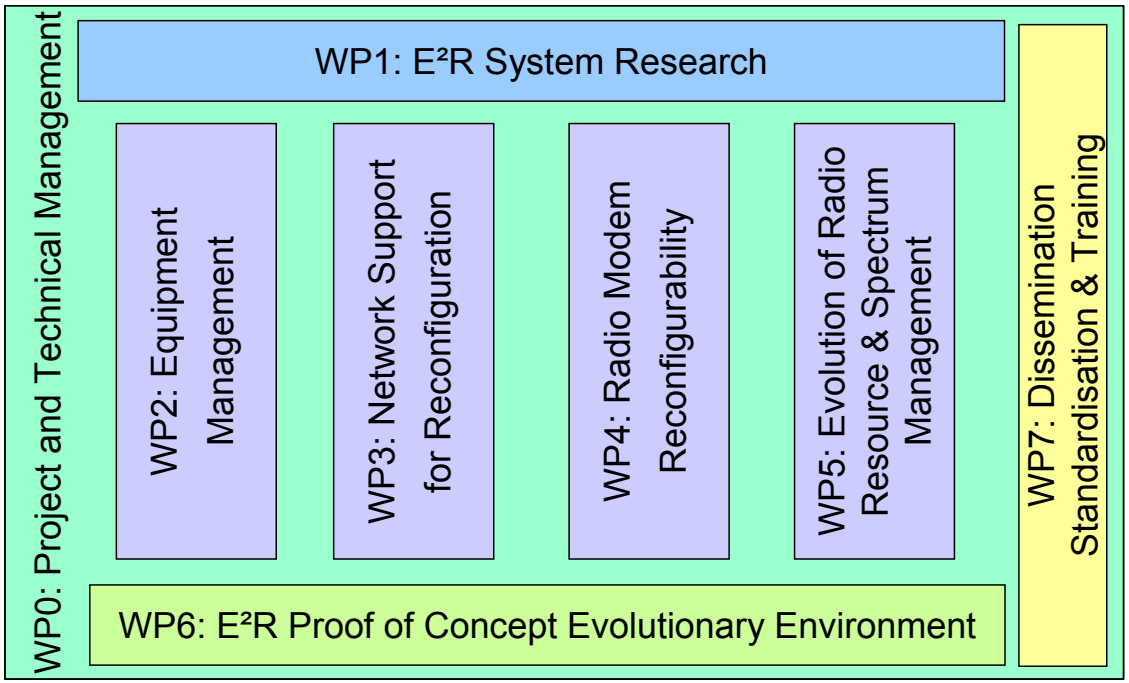
End-to-End Reconfigurability (E²R) Project – Key Enabler

- ✓ Reconfigurable equipments and systems will generally provide much higher flexibility, scalability, configurability and interoperability than currently existing mobile communications systems
- ✓ End-to-End Reconfigurability is a key enabler to support the heterogeneous and generalized wireless access, in a flexible and intelligent manner
  - ✓ Ubiquitous access
  - ✓ Pervasive services
  - ✓ Dynamic resources provisioning

This presentation has been elaborated in the framework of the EU FP6 funded project E²R, which is part of a linked group of projects within the Wireless World Initiative WWI. This publication/presentation reflects solely the author's views. The Commission/Community is not liable for any use of the information contained therein.

E²R IP Technical Research (9/25)

E²R Project Structure – Workpackages Leaderships



- ✓ **WP0: Motorola**
- ✓ **WP1: Thales**
- ✓ **WP2: Panasonic**
- ✓ **WP3: Siemens**
- ✓ **WP4: Nokia**
- ✓ **WP5: UoSurrey**
- ✓ **WP6: Motorola**
- ✓ **WP7: UoAthens**

E²R IP Technical Research (10/25)

E²R Technical Research

- ✓ **WP1: E²R System Research**
  - ✓ **WP1 aims to build and develop the system research for end-to-end reconfigurability, aggregating the technical, business and regulatory visions from the different actors of the Project and this, across the WPs.**
  - ✓ **WP1 Research is addressing the E²R scenarios and requirements, the E²R business path elaboration and road-map, the overall E²R architectures, reference models and reconfigurability management, and finally the E²R regulatory perspectives.**
  - ✓ **WP1 leads and coordinates the bi-annual E²R Internal Workshops to address specific technical thematic across workpackages and build the vision over the complete project.**

E²R IP Technical Research (11/25)

E²R Technical Research

- ✓ **WP1: E²R System Research**
  - ✓ **sWP1.1: E²R System analysis and Techno-economic**
    - ✓ **E²R Scenarios and Requirements Capture**
    - ✓ **Business Path Elaboration**
    - ✓ **Roadmap**
  - ✓ **sWP1.2: Architectures, Models and Reconfigurability Management**
    - ✓ **Reconfigurability Management Architectures and Models Elaboration**
    - ✓ **Reconfigurability Management Relationships and Interface Validation**
  - ✓ **sWP1.3: E²R Regulatory Perspectives**
    - ✓ **Regulatory Framework for E²R**
    - ✓ **Potential Evolution of Regulation in E²R Context**

E²R IP Technical Research (12/25)

E²R Technical Research

- ✓ **WP2: Equipment Management**
  - ✓ **WP2 addresses the reconfiguration issues related to equipment, i.e. terminals and base-stations/access-points, which are capable of being reconfigured securely, reliably and seamlessly.**
  - ✓ **Initially, the focus is on the terminal centric development of the local (to the equipment) reconfiguration management, and the development of extensions for execution environments to provide the basic mechanisms supporting the needed reconfiguration capabilities for dynamic adaptation and secure/reliable operation.**
  - ✓ **As progress in the aforementioned topics will be made, deeper integration and exploitation of reconfigurable and flexible protocol stacks will be pursued.**

This presentation has been elaborated in the framework of the EU FP6 funded project E²R, which is part of a linked group of projects within the Wireless World Initiative WWI. This publication/presentation reflects solely the author's views. The Commission/Community is not liable for any use of the information contained therein.

E²R IP Technical Research (13/25)

E²R Technical Research

- ✓ **WP2: Equipment Management**
  - ✓ **sWP2.1: Reconfiguration Management Architecture: Procedures, Interfaces**
    - ✓ **Scenario Analysis and Requirements Definition**
    - ✓ **Reconfiguration Management Interfaces**
    - ✓ **Equipment local Management Procedures**
  - ✓ **sWP2.2: Execution Environments**
    - ✓ **Reconfigurable Protocol Stack Framework**
    - ✓ **Reliability/Security Issues (Mechanisms and Policies)**

E²R IP Technical Research (14/25)

E²R Technical Research

- ✓ **WP3: Network Support for Reconfiguration**
  - ✓ **WP3 concentrates on the support of reconfigurability of network entities and terminals by network functions for secure download, reconfiguration management and validation. WP3 works closely with WP2 to define a suitable reconfiguration management plane.**
  - ✓ **Concepts for end-to-end reconfigurations and its impact on end-user service provision management are developed and applied for the design of heterogeneous coupled multi-standard networks based on reconfigurable network elements.**
  - ✓ **This will result in new architectures and signaling for network reconfiguration concepts and negotiations and trading services are partly validated.**

This presentation has been elaborated in the framework of the EU FP6 funded project E²R, which is part of a linked group of projects within the Wireless World Initiative WWI. This publication/presentation reflects solely the author's views. The Commission/Community is not liable for any use of the information contained therein.

E²R IP Technical Research (15/25)

E²R Technical Research

- ✓ **WP3: Network Support for Reconfiguration**
  - ✓ **sWP3.1: Reconfiguration Management, Policies and Services**
    - ✓ **Reconfiguration Policies, related Services and Platforms**
    - ✓ **Reconfiguration Security and Safety Concepts**
  - ✓ **sWP3.2: Reconfiguration Architectures and Mechanisms**
    - ✓ **Download and Reconfiguration Functions provided by Network**
    - ✓ **Network Planning Concepts and flexible Partitioning**

E²R IP Technical Research (16/25)

E²R Technical Research

- ✓ **WP4: Radio Modem Reconfigurability**
  - ✓ **WP4 focuses on the development of local configuration control concepts and mechanisms for the physical layer resources, reconfiguration strategies and the development of the reconfigurable physical resources.**
  - ✓ **WP4 works closely with WP2 to define the partitioning of configuration management and control function and their interfaces and capabilities towards the physical layer resources.**
  - ✓ **WP4 will provide physical layer related reconfiguration capability information to the configuration management entity and will be responsible for reliable reconfiguration processes. Hardware architectural elements as well as operational software aspects will be considered. A common terminal and base station approach will be targeted.**

This presentation has been elaborated in the framework of the EU FP6 funded project E²R, which is part of a linked group of projects within the Wireless World Initiative WWI. This publication/presentation reflects solely the author's views. The Commission/Community is not liable for any use of the information contained therein.

E²R IP Technical Research (17/25)

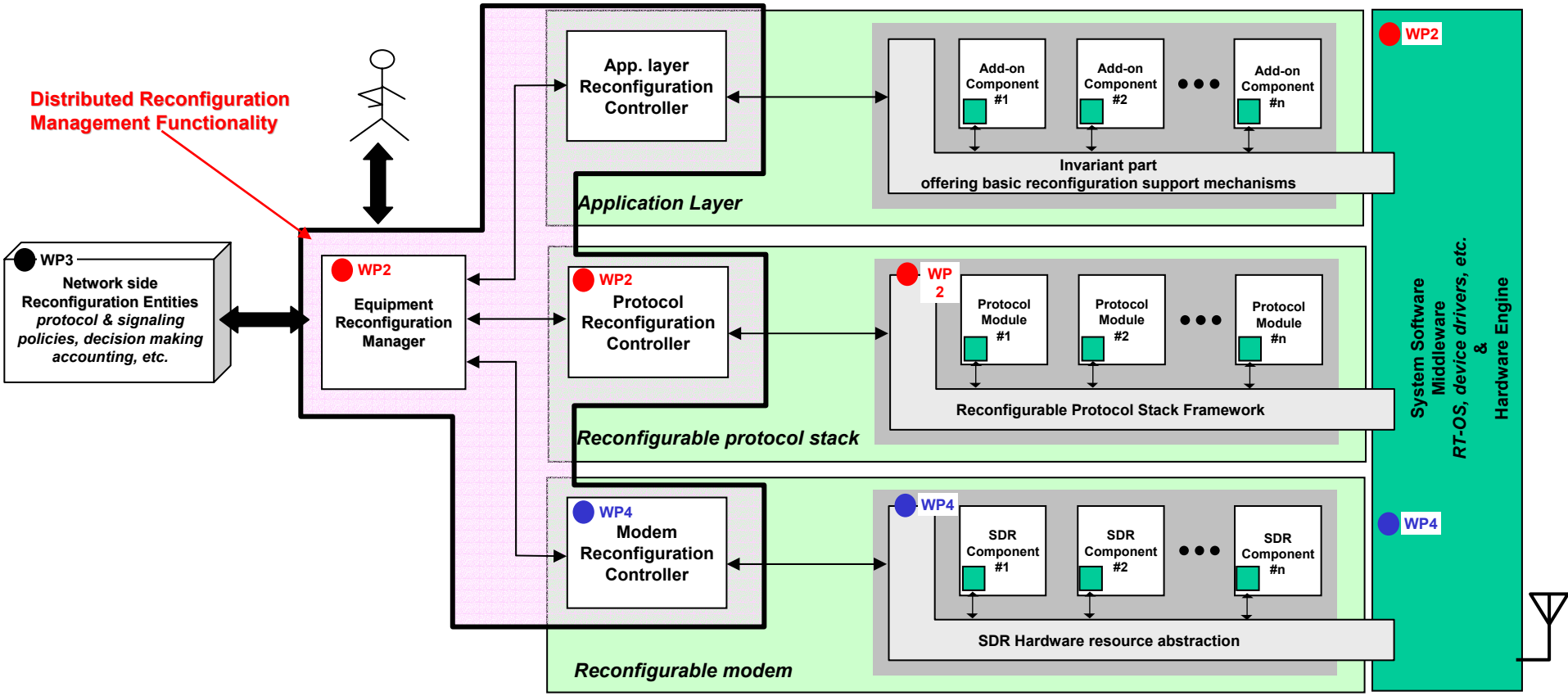
E²R Technical Research

- ✓ WP4: Radio Modem Reconfigurability
  - ✓ sWP4.1: E²R Physical Layer Architecture
    - ✓ Requirements, Scenarios and Constraints
    - ✓ Physical Layer Functional Architecture
    - ✓ Physical Layer Operational Software Environment
  - ✓ sWP4.2: Configuration Control Module (CCM)
    - ✓ Functional Specification
    - ✓ Interface to Configuration Management Module (CMM)
    - ✓ Interface to Physical Layer Resources (Digital Baseband and RF-FE)
    - ✓ CCM Modelling
  - ✓ sWP4.3: Key Concepts of E²R Resources
    - ✓ Abstract HW Modeling
    - ✓ Reconfiguration Strategies and Parameter Extraction
    - ✓ Use Case Modelling

This presentation has been elaborated in the framework of the EU FP6 funded project E²R, which is part of a linked group of projects within the Wireless World Initiative WWI. This publication/presentation reflects solely the author's views. The Commission/Community is not liable for any use of the information contained therein.

E²R IP Technical Research (18/25)

E²R Technical Research



This presentation has been elaborated in the framework of the EU FP6 funded project E²R, which is part of a linked group of projects within the Wireless World Initiative WWI. This publication/presentation reflects solely the author's views. The Commission/Community is not liable for any use of the information contained therein.

E²R IP Technical Research (19/25)

E²R Technical Research

- ✓ **WP5: Evolution of Radio Resource and Spectrum Management**
  - ✓ **WP5 aims at developing the mechanisms for dynamic allocation of radio resources. This requires research into combining reconfigurable technology and support structures with novel resource management techniques that are capable to control the complete spectrum in a local area.**
  - ✓ **Deployment of such technology requires a new approach to regulation and economics of spectrum.**
  - ✓ **Hence the second major aim of this WP is to develop, based on the results of the research in WP1, new options and mechanisms to enable more progressive spectrum regulation and market-based approaches and to facilitate a more efficient resource usage.**

This presentation has been elaborated in the framework of the EU FP6 funded project E²R, which is part of a linked group of projects within the Wireless World Initiative WWI. This publication/presentation reflects solely the author's views. The Commission/Community is not liable for any use of the information contained therein.

E²R IP Technical Research (20/25)

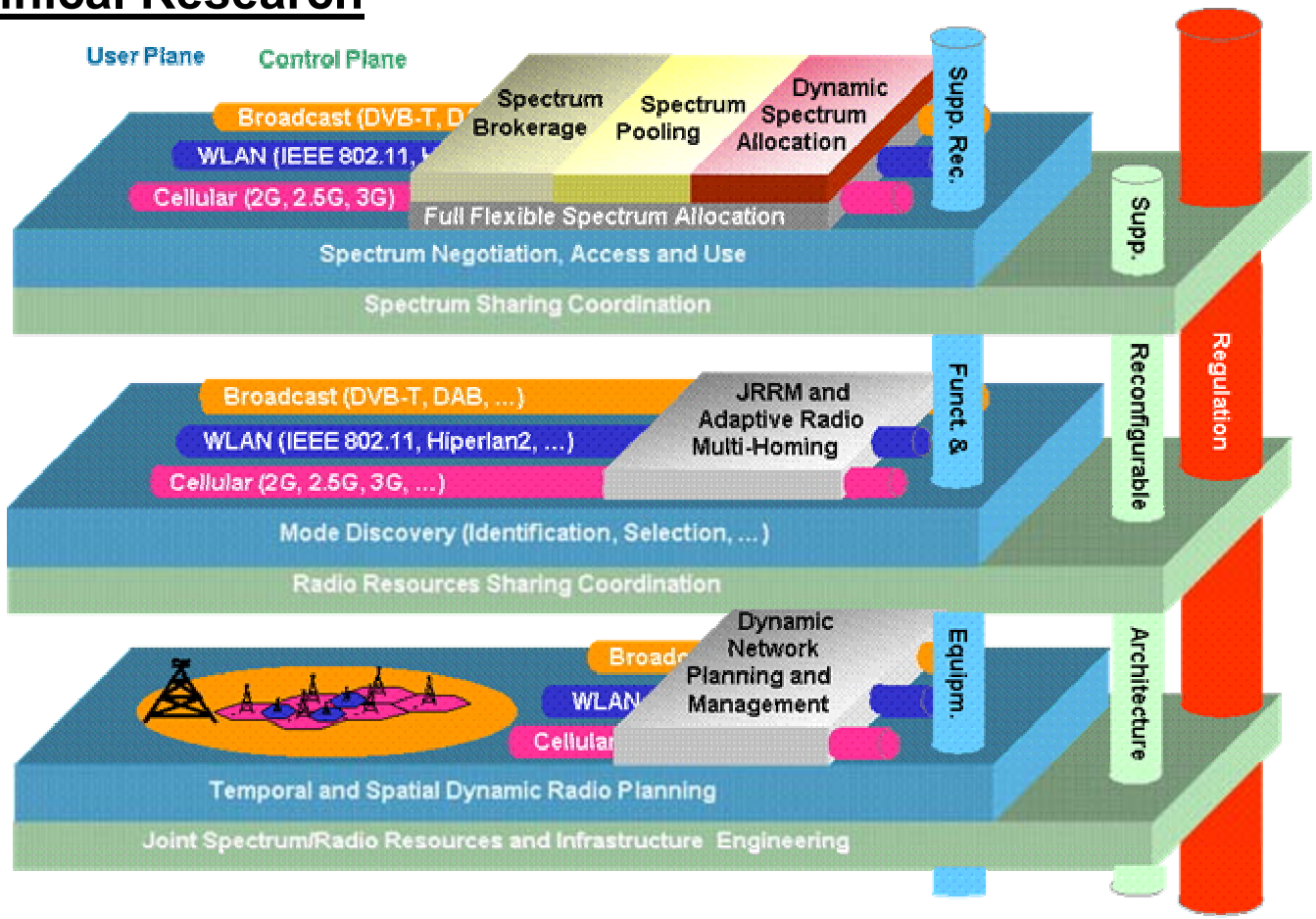
E²R Technical Research

- ✓ **WP5: Evolution of Radio Resource and Spectrum Management**
  - ✓ **sWP5.1: Scenarios Definition and Combined ASM/ARRM Approach**
    - ✓ **ASM and ARRM Scenarios**
    - ✓ **ASM/ARRM Modelling Approach**
  - ✓ **sWP5.2: Advanced Spectrum Management (ASM)**
    - ✓ **Flexible Spectrum Allocation (FSA)**
    - ✓ **Enabling Technologies**
  - ✓ **sWP5.3: RRM and Network Planning in Composite Environments**
    - ✓ **RRM in a heterogeneous environment (JRRM)**
    - ✓ **Network Planning in a Reconfigurability Context**

This presentation has been elaborated in the framework of the EU FP6 funded project E²R, which is part of a linked group of projects within the Wireless World Initiative WWI. This publication/presentation reflects solely the author's views. The Commission/Community is not liable for any use of the information contained therein.

E²R IP Technical Research (21/25)

E²R Technical Research



This presentation has been elaborated in the framework of the EU FP6 funded project E²R, which is part of a linked group of projects within the Wireless World Initiative WWI. This publication/presentation reflects solely the author's views. The Commission/Community is not liable for any use of the information contained therein.

E²R IP Technical Research (22/25)

E²R Technical Research

- ✓ **WP6: E²R Proof of Concept Evolutionary Environment**
  - ✓ **WP6 aims at integrating the results of WP2, WP3, WP4 and WP5, and validating the vision of the reconfigurability developed in the overall project.**
  - ✓ **The main expected outcome of WP6 is the development of an experimental proof of concept environment capable of demonstrating end-to-end reconfigurability features in an all-IP heterogeneous network architecture.**
  - ✓ **This flexible, scalable, and evolutionary environment will allow the validation of the scenarios proposed by the WP1. Those developments and experiments will also provide numerous outputs and feedbacks for the other workpackages.**

This presentation has been elaborated in the framework of the EU FP6 funded project E²R, which is part of a linked group of projects within the Wireless World Initiative WWI. This publication/presentation reflects solely the author's views. The Commission/Community is not liable for any use of the information contained therein.

E²R IP Technical Research (23/25)

E²R Technical Research

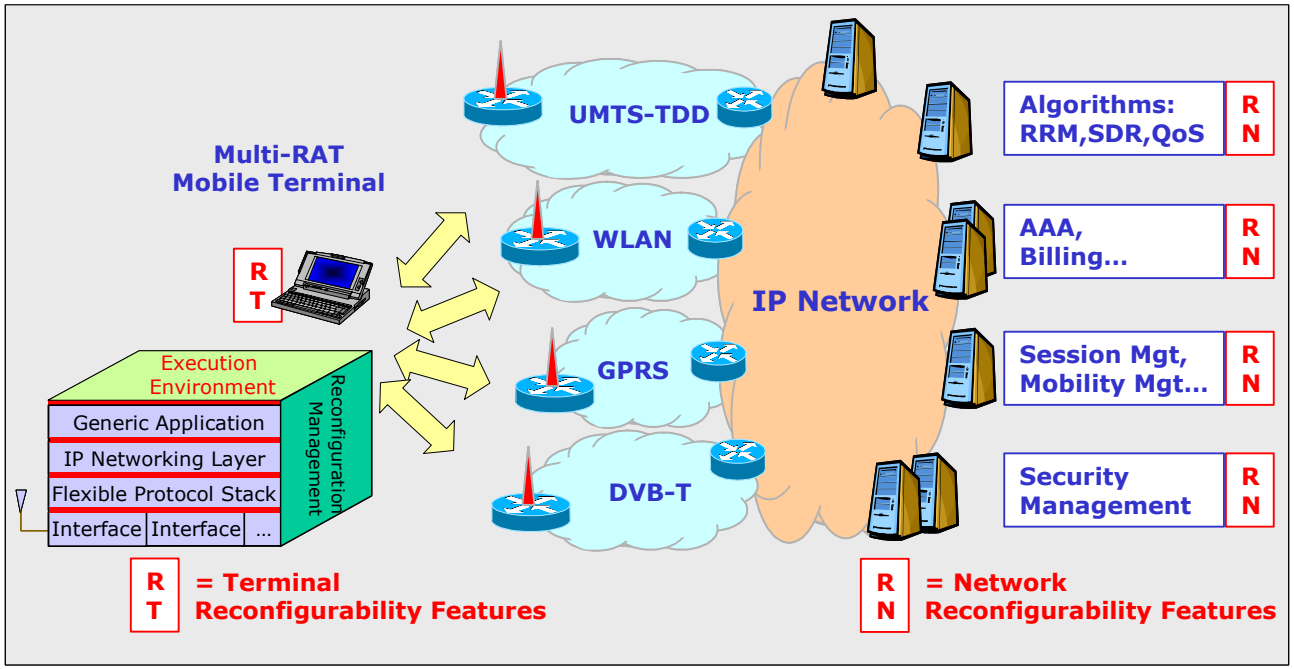
- ✓ **WP6: E²R Proof of Concept Evolutionary Environment**
  - ✓ **sWP6.1: General Specification**
    - ✓ **System Architecture Definition for the Proof of Concept**
    - ✓ **Interfaces and Requirements Definition**
  - ✓ **sWP6.2: Prototyping and Integration**
    - ✓ **Development of HW/SW Modules and Tools**
    - ✓ **System Integration**
  - ✓ **sWP6.3: Proof of Concept and Feedback to Workpackages**
    - ✓ **Proof of Concept and Scenarios Validation**
    - ✓ **Events, Demonstrations and Feedback to others Workpackages**

This presentation has been elaborated in the framework of the EU FP6 funded project E²R, which is part of a linked group of projects within the Wireless World Initiative WWI. This publication/presentation reflects solely the author's views. The Commission/Community is not liable for any use of the information contained therein.

E²R IP Technical Research (24/25)

E²R Technical Highlight: Demonstrations Activities (1/2)

- ✓ The brand-new concept of this phase is to bring together key research activities that have been working up-to-now independently and assess the feasibility of an integrated proof-of-concept framework for the support and provision of reconfigurability
- ✓ Snapshot of the progress at the end of each phase provided by the demonstration planned in WP6



E²R IP Technical Research (25/25)

E²R Technical Highlight: Demonstrations Activities (2/2)

- ✓ Two main demonstrations planned in Phase 1 (2004-2005)
  - ✓ IST Wireless and Mobile Summit (June 2005, Germany)
  - ✓ Final Demonstration at Motorola Labs (December 2005, France)
- ✓ Validation of specific scenarios
  - ✓ Flexible service deployment support, such as flexible service creation, authentication and billing
  - ✓ Mode switching of a multi-RAT mobile terminal in a heterogeneous network
  - ✓ Software upgrade of terminal and network entities as well as different layers in the protocol stack

This presentation has been elaborated in the framework of the EU FP6 funded project E²R, which is part of a linked group of projects within the Wireless World Initiative WWI. This publication/presentation reflects solely the author's views. The Commission/Community is not liable for any use of the information contained therein.

E²R IP – SDRF Liaison Agreement (1/7)

E²R – SDRF Liaison Agreement – MoU (1/3)

E²R and SDRF will conduct joint Activities in the following Areas:

- ✓ **Representatives of E²R will be invited to submit Contributions to and participate in the annual SDRF Technical Conference,**
- ✓ **Representatives of SDRF will be invited to submit Contributions to and participate in E²R Workshops and Wireless World Research Forum Meetings (WWRF – WG6 Reconfigurability),**
- ✓ **E²R and SDRF will exchange White Papers, Request for Comments and other Information in Areas of mutual Interest to E²R and SDRF,**
- ✓ **E²R and SDRF will conduct joint Workshops and organise Working Meetings within the Framework of such Workshops,**
- ✓ **…**

This presentation has been elaborated in the framework of the EU FP6 funded project E²R, which is part of a linked group of projects within the Wireless World Initiative WWI. This publication/presentation reflects solely the author's views. The Commission/Community is not liable for any use of the information contained therein.

E²R IP – SDRF Liaison Agreement (2/7)

E²R – SDRF Liaison Agreement – MoU (2/3)

E²R and SDRF will conduct joint Activities in the following Areas:

- ✓ **…**
- ✓ **E²R and SDRF will exchange Information concerning their Road-Maps and respective Plans for the Dissemination of Information in Areas of mutual Interest,**
- ✓ **E²R and SDRF will share Activities in conducting Surveys among interested Parties in the field of Reconfigurability, Software Defined Radio and Cognitive Radio,**
- ✓ **Where considered appropriate E²R and SDRF will jointly disseminate Information in areas of mutual Interest.**

E²R IP – SDRF Liaison Agreement (3/7)

E²R – SDRF Liaison Agreement – MoU (3/3)

- ✓ E²R and SDRF agree that no Information exchanged as a Result of any of the Activities envisaged by this Memorandum, shall be regarded as confidential. Information provided by E²R Consortium Members will correspond to Data to be Part of Public Project Deliverables (PU Deliverables, according to EU Commission Contract) and E²R dissemination (Publication, Standardization Contributions, Training Material)

This presentation has been elaborated in the framework of the EU FP6 funded project E²R, which is part of a linked group of projects within the Wireless World Initiative WWI. This publication/presentation reflects solely the author's views. The Commission/Community is not liable for any use of the information contained therein.

E²R IP – SDRF Liaison Agreement (4/7)

E²R – Public Deliverables (1/3)

- ✓ D4.1: Requirements and Scenario Definition (T0+6)
- ✓ D4.2: State-of-the-Art and Outlook (T0+6)
- ✓ D2.2: Equipment Management Framework for Reconfiguration: Architecture, Interfaces and Functions (T0+12)
- ✓ D4.3: Functional Physical Layer Architecture (T0+12)
- ✓ D7.1: Report on Project Dissemination, Training and Standardization Activities (T0+12)
- ✓ D3.3: Reconfiguration Management Plane and Design of Network Support Functions and Signalling (T0+18)

E²R IP – SDRF Liaison Agreement (5/7)

E²R – Public Deliverables (2/3)

- ✓ **D5.3: Algorithms and Performance (including FSM & RRM/Network Planning) (T0+18)**
- ✓ **D1.3: Techno-Economic and Regulatory Perspectives (T0+22)**
- ✓ **D3.4: Function Split and Procedures for flexible Partitioning of Network Entities (T0+22)**
- ✓ **D1.4: E2E Reconfigurability Management System-level Architecture (T0+24)**
- ✓ **D2.4: Final Equipment Management Framework for Reconfiguration: Architecture, Interfaces, Functions and Performance Evaluation Results (T0+24)**

This presentation has been elaborated in the framework of the EU FP6 funded project E²R, which is part of a linked group of projects within the Wireless World Initiative WWI. This publication/presentation reflects solely the author's views. The Commission/Community is not liable for any use of the information contained therein.

E²R IP – SDRF Liaison Agreement (6/7)

E²R – Public Deliverables (3/3)

- ✓ **D3.5: Reconfiguration Security Concepts (T0+24)**
- ✓ **D4.7: Use Case Modelling (T0+24)**
- ✓ **D5.4: Analysis of Combined Strategies including Concepts, Algorithms and Reconfigurable Architecture Aspects (T0+24)**
- ✓ **D6.5: Demonstrations and Events Report (T0+24)**
- ✓ **D7.2: Report on Project Dissemination, Training and Standardisation Activities (T0+24)**

E²R IP – SDRF Liaison Agreement (7/7)

E²R – SDRF Detailed Interactions Framework

- ✓ Identification of potential Cross-Fertilization in SDRF Technical Conference, E²R Workshops, WWRF WG6…
- ✓ Identification of potential White Papers, Request for Comments
- ✓ Organization of one E²R - SDRF joint Workshop per Year including Working Sessions
- ✓ Analysis of E²R and SDRF Road-Maps / Plans for the Dissemination
- ✓ Definition of Joint Surveys on Reconfigurability, SDR, CR
- ✓ Analysis of candidate joint Disseminatation

This presentation has been elaborated in the framework of the EU FP6 funded project E²R, which is part of a linked group of projects within the Wireless World Initiative WWI. This publication/presentation reflects solely the author's views. The Commission/Community is not liable for any use of the information contained therein.

E²R IP – SDRF Workshop Organization

E²R – SDRF Workshop Organization

- ✓ First Joint Workshop
  - ✓ Plenary Synchronization Session
  - ✓ Parallel Working Sessions
    - ✓ What are the Key Domains of Interests and the Key Questions to be covered by E²R and by SDRF ?
    - ✓ What are the mutual Interests for Interactions ?
    - ✓ What should be the Form of the Interactions (White Paper, Survey, Joint Dissemination…) ?
    - ✓ When should we consider the identified Interactions ?
    - ✓ Who should be working on the identified Interactions ?
  - ✓ Panel Session
  - ✓ Plenary Synchronization

E²R IP Key Points

E²R Project Impact: Key Points

- ✓ Only Project addressing the Reconfigurability Thematic in the EU FP6 SO "Mobile and Wireless Systems Beyond 3G"
- ✓ Strong Potentials from Research and Consortium Perspectives to radically change Foundation for building future wireless Systems:
  - ✓ End-to-End Coverage (Components and Reconfigurability Support)
  - ✓ E²R Approach is radically different (and complementary) to the traditional Approach (Developing next generation NW and AI)
  - ✓ Phase 1 including early Proof of concept Developments
  - ✓ Consortium based on Skills and Expertise, including all major Reconfigurability Players (building on FP5)
  - ✓ Only Project involving Regulators within the Consortium
- ✓ Establish European competitiveness in this domain:
  - ✓ Lead in Reconfigurability IPR
  - ✓ Drive Standards and Regulation Bodies
  - ✓ Enhance and spread excellence on Reconfigurability (Knowledge Sharing, Training, Field Trials)