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EU Strategic visions on B3G:
Perspective for Mobile and Wireless Communications in FP6

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EC INFSO E4

Wireless Going IP
International Project Summit

November 14, 2002, Leganés (Madrid) SPAIN

NB:The views expressed herein are those of the authors and are not necessarily those of the European Commission

Outline of presentation

- **Beyond 3G: Scenarios and challenges**
- **Beyond 3G: Supporting RTD under FP6**
- **Conclusions**

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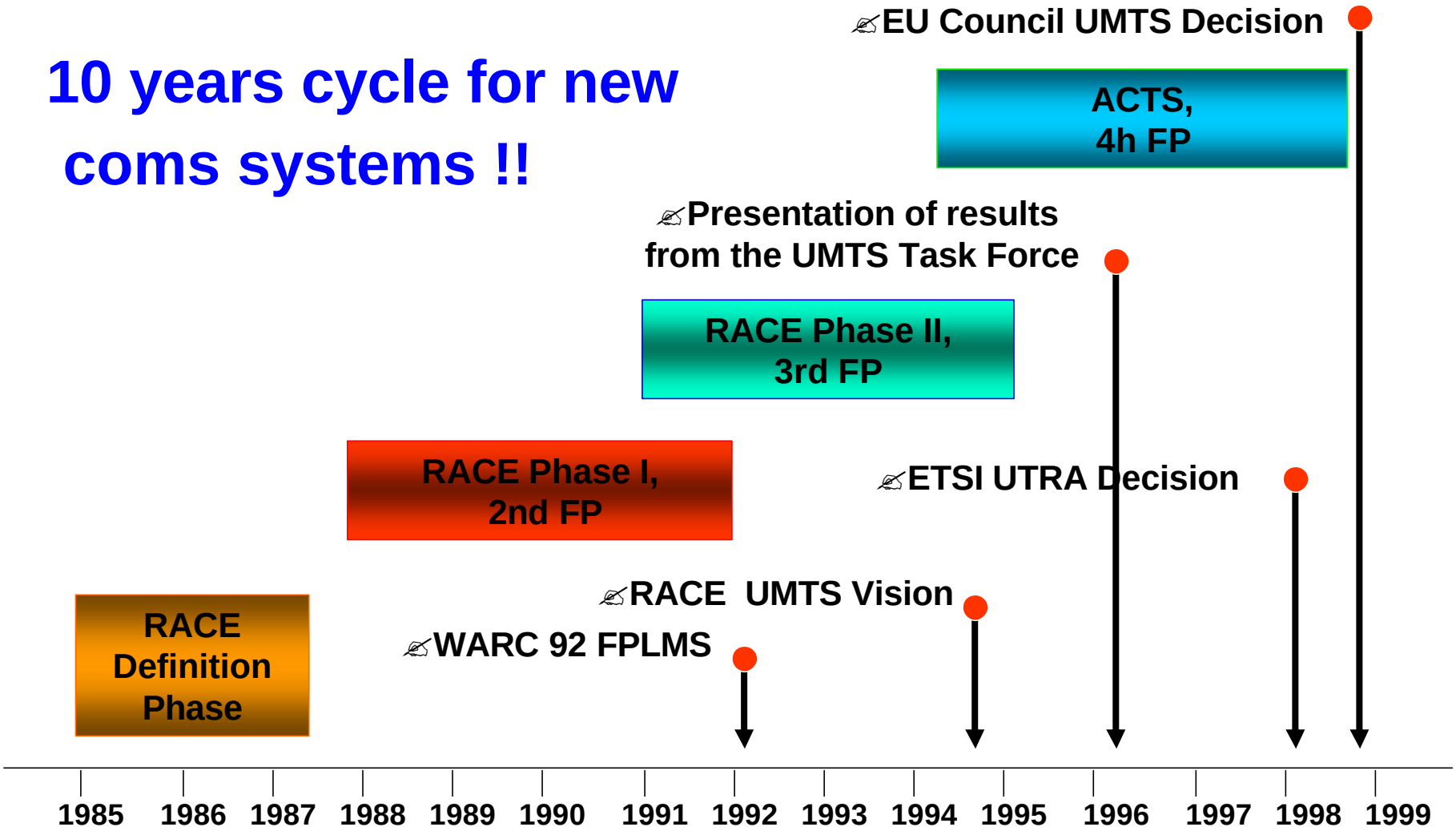
The R&D Path to 3G

10 years cycle for new coms systems !!



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IST today: Main Wireless Topics

- *Re-configurable Radio*
- *Integration with Digital Broadcasting*
- Broadband Wireless
- *Location-based VAS, Security*
- S-UMTS & Broadband Multimedia Satellites
- *Smart antenna and adaptive modulations*
- Network management and optimisation
- *4G Wireless, Wireless IP*
- Trials: WAP, digital AM radio, speech recognition

IST in FP5: The Transition phase, exploring new system/technology concepts

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SYSTEMS BEYOND 3G: SOME DRIVERS

Manufacturers: ***Looking for innovative system concepts allowing introduction of new, mass market equipment;***

Operators: ***interest in introduction of new services still without having to throw away existing infrastructures;***

Users: ***affordable new services without access restrictions;***

Challenge: ***introduction of innovative systems and services with backwards compatibility;***

Requirement: ***proliferation of wireless devices implies optimised use of spectrum: the right service should use the right access network in the right frequency band.***

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BEYOND 3G: SCENARIOS

Seamless personalized access from a range of environments

Home: ***the intelligent home supports private activities as well as business processes***

Work: ***new forms of flexible team networks outperform old hierarchical forms of organization***

Transportation: ***higher efficiency and safety through better information processing***

Public places: ***will offer a variety of edutainment and sport thrills***

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BEYOND 3G: SCENARIOS

Seamless personalized access for a range of applications

Education: education & training is a lifelong activity

Leisure, entertainment: spectacular, multisensory entertainment will meet the demands from more leisure time

Knowledge-based business: access to knowledge more critical than ever for wealth creation

Electronic commerce: " desktop shopping" is a time-saving alternative to traditional ways of shopping

Health: improved diagnosis, more prevention, less treatment

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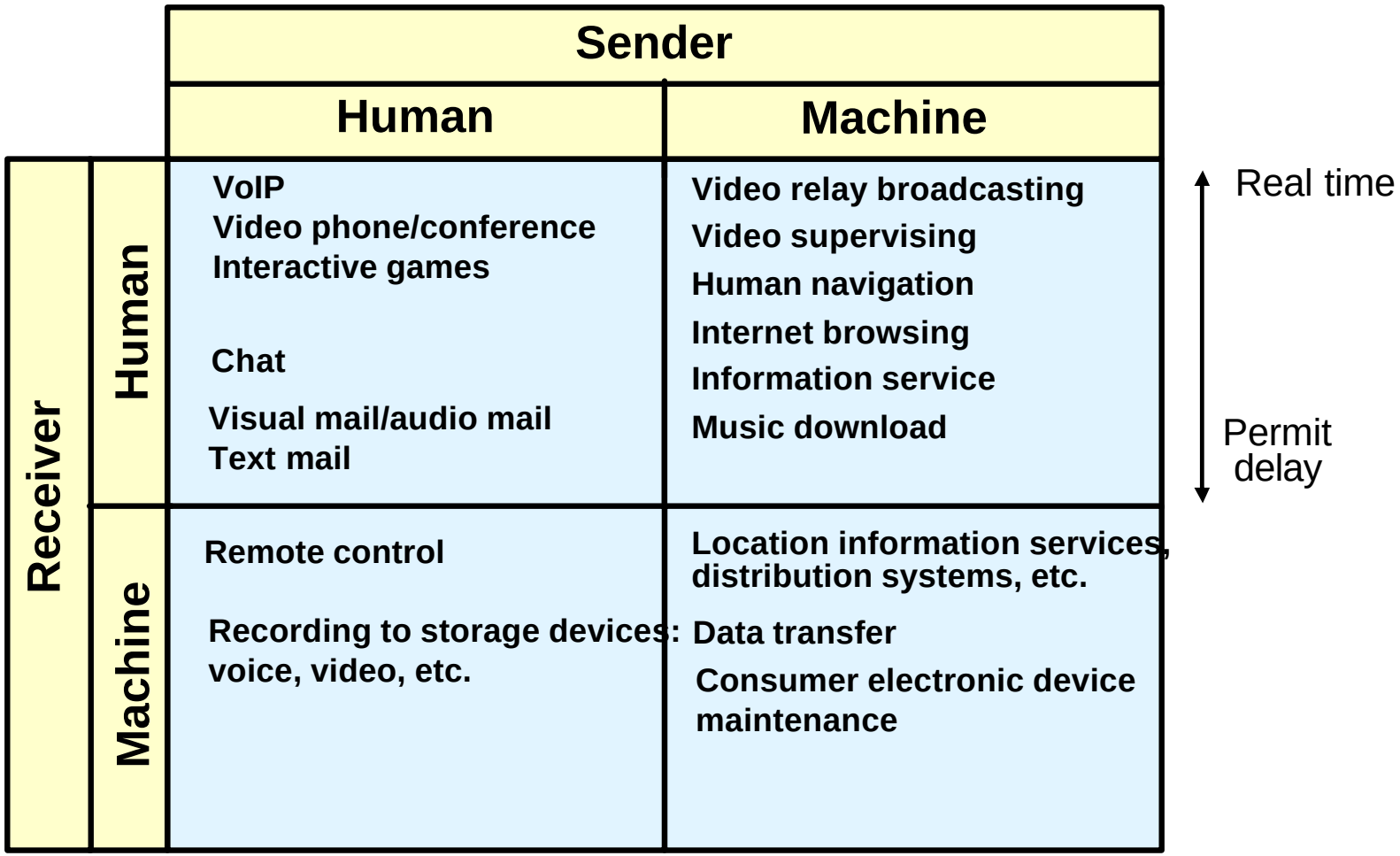
BEYOND 3G: SCENARIOS

Access for a range of Devices



Source: NTT DoCoMo

Support of *real time* and *non-real time* services

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BEYOND 3G: SCENARIOS

Moving closer to the local sphere: Spontaneous Device Networking (self-organising, ad-hoc)

Some Issues:

- service discovery
- security
- management
- spectrum coexistence

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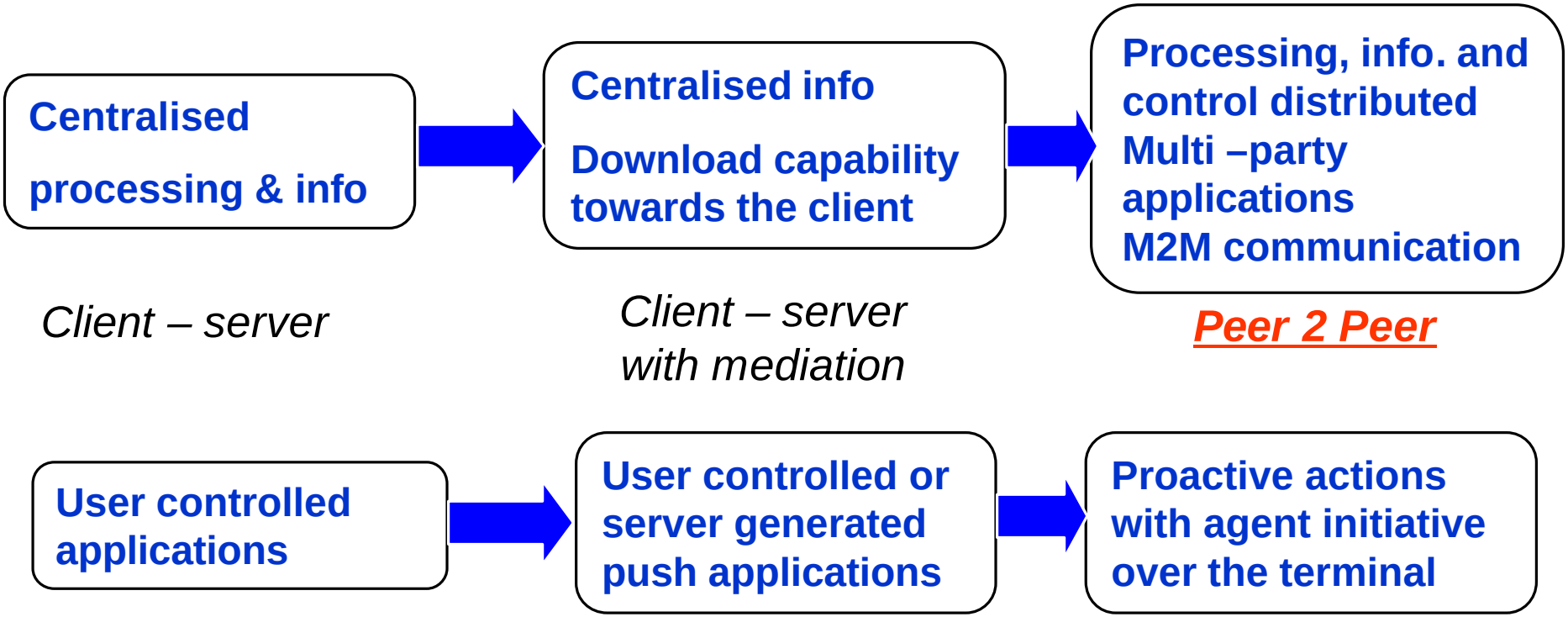
BEYOND 3G: SERVICE CHALLENGE



Personal Service Sphere;
User defined services
Context awareness;
Human senses reactivity...

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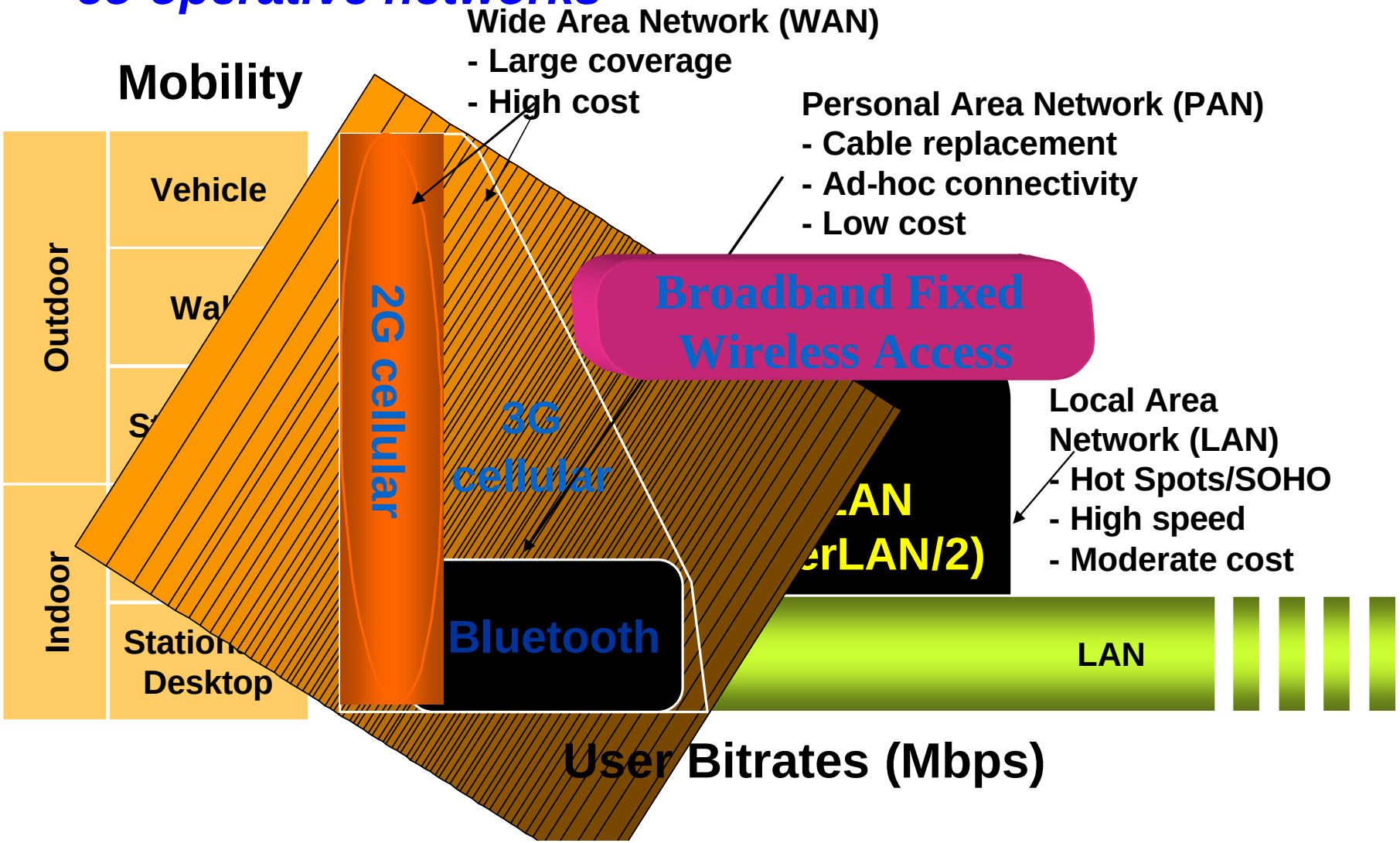
BEYOND 3G: NETWORK CHALLENGE

Addressing ubiquity and capacity bottlenecks through co-operative networks



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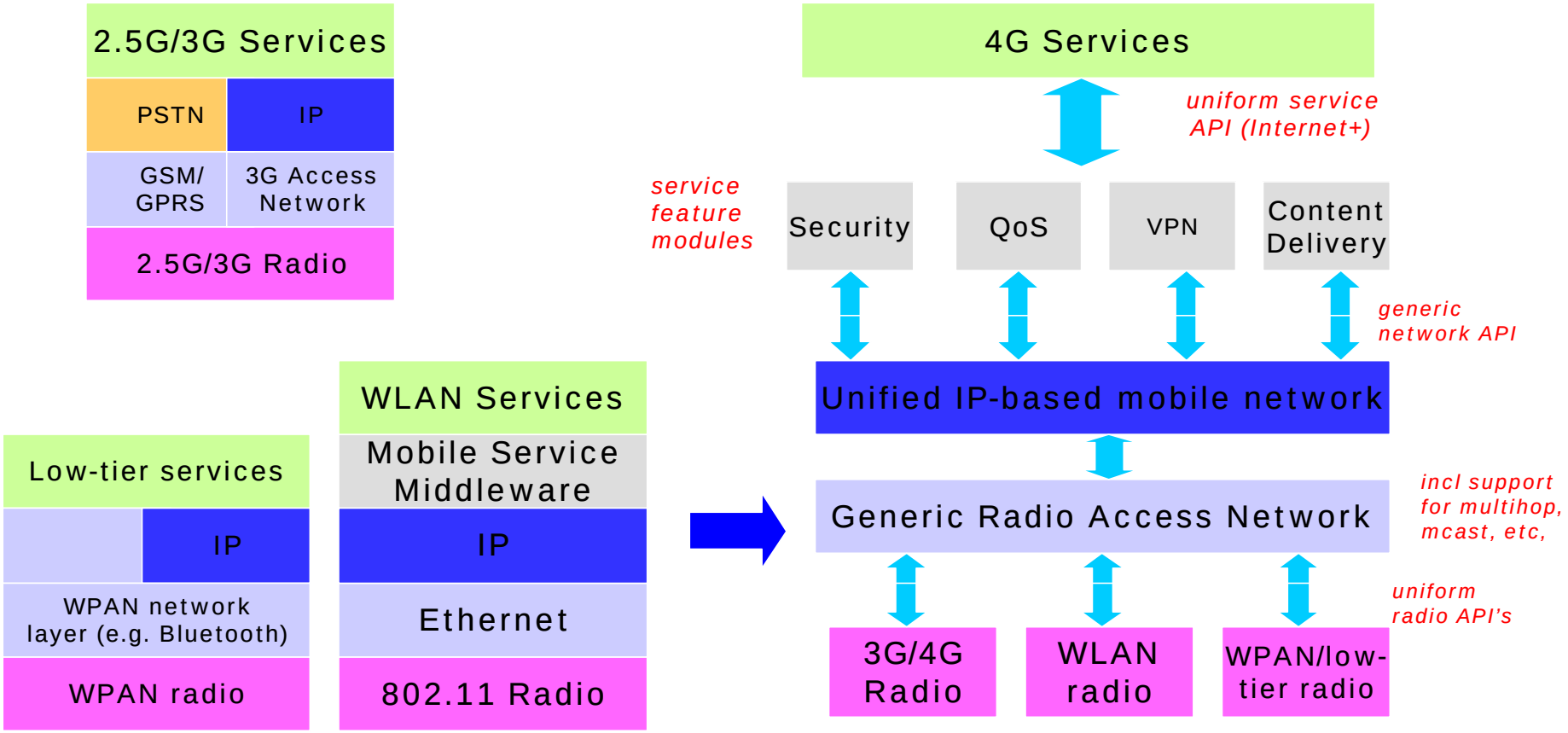
BEYOND 3G: PROTOCOL ISSUES



Radio-specific vertically integrated systems with complex intetworking gateways

Radio Independent modular system architecture for heterogeneous networks

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BEYOND 3G: TECHNOLOGICAL CHALLENGE

- **Co-operative Networks**
  - Wireless Protocols, all IP (v6)
  - Security across different layers & Privacy,
  - Resource and Mobility management,
  - QoS, Network management, flexible billing system,
  - Advanced network architectures, new accesses
  - Network planning techniques and tools
  - System Architecture (e.g ad hoc + services)
  - dynamic spectrum usage
- **Software Defined Radio Terminal and Base Station**
  - Re-configurable RF and Baseband techniques, architectures and platforms
  - Reconfiguration management software architecture
  - Software and hardware partitioning

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BEYOND 3G: OTHER CHALLENGES

- Business Models
- User behaviour and service acceptability;
- Regulations: security, reconfigurability, spectrum
- Standards
- Pervasive usage across a large untested user community

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Outline of presentation

- Beyond 3G: Scenarios and challenges
- Beyond 3G: Supporting RTD under FP6
- Conclusions

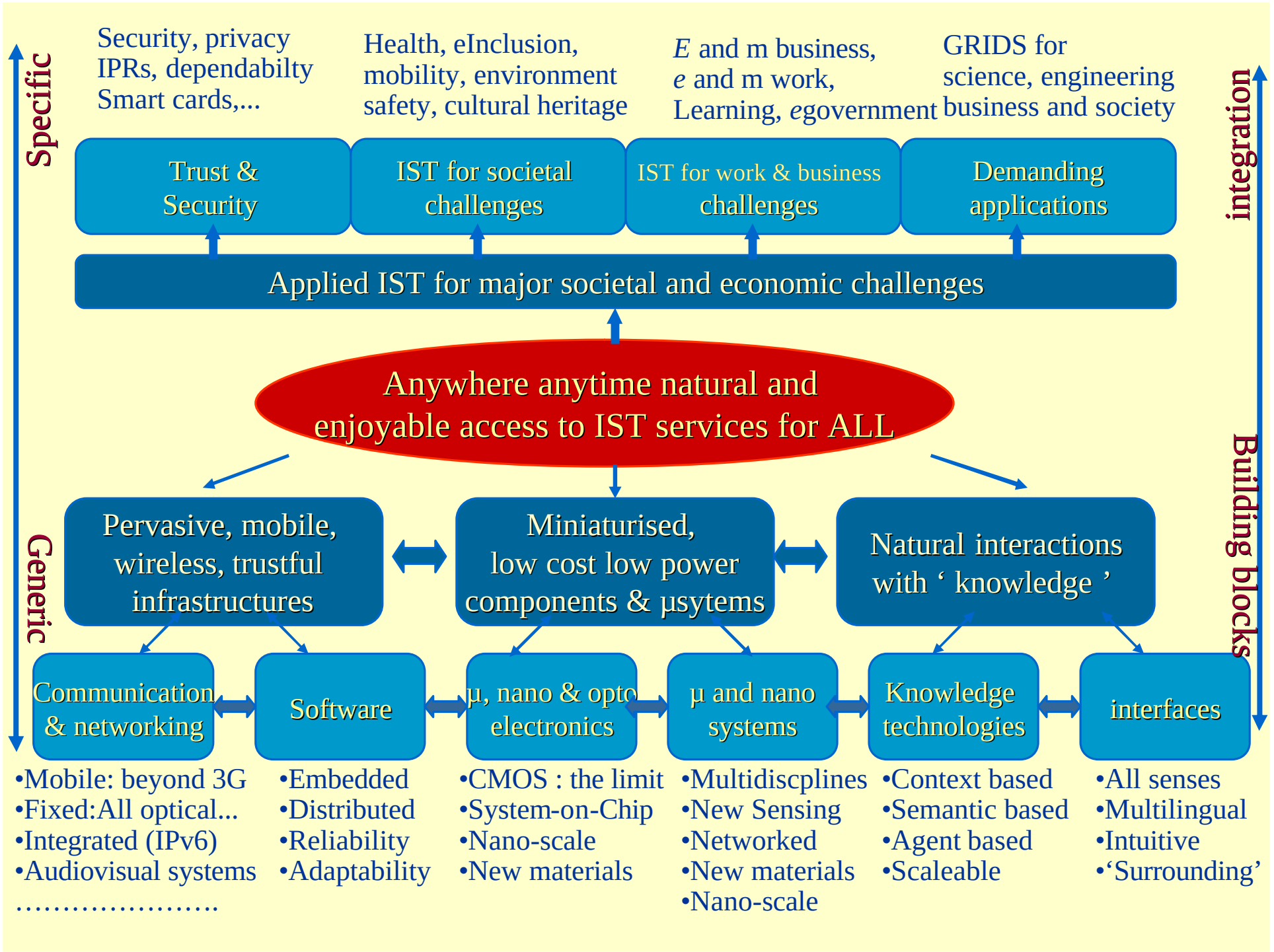
FP6 Timetable

October 2001	Parliament ’s first reading of FP6
December 2001	Council agreement on FP
January 2002	Council formal common position Modified proposal on Rules for participation Modified proposal on Specific programmes
Feb-May 2002	Parliament second reading of FP
June 2002	Final adoption of the FP
September 2002	Final adoption of the Specific Programmes
November 2002	rules for participation adopted by the Council
December 2002 ….	Expect first call of FP6

FP6 Budget breakdown

- Focussing and Integrating
  - Genomics 2255 M€
  - Information Society Technologies 3625 M€ → ~100M€ for GEANT/GRID
  - Nanotechnologies, int.. 1300 M€
  - Aeronautics and space 1075 M€
  - Food quality and safety 685 M€
  - Sustainable development 2120 M€
  - Citizens and governance .. 225 M€
  - Anticipation of S&T needs
    - Anticipating needs 555 M€
    - SMEs 430 M€
    - Specific INCO 315 M€
- Strengthening ERA foundations 320 M€
- Structuring ERA
  - Research and Innovation 290 M€
  - Human resources 1580 M€
  - Research Infrastructures 655 M€ → ~200M€ for GEANT/GRID
  - Science/Society 80 M€
- Joint Research Centre 760 M€

16270 M€


Specific
Generic
integration
Building blocks
Security, privacy
IPRs, dependabilty
Smart cards,...
Health, eInclusion,
mobility, environment
safety, cultural heritage
E and m business,
e and m work,
Learning, egovernment
GRIDS for
science, engineering
business and society
Trust & Security
IST for societal challenges
IST for work & business challenges
Demanding applications
Applied IST for major societal and economic challenges
Anywhere anytime natural and enjoyable access to IST services for ALL
Pervasive, mobile, wireless, trustful infrastructures
Miniaturised, low cost low power components & µsytems
Natural interactions with ' knowledge '
Communication & networking
Software
µ, nano & opto electronics
µ and nano systems
Knowledge technologies
interfaces
•Mobile: beyond 3G
•Fixed:All optical...
•Integrated (IPv6)
•Audiovisual systems
…….
•Embedded
•Distributed
•Reliability
•Adaptability
•CMOS : the limit
•System-on-Chip
•Nano-scale
•New materials
•Multidiscplines
•New Sensing
•Networked
•New materials
•Nano-scale
•Context based
•Semantic based
•Agent based
•Scaleable
•All senses
•Multilingual
•Intuitive
•'Surrounding'

FP6 Workprogrammes Elaboration

- **Focus and concentration on limited number of Objectives**
- **Provides further details on …**
  the Scientific and technical content of the calls
  - Based on the Specific Programme text
- **Defines the evaluation and selection criteria**
- **Defines the terms of the calls for proposals**
  - Objectives to be called for
  - Distribution of budget between old and new instruments
  - Weights and thresholds of criteria to be used
    - Including participation eligibility criteria
- **Updated as appropriate**
  - Every year for IST

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IST Workprogramme - approach

PROVISIONAL

- **A <u>two year WP</u>** to ensure concentration of effort and visibility for the research Community
- **More limited number of calls** (three over two years)
- **Concentration on a <u>limited set of « Strategic Objectives »</u>**
- **A total of 23 strategic objectives** for the two years
  - 12 in 2003, 11 in 2004 (one of which common with Priority 3)
- **Addresses technologies and applications**
- **Instruments**
  - ~70% of budget targeted to new instruments
  - For each Objective: a couple of IPs and NoEs and some TRPS,..

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PROVISIONAL

Description of the strategic objectives

Each strategic objective of the workprogramme

- Defines the goals to be achieved with RTD in Europe
- Focuses on the parts that need to be addressed in the EU
- Provides guidance on the types of instruments that need to be supported
- Identifies links with other RTD activities
- Identifies links with policies, eEurope,..
- Three basic types: reinforcing leadership, addressing weaknesses, seizing new opportunities

Indicative call sequence (draft)

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Strategic objectives addressed in Call 1

1. Pushing the limits of CMOS, preparing for post-CMOS
2. Micro and nano-systems
3. **Broadband Access for All**
4. **Mobile and wireless systems beyond 3G**
5. Towards a global dependability and security framework
6. Multimodal interfaces
7. Semantic-based knowledge systems
8. Networked audiovisual systems and home platforms
9. Networked business and government
10. eSafety for road and air transport
11. e Health
12. Technology-enhanced learning and access to cultural heritage

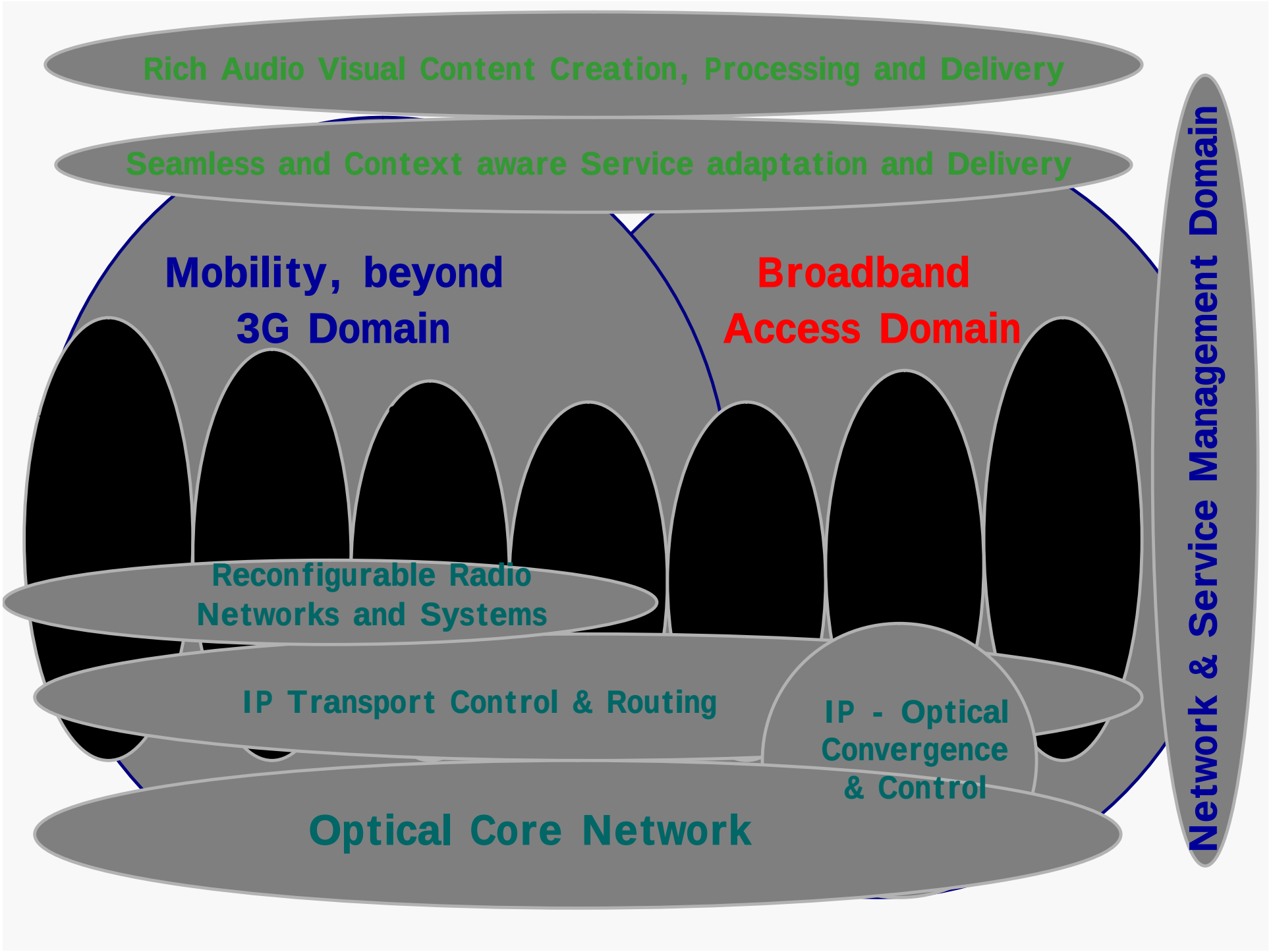
Strategic objectives covered in Call 2

1. Advanced displays
2. Optical, opto-electronic, photonic functional components
3. **Open development platforms for software and services**
4. Cognitive systems
5. Embedded systems
6. **Applications and services for the mobile user and worker**
7. Cross-media content for leisure and entertainment
8. GRID-based Systems and solving complex problems
9. Improving Risk management
10. eInclusion
11. Product design and manufacturing 2010

Technology components

Integrated systems

Applications


Rich Audio Visual Content Creation, Processing and Delivery
Seamless and Context aware Service adaptation and Delivery
Mobility, beyond 3G Domain
Broadband Access Domain
Network & Service Management Domain
Reconfigurable Radio Networks and Systems
IP Transport Control & Routing
IP - Optical Convergence & Control
Optical Core Network

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PROVISIONAL

IST Workprogram - budget phasing

Planning over 4 years

Year	2003	2004	2005	2006
Indicative Budget	835,000	891,000	935,000	964,000
Calls per year	Two calls drawing on 2003 and 2004 budgets	One call drawing on 2005 budget	Second WP (covers also all topics of SP) with updated focus	

First WP covers all topics of the SP

New instruments for the “Priority Areas”

- Integrated Projects
  - Objective driven
- Networks of Excellence
  - Exploratory research
- Article 169
  - Member states initiative

New

- Targeted research projects
  - Addressing specific issues
- Co-ordination actions
- Support Actions

No longer available …..
- Individual Take-up Actions
- SME Exploratory Awards

FP6 instruments & financing schemes

	Grant for integration	Grant to the budget	Grant as a lump sum
Networks of Excellence	✍		
Integrated Projects		✍	
Targeted research projects		✍	
Specific Research activities for SMEs		✍	
Integrated initiatives for Infrastructure		✍	
Actions to promote human resources and mobility		✍	✍
Coordination actions		✍	
Specific support actions		✍	✍

Use of the IP and NoE Instruments

- **Calls for proposals will identify …..**
  - which instruments are to be used,
  - which have priority …. and for what

- **IP's and NoE's will be the priority means**
  - where it is deemed appropriate
  - while maintaining the use of specific "targeted research projects" and "co-ordination actions"

- **In 2004, an independent evaluation**
  - of the use of the instruments may lead to adjustments of their relative weightings

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Overview of the instruments

Instrument	Purpose	Primary deliverable	Scale
IP	objective-driven research	knowledge	med-high
NoE	tackle fragmentation	structuring	med-high
169	joint MS programmes	knowledge and/or structuring	high
STRP	research	knowledge	low-med
CA	coordination	coordination	low-med
SSA	support	support	low-med

Next steps on the Commission side

- Preparations for the first call
  - WP approval, ISTC and ISC
  - Complete & publish workprogramme 2003-2004
  - Complete & publish call related documentation
    (Call details, Guide for proposers, Evaluation manuals, etc)
  - Retrofit internal procedures to FP6
    (committee, advisory structure, informatics support)
  - Support to information days and bidders

Sources of information

DG-Research FP6 web main page
http://europa.eu.int/comm/research/fp6/index_en.html

New Instruments
http://europa.eu.int/comm/research/fp6/networks-ip.html

Model Contracts
http://europa.eu.int/comm/research/fp6/working-groups/model-contract/index_en.html

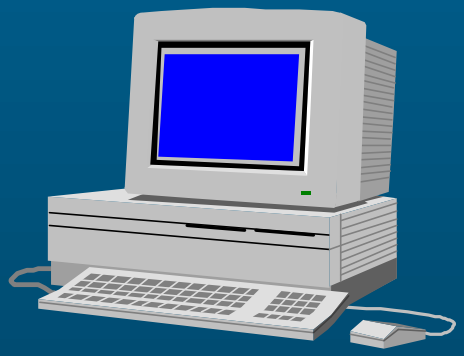
Frequently asked Questions
http://europa.eu.int/comm/research/faq.html

The European Research Area
http://europa.eu.int/comm/research/era/index_en.html

CORDIS RTD beyond 2002
http://www.cordis.lu/rtd2002/

IST on CORDIS
http://www.cordis.lu/ist/fp6/fp6.htm

IST in FP6
http://www.cordis.lu/ist/fp6/fp6.htm



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Conclusions

- Systems beyond 3G are considered as a key technological challenge for Europe;
- Federating RTD work in this area is crucial to develop a European position in the world scene;
- Partnership beyond Europe will be an asset;
- The upcoming FP6 opens a range of opportunities for collaborative work on SB3G.
- With a 10 years time frame perspective to deploy new coms systems, the time is right to start ambitious EU initiatives in this field.