



**NoE EuroFGI**

**FIW 2007**

**Design and Engineering of the  
Future Generation Internet  
Towards convergent multi-service networks**



# Introduction

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## ✓ Euro-FGI main target

- ⇒ Create and maintain the most prominent European centre of excellence in **Future Generation Internet design and engineering**,
- ⇒ Acting as a “**Collective Intelligence Think Tank**”, representing a major support for the Information Society industry.

## ✓ Continuation of NoE EuroNGI:

- ⇒ 56 institutions, ~200 researchers, > 300 PhD students, 18 countries
- ⇒ Academy and industry
- ⇒ EC Contribution: 1.5 M€ (1.5 years)

## ✓ Starting Date: December 1st, 2006

## ✓ Follows the larger NGI network (same scheme)



# Project Key Issues

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- ✓ **Technology diversity**

- ⇒ is growing fast and mastering such a heterogeneous environment becomes essential for network designers.

- ✓ This new environment makes **obsolete the design and engineering methods and tools**

- ⇒ forces the scientific community to develop **new principles and methods**

- ⇒ **to design/dimension/control/manage** the new multi-technology architectures.

- ⇒ To provide seamless end-to-end connectivity by hiding the technology diversity from service developers and users

- ✓ Future high-speed wire-line and wireless access technologies provide instant high bandwidth connectivity

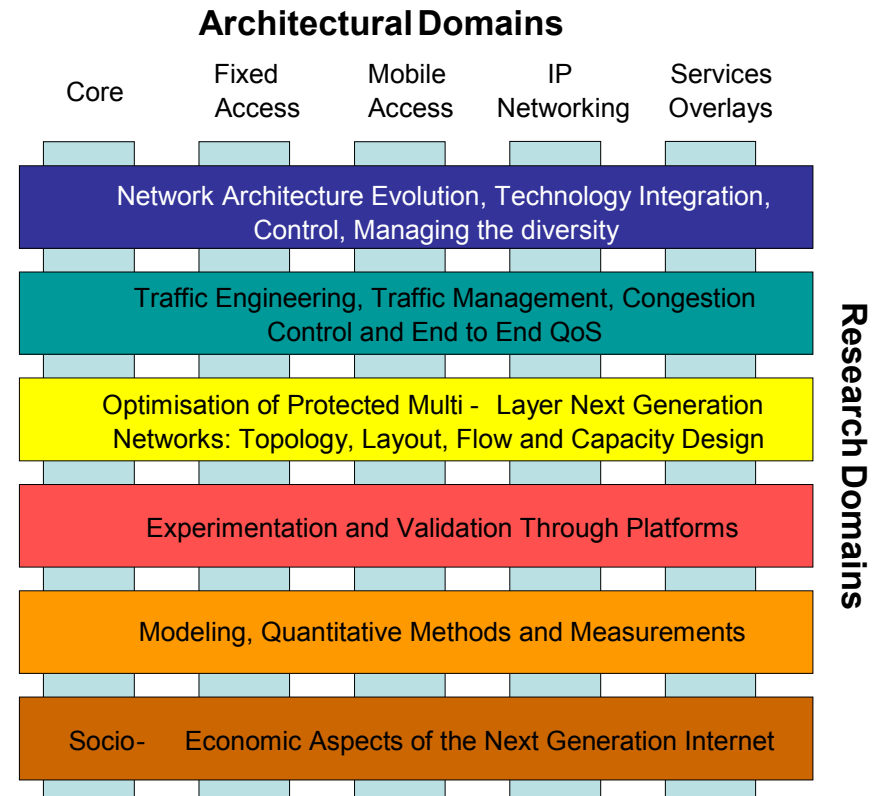
- ⇒ **making it difficult to forecast demand** and thus to apply traditional traffic engineering methods.



# Project Objectives

✓ Euro-FGI will strengthen the **integration** of the scientific community activities:

- ⇒ Overcoming the **challenge of technology diversity** (vertical and horizontal integration) in the design of efficient and flexible FGI architectures
- ⇒ Providing **innovative traffic engineering approaches** adapted to the new requirements and developing the appropriate quantitative methods for analysis, simulation and measurement



**It requires the integration of a wide range of research capacities**  
a role that will be fulfilled by Euro-FGI.



# Issues for collaboration with other projects

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- ✓ The FGI views

- ⇒ multi-service/multimedia, mobility, service ubiquity and context awareness, convergence (services and fixed-mobile), Quality of Service, variable connectivity (“always best connected”), spontaneous networking and other capabilities **as the norm.**

- ✓ Glimpse at cooperation:

- ⇒ BREAD
  - ⇒ EMANICS
  - ⇒ MOME
  - ⇒ CONTENT
  - ⇒ ...

- ✓ EuroFGI and its partners are open for cooperation via

- ⇒ common workshops,
  - ⇒ education events,
  - ⇒ expertise exchange and common research activities

- ✓ <http://www.eurongi.org>



# Cluster participation

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## ✓ Broadband

- ⇒ Network Engineering, Management and Control
- ⇒ Service enabling Technologies – Broadcast Multicast

## ✓ Mobile

- ⇒ Seamless Service Provisioning – System architecture and Control

## ✓ Contact person:

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# About the future

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- ✓ Prospective effort done in NGI about the future of the Internet
- ✓ Report produced mid-2006, about
  - ⇒ evolution of network architectures, with zooms on
    - IPv6, home networks, “beyond IP”, sensor networks,
    - access networks, core and metropolitan networks
  - ⇒ new visions in traffic engineering,
  - ⇒ evolution in services overlays,
  - ⇒ socio-economic aspects, business models.



# Some prospective elements

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## ✓ Present

- ⇒ evolution towards all-IP
- ⇒ strong increasing in service diversity, some in parallel “closed” IP networks
- ⇒ increasing capacity to support video traffic and to improve QoS
- ⇒ starting a user-driven approach
  - transparency of the network
  - access to services anyX
  - personalized services (networks adapts)





## ✓ Emerging technologies

- ⇒ autonomic and spontaneous networking (self-organization)
- ⇒ always best connected
- ⇒ context aware services
- ⇒ in summary, evolution towards a generalized convergence:
  - fixed-mobile ⇒ “always best connected”
  - triple-play ⇒ dynamically composed services
  - also between communities (through P2P) and resources (ad hoc networks)



## ✓ Some today's limitations

- ⇒ Neither IPv4 nor IPv6 seems adapted to the future needed integration of billions of wireless devices (addressing problems, routing problems, level-4 (TCP) problems...)
- ⇒ today's technologies bad adapted to strong security requirements from operated and from non operated networks, as well as by their integration
- ⇒ QoS remains a hot issue, in spite of the strong research effort deployed so far
- ⇒ resuming: **generalized** horizontal and vertical **integration** is extremely (too) hard with the current architecture and paradigms



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- ✓ Required evolution
  - ⇒ new **multi-level addressing plans** in a **global mobility-oriented architecture**
  - ⇒ associated with, **new routing paradigms**
  - ⇒ together with the integration of mobility aspects and **scaling aspects** (huge numbers of wireless devices connected), the new architecture must integrate **security** functionalities and variable **robustness**
  - ⇒ **operation** and **management** must be “proportionally” simplified, including self-organizing aspects
- ✓ FOR DETAILS AND DEVELOPMENTS: SEE REPORT AT [www.eurongi.org](http://www.eurongi.org)