

# The (draft) White Paper from the FIRE Expert Group

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## The White Paper (2009)

- **It is the result of a couple of consultation meetings between the EC FIRE Unit (F4), representatives of the existing FIRE projects (especially the testbeds) and invited “experts”**
- **It has the goal**
  - to define the current framework and status of the FIRE initiative,
  - also in view of the next Call under Objective 1.6 of the ICT workprogramme

# The White Paper (2009)

## **Part A (summary of the main aspects of FIRE):**

- The FIRE vision and a description of the (evolving) FIRE initiative
- The FIRE (federated testbed) facility
- A portfolio analysis of the existing FIRE projects comparing their coverage also with other ICT research projects and testbeds
- A positioning of FIRE in the context of ICT Challenge 1
- Relationships with other initiatives
- Examples of large-scale experimental research Use Cases

## **Part B (additional information):**

- More details about the existing projects
- Potential research activities
- Further Use Cases

## **Annex (background information):**

- Text of the forthcoming Call
- Project descriptions
- Relationships to other national and international programmes/  
projects

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## The FIRE vision

FIRE aims at addressing the emerging expectations which are being put on the Internet by providing a research environment for investigating and experimentally validating highly innovative and revolutionary ideas.

Two strictly interrelated dimensions:

- promoting the investigation of new and possibly unexpected Internet concepts, under an experimentally-driven, long-term yet empirical approach considering the system complexity of the Internet architecture
- making available to researchers, in industry and academia, an integrated, sustainable, dynamic, large scale experimental facility on future Internet technologies, federating or integrating existing or planned relevant testbeds for emerging or Future Internet technologies.

# Overview of the FIRE initiative

FIRE provides an environment for doing rigorous and quantitative research on the broader impact of changes to the Internet, not only in technical but also in socio-economic terms

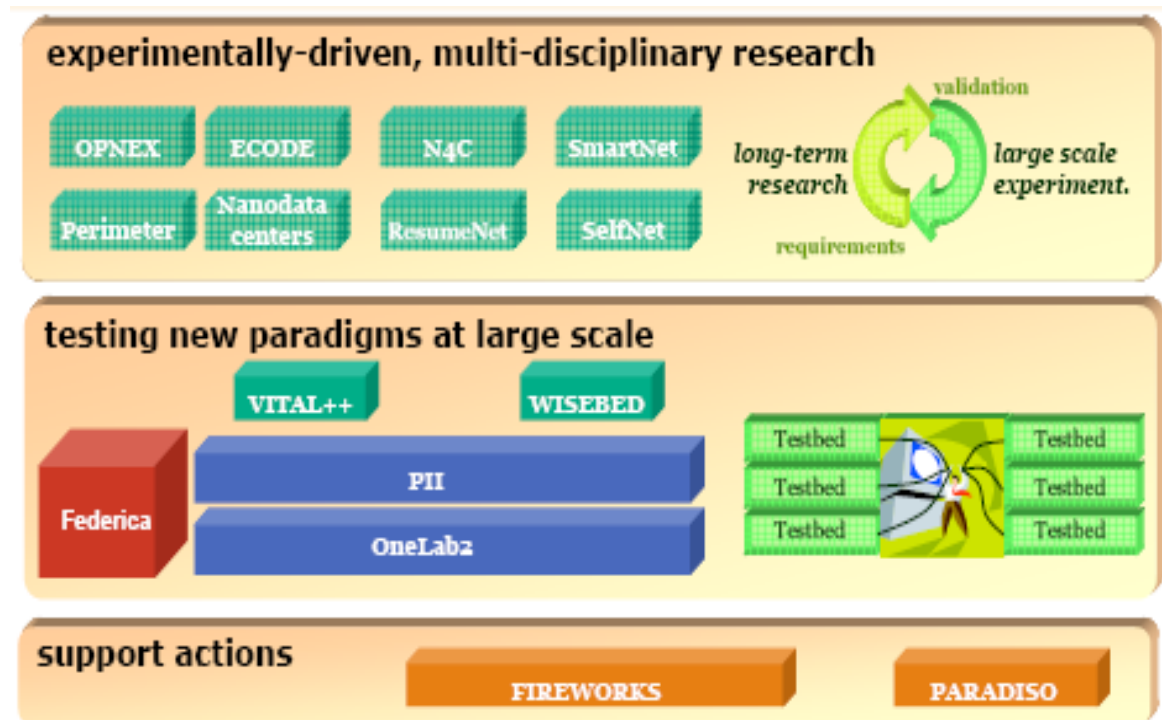
FIRE strengthens European industry by providing the innovative concepts and practical means for the development of advanced networking technologies and experimentation at network and service levels so as to reinforce their competitiveness in a global market

FIRE mobilises European resources around a common theme, and creating a critical mass

# Overview of the FIRE initiative

Experimentally-driven long term research on new paradigms and networking approaches for the Future Internet

Building a sustainable, dynamic, large scale experimentation facility by gradually federating existing and new testbeds for emerging or Future Internet technologies.



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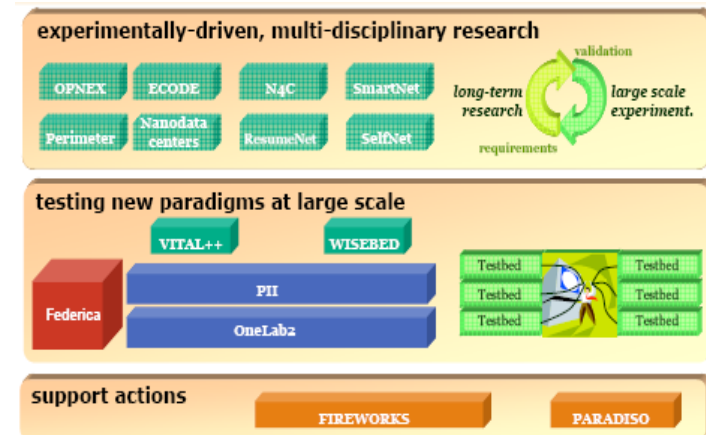
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# The FIRE experimental facility (the federated testbeds)



- is open to include testbeds from other projects of Challenge 1 and beyond
- Is for doing truly multidisciplinary experimental research
- is for testing new Internet architectures and paradigms including the service level
- can be used for making socio-economic impact assessments of future changes to the Internet
- must have the potential to provide a service to others in the future

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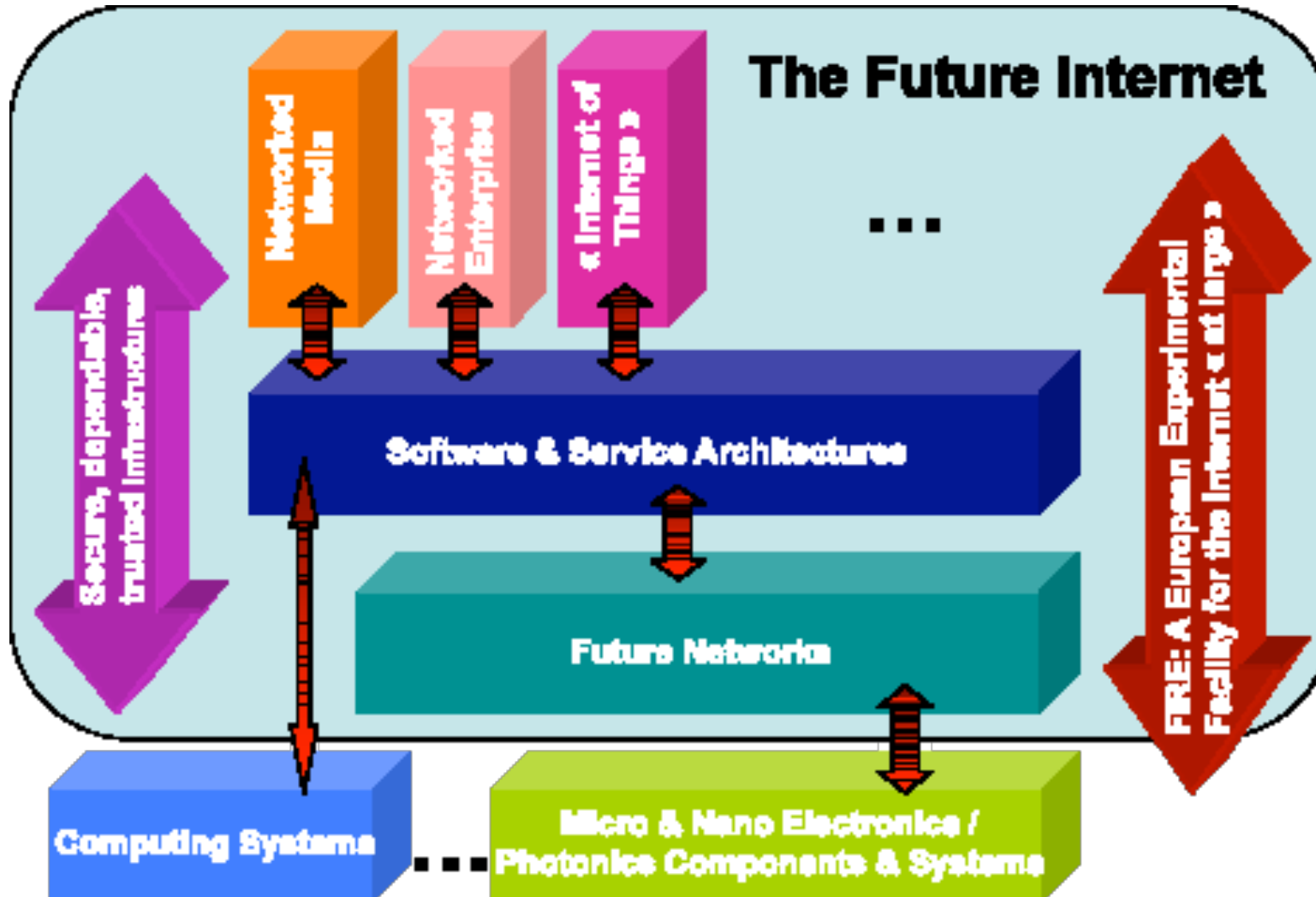
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# A positioning of FIRE in the context of ICT Challenge 1



# A positioning of FIRE in the context of ICT

## Challenge 1

Specific characteristics of FIRE research within Challenge 1:

- integration of projects in a sustainable environment for investigation and experimentation of new (evolutionary and revolutionary) paradigms
- empirical, experimentally-driven character of the research (not just paperwork).
- bottom-up approach, multidisciplinary, considering the internet as a complex system.
- research must exploit the FIRE facility as much as possible - and drive its development

# Topics addressed by the FIRE, SAC and relevant Future Network projects

	ECODE	N4C	NADA	OPNEX	PERIMETER	ResumeNet	Self-NET	SMART-Net	OneLab2	PII	WISEBED	Vital++	Federica	BIONETS	ANA	HAGGLE	CASCADAS	4WARD	TRILOGY	PSIRP	CHIANTI	AUTOI	MOMENT	N-CRAVE	SmoothIT	EFIPSANS	Euro-NF
Autonomic Configuration	X			X	X	X	X							X	X	X	X	X				X				X	
Best Connectivity and Quality					X								X						X			X			X		X
Control Plane Functionality						X	X	X		X		X							X	X					X		X
DT, Opportunistic Networking		X							X					X		X		X				X					
Data Centric Networking			X						X									X		X							
Passive and Active Measurement Technologies	X						X		X				X										X				
Incentive mechanisms for sharing resources									X	X	X								X						X		
Multi-hop ad hoc wireless sensor networks and mesh networks optimisation				X			X	X	X		X																X
Cognitive techniques and components	X					X	X							X		X	X										
P2P architectures			X									X		X		X				X					X		
Virtualisation of resources			X						X	X			X					X									X
Optimisation frameworks				X																							
Novel Architectural principles	X		X	X		X	X							X	X	X	X	X		X							X
Resiliency and Fault Tolerance						X								X			X										
Cross-layer approaches				X			X	X			X			X		X											
User-centric design					X											X											
Monitoring and Self Governance														X	X	X	X	X				X				X	
Network Coding															X									X			

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# Relationships to other initiatives

## United States

- GENI
- PlanetLab
- ORCA
- DETER

## Japan

- Next Generation Network (NXGN)
- New Generation Network (NWGN)
- AKARI (architecture)
- Japan Gigabit Network (JGN2)

## Korea

- *Initial discussions*

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# Examples of large-scale experimental research Use Cases

- Cloud Computing (using OneLab2)
- Emulating AS Relationships (using FEDERICA)
- Mapping Systems for Future Internet Routing (using G-Lab)
- Locality of P2P traffic (using G-Lab)
- Congestion aware routing and network navigation - from the Computer Research Institute of Hungarian Academy of Sciences
- SOA Scenario for Engagement with FIRE Testbeds
- Distributed High-performance computing (using OneLab2 and FEDERICA)

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