

# Post-IP Internet Working Group

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**Next Generation Internet**

**In**

**Post-IP era**

**From**

**Mobile/Wireless Requirements  
points of View**

**Current and Future**

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- ❑ Objective - To provide a discussion forum for the following issues:
  - Future Usage of Services
  - Technical Challenges
  - Possible regulatory/standardisation impacts
  - Mechanisms to ensure maximum impact in Europe
  
- ❑ Current Activities
  - Pan-European Test-bed(s) requirements

<http://www.eMobility.eu.org>

# Post-IP Definition

## Clean Slate Approach



Sources of Current Internet limitations:

- Architecture
- End-to-end paradigm
- Internet Protocols

Post-IP approach:

- New Architecture with management capability supporting multi-domain
- New Wireless-friendly (Energy and spectral efficiency) Protocols capable of supporting variety of wireless networks, from very low power sensor networks to wide area mobile networks

# Experimental Research eMobility on Next Generation Internet

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- ❑ Experimental research topics and research approach
  - ❑ Test-bed requirements, capabilities, and phased approach to a wide scale European testbed
  - ❑ Test-bed Framework
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# Main research topics and approach



- ❖ **Testing and optimisation of integrated solutions leading to:**
  - **innovative protocols and architectures for Service and Network**
  
- ❖ **Research Topics:**
  - Impact of different business models and interfaces on service & network architectures and Interfaces
  - Networking framework, protocols and intermittent connectivity management for wide area transportation and Wireless Sensors, actuators, RFIDs, (objects)
  - Full Delay tolerant networking

# Main research topics eMobility

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- Autonomous communications, dynamic networking compositions, its stability versus degree of autonomous operation
  - Dynamic peering and **coopetition**
  - Operating system independency
  - Dynamic service/content blocks integration and composition
  - Manageability (e.g., traffic engineering)
  - Self-healing
  - Virtualisation
  - Integrated security, privacy, mobility, QoS
  - Intelligent resource management
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# Main research topics eMobility

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- Minimum protocol stack on radio and role of radio over fibre in realising this
  - New and flat protocol framework (collapsed stack structure)
  - Semantic networking
  - Cognitive networking, stability, degree of decision making on robustness and stability
  - Community services networking support, interfaces and protocols for easier and faster development of new services by the community members
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# Recommendations for Experimental Facilities eMobility

- Provide unconstrained connectivity to experimental facility to address challenges in Future Internet design: overall architecture, manageability and governance;
- Provide dependable Post-IP research and technology development facilities that enable the set up of experiments at the right scale under realistic operational conditions;
- Provide a framework for investigation, prototyping and evaluation that is neither limited by current **technologies** nor by the current Internet **architecture** and that encompasses any device, content and system present in the world that is not directly and naturally part of the Internet today;
- Provide effective and efficient test-bed control/management architecture that guarantees isolation, protection and correct behaviour under different and extreme conditions

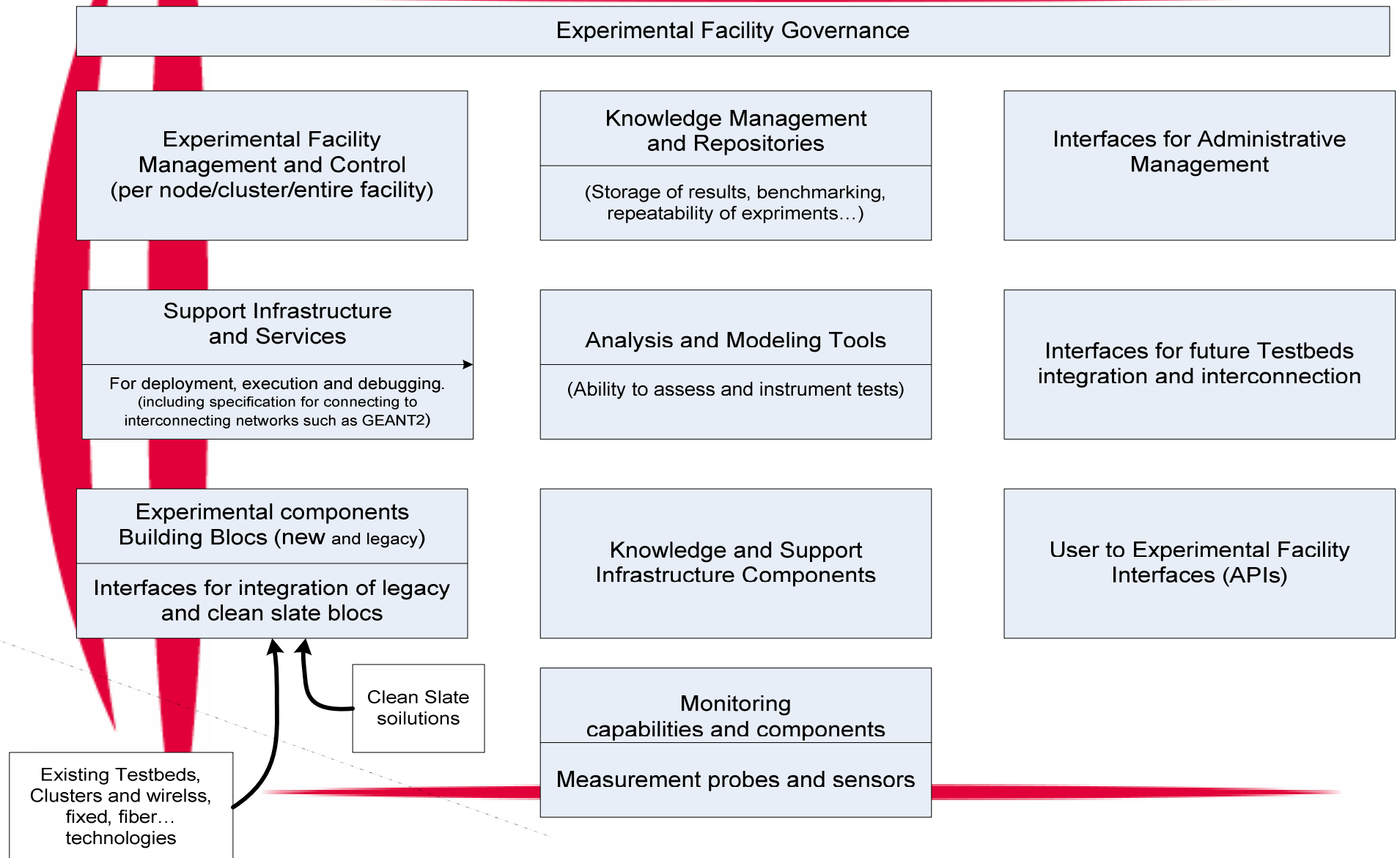
bandwidth, routing, switching, control, management, services, specific business models...  
addressing, naming, security, QoS and mobility management, transport and control protocols

# Testbed Features



- Toolbox (new protocols) and interfaces for variety of experiments
- Information passing mechanisms between Network protocols and application
- Flexibility to accommodate a variety of different business models and interfaces
- Facilitate protection of IPR to encourage full involvement of all stake holders.
- Flexibility to experiment new protocols, applications, new or minimum protocol stacks operation and test
- Ability to model and test interaction between network and services
- Tools for analytical/practical models extractions from tests
- Management layer
- Building blocks to enable bootstrapping
- Suitability of existing infrastructures such as Geant
- Disruptive networking, and means to test protocols for spontaneous networking and intermittent connectivity
- Ability to test integrated and end to end solutions (e.g., mobility and security, and application and their adaptability, etc..)
- Traffic and load generation

# Ref. Model



**Thank you**