

SAIL – Scalable & Adaptive Internet Solutions

24 leading telecommunication operators, vendors, and research institutions, from nine European countries and Israel and Australia, collaborate to develop the Networks of the Future. SAIL will both design technologies for the Networks of the Future and develop techniques to transition from today's networks to such future concepts. Using experimentally-driven research and extensive prototyping, the advantages will be proven in concrete use cases.

At A Glance: SAIL

Scalable & Adaptive Internet Solutions



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Funding scheme: IP

Total Cost: € 20.7 m

EC Contribution: € 12.4 m

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Main Objectives

The internet's architectural model has sustained continuous development for the past four decades and provided an excellent substrate for a wide range of applications. Despite its uncontested successes, some challenges for this model are though becoming apparent:

- Difficulties to add more complex applications than simple client/server or peer-to-peer based ones.
- Coordination and integration of diverse technologies, networks, and edge devices is getting overly expensive.
- Security issues are becoming real barriers to deployment and use.

These challenges will be addressed in a comprehensive and consistent manner in SAIL - "Scalable & Adaptive Internet Solutions".

SAIL will integrate the concepts of Network of Information (NetInf), Cloud Networking (CloNe), and Open Connectivity Services (OConS) as well as study the socio economic impacts of them.

- Mechanisms and protocols will be developed that handle heavy information retrieval workloads more efficiently than today's networks.
- Cloud computing will be integrated as close to the customer as possible for efficient on-demand network operations and service awareness.
- Transport and routing services will be possible to control and orchestrate over various technologies, ranging from fibre backbones to wireless access networks.

In essence: We will apply Future Internet research to the real world!

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Technical Approach

SAIL implements a project work plan that combines both detailed technical developments within the main technical objectives, with their early prototyping for **evaluation of their interactions and suitability** in SAIL's network architecture and operational framework.

The project structure is organized in the following Work Packages:

WP-A will take **socio-economic aspects** into consideration to evaluate, identify and propose new business models and make recommendations regarding regulations. An **integrated project demonstration** at a major industry trade show as a means to enable significant European industrial impact will be arranged.

NetInf (WP-B) will develop a general-purpose **information-centric networking architecture** that provides efficient communication and information dissemination by leveraging secure naming, name-based routing, in-network caching, and optimized distribution as general services to all applications. SAIL will prototype implementations that demonstrate the benefits in real-world scenarios such as Internet-TV and mobile communications. In these application domains, we expect a **significantly improved transmission-bandwidth and efficiency** compared to today's approaches.

OConS (WP-C) will develop and implement proof-of-concept protocols and mechanisms capable of **managing data transport flows between end-to-end and edge-to-edge**, efficiently exploiting different technologies and different traffic patterns.

CloNe (WP-D) will design a cloud networking architecture supporting flash **network slices**, evaluated through a large scale prototype distributed across at least three different sites in Europe.

Key Issues

Both the **Internet itself and its uses are changing**. The Internet itself changes by continuously growing in several dimensions. The use of the Internet is continuously changing since e.g. the applications being deployed over the Internet are becoming more and more complex. To meet these changes, SAIL will:

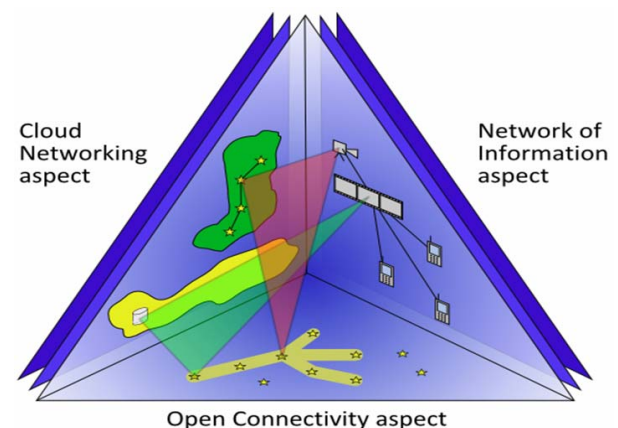
Reduce the cost of setting up, running, and combining networks, network applications, and network services increasing the efficiency of deployed resources like personnel, equipment, and energy.

Deliver a Network of Information by developing a concrete set of mechanisms for efficient content access and distribution

Develop networking **functions for highly variable applications** and integrate networking with cloud computing/storage, along with the necessary tools for fault and security issues, providing Cloud Networking (CloNe) and flash network slices.

Develop open connectivity services (OConS) that provide **alternative signaling and control interfaces** able to control different technologies across the different aggregation stages, exploit diversity in networks, and cater to different traffic patterns

As an integrated project, SAIL will also combine socio-economic, regulation, standardisation, and migration aspects with purely technical considerations.



Expected Impact

- For EU, innovations in SAIL will allow the European industry to stay ahead in ICT development, fostering the creation of skilled jobs in ICT.
- For Academia, SAIL will be central in the education of MSc and PhD students.
- For industrial partners, our results will ensure industry wide acceptance of future products and enhance possibilities for standardization. Prototypes will be used to showcase and validate the feasibility of ideas as an important part of the results dissemination.
- For European citizens, the SAIL innovations will influence the solutions used in our daily lives for instance receive information in technologically or geographically challenged environments and help us publish ideas and their virtual belongings more freely.