Objective 1.2
Cloud Computing, Internet of Services and Advanced Software Engineering

Arian Zwegers
European Commission
Information Society and Media Directorate General
Software & Service Architectures and Infrastructures Unit

ICT Work Programme 2011-12

Objective 1.2

Target outcomes

Cloud computing

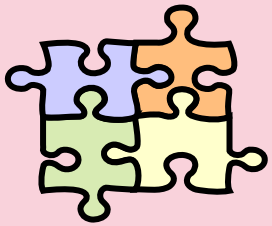
Management of cloud resources

Infrastructure virtualisation

Cloud Interoperability

Open source implementation of a software stack for clouds

Internet of services

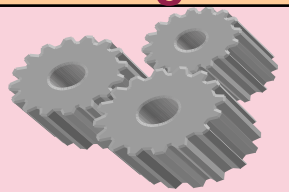


Service engineering

Integration of real and virtual worlds

Scalability, self-management, fault localisation, …

Advanced software engineering



Advanced engineering for software

Quality measure and assurance

Tools and methods for community-based and open source software development

70 M€: 68.5 M€ + 1.5 M€

Support actions

Standardization and collaboration
Open source development model
International cooperation on cloud computing

ICT Work Programme 2011-12
Objective 1.2

Cloud computing

Management of cloud resources

Infrastructure virtualisation

Cloud Interoperability

Open source implementation of a software stack for clouds

Intelligent and autonomic **management of cloud resources**, ensuring agile elastic scalability. Scalable data management strategies, addressing the issues of heterogeneity, consistency, availability, privacy and supporting security.

Technologies for **infrastructure virtualisation**, cross platforms execution as needed for service composition across multiple, heterogeneous environments, **autonomous management** of hardware and software resources.

Interoperability amongst different clouds, portability, protection of data in cloud environments, control of data distribution and latency.

Seamless support of **mobile, context-aware** applications.

Energy efficiency and sustainability for software and services on the cloud.

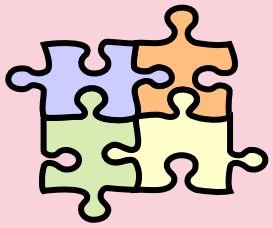
Architectures and technologies supporting integration of **computing and networking environments**; implications of Cloud Computing paradigm on networks

Open Source implementations of a software stack for Clouds

ICT Work Programme 2011-12

Objective 1.2

Internet of services



Service engineering

Integration of real and virtual worlds

Scalability, self-management, fault localisation, …

Service engineering principles, methods and tools supporting development for the Internet of Services, including languages and tools to model parallelism.

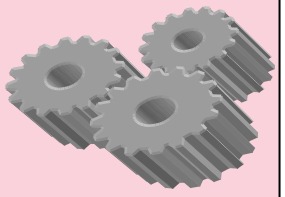
Services enabled by technologies for seamless integration of real and virtual worlds, through the convergence with Internet of Things and Internet of Contents.

Massive scalability, self-management, verification, validation and fault localisation for software-based services.

Methods and tools to manage life cycle of secure and resilient Internet-scale applications from requirements to run-time and their adaptive evolution over time.

ICT Work Programme 2011-12
Objective 1.2

Advanced software engineering



Advanced engineering for software

Quality measure and assurance

Tools and methods for community-based and open source software development

Advanced engineering for software, architectures and front ends spanning across all abstraction levels.

Quality measure and assurance techniques which adapt to changing requirements and contexts, to flexibly deal with the complexity and openness of the Future Internet.

Management of non-functional requirements typical of Internet-scale applications, like concurrency levels which will be orders of magnitude larger than in today's applications, huge data stores and guaranteed performance over time.

Tools and methods for community-based and open source software development, composition and life cycle management.

ICT Work Programme 2011-12
Objective 1.2

Support actions	Standardization and collaboration Open source development model International cooperation on cloud computing

Support for standardization and collaboration in software and services technologies.

Support for the uptake of open source development models in Europe and beyond.

Collaboration with Japanese entities on: cloud computing, particularly on common standards for data portability and on interoperability; services having more efficient energy usage.

ICT Work Programme 2011-12
Objective 1.2

A proposal or project should

contribute to

Target outcomes

- **Cloud computing**
- **Internet of services**
- **Advanced software engineering**

achieve

Expected impact

- **Emergence of European interoperable clouds**
- **Platforms for development and deployment of services**
- **Lower barriers to develop and use services through advances in technology and standardized interfaces**
- **Efficient software applications on parallel architectures**
- **Easier evolution of legacy software**
- **Fast innovation cycles in service industry**
- **A strengthened industry in Europe for software-based services**

What are we looking for?

- Bold, visionary projects
  - New research directions
  - No repetition of existing projects
  - Considering controversial aspects
- Taking into account key European values
  - Data protection, energy efficiency, …
- Expected industrial impact
  - New offerings, new jobs, increased competitiveness
  - Me too or something different?
- Based on widely-shared research agendas
  - Creating consensus where applicable
  - User involvement

Who are the leading players?

Call 1
- SAP
- UPM
- Telefonica
- Thales
- INRIA
- Politecnico di Milano
- Atos Origin
- CNR
- Engineering
- SINTEF
- Univ. Innsbruck
- TIE Nederland
- Technische Univ. Dresden
- Univ. Stuttgart

Call 5
- ICCS
- SAP
- Fraunhofer
- IBM Israel
- France Telecom
- Telefonica
- Atos Origin
- CNR
- EBM Websourcing
- Engineering
- Flexiant
- GEIE ERCIM
- Hewlett Packard Italiana
- INRIA
- SINTEF
- Telecom Italia
- UPM

ftp://ftp.cordis.europa.eu/pub/fp7/ict/docs/ssai/ssai-fp7-project-portfolio-final_en.pdf

http://cordis.europa.eu/fp7/ict/ssai/docs/2010-3197-call5factsheets-final.pdf

For more information

FP7
http://cordis.europa.eu/fp7/
http://cordis.europa.eu/fp7/ict/

Software & Service Architectures and Infrastructures
http://cordis.europa.eu/software-services

E-mail
infso-st@ec.europa.eu

Future events
14 June 2011 – Warsaw, Info day with Future Networks
27 September 2011 – Brussels, Objective 1.2 Info Day