H2020 LEIT ICT Funding Opportunities

ICT 7: Advanced cloud infrastructures and services
ICT 9: Tools and methods for software development

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Vision and Priorities for Cloud Computing

Commission Communication of 27 September 2012

http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2012:0529:FIN:EN:PDF

Also known as the "EU Cloud Strategy"

Strategy designed to speed up the adoption and increase the use of cloud computing across all sectors of the economy
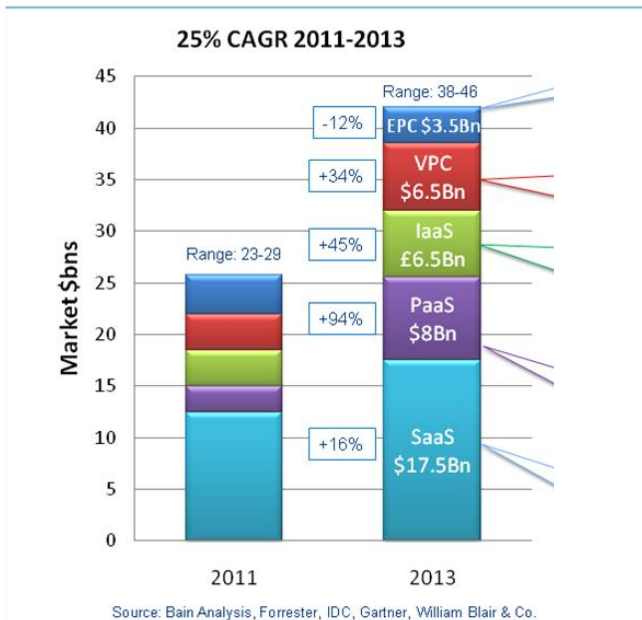
http://europa.eu/rapid/press-release_IP-12-1025_en.htm

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Expected benefits

- **Motivation for the fast adoption of cloud computing**

  - ➤ Cost savings in the deployment of IT services (infrastructures, installations, human resources)
  - ➤ Forecast of expenditure for 'public cloud' services in the EU <u>until</u> 2020: http://ec.europa.eu/information_society/activities/cloudcomputing/docs/quantitative_estimates.pdf
    - €35 billion without policy intervention
    - €78 billion if appropriate policy initiatives are implemented

- **Impact in <u>all</u> sectors of the economy**
  - ➤ Increase of the EU GDP in the year 2020 due to cloud computing:
    - €88 billion without policy intervention
    - €250 billion if appropriate policy initiatives are implemented

Cloud Computing: a fast growing market

Cloud services: market forecast

25% CAGR 2011-2013

Range: 38-46

	2013
-12%	EPC $3.5Bn
+34%	VPC $6.5Bn
+45%	IaaS £6.5Bn
+94%	PaaS $8Bn
+16%	SaaS $17.5Bn

Range: 23-29

Market $bns

Source: Bain Analysis, Forrester, IDC, Gartner, William Blair & Co.

STL

Global cloud computing market

Gartner: worldwide 'public cloud' services $111 billion in 2012

Gartner: worldwide 'public cloud' services $131 billion in 2013 (estimate)

Gartner: worldwide 'public cloud' services $154 billion in 2014 (forecast)
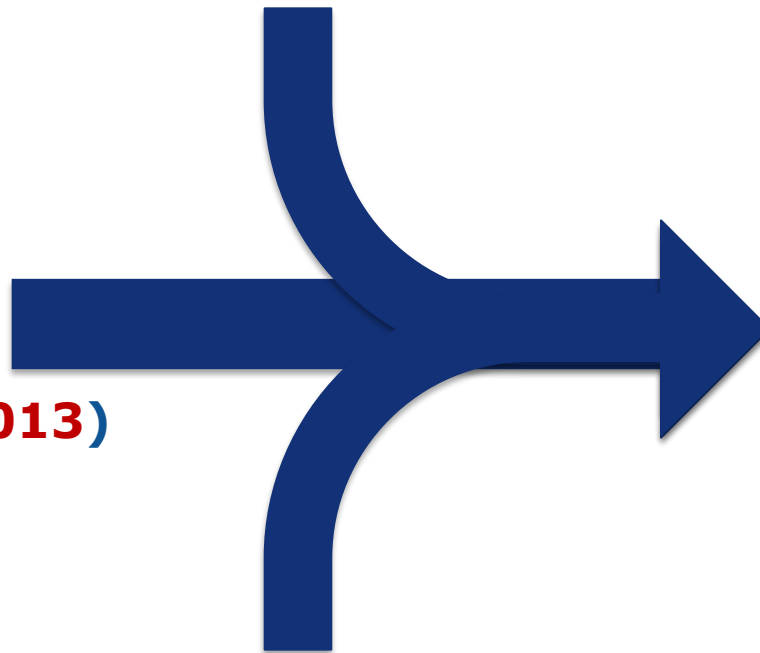
EPC = Enterprise Private Cloud
VPC = Virtual Private Cloud

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H2020 WP preparation

Internal consultation

Public consultation (Feb 2013) Workshop (Apr 2013)

10 Dec 2013

H2020 WP2014-2015 ICT7 and ICT 9

Other sources: ISTAG Report on Software (July 2012), NESSI ETP position papers, Cloud Expert Group reports (2012)

Advanced cloud infrastructures and services

The challenge: develop infrastructures, methods and tools for high performance, adaptive cloud applications and services

Research and innovation actions: €66 million budget

- High performance heterogeneous cloud infrastructures
- Federated cloud networking
- Dynamic configuration, automated provisioning and orchestration of cloud resources
- Automated discovery and composition of services
- Cloud security

Expectation: mix of proposals requesting small (€2M-€4M) and large contributions (€5M-€8M); covering one or more themes, not necessarily all themes

European Commission

Automated discovery and composition of services

"Innovative ways to facilitate collaboration between public administrations, users and other stakeholders as to produce, discover, mix and re-use different service components and create new public services through pooling and sharing of resources, data, content and tools, even across national borders"

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European Commission

Automated discovery and composition of services

The research will build upon the 'cloud of public services' concept
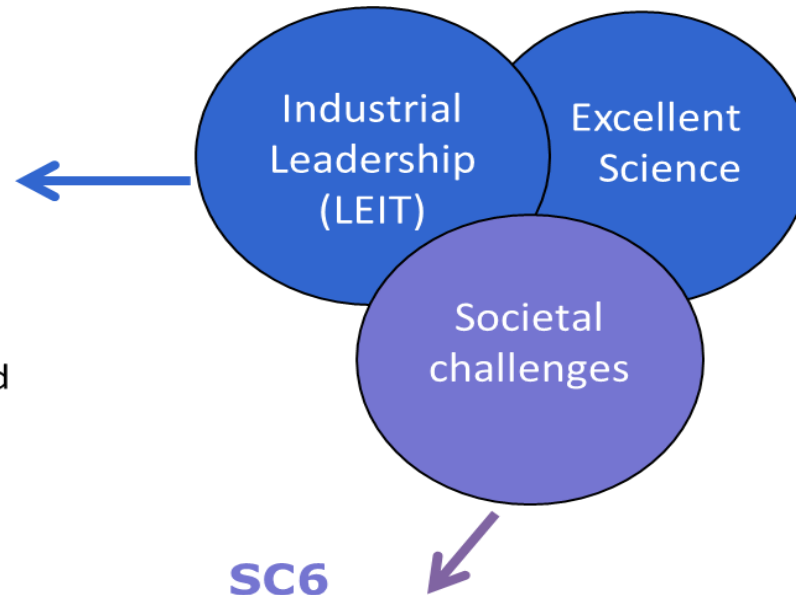http://ec.europa.eu/digital-agenda/sites/digital-agenda/files/smart2010-0074summaryreport_0.pdf

"The notion of a 'cloud' is often associated with 'cloud computing' and the technical aspects of enabling a cloud environment

However, 'cloud' refers to a collection of public services serving as building blocks, which can be offered in an open, interoperable way and reused and combined by public administrations and third parties as part of other services, based upon an Universal or Global Service Oriented Architecture (SOA)"

European
Commission

**LEIT: ICT-7
Advanced Cloud
Infrastructures
and Services**

- Automated discovery and
composition of services

Industrial
Leadership
(LEIT)

Excellent
Science

Societal
challenges

**SC6
News forms of innovation**

- Innovation in the public sector by
using emerging ICT technologies

- ICT-enabled open government

- Innovative mobile e-government
applications for SMEs

https://ec.europa.eu/digital-agenda/en/ict-enabled-public-sector-innovation-through-open-government

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European Commission

Advanced cloud infrastructures and services

Innovation actions: €5 million budget

- Platforms for trusted cloud systems: collaborative development, adaptation and testing of open source software for innovative and trusted cloud-based services

Expectation: proposals requesting small (€2M-€4M) contributions

Advanced cloud infrastructures and services

Coordination and support actions: €2 million budget

- Support the definition of common reference models for SLAs in the cloud
- Support to the adoption of cloud infrastructures and services (legal, economic and social factors)
- Support collaboration among research projects
- Support dissemination, exploitation and "road mapping"

Expectation: all topics to be covered, not necessarily by one single proposal

Expected impact

- Higher quality of user experience and trust through stronger security and data protection solutions

- Demonstration of:
  - ✓ Cloud-based services in federated, heterogeneous and multi-layered (IaaS, PaaS, SaaS) cloud environments
  - ✓ Dynamic provisioning of interoperable applications and services
  - ✓ High level of performance and QoS, even in highly secure solutions

- Increased innovation opportunities for service providers, including SMEs and public administrations. Promotion of the use of open source software solutions

- Demonstration, through appropriate use cases, of the potential to improve the competitive position of the European cloud sector

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Tools and methods for software development

The challenge: enhance quality levels required for complex and critical systems (reliability, resilience, automatic adaptation)

Research and innovation actions: €25 million budget

- Software tools and methods for large, complex and data-intensive systems
  - ✓ Tools and methods for incorporating integrity, robustness, reliability and resilience into evolving software systems, especially for complex and secure business-critical systems
  - ✓ Innovative means to manage the complexity of large software and data-intensive systems, including simulation, testing and verification

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Tools and methods for software development (2)

- Software architectures and tools for highly distributed applications

  ✓ Novel approaches to development, deployment, management and dynamic reconfiguration of distributed applications
  ✓ Architectures and tools to maximise quality of experience in elastically scalable applications
  ✓ Taking into account data location, latency and data throughput in heterogeneous cloud environments, including specialised hardware resources and sensors

Expectation: proposals requesting small (€2M-€4M) contributions; covering one or more themes, not necessarily all themes

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Expected impact

- Significant and substantiated productivity increase in the development, testing, verification, deployment and maintenance of data-intensive systems and highly distributed applications

- Availability and market take-up of innovative tools for handling complex software systems

- Credible demonstration that larger and more complex problems can be effectively and securely tackled

- At macro level, evidence of potential productivity gains through appropriate use cases in EU industry

Selection criteria

- Financial capacity: in line with the Financial Regulation and the Rules for Participation. At the proposal stage, coordinators will be invited to complete a self-assessment using an online tool

- Operational capacity: as a distinct operation, carried out during the evaluation of the award criterion 'quality and efficiency of the implementation', experts will indicate whether the participants meet the selection criterion related to operational capacity, to carry out the proposed work, based on the competence and experience of the individual participant(s).

Award criteria: excellence (1)

The following aspects have been taken into account, to the extent that the proposed work corresponds to the topic description in the Work Programme:

- Clarity and pertinence of the objectives
- Credibility of the proposed approach
- Soundness of the concept, including trans-disciplinary considerations, where relevant
- Extent that proposed work is ambitious, has innovation potential, and is beyond the state-of-the-art (e.g. ground-breaking objectives, novel concepts and approaches)

Award criteria: impact (2)

The following aspects have been taken into account, to the extent to which the outputs of the project should contribute at the European and/or international level:

- The expected impacts listed in the work programme under the relevant topic

- Enhancing innovation capacity and integration of new knowledge

- Strengthening the competitiveness and growth of companies by developing innovations meeting the needs of European and global markets, and where relevant, by delivering such innovations to the markets

- Any other environmental and socially important impacts

- Effectiveness of the proposed measures to exploit and disseminate the project results (including management of IPR), to communicate the project, and to manage research data where relevant

Award criteria: quality and efficiency of the implementation (3)

The following aspects will be taken into account:

- Coherence and effectiveness of the work plan, including appropriateness of the allocation of tasks and resources
- Complementarity of the participants within the consortium (when relevant)
- Appropriateness of the management structures and procedures, including risk and innovation management

Exception to the rule

- For Innovation Actions and the SME Instrument (phases 1 and 2), to determine the ranking for proposals that have passed the relevant thresholds, the score for the criterion 'impact' is given a weight of 1.5

- Weighted total score: C1+C2*1.5+C3

Background documents

Toward a Strategic Agenda for Software Technologies in Europe",
Information Society Technologies Advisory Group (ISTAG), July 2012
http://cordis.europa.eu/fp7/ict/docs/istag-soft-tech-wgreport2012.pdf

NESSI ETP Strategic Research and Innovation Agenda, April 2013
http://www.nessi-europe.com/Files/Private/NESSI_SRIA_Final.pdf

Public Consultation on Cloud Computing, Software and Services,
European Commission, March 2013
http://ec.europa.eu/digital-agenda/en/public-consultation-cloud-computing-software-and-services

Post-Consultation Workshop, European Commission, 14 April 2013
http://ec.europa.eu/information_society/newsroom/cf/document.cfm?action=display&doc_id=2172

Further information

Horizon 2020

http://ec.europa.eu/programmes/horizon2020/

Digital Agenda – Cloud Computing

https://ec.europa.eu/digital-agenda/en/telecoms-and-internet/cloud-computing

Magazine: Net-Cloud Futures

https://ec.europa.eu/digital-agenda/en/our-media-library