

New Approaches for Infrastructure Services

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Cluster membership

- ▶ Started in June 2015

- ▶ Web site:

<https://eucloudclusters.wordpress.com/new-approaches-for-infrastructure-services>



Cluster Objective

Forum
for discussing
the current research and innovation challenges
encountered at infrastructure-as-a-service level
and generated by the desire
to improve
the user experiences
and the efficient use of the available resources

Goals

1. define a **map of the challenges** related to the group topics that have been/are tackled by the projects and of the solution approaches that have been/are taken
2. identify **complementarities and synergies** as well as possibilities for collaboration/results adoptions between projects, including common standardization bodies to be in contact with
3. identify **new challenges** to influence the new research agendas by providing recommendations
4. organisation of **common dissemination actions** like
 - ▶ common publications (books, articles, white papers, newsletters) using the maps defined above and describing the current projects and the challenges for future research
 - ▶ trainings and workshops

Achievements until current date

- ▶ **Joint dissemination:**
 - ▶ **MICAS 2015**, 21-22 Sept 2015
 - ▶ 1 project tutorial
 - ▶ 6 project presentations
- ▶ **Public and joint dissemination material:**
 - ▶ **Map of challenges**, Oct 4th 2015
 - ▶ identifies the common topics of interest, tools, common development directions, used standards.
 - ▶ essential to identify the key subjects for collaborations and take-ups between the projects and actions
- ▶ **Incoming:**
 - ▶ **White paper**, 31 Dec 2015
 - ▶ **Special issue for the R&D results of the cluster activities**
 - ▶ CFP for SCPE, open access journal (joint publications?), 31 Mar 2016

Participants at CF2015

1. AppHub: Cedric Thomas (2s)
2. ARCADIA: Constantinos Vassilakis (2s)
3. CloudLightning: Dana Petcu (2s)
4. ENTICE: Simon Ostermann, Vlado Stankovski
5. INPUT: Roberto Bruschi
6. MIKELANGELO: Gregor Berginc
7. MODAClouds: Elisabetta Di Nitto, Dana Petcu (7th)
8. MUSA: Massimiliano Rak
9. RAPID: Lara Lopez Muniz
10. SPECS: Massimiliano Rak, Dana Petcu
11. SWITCH: Zhiming Zhao, Vlado Stankovski (7th)

Agenda

1. Present the Map of Challenges
 - ▶ Overview of the deliverable
 - ▶ Updates from the projects (project presentations)
2. Discussions about the requirements and ToC of the white paper
3. Update on the dissemination actions – joint actions?
4. Contribution to policy aspects
5. Research challenges to be identified for WPI8
6. Exploitation intentions - experience exchange
7. Standardization intentions - a common plan?

Standards

- ▶ **Targets:** A white paper from the 3 (4?) clusters
 - ▶ How the standards are used
 - ▶ How the contributions are addressed
- ▶ **Timeline:**
 - ▶ Oct 31: collect internally the informations
 - ▶ Dec 31: groups of prjs for contributions to standardization bodies
 - ▶ CloudWatch2 help?

White paper

- ▶ **Scope**
 - ▶ Infrastructure services, on deployment levels (aprox. PaaS, IaaS)
- ▶ **Challenges**
 - ▶ Technological challenges
 - ▶ Timeline
 - ▶ Effects to other areas
- ▶ **SoTA**
 - ▶ as output of the prjs
 - ▶ Relative to WPI6
 - ▶ Technologies will be developed
 - ▶ Impact on the market, services that will be provided
 - ▶ Sustainability, business models?
- ▶ **Gap analysis**
 - ▶ Relative to WPI6
 - ▶ Future challenges

Map of challenges

- ▶ identifies
 - ▶ the common topics of interest,
 - ▶ the common tools,
 - ▶ the common development directions,
 - ▶ the commonly used standards.
- ▶ essential to identify
 - ▶ the key subjects for collaborations and
 - ▶ take-ups between the projects and actions
- ▶ relative to WPI 6-17

Map of challenges (1/2)

4.1 Research point of view

The following table identifies which cluster initiative is working on topics identified in H2020-LEIT-ICT-2016-6.

Research subjects as in WP 2016-2017 ⁶	AppHub	ARCADIA	CloudLightning	ClouT	ENTICE	iKaaS	INPUT	Mikelangelo	Mo-Bizz	MODAClouds	MUSA	RAPID	SPECS	SWITCH
Development of distributed, federated and heterogeneous cloud computing model		X	X			X			X		X	X		X
Deployment and management of resources: in a decentralised, autonomous way		X	X	X	X	X	X			X	X	X	X	X
Extension of extreme edge of the network							X							X
Software defined networking,		X			X		X							X
Software defined data center							X						X	
Data storage infrastructures				X	X									
Security, privacy						X					X	X	X	

Map of challenges (2/2)

4.2 Examples of contributions

The following table identifies what the cluster initiatives are doing in relationship with the topics identified in H2020-LEIT-ICT-2016-6.

Topics	What the clustered projects are doing
Development of distributed, federated and heterogeneous cloud computing model	<p>iKaaS is developing a hierarchical cloud computing model formed from a Global Cloud (legacy cloud computing) and Local Clouds (formed on demand).</p> <p>MUSA aims at offering solutions to develop multicloud applications granting security requirements</p> <p>RAPID aims to develop an efficient CPU-GPU heterogeneous multi-tier infrastructure. The offloading framework aims to support application offloading from Android, Linux, and Windows devices.</p> <p>ARCADIA is to provide for the deployment of Highly Distributed Applications in multi-IaaS environments.</p>
Deployment and management of resources: in a decentralised, autonomous way	<p>Improving the efficiency of deployed resources/Deploying of resources efficiently - use of low overhead, very efficient virtual technology stack.</p> <p>iKaaS is developing distributed autonomic resource (cloud, IoT) allocation mechanisms, taking into account service needs and resource capabilities and availability.</p> <p>The Dynamic Real-time Infrastructure Planner (DRIP) subsystem in SWITCH prepares the</p>