



Cloud computing and mobile applications are key drivers for innovation. However, mobile device limitations still hinder today's mobile applications from reaching their full potential. The joint South-Korean and EU Horizon 2020 project BASMATI develops an integrated brokerage platform targeting federated clouds that supports the dynamic needs of mobile applications and users since 1st of June 2016.

AT A GLANCE

Project title:

BASMATI - Cloud Brokerage Across Borders for Mobile Users and Applications

Project coordinator

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Partners from:

1. Institute of Communications and Computer Systems (Greece)
2. Consiglio Nazionale Delle Ricerche (Italy)
3. CAS Software AG (Germany)
4. Atos Spain SA (Spain)
5. Amenesik Sarl (France)
6. Electronics and Telecommunications Research Institute (Korea)
7. InnoGRID (Korea)
8. Seoul National University (Korea)

Duration: 01.06.2016-31.05.2018

Total cost: 3.000.000 €

EC Contribution: 1.500.000 €

Programme: EUK-03-2016

Further information:

<http://www.basmati.cloud>

Context and motivation

Several studies highlight the penetration and wide use of mobile devices, sensors and virtual entities. In this context cloud environments are increasingly considered as the enabling technology for a broad set of scenarios and applications. As a matter of fact, mobile devices are becoming more and more powerful and sophisticated, enabling rich-multimedia service provisioning and accessing at the same time various information sources (e.g. GPS), however **resource constraints still hinder today's mobile applications** from reaching their full potential.

Challenge

The current technological and social landscape calls for a shift towards the introduction of a hybrid computing paradigm, following the rise and limitations of mobile applications. BASMATI aims at providing a **complete ecosystem** that integrates cloud federation with mobile devices. It enhances mobile applications via a **seamless usage of cloud platforms and of mobile devices** for overcoming mobile devices limitations and supporting the management of services and data. Thus, BASMATI addresses challenges related to resource heterogeneity, ultra-

scalable provisioning, offloading, context- and situation identification, and quality of service and security guarantees when (crowds of) mobile users access their data and applications across borders.

Solution

BASMATI provides an **integrated brokerage platform** targeting federated clouds with heterogeneous resources and supporting the efficient, cost-effective execution of mobile cloud applications in a transparent and ubiquitous manner. **Runtime-adaptable federation patterns** also considering business aspects, **dynamic** and runtime-optimized **brokerage** and **offloading** decisions enable fully automated resource exploitation: cloud to cloud, device to federation and device to device. **Modelling and prediction** of applications and users in terms of mobility patterns, behavior and interactions provide insight to the aforementioned decisions, while runtime reconfiguration of mobile services fosters the achievement of ultra-scalability. The envisioned **hybrid infrastructure management** allows abstracting heterogeneous resources and enabling dynamic service networks based on evolving situations.

EXPECTED RESULTS:

- Three real-world use cases
- BASMATI Brokerage Platform with
 - Models and analysis tools for

mobile users and cloud applications

- Advanced models for application adaptation and reconfiguration
- Multi-objective optimization techniques for enhanced brokerage and offloading
- Dynamic application placement decision making
- BASMATI Hybrid Infrastructure with
 - Real-time big data management and analytics for data related to the cloud services
 - Quality of service and quality of protection management framework
 - Across-cloud, multi-layer cloud service monitoring

Expected impact

BASMATI addresses the most critical issues with mobile cloud applications and users. BASMATI enables the **emergence of a new wave of mobile applications** which fully exploit mobile application information sources and overcome devices limitations in mobile service provisioning. Three real-world use cases will prove BASMATI's potential: Large Events management (including audio-streaming in dynamic and crowded scenarios), TripBuilding in dynamic environments and Virtual Mobile Desktop for highly nomadic users; **tested under extreme conditions** at DAS FEST - one of the biggest German festivals counting 250.000 participants across a week.

