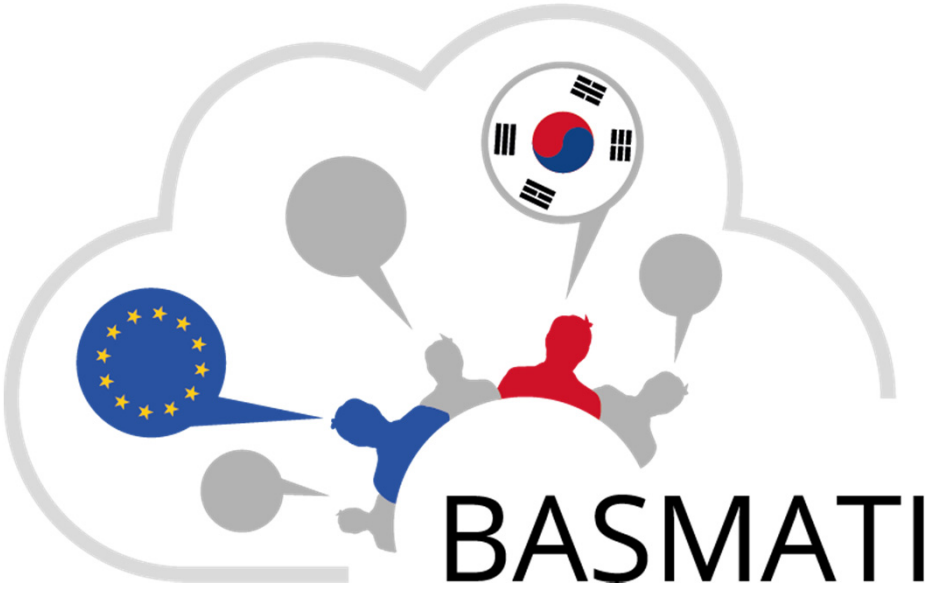
# BASMATI - A Brokerage Architecture on Federated Clouds for Mobile Applications

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# The BASMATI Consortia

## EU consortium

- ICCS – NTUA, Greece
  [EU Project Coordinator]
- ISTI – CNR, Italy
  [Scientific Coordinator]
- ATOS, Spain
- CAS, Germany
- Amenesik, France

## Korean consortium

- ETRI
  [Korean Project Coordinator]
- SNU
- INNOGRID

# Background

- Diffusion of **smart mobile devices** has increased
  - Pervasive and permanent connection to the Internet
  - Internet as a way to access services
- **Mobile services become more complex** through personalization, computational- and data-intensive tasks, and contextualization
- Cloud computing could become an **enabling technology for** providing storage and computing capabilities to **smart mobile devices**

# Current Issues and Shortcomings


- **Heterogeneity of applications** and **mobility of users** lead to unpredictable demand posing relevant challenges to provisioning of resources

- **Location and capacity constraints** are still a challenge
  - As existing solutions target specific cloud providers and
  - **No federations of cloud providers** that allow strategic sharing of resources, and
  - **No socio-economic optimization**

- Therefore, there is need for **scalable resource provisioning at low cost**
  - Advanced provisioning mechanisms (e.g., computing offloading, context-awareness, brokering)
  - Advanced data and code management (e.g., code portability, data integrity)

# Research Objective

- **Delivering an architecture** that supports the changing needs of mobile users and considering different socio-economic optimization objectives

- The architecture also needs to support:
  - Modelling and run-time adaptable prediction of mobile applications and mobile users
  - Cross-border, business-aware federation of cloud resources
  - Scalable brokerage and dynamic offloading of services

# State-of-the Art and Methodology

- **Foundation of the architecture** comes from the projects: CompatibleOne, BetaaS, OPTIMIS, PaaSport, Broker@Cloud, Easiclouds, and AnyBroker

- The **methodology** used comprises:
  - Specification of requirements, which is based on
    - Insights of stakeholders through ad-hoc meetings, and
    - Literature research of market studies, scientific articles, innovation standards, standards, and
    - Project-specific (use-case-specific) requirements
  - Deriving architecture functionality from the requirements
  - Integration of the functionality into the BASMATI architecture

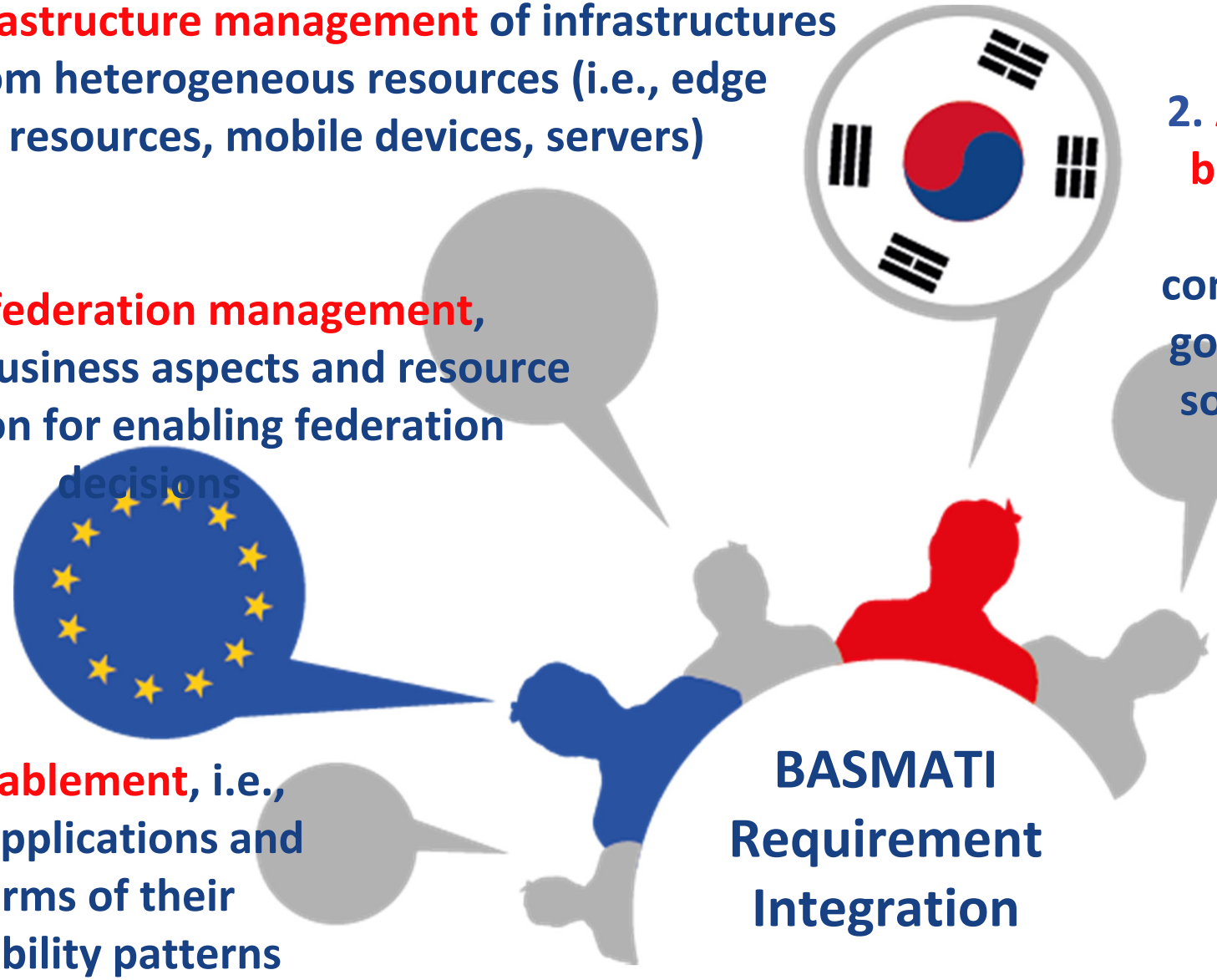
# The BASMATI Architecture Requirements

1. **Infrastructure management** of infrastructures from heterogeneous resources (i.e., edge resources, mobile devices, servers)

2. **Algorithms for brokerage and offloading**, considering legal, governance, and socio-economic aspects

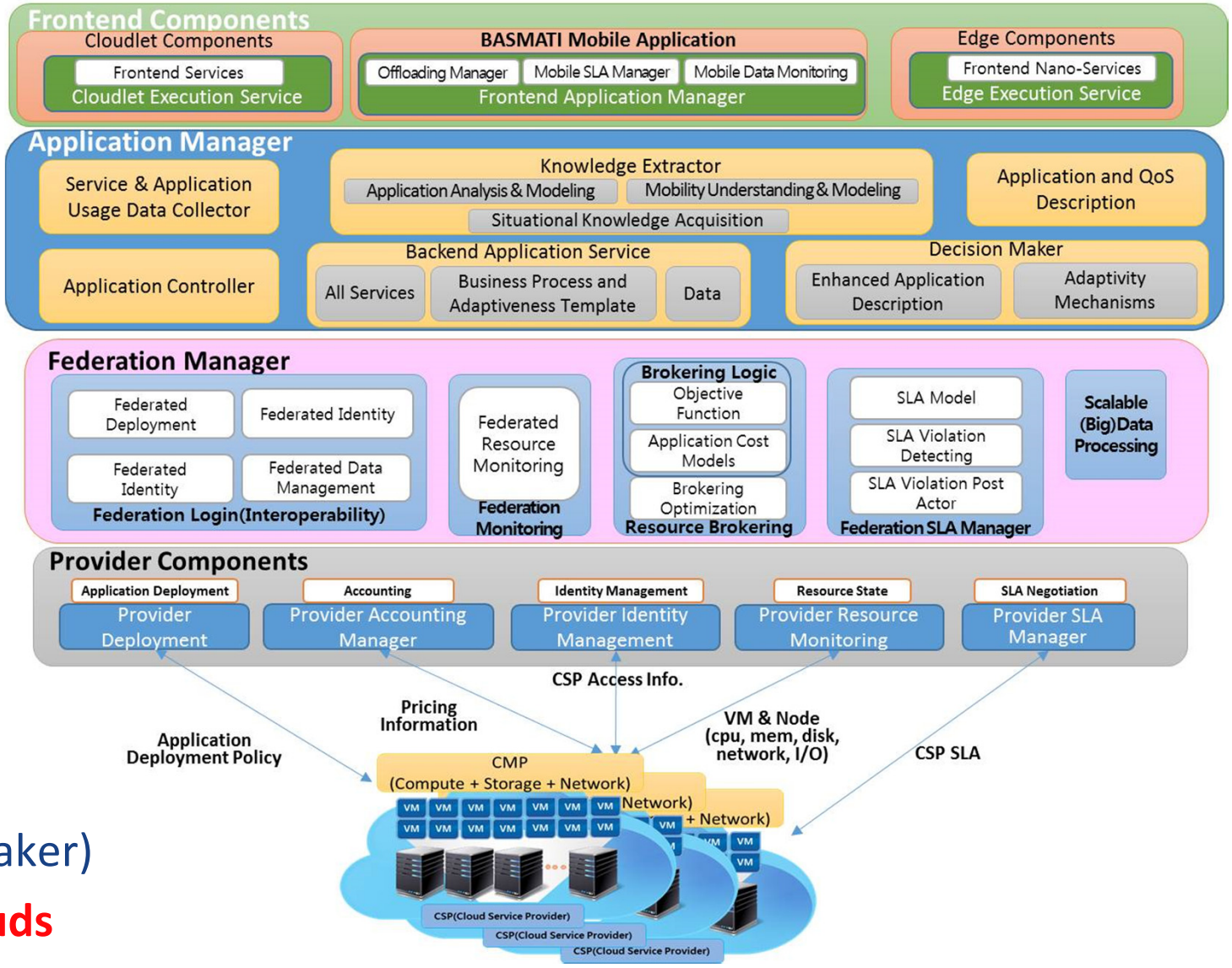
3. **Cloud federation management**, considering business aspects and resource information for enabling federation decisions

4. **Service enablement**, i.e., modeling of applications and users in terms of their different mobility patterns



# BASMATI Architecture

- Stakeholders are
  - **Mobile users, mobile application vendors, federated cloud provider, BASMATI platform provider**
- Functions for
  - **Handling mobile applications** on server and client-side (Application Manager)
  - **Strategic and automated reconfigurations of applications** (Decision Maker)
  - **Managing federated clouds** (Federation Manager)



# Conclusion and Future Work

- Advancement through BASMATI architecture
  - **Multi-objective optimization technique** for enhancing the brokerage logic with respect to legal, governance and socio-economic aspects
  - **Management models for** adaptive and reconfigurable **mobile applications**
  - **Federation models** that consider **cooperative modes and strategic utilizations** of computing resources

- Future Work
  - **Detailed interaction model** between different functions and stakeholders of the architecture
  - **Validation** through a prototype implementation

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# Questions?

## Acknowledgements:

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