Challenges of totally distributed scenario

Doctoral Consortium
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Motivation

- New mobile device and technologies
- New applications (e.g. Location based context aware service)
- Lack of middleware layer
  - Adaptive
- Lack of methodologies, languages and tools for designing such application

Reflective Architecture

E-Service Composition Platform

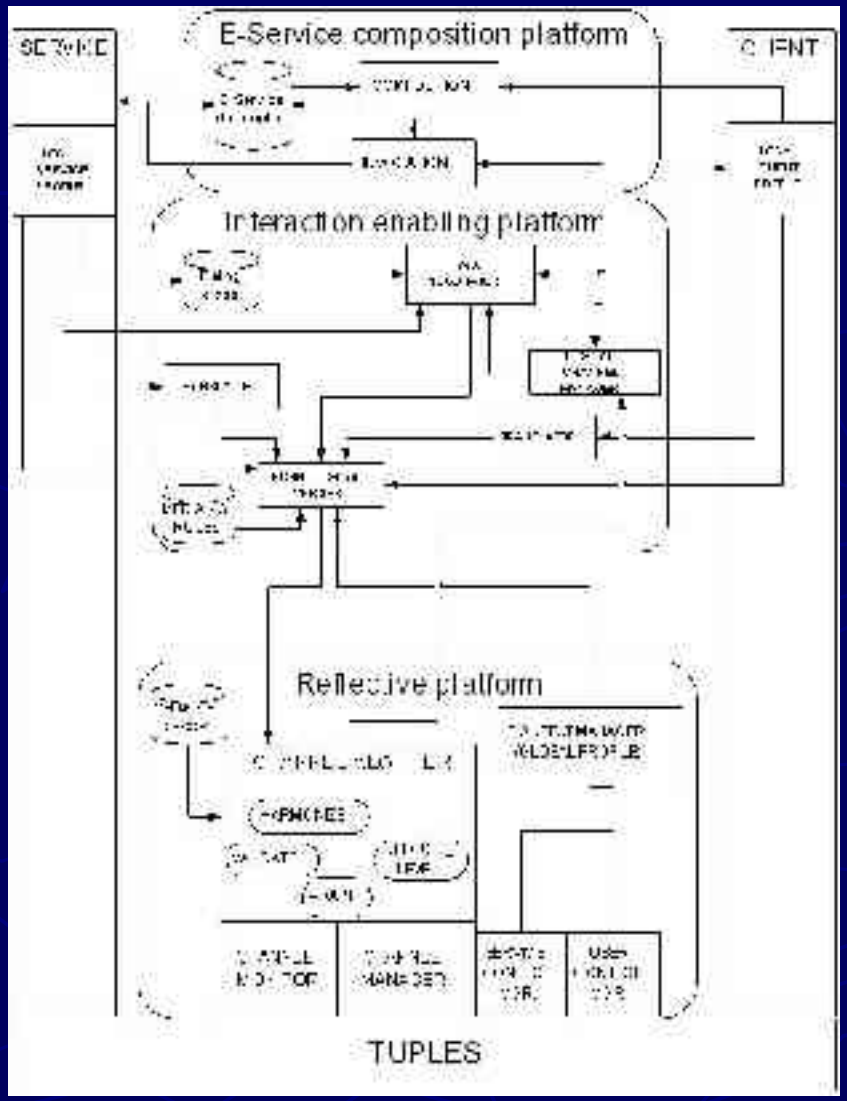
Chooses and invokes services

Interaction Enabling Platform

Negotiate the Qos
Chooses the distribution channel for service delivery
Manages the multichannel aspects

Reflective Platform

Manages the technological adaptivity by modifying the controllable attribute of distribution channel



The goal

- The goal is to design a system able to manage a totally distributed workflow in a mobile environment
- Where all control tasks, usually carried out by a central node, can be carried out by means of distributed policies from someone, somewhere in the community,
- According to its current capability and state.

Related work

- In the literature the problems related to workflow distribution problems are widely considered, but a mobile scenario is more then a distributed one.

In fact I have to consider

- the possibility of offline work followed by a reconnection
  - the possibility of device dead
- the device capability
- The discovery of new actors in the process

From one workflow to many workflows

I'm trying to realize an automatic method able to subdivide an initial workflow in n workflows.

My idea is to define a kind of local view that allows realizing a single-device point of view of total workflow.

I'm using UML and BPEL4WS to carry out this task.

I want to create a totally distributed scenario so I stress the device independency so I'm trying to reduce the relevance of a coordinator.

PUSH/PULL

Moreover I’m studying about a pull mechanism that can be developed and can be associated with the traditional push method for the workflow managing.

The goal of this task is to improve the distributed control of community state.

The case study

- Often rich studies and models have a weak correspondence with real world. Instead I want to have a strong correspondence and so I'm studying and modeling a real situation where our ideas can be validated.
- In my personal opinion Italy probably hosts one of the most wide and significant cultural heritages in the world.
- In 1990 the Italian government began a project to realize MARIS, the risk map of cultural heritage. We assume that the MARIS system can be improved by using cooperative mobile information systems in data acquisition p hase.

The open issue

- In a mobile scenario a coordinator has to exist?
- What is its role?
- How the community can establish if an actor is transitorily or permanently not connected to the net.
- How it is possible to redistribute the tasks of a dead actor (the replanning phase)?
- How it is possible to dynamically discover and add new actor to the community?
- How to guarantee, if it is necessary, the transaction properties of tasks?
- .....

Question

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