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UDESC

# SuMMIT - An Architecture for Mobile Devices to Coordinate the Execution of Applications in Grid Environments

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Laboratório de Pesquisas em Sistemas Distribuídos



# Guide



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- Introduction
- Related Works
- SuMMIT Architecture
- Experimental Results
- Conclusions
- Future Works

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- **Introduction**
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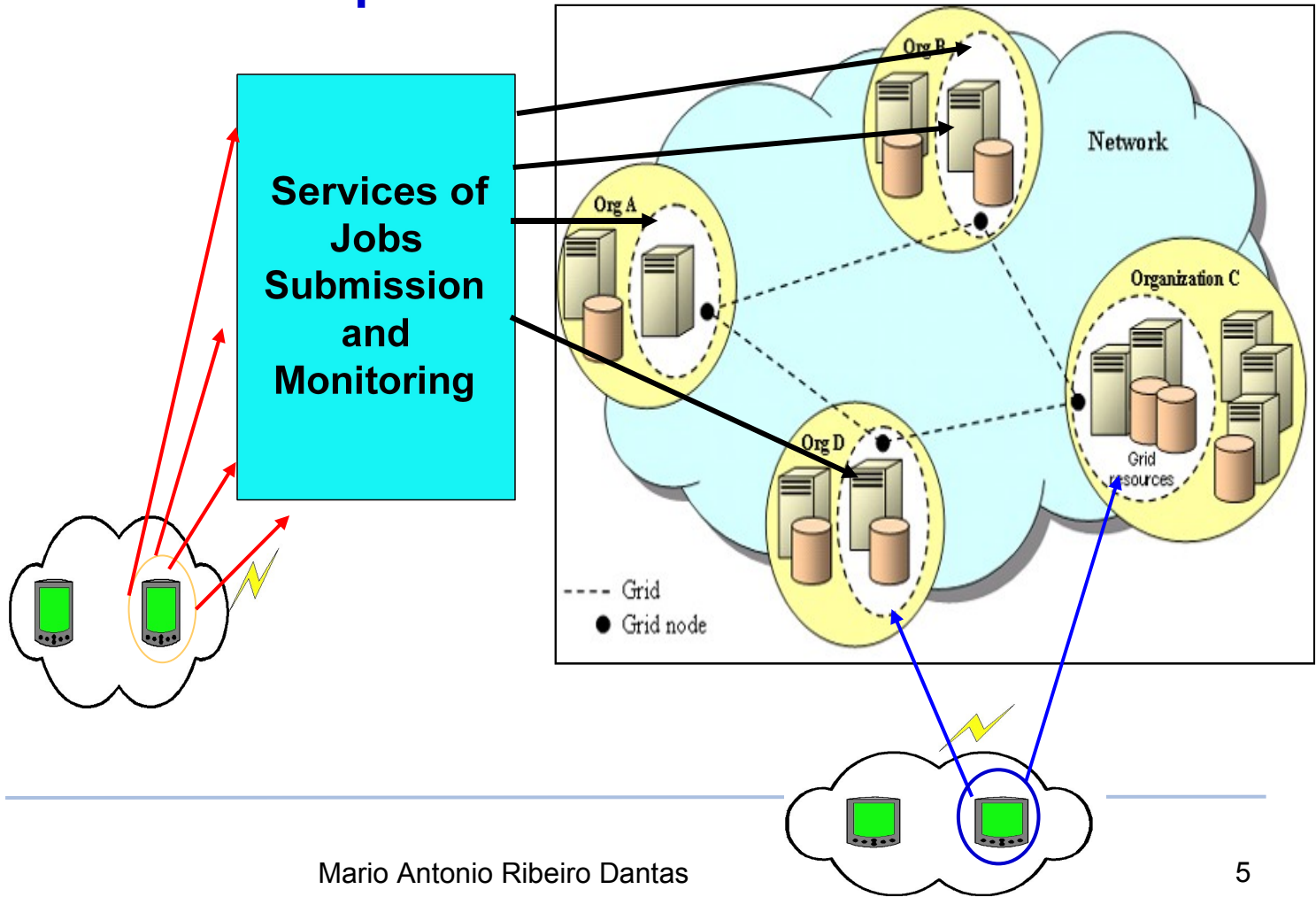
# Introduction (1/2)



- Limitations of mobile devices impose great difficulties to provide to users an option for solve complex problems (Solution: **Mobile Grid**);
- The majority of researches only allow submission and monitoring of one task per time from device;
- Considering their **limitations**, these devices are more susceptible to **disconnections**;
- Disconnections: **fault** → **error** → **failure**.

# Introduction (2/2)

4 Jobs for resolution problem



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# Related Works



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	<b>Saving Usage of Battery</b>	<b>Disconnection</b>	<b>Workflow</b>
<b>Shi et al. 2006</b>	NO	NO	NO
<b>Sajjad et al. 2005</b>	NO	NO	NO
<b>Grabowski et al. 2006</b>	NO	NO	NO
<b>Brooke and Parkin 2005</b>	NO	NO	Yes
<b>Hummel et al. 2006</b>	NO	NO	Yes

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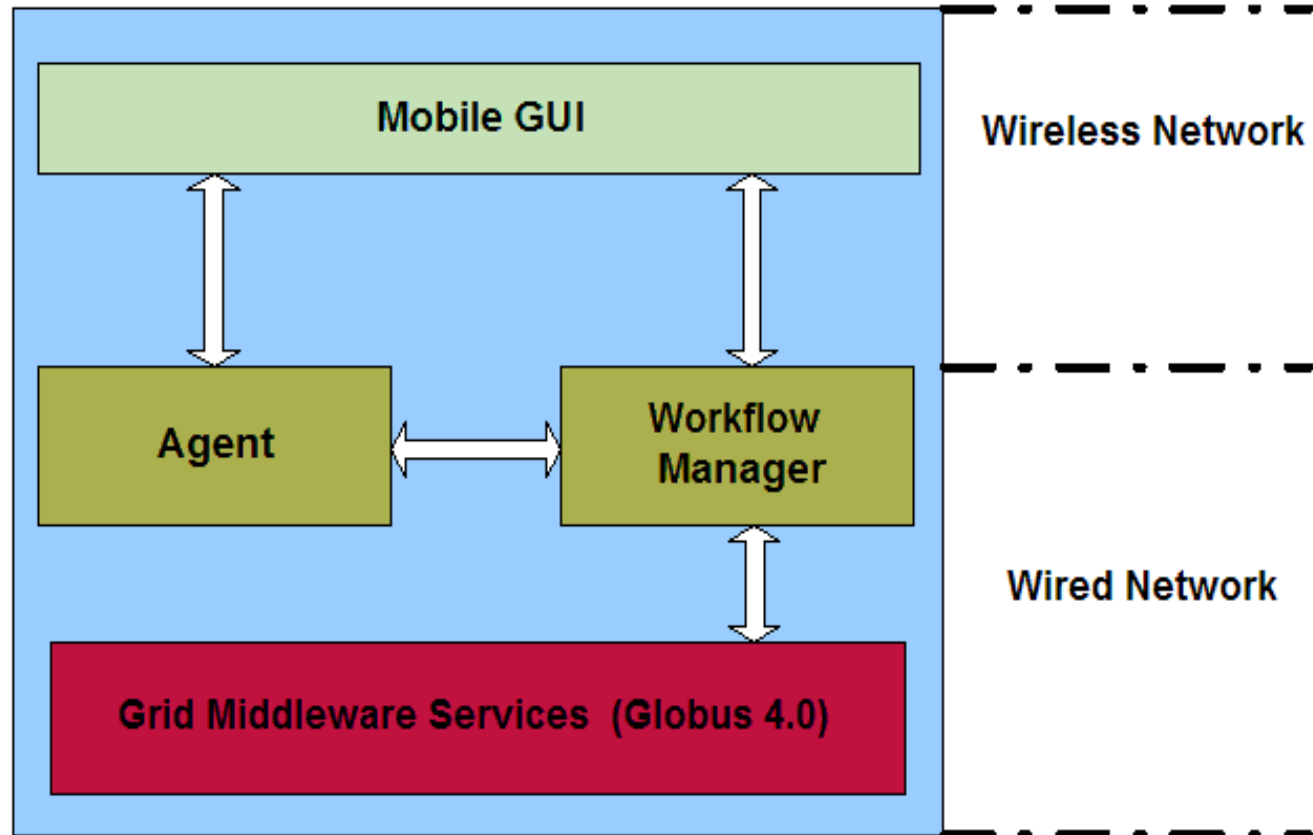


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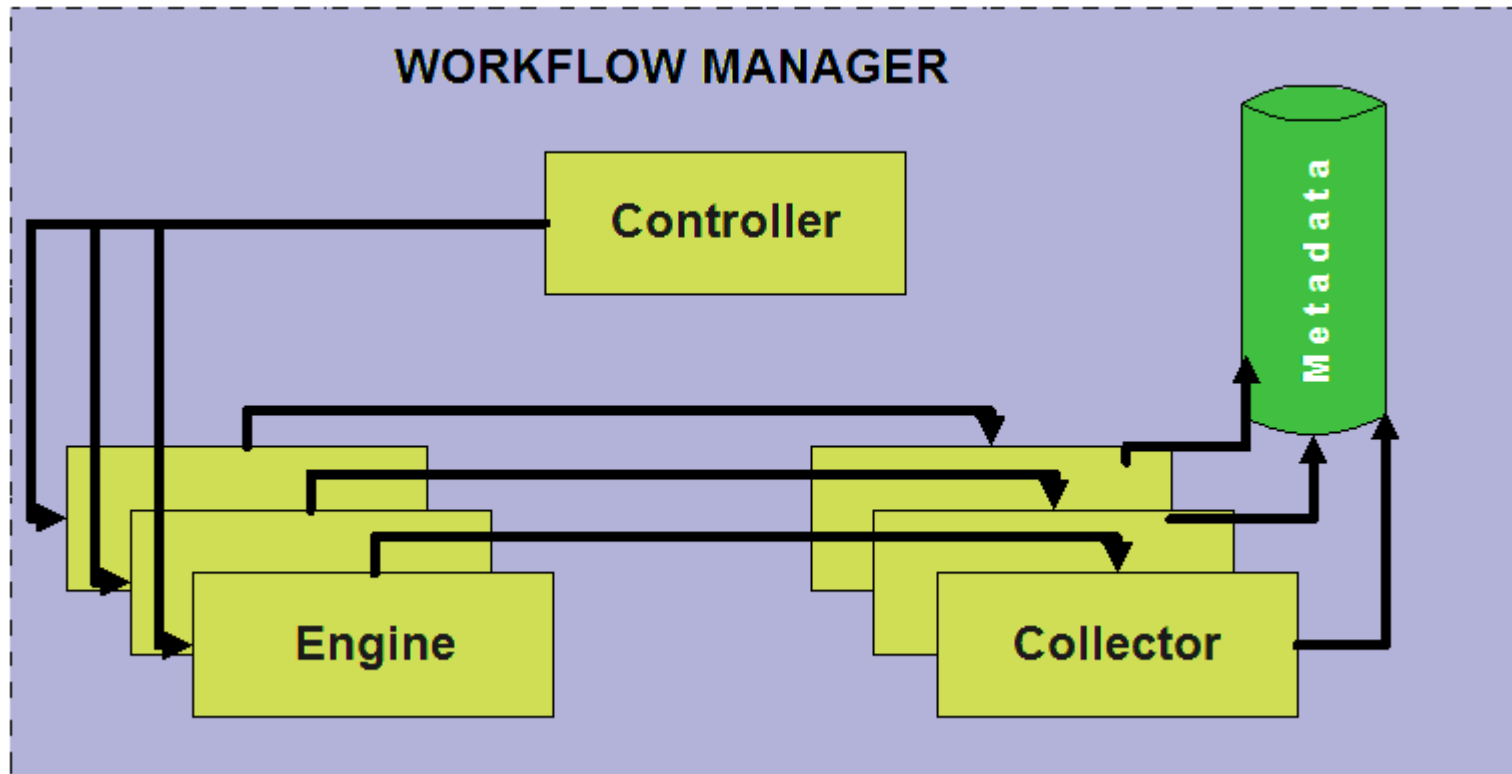
# SuMMIT Architecture (1/7)



# SuMMIT – Workflow Manager (2/7)



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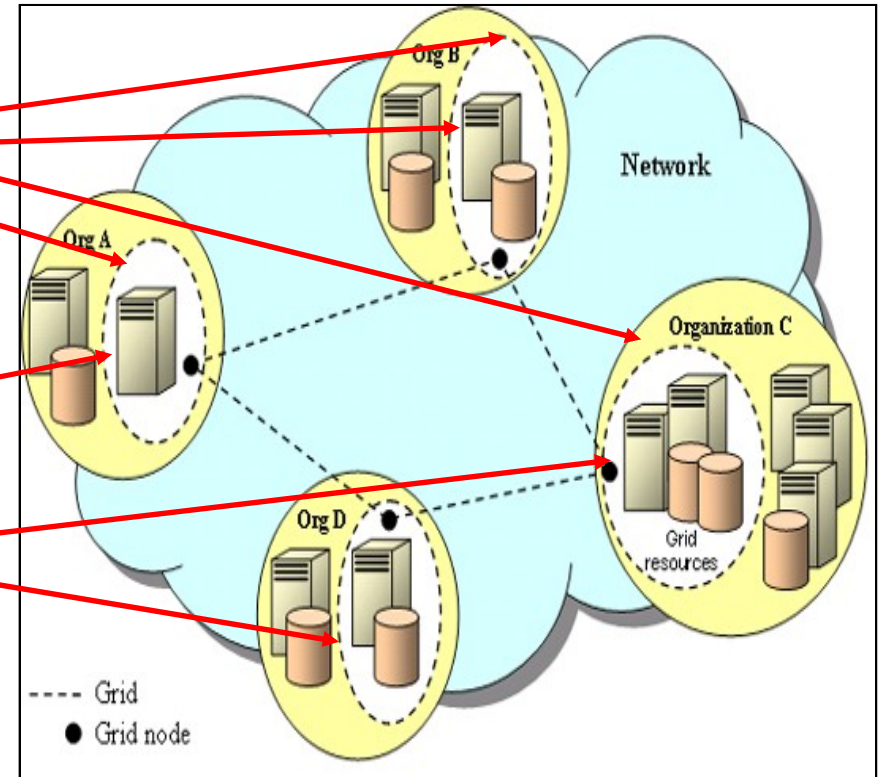
# SuMMIT – Model (3/7)

**Automation e  
Coordination**

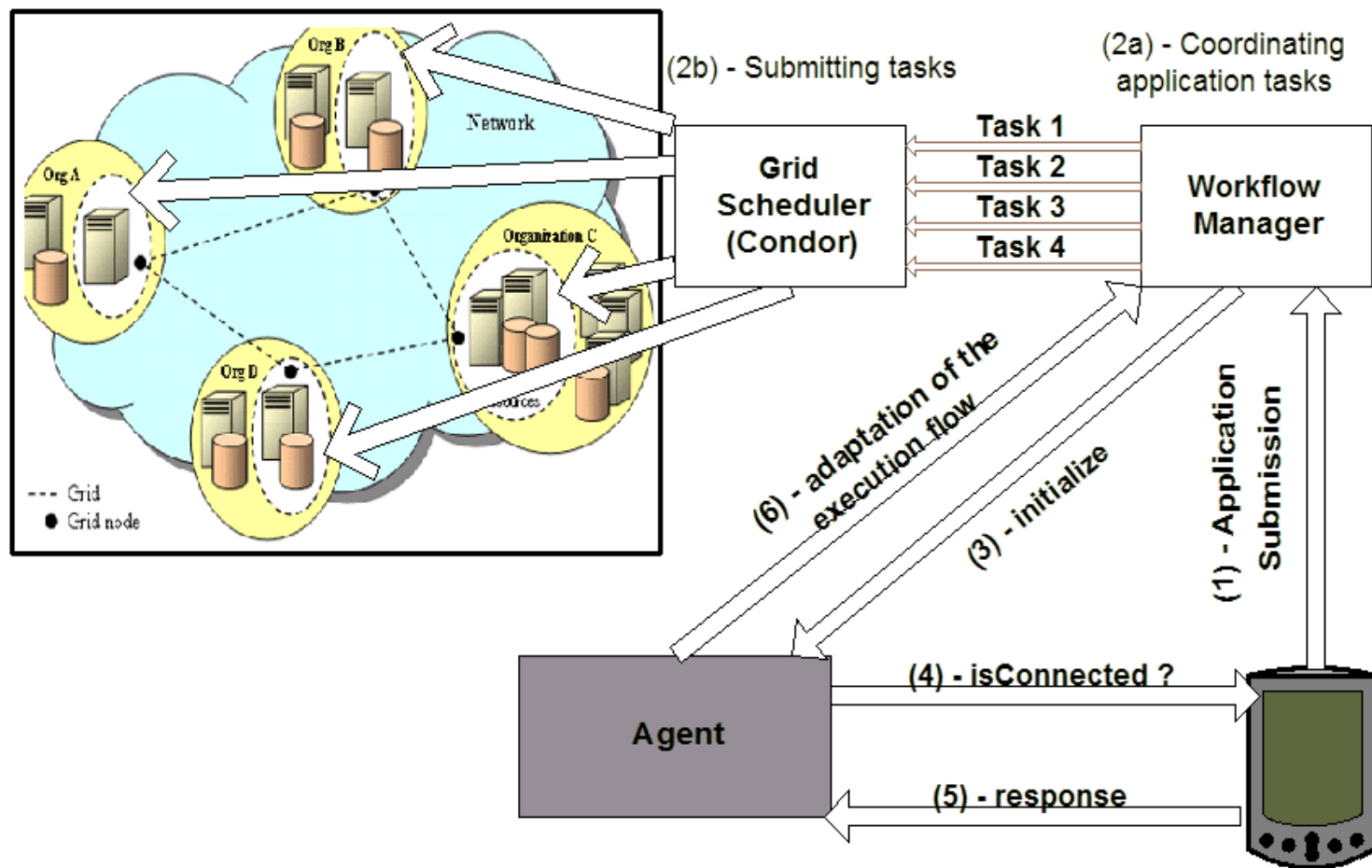
**MOBILE GUI  
(Submission and  
Monitoring  
Applications)**



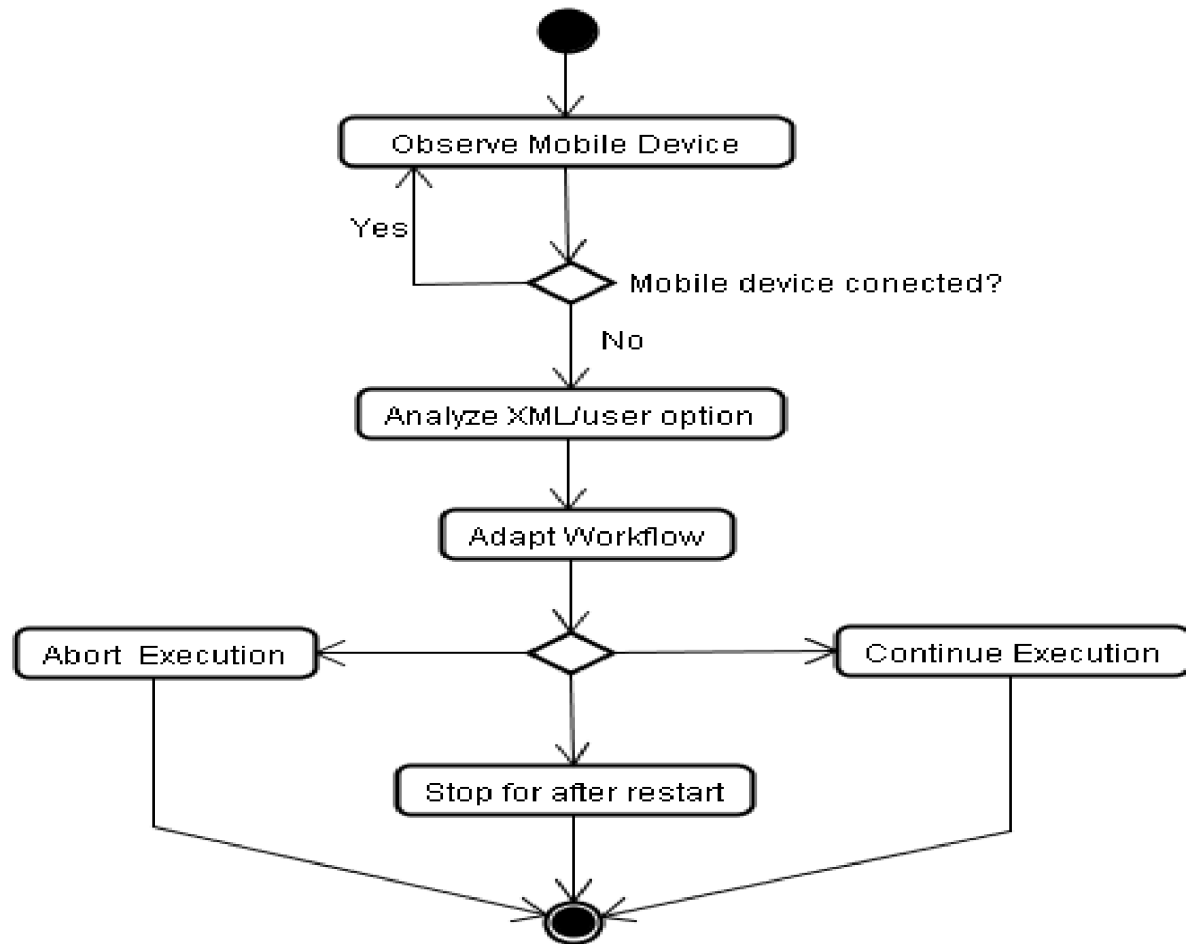
**Services of  
Workflow  
Submission  
and  
Monitoring**



# SuMMIT – Agent (4/7)

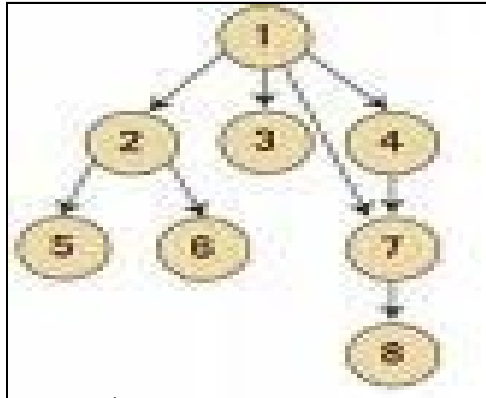


# SuMMIT – Agent (5/7)

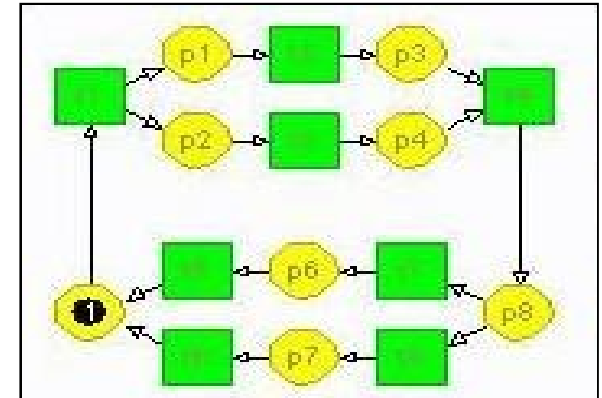


# SuMMIT – Mobile GUI (6/7)

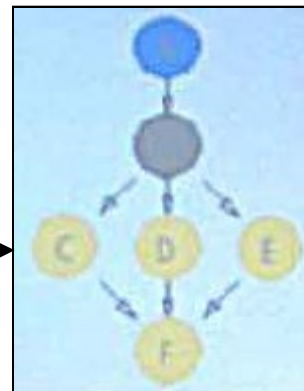
**DAG**



**Petri Net**



**NO-DAG**



Simplification

Expressive



# SuMMIT – Mobile GUI (7/7)



**Monitoring Interface**

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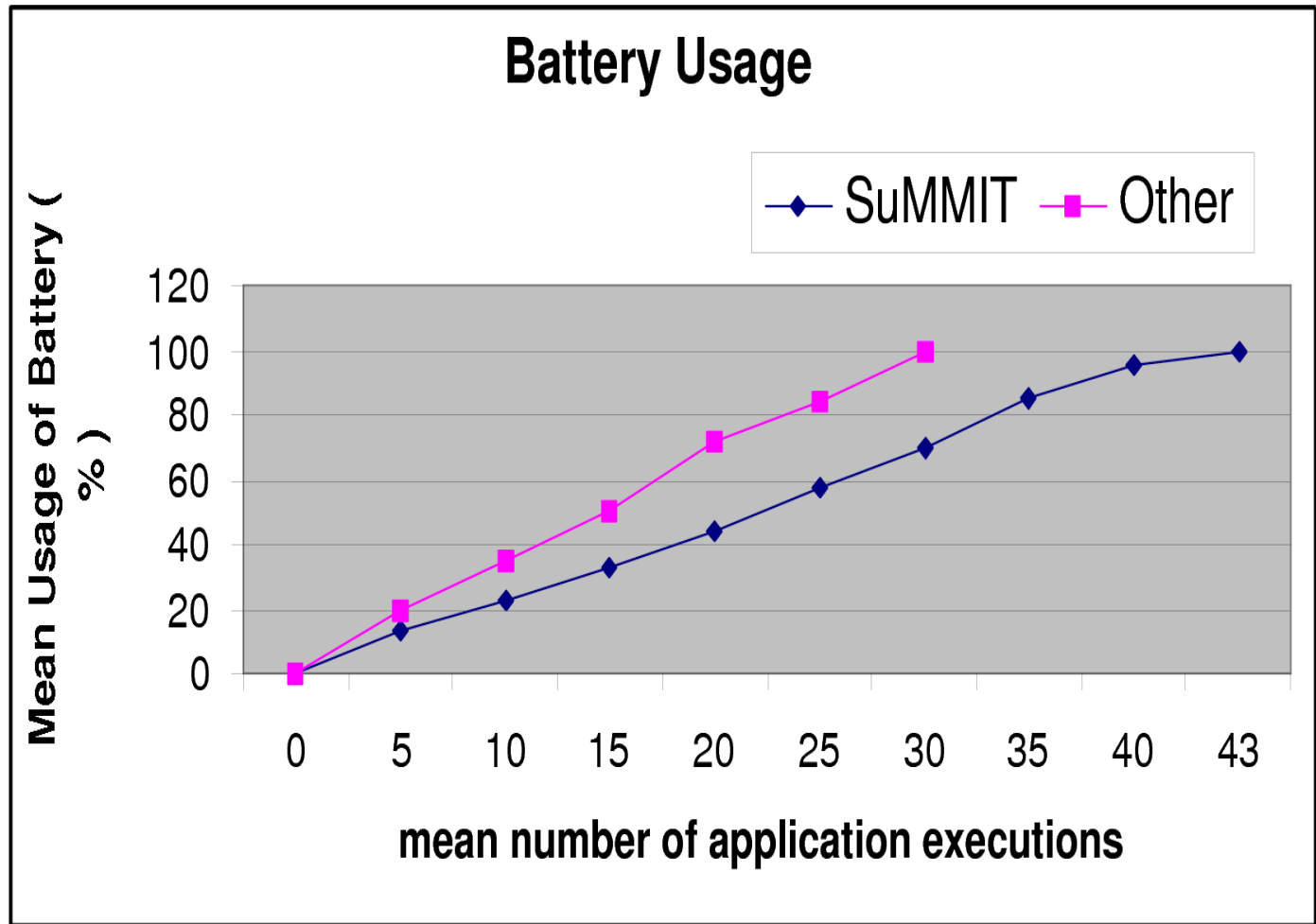


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# Experimental Results



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# Conclusions



- SuMMIT provides a more **coordinated** and **automated** way for executing applications in the mobile grid;
- It also provides an **adjustment** facility for the execution of the tasks flow, **matching requirements** of submitted application and options defined by a user;
- **Consume less battery energy** of mobile devices for submission and monitoring applications.

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# Future Works



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- ❑ SSL (*Secure Socket Layer*);
- ❑ Develop a more flexible and incremental selector engine to choose grid resources;
- ❑ Provides an **time interval** for verification of the disconnection state and for monitoring workflow in a more **dynamic** fashion, considering input parameters, e.g., **battery lifetime** and/or **traffic volume** in the wireless network;

# Questions



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