

# MOSQUITO

MOdel driven conStRuction of QUeuing neTwOrks

---

## Luca Berardinelli

Ph.D Student  
Computer Science Department  
University of L'Aquila - Italy  
[berardinelli@di.univaq.it](mailto:berardinelli@di.univaq.it)  
SEALAB Quality Group Member

## Fabio Calvarese

Doctor in Computer Science  
Info Mobility s.r.l.  
S.Atto - Teramo - Italy  
[fabio\\_calvarese@tele2.it](mailto:fabio_calvarese@tele2.it)  
SEALAB Quality Group Member

## Vittorio Cortellessa

Associate Professor  
Computer Science Department  
University of L'Aquila - Italy  
[cortelle@di.univaq.it](mailto:cortelle@di.univaq.it)  
SEALAB Quality Group Chair

<http://sealabtools.di.univaq.it/>

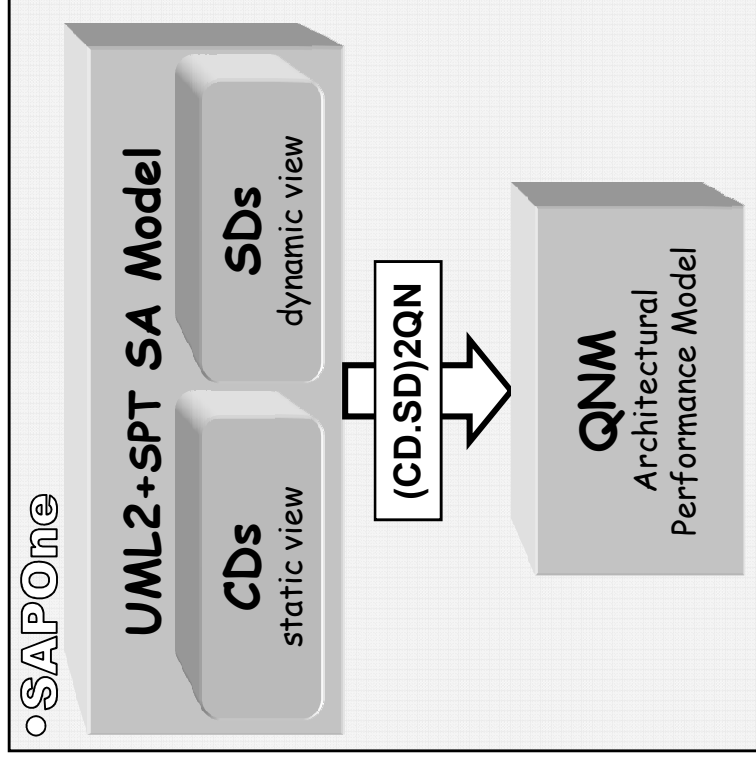
## Problem: Model Driven Performance Engineering

- **GOAL:** Supporting Performance Engineering (PE) of distributed component-based applications in Model Driven Processes;
- **SAP·one** (Software Architecture Performance Analysis) and **PRIMA-UML** (PeRformance IncreMental vAlidation in UML) are two methodologies supporting PE for component-based systems;
- **MOSQUITO** (MOdel driven conStuction of QUeuIng neTwOrks) is a web service **CASE** tool for SAP·one and PRIMA-UML. It allows the automated generation of XML-based performance models (EG, QN) starting from an EclipseUML-based system design model.



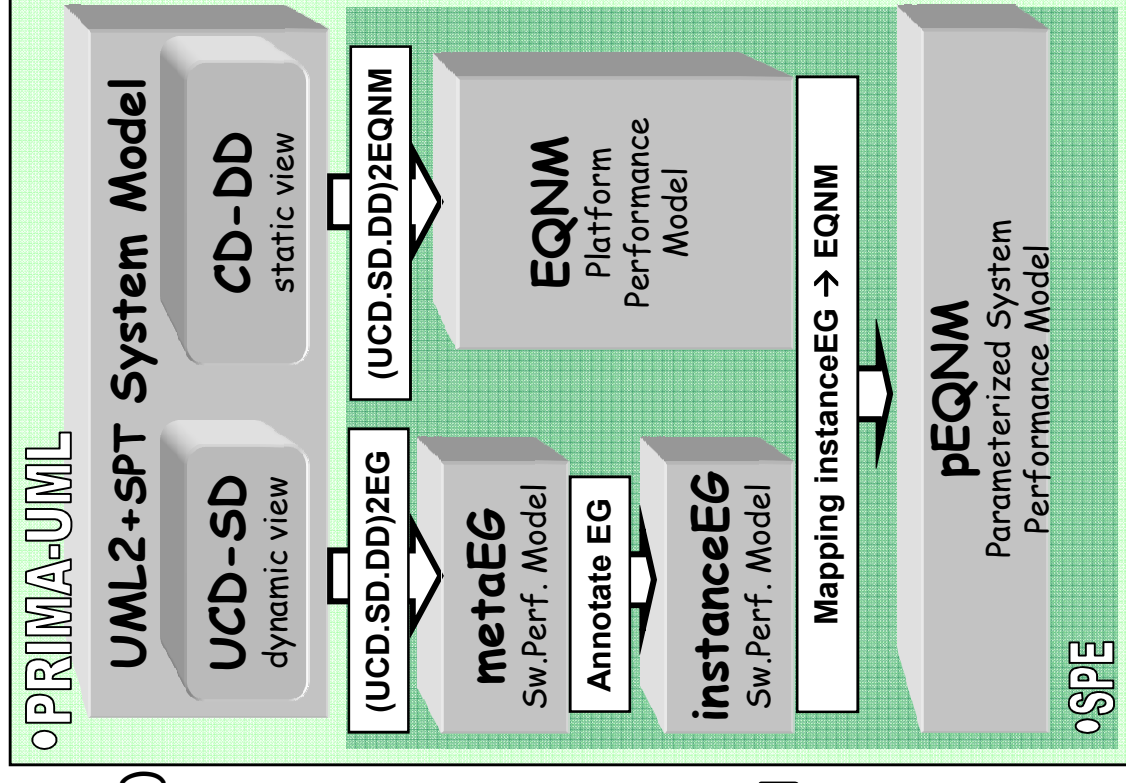
# The Methodologies: SAP·one

- **INPUT:**
  - UML Design Model representing a **Software Architecture** (Component and Sequence Diagrams)
  - Performance additional info (by Pprofile  $\subset$  UML SPT)
- **OUTPUT:**
  - **Queuing Network Model (QNM)** representing an Architectural Performance Model (Service Center = UML Component)



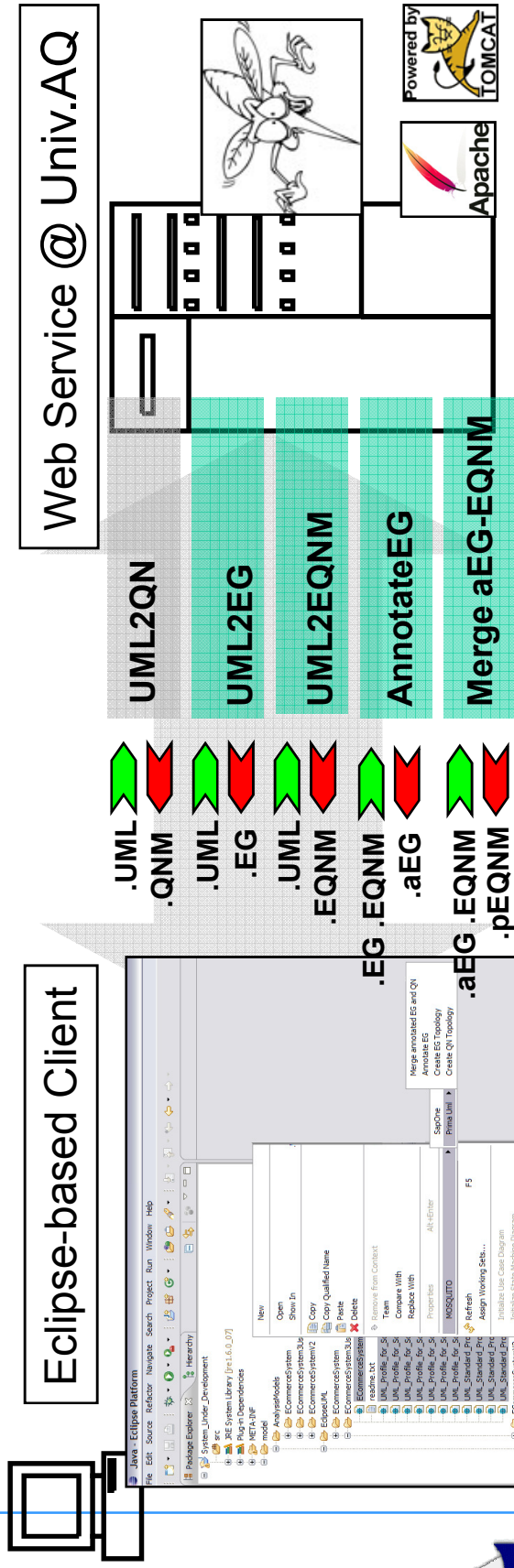
# The Methodologies: PRIMA-UML

- **INPUT:**
  - UML System Model (UCD, CD, SD, DD)
  - Performance additional info (by PProfile  $\subset$  UML SPT)
- **INTERMEDIATE MODEL:**
  - Execution Graphs: flows of component operation invocations (metaEG) and sw resource consumption (instanceEG)
- **OUTPUT:**
  - Extended Queuing Network Model (Service Center = Hw resource)
- **GOAL:** It allows to distinguish different system (hw/sw) configurations.



# MOSQUITO for SAP·one and PRIMA-UML

- MOSQUITO is a Web Service CASE tool.
- Its client-side is a Eclipse plug-in that invokes remote model2model transformations on the server-side located at University of L'Aquila.



## SOAP/TCP-IP

MOSQUITO - Model driven construction of QJeuIng neTwOrks



# PLASTIC and GSP Projects

- Our tool has been used and suitably refined in two projects.

## PLASTIC

[www.ist-plastic.org](http://www.ist-plastic.org)

Providing Lightweight and Adaptable Service Technology for pervasive Information and Communication

EU's Sixth Framework Programme for Research and Technology Development (RTD)  
Gennaio 2006 - Settembre 2008

## GSP v4

Global Software Performance (Global Software Development)

**SIEMENS** Corporate Research

Princeton, New Jersey, USA.

MOSQUITO - MOdel driven conStruction of QUeuIng neTworks



## Conclusions and Future Works

- Adoption of a Model Management Platform (AMMA?);
- Using a DSL (ATL?) for model2model transformation specification in place of OO Programming Languages (actually Java);
- Integrating MOSQUITO with other Model Generator Tool for Non Functional Analyses (see <http://sealabtools.di.univaq.it> for details);
- Integrating analysis results interpretation (what effects on the source design model?).



# MOSQUITO

MOdel driven conStRuction of QUeuing neTwOrks

---

## Luca Berardinelli

Ph.D Student  
Computer Science Department  
University of L'Aquila - Italy  
[berardinelli@di.univaq.it](mailto:berardinelli@di.univaq.it)  
SEALAB Quality Group Member

## Fabio Calvarese

Doctor in Computer Science  
Info Mobility s.r.l.  
S.Atto - Teramo - Italy  
[fabio\\_calvarese@tele2.it](mailto:fabio_calvarese@tele2.it)  
SEALAB Quality Group Member

## Vittorio Cortellessa

Associate Professor  
Computer Science Department  
University of L'Aquila - Italy  
[cortelle@di.univaq.it](mailto:cortelle@di.univaq.it)  
SEALAB Quality Group Chair

<http://sealabtools.di.univaq.it/>