

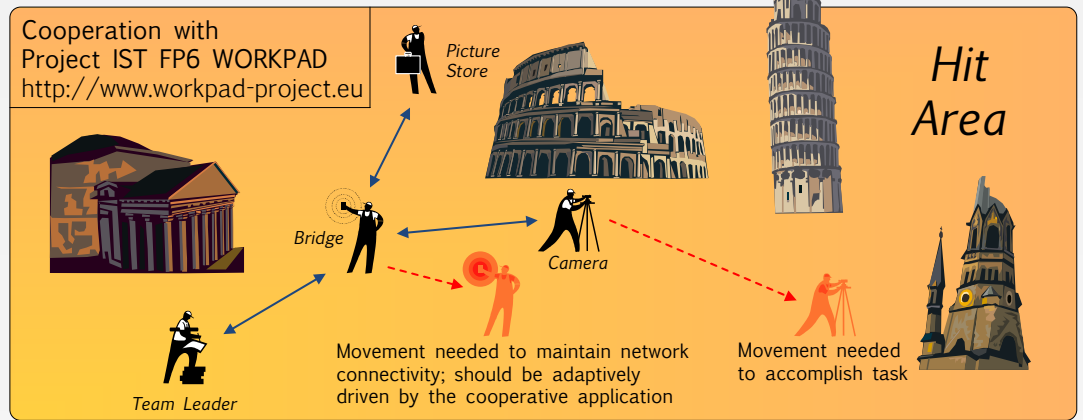
# forMAfNET

## Formal Modeling and Analysis of Flexible Processes in Mobile Ad-hoc Networks

### Aims

#### Emergency Scenario: Archaeological Site after an Earthquake

- Network of mobile devices
- Team members communicate with one another via wireless links without relying on an underlying infrastructure
- Team members execute sets of activities modeled as workflows
- MANETs topology both influences and is influenced by the workflow
- Modeling workflow modifications as required by topology transformations



### GOAL

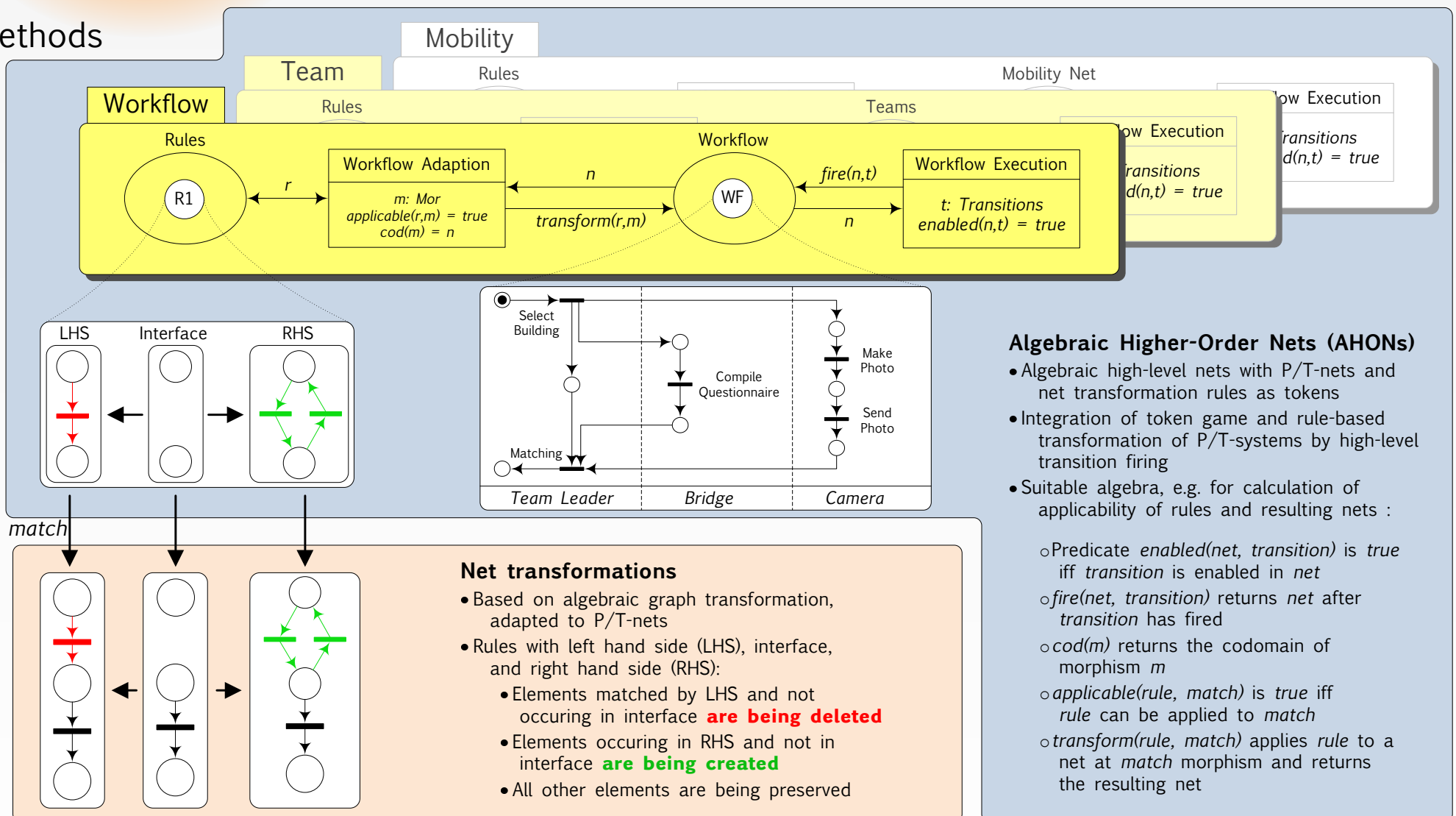
Adequate specification technique for multi-level modeling of workflows in MANETs

### Layered Architecture

- Separating different views with different granularity
- Layered architecture for modeling workflows in MANETs with three different aspects
- Distribution of workflows and mobility issues

1. **Workflow Layer:** general activities concerning the workflow
2. **Team Layer:** local view of team members' workflows
3. **Mobility Layer:** movement activities for reacting on signals of probable disconnections sent by a predictive layer

### Methods



### Research Focus

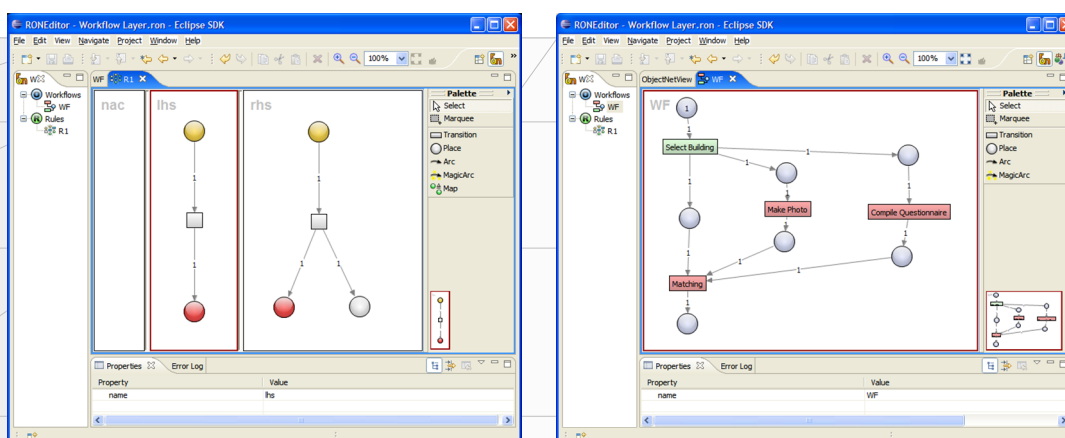
#### Workflows in layered architectures

- Methodology for modeling workflows in MANETs
- Notion of consistent layer environment
- Maintaining resp. restoring consistency during workflow adaption and execution
- Distribution of workflows for each team member

#### Behavior and analysis of AHONs

- Structuring and transformation
- Simulation and validation of AHON behavior
- Compatibility of net transformation and transition firing [Petri Nets'07]
- Property preserving rules  $\Rightarrow$  restriction of rules and firing conditions

### Tool Support



#### Graphical Editor as Eclipse Plug-In

- Based on Graphical Editor Framework (GEF)
- Allows editing and simulation of specialized AHONs with fixed transition types
- P/T-nets and net transformation rules as tokens in a high-level net
- Simulation of P/T-net transformations via graph transformation tool AGG
- Prototypes developed by students in 2007
- Project web site with downloads (August '07): <http://tfs.cs.tu-berlin.de/roneditor>