A Debugging Calculus for Mobile Ambients

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Overview of the Talk

- Motivations
- Debugging Calculus (informally)
- Results
- Future Work

Motivations

- Network applications access remote services & resources

- New downloaded components dynamically added...

- ...mobile code and mobile agents

- Many programming models proposed

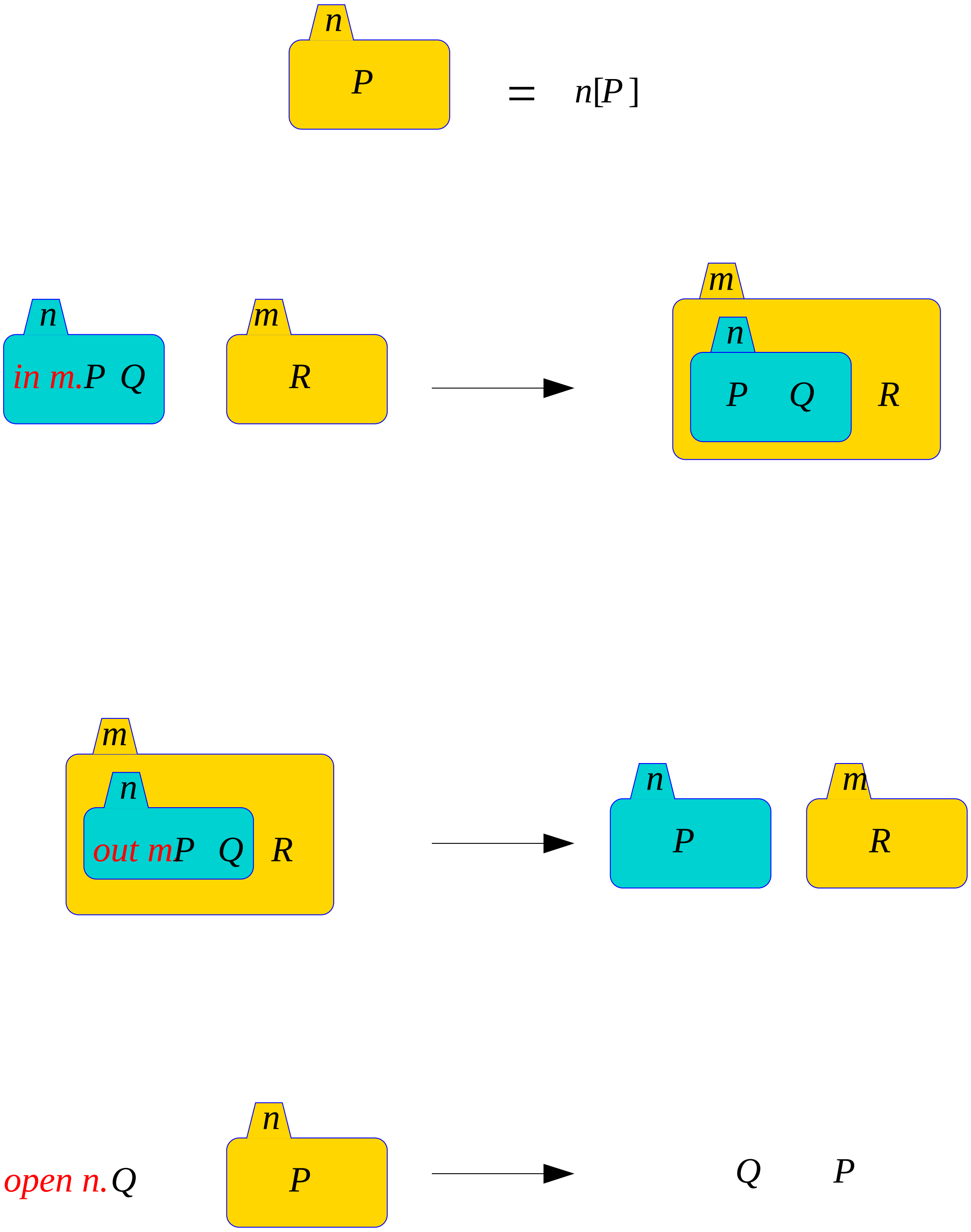
Motivations 2

- Our aim: Distributed Programming Model
  - formal basis for debugging abstractions
  - tool for distributed program analysis

- Our Proposal: Debugging Language = Language + Debugging Abstractions

- A case study: Ambient Calculus + Debugging Abstractions

Ambient Calculus (...a representation)



Debugging Calculus

- names $\mapsto$ debugging state (T, S)

- $(T, S)\begin{cases}\text{monitors interactions in a boundary}\\ \text{logs boundary crossing operations}\end{cases}$

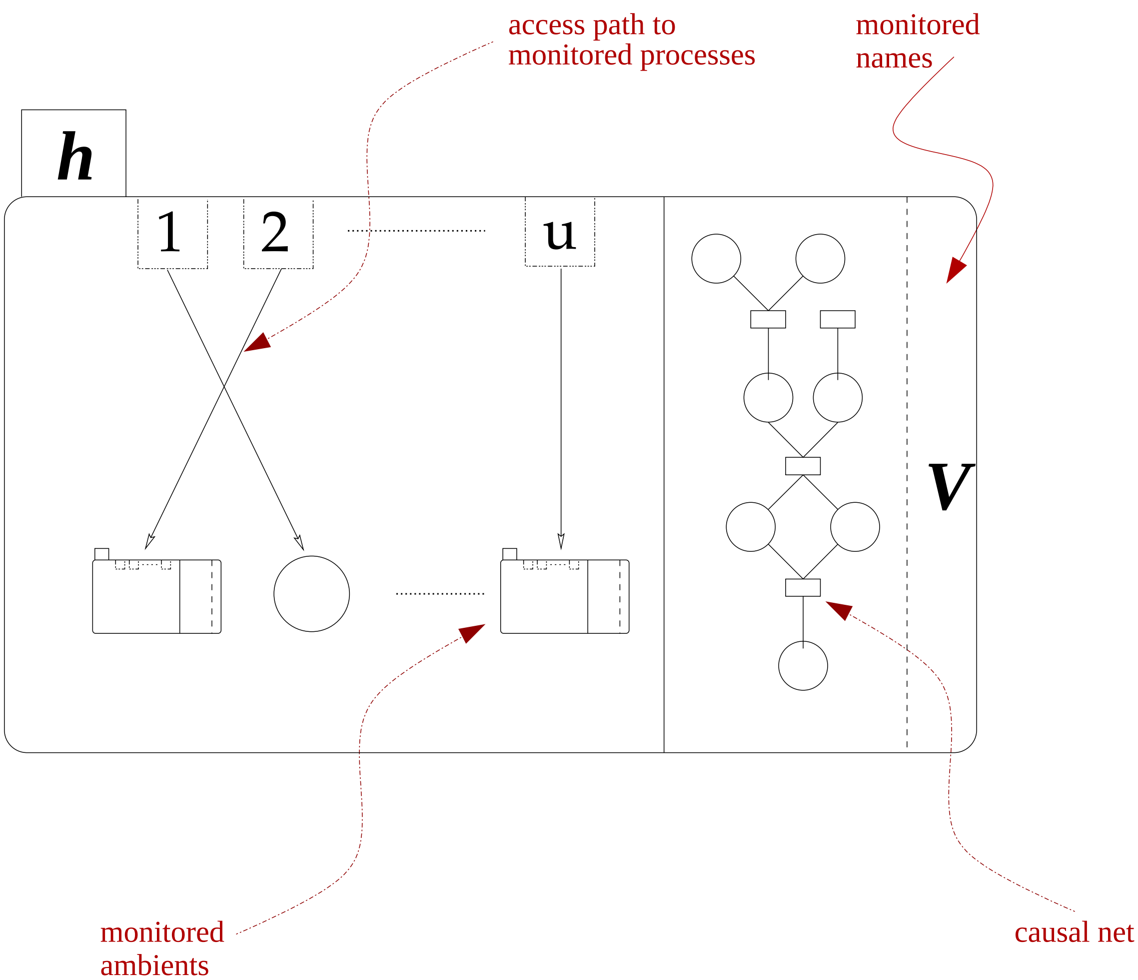
- T: an abstraction of execution traces in terms of causal infos on events (Petri Nets)

- S: monitored ambients

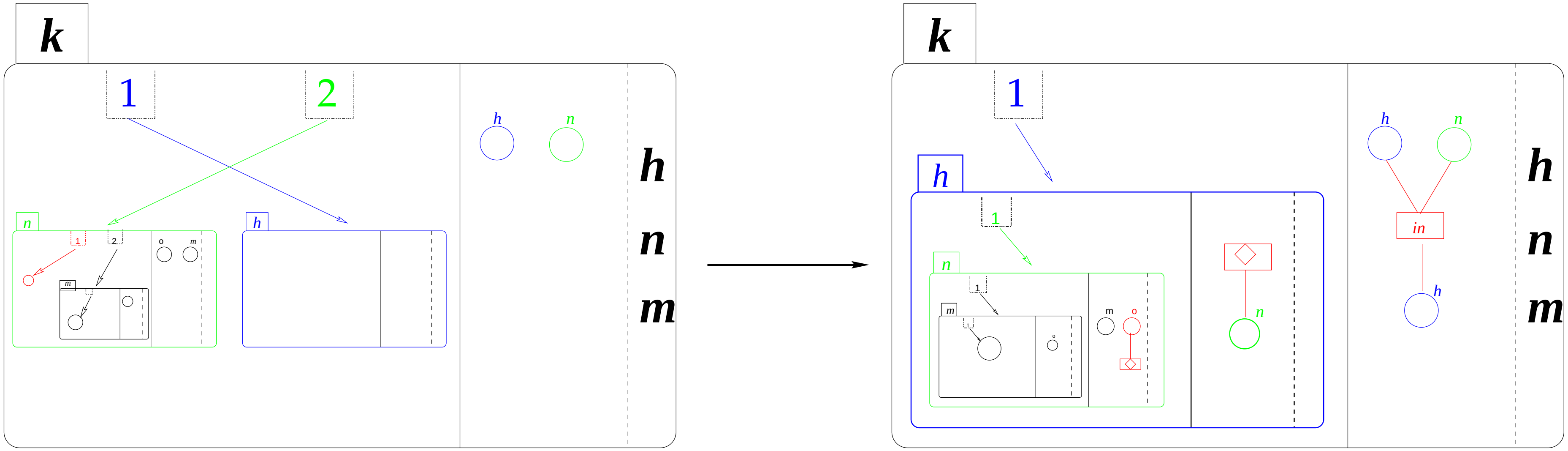
- V: list of monitored ambient names

Debugging Ambient (graphically)

$h^V_{T,\,S}[P]$ is graphically represented as



A Debugging Calculus Transition



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Results

- Formal definition of distributed debugging model
- Semantics theory to support debugging reasoning
- The semantics of ambient processes not altered
- General technique: Klaim debugger http://music.dsi.unifi.it/klaim.html
- Relations with Security: causal flow of information

More...

http://www.di.unipi.it/ etuosto/ENGLISH/papers.html