



Mikado

Mobile calculi based on domains

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Plan

- ❑ Objectives
- ❑ Domains
- ❑ Workprogramme
- ❑ Milestones
- ❑ Consortium and figures
- ❑ Challenges and risks
- ❑ Dissemination



Objectives

- ❑ To develop a formal programming model for large scale, mobile distributed computing
 - ◆ In Mikado, ' programming model ' = ' (higher-order) process calculus '
- ❑ To develop associated type systems and proof techniques
 - ◆ Safety, security
- ❑ To develop effective prototypes
 - ◆ Virtual machines
 - ◆ Language experiments



Domains

- ❑ Key insight for the Mikado programming model : domains
- ❑ Large scale distributed systems take the form of multiple interacting areas or regions, with different properties
 - ◆ e.g. spatial location and extent, fault models, security policies, resource management policies
- ❑ A domain is a first-class programming entity introduced to capture the notion of region or sub-system
- ❑ Insights for domains :
 - ◆ Ambients, locations in distributed process calculi
 - ◆ Domains, regions and autonomous systems in network architecture



Work-programme

- ❑ WP1 : to develop the Mikado programming model and study its relation with other programming paradigms (functional, object-oriented)
- ❑ WP2 : to develop type systems and (co-inductive) proof techniques for the Mikado programming model
- ❑ WP3 : to develop virtual machine and programming language technology based on the Mikado programming model
- ❑ WP4 : management, dissemination and evaluation



Milestones

- ❑ Year 1 : key requirements and analysis for the Mikado programming model
- ❑ Year 2 : core programming model and type systems, early prototypes
- ❑ Year 3 : combination with other programming paradigms, final prototypes



Consortium and figures

□ Mikado Partners :

- ◆ INRIA (prime - F) : G. Boudol, JB Stefani
- ◆ France Telecom R&D (F) : K. Milsted
- ◆ University of Florence (I) : R. de Nicola
- ◆ University of Sussex (GB) : M. Hennessy
- ◆ University of Lisbon (P) : V. Vasconcelos

□ Duration : 36 months

□ Manpower : 434 mm (360 mm funded)

□ Funding requested : 1.9 M€



Challenges and risks

- ❑ To turn the multi-faceted, informal notion of ‘domain’ into effective programming model abstractions
- ❑ To show that Mikado’s approach can subsume other recent distributed process calculi and meet key technical requirements for programming global computing systems
- ❑ To turn Mikado’s theoretical results into effective (i.e. efficient, practical) programming language technology



Dissemination

- ❑ Publications
- ❑ Workshops
- ❑ Web site
- ❑ Open source
 - ◆ Inclusion in the ObjectWeb code base for the more mature prototypes (see: <http://www.objectweb.org>)

