Julien.deantoni@unice.fr

Railroad Crossing Heterogeneous Model

Toward composition of xDSML

Matias Vara Larsen
Université Nice Sophia Antipolis
CNRS – I3S
varalars@i3s.unice.fr

Arda Goknil
INRIA Sophia Antipolis
arda.goknil@inria.fr

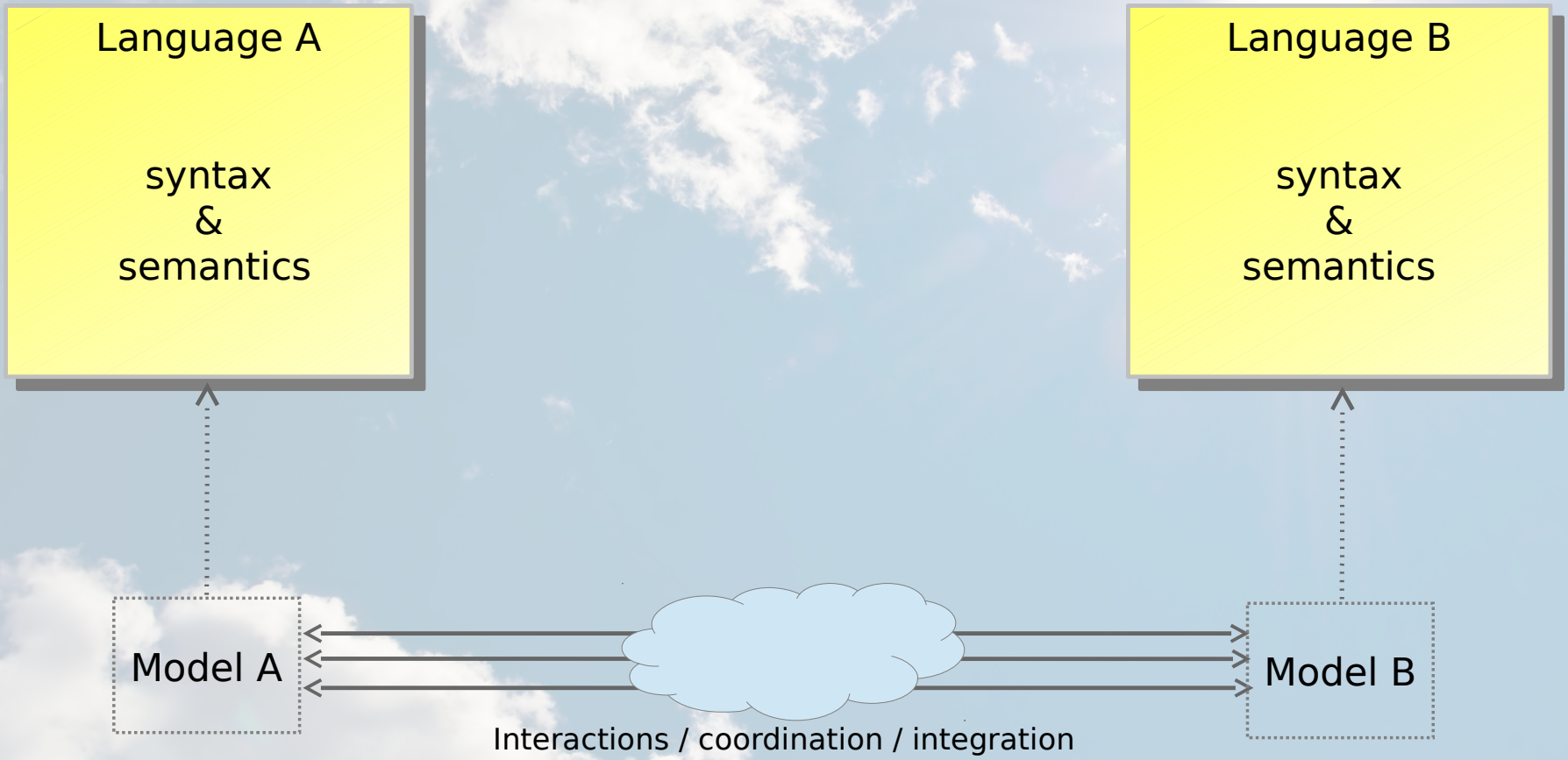
AOSTE team

By julien DeAntoni

Goal


Language A
syntax
&
semantics
Language B
syntax
&
semantics
Model A
Model B

Goal


Language A
syntax
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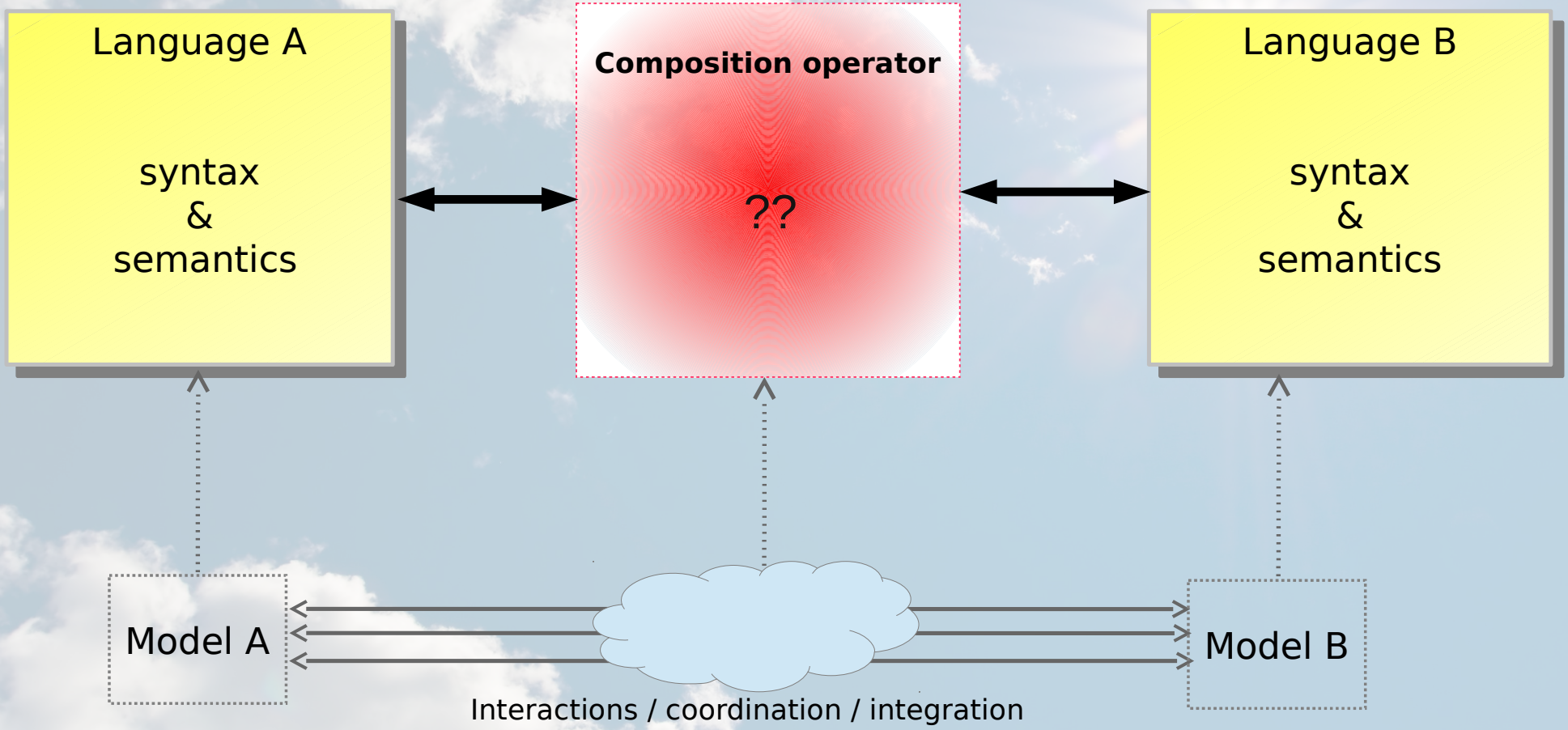
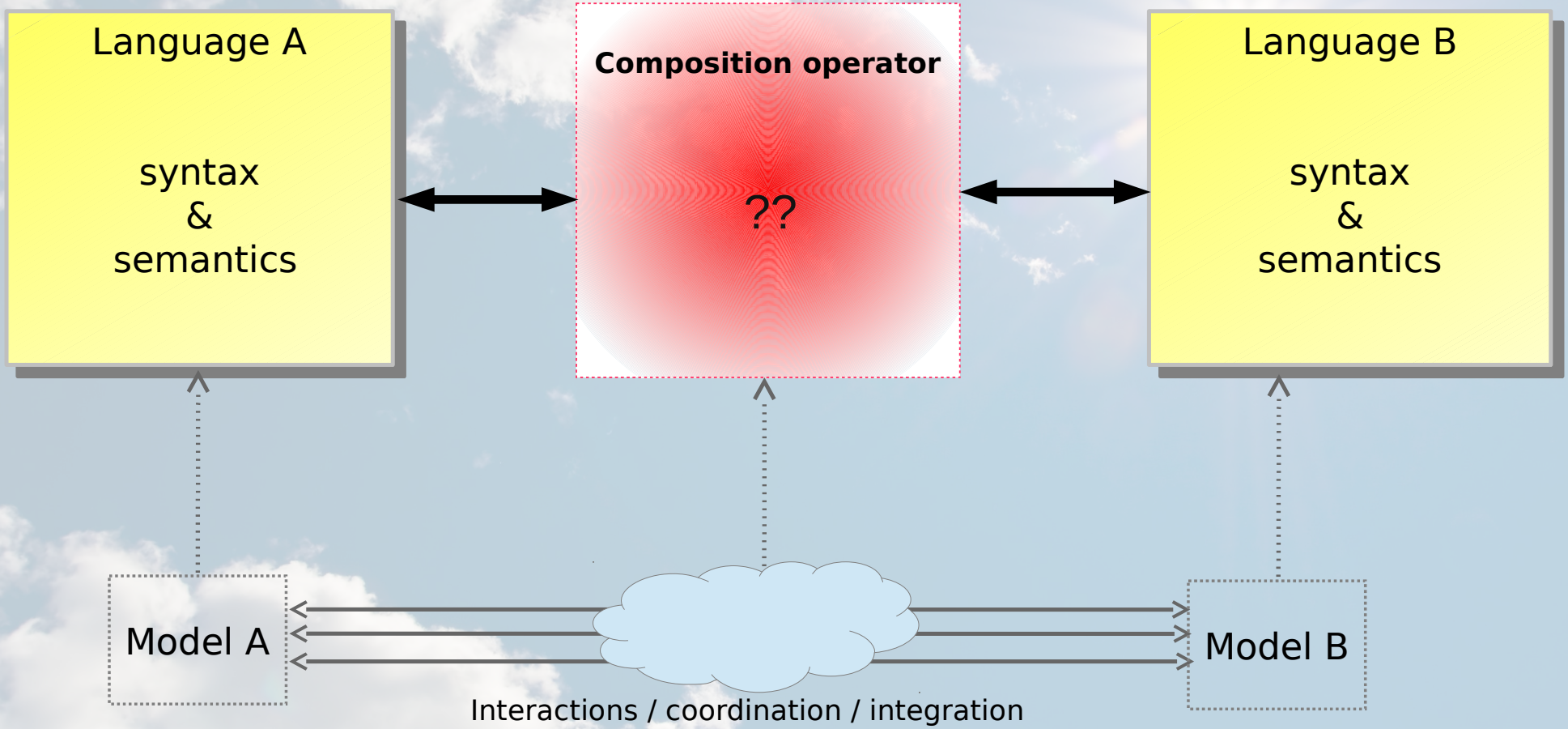
Interactions / coordination / integration

Goal

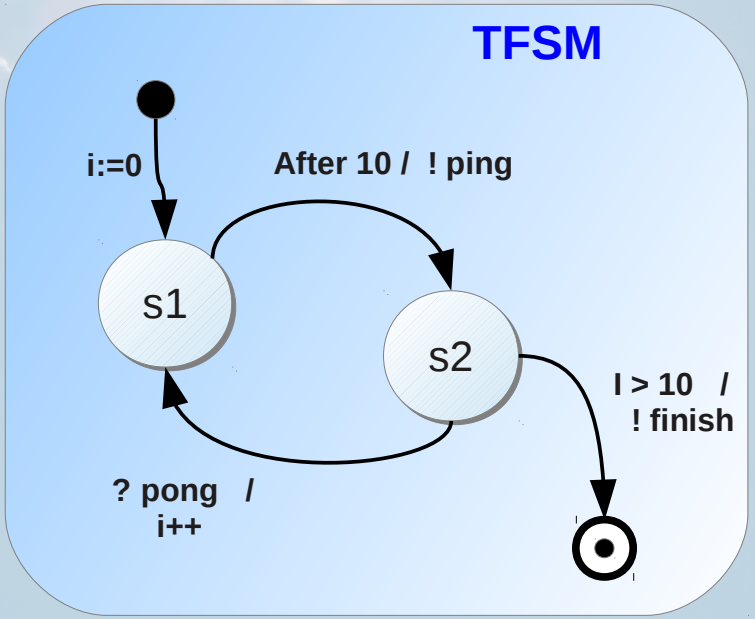

Language A
syntax
&
semantics
Composition operator
??
Language B
syntax
&
semantics
Model A
Model B
Interactions / coordination / integration

Goal



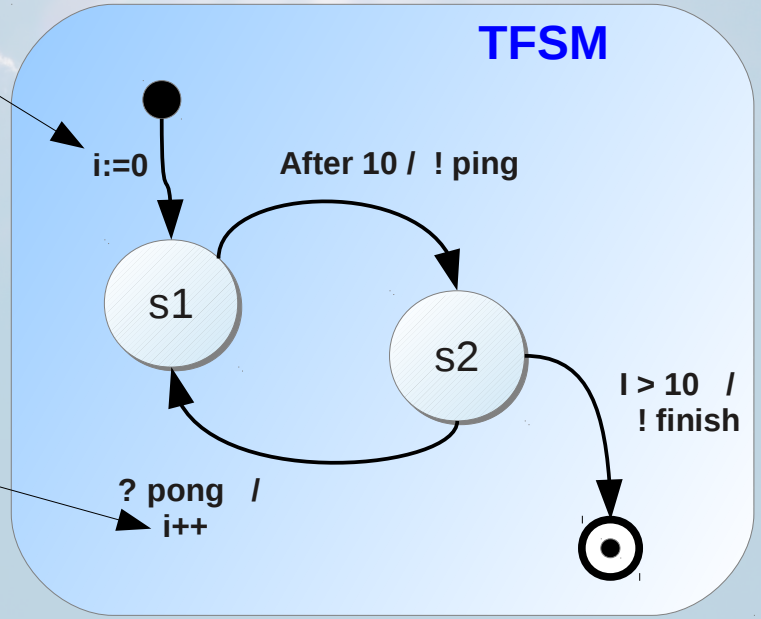
Considering the semantics of a language as opaque (as a whole) makes difficult the composition

from what ingredients the semantic domain is made up with ?



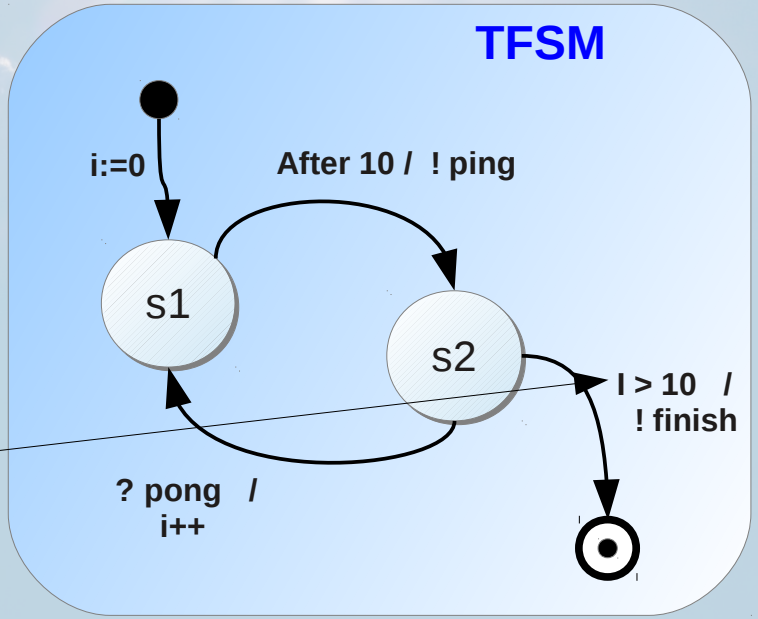
from what ingredients the semantic domain is made up with ?

- Data “management”
  - Structuring
  - Computing
  - …



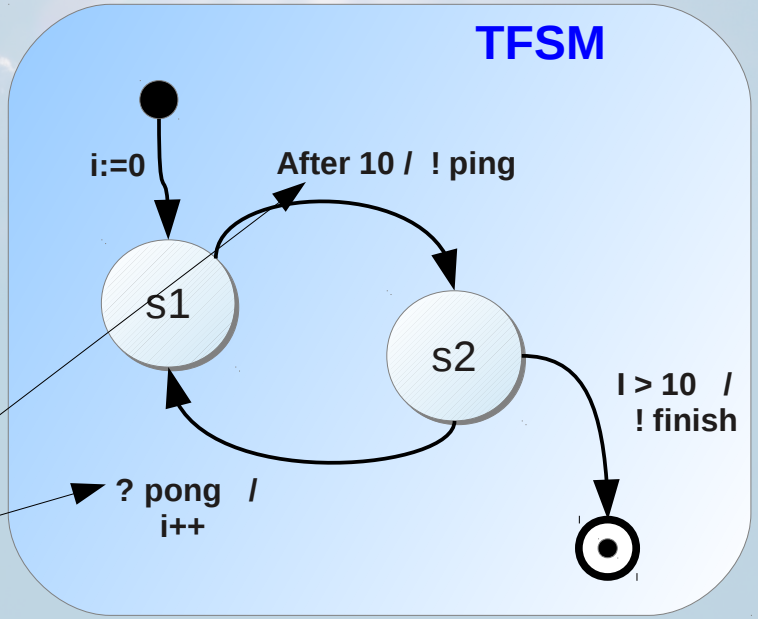
from what ingredients the semantic domain is made up with ?

- Data management
  - Structuring
  - Computing
  - …
- Conditional control
  - If (boolean condition)



from what ingredients the semantic domain is made up with ?

- Data management
  - Structuring
  - Computing
  - …
- Conditional control
  - If (boolean condition)
  - When
    - Internal control (tokens)
    - External control (events)



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- Data management
  - Structuring
  - Computing
  - …
- Conditional control
  - If (boolean condition)
  - When
    - *Internal* control
    - *External* control

from what ingredients the semantic domain is made up with ?

- "sequential" semantics specification
  - Operational
  - Axiomatic
  - Translational
  - …
- Concurrency specification
  - Tagged structure
  - Event structure
  - Model of Computation
  - …

Specifies evolution of the model state

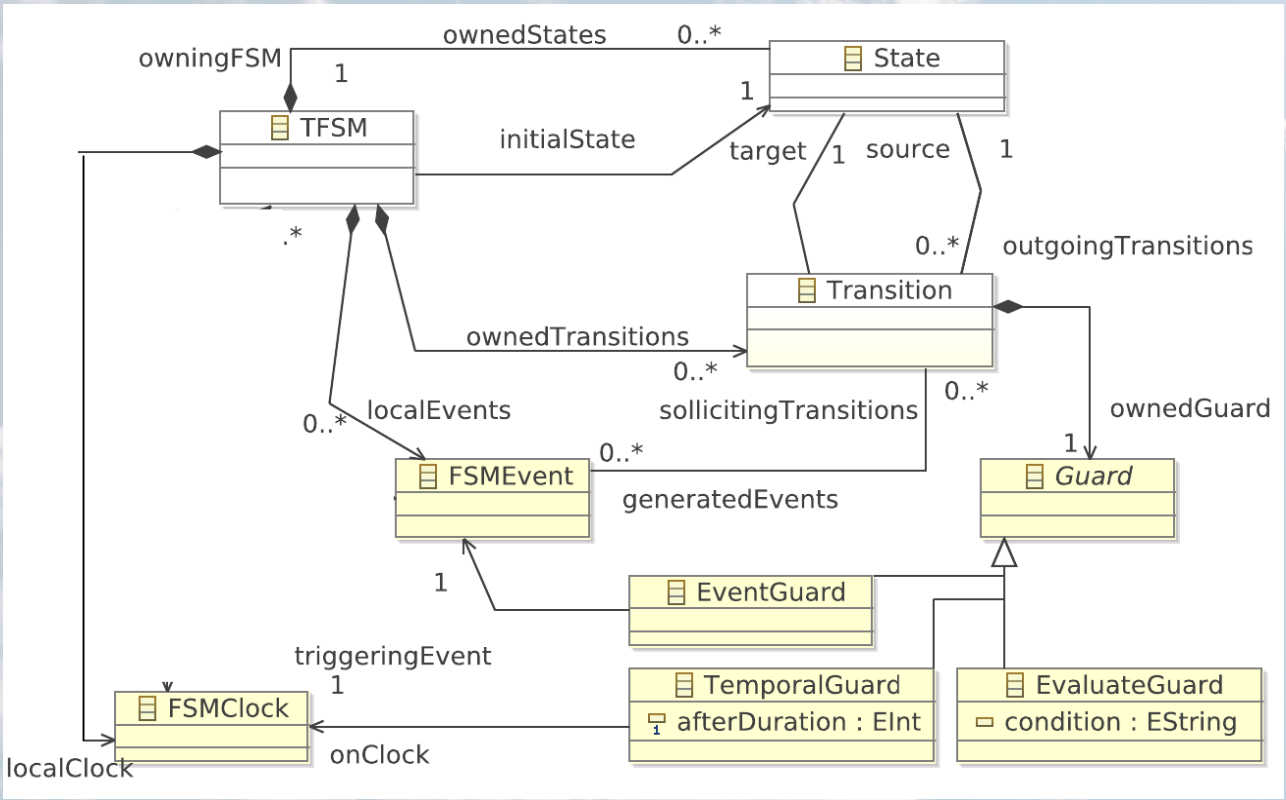
Specifies (possibly timed) Causal relation and synchronization

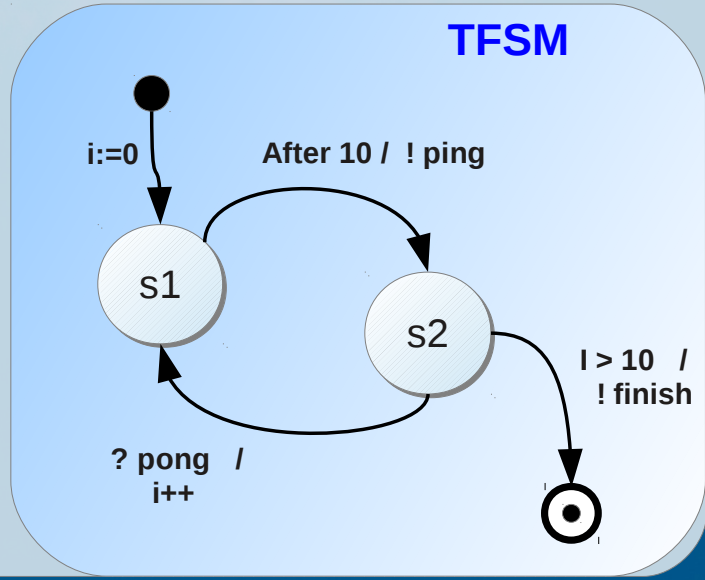
Language Theory

Concurrency Theory

from what ingredients a DSML is made up with ?

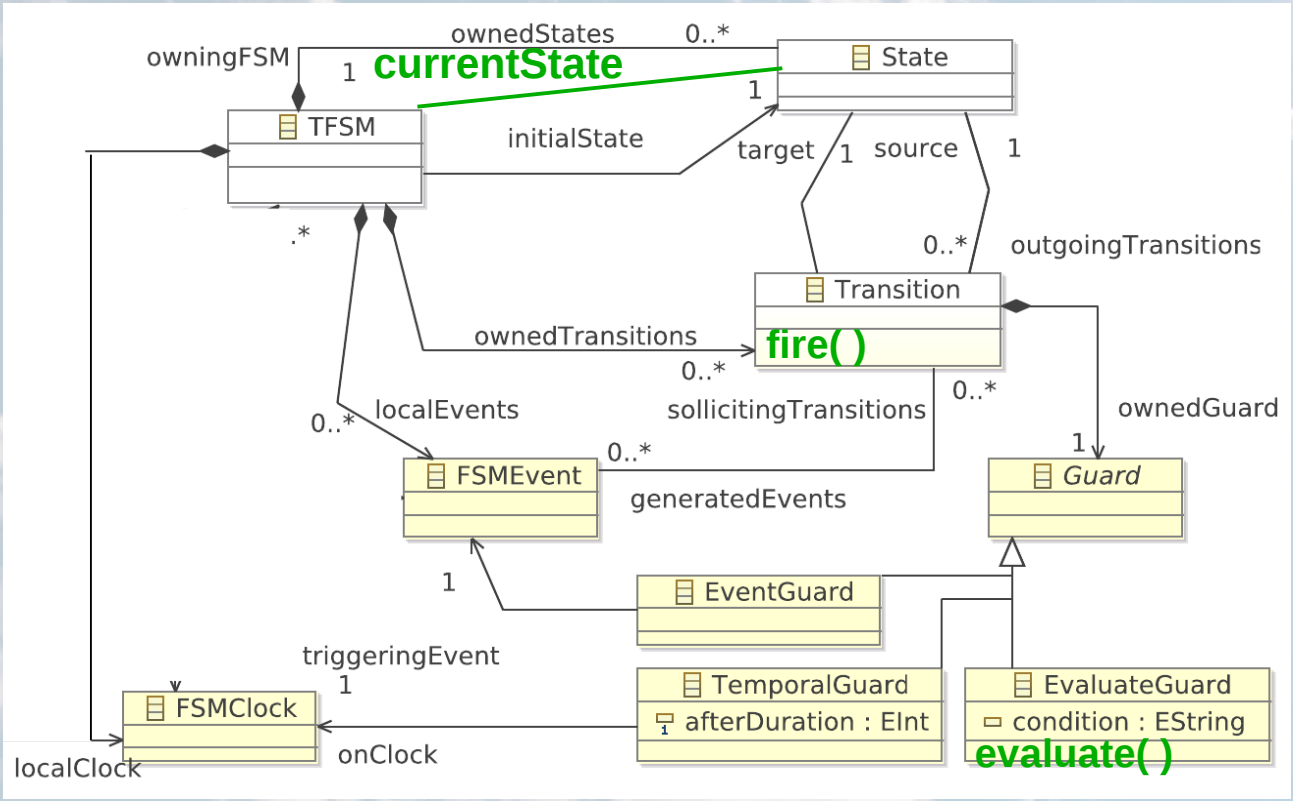
DSML $\stackrel{def}{=}$ < Abstract Syntax, … , … , … >

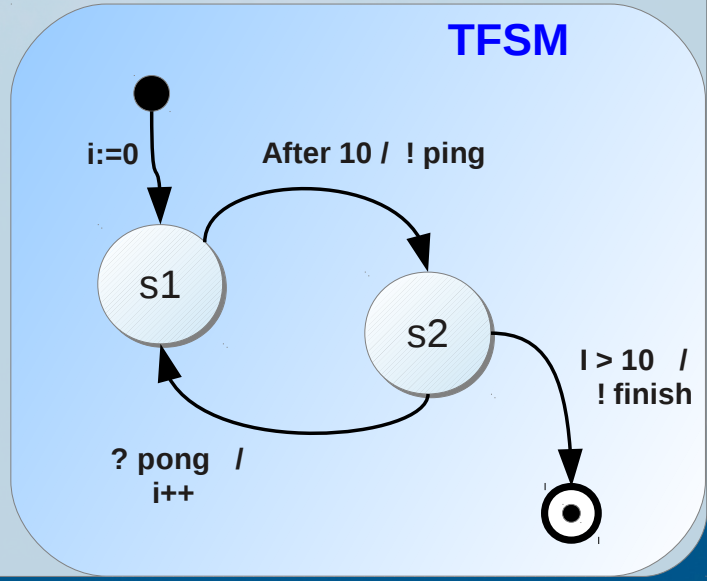




from what ingredients a DSML is made up with ?

DSML $\stackrel{def}{=}$ < AS, Domain Specific Actions, … , … >





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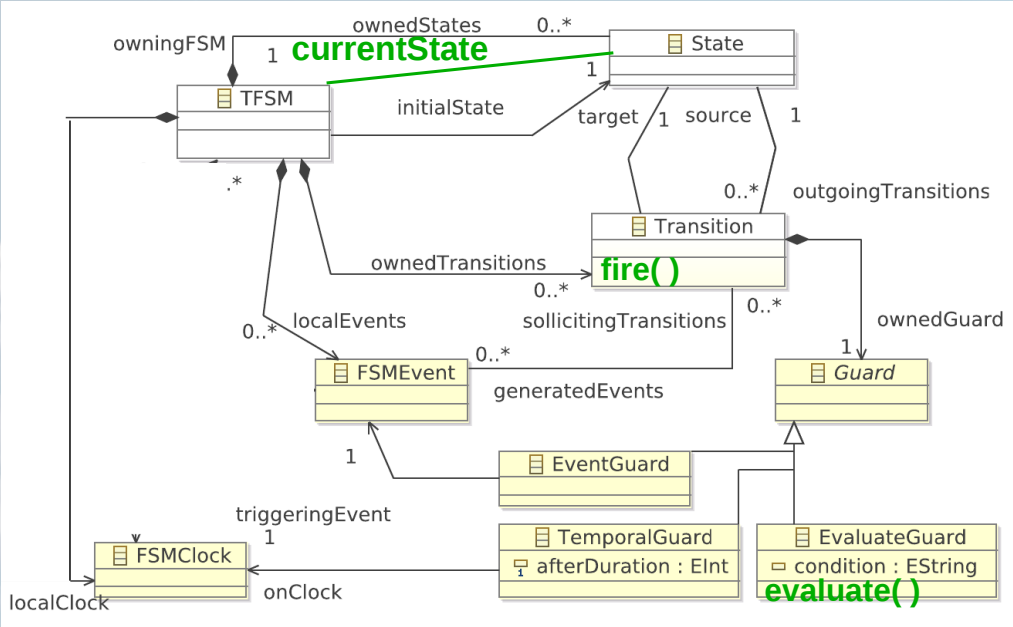

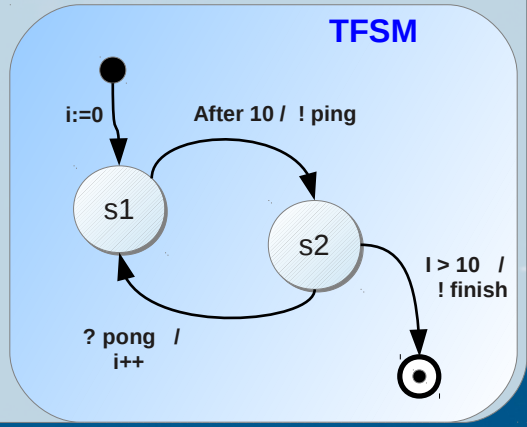

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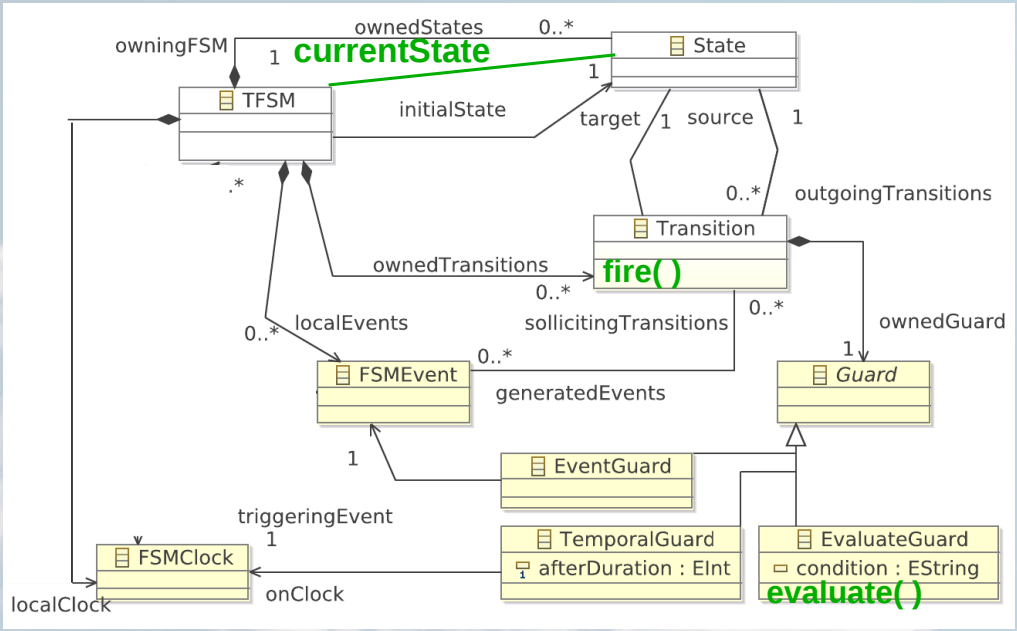

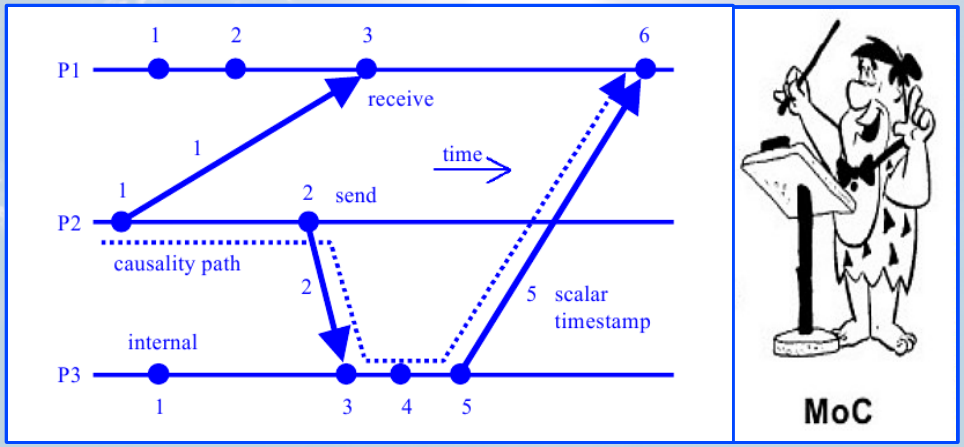

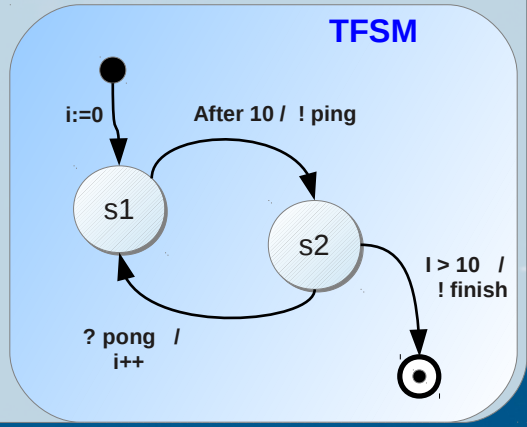

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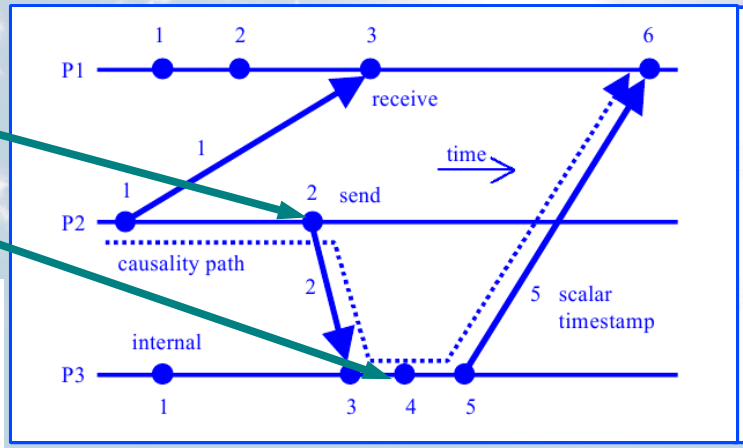
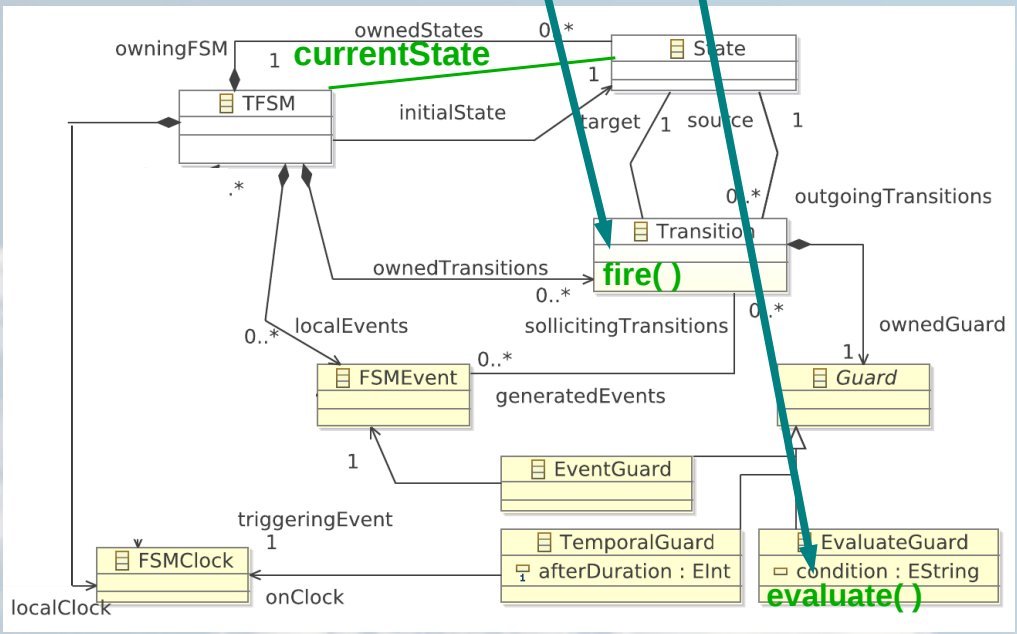
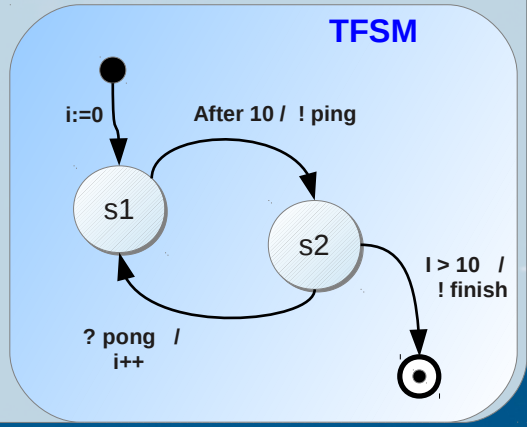
DSML $\stackrel{def}{=}$ < AS, DSA, Domain Specific Events , MoC >







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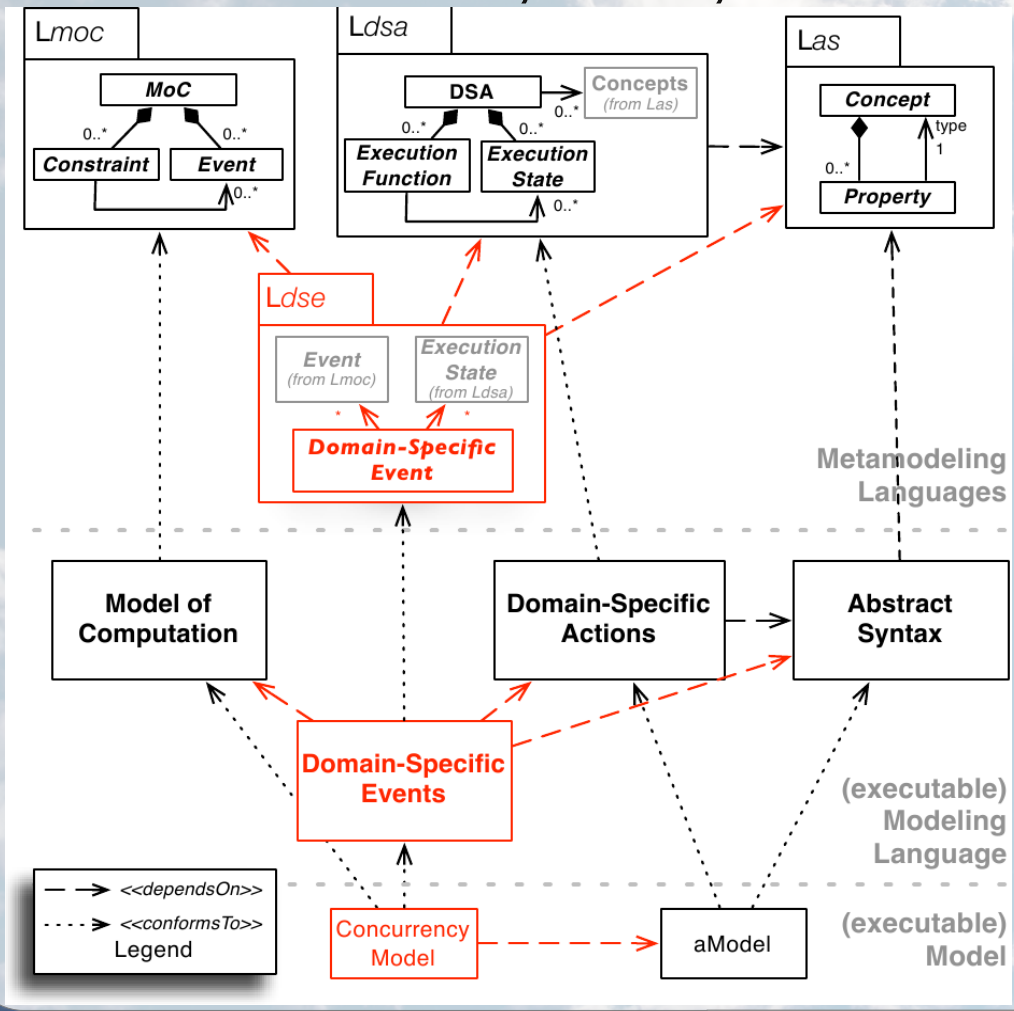
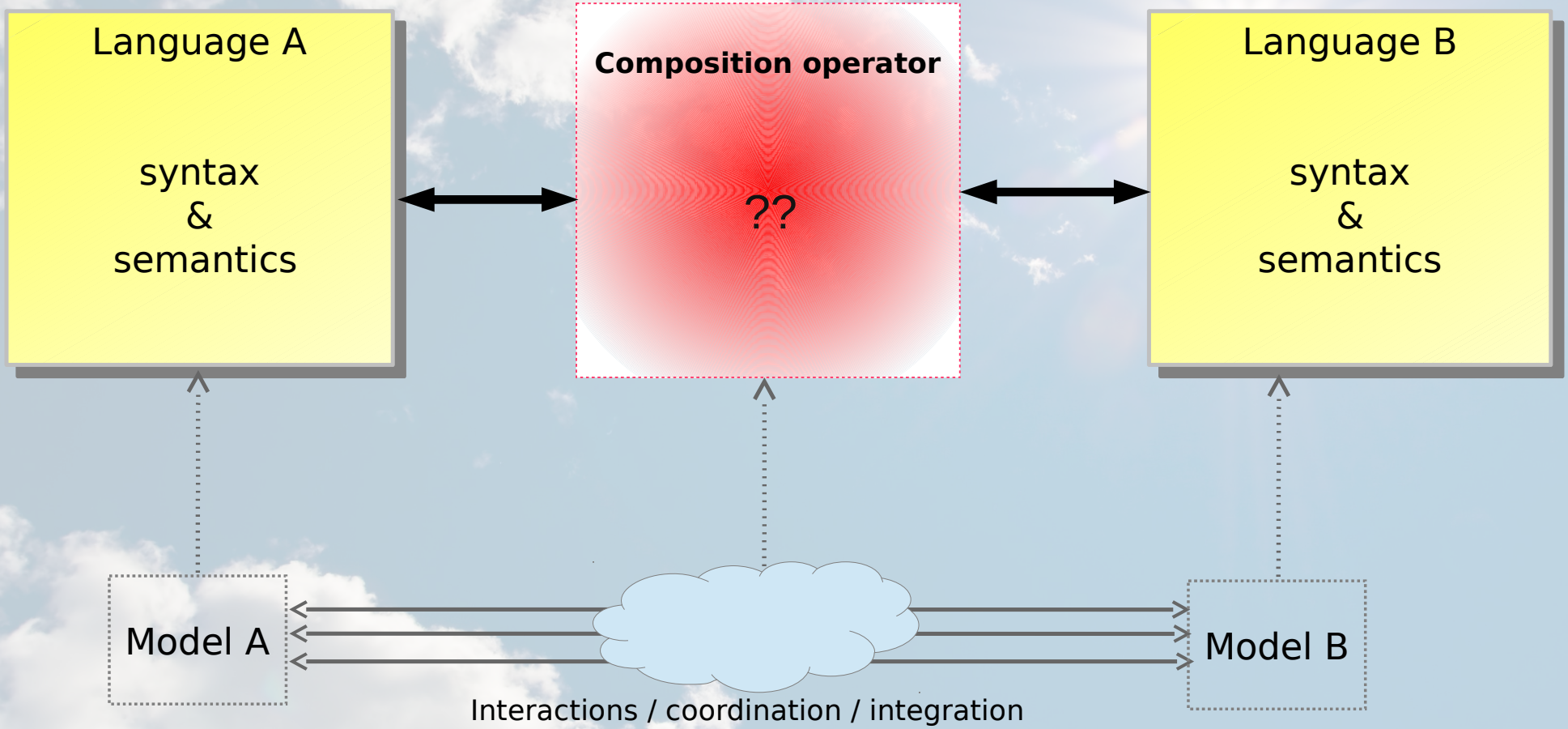


Reifying Concurrency for Executable Metamodeling (Benoit Combemale, Julien Deantoni, Matias Vara Larsen, Frédéric Mallet, Olivier Barais, Benoit Baudry, Robert France), In 6th International Conference on Software Language Engineering (SLE 2013) (Richard F. Paige Martin Erwig, Eric van Wyk, eds.), Springer-Verlag, 2013. [bibtex] [pdf]

Goal



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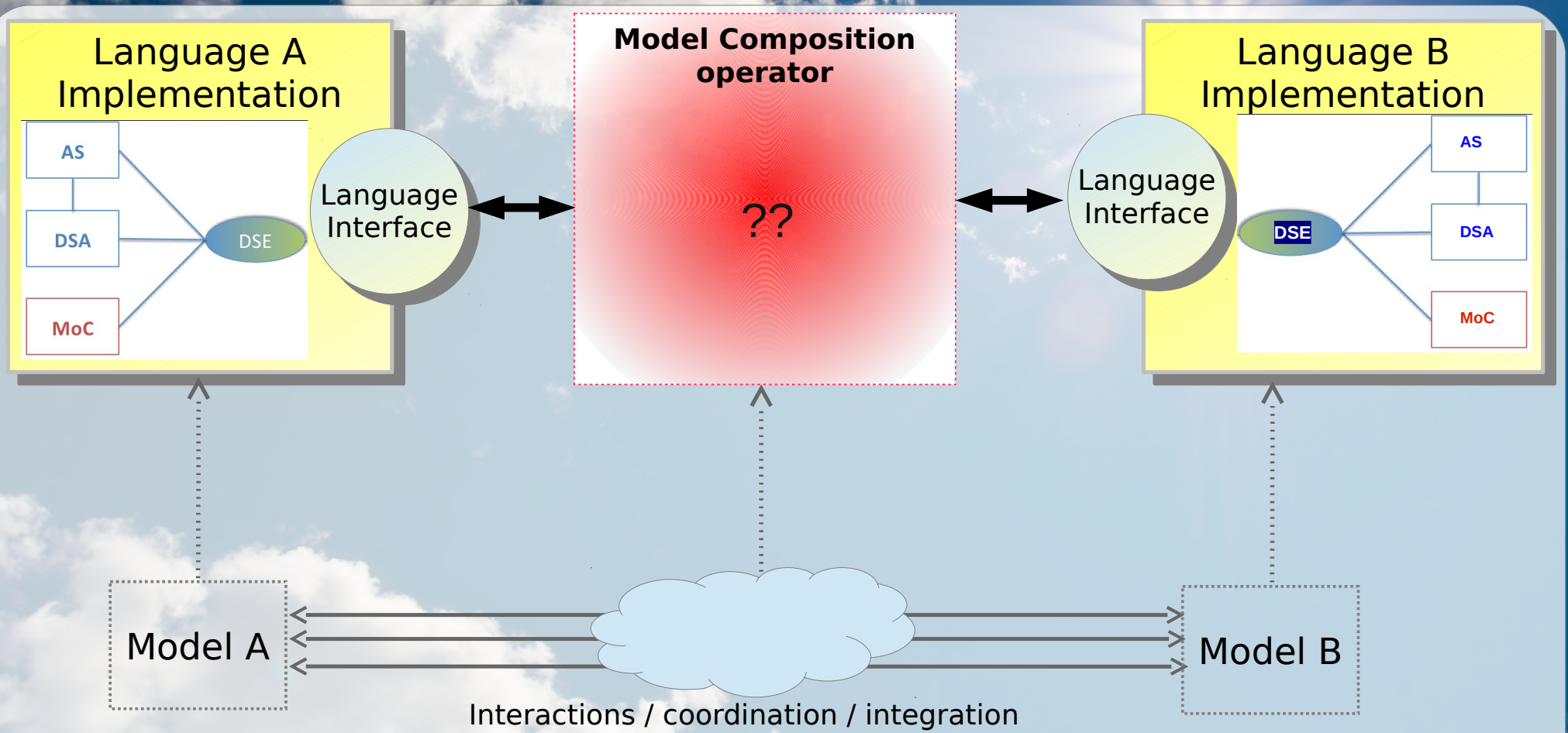
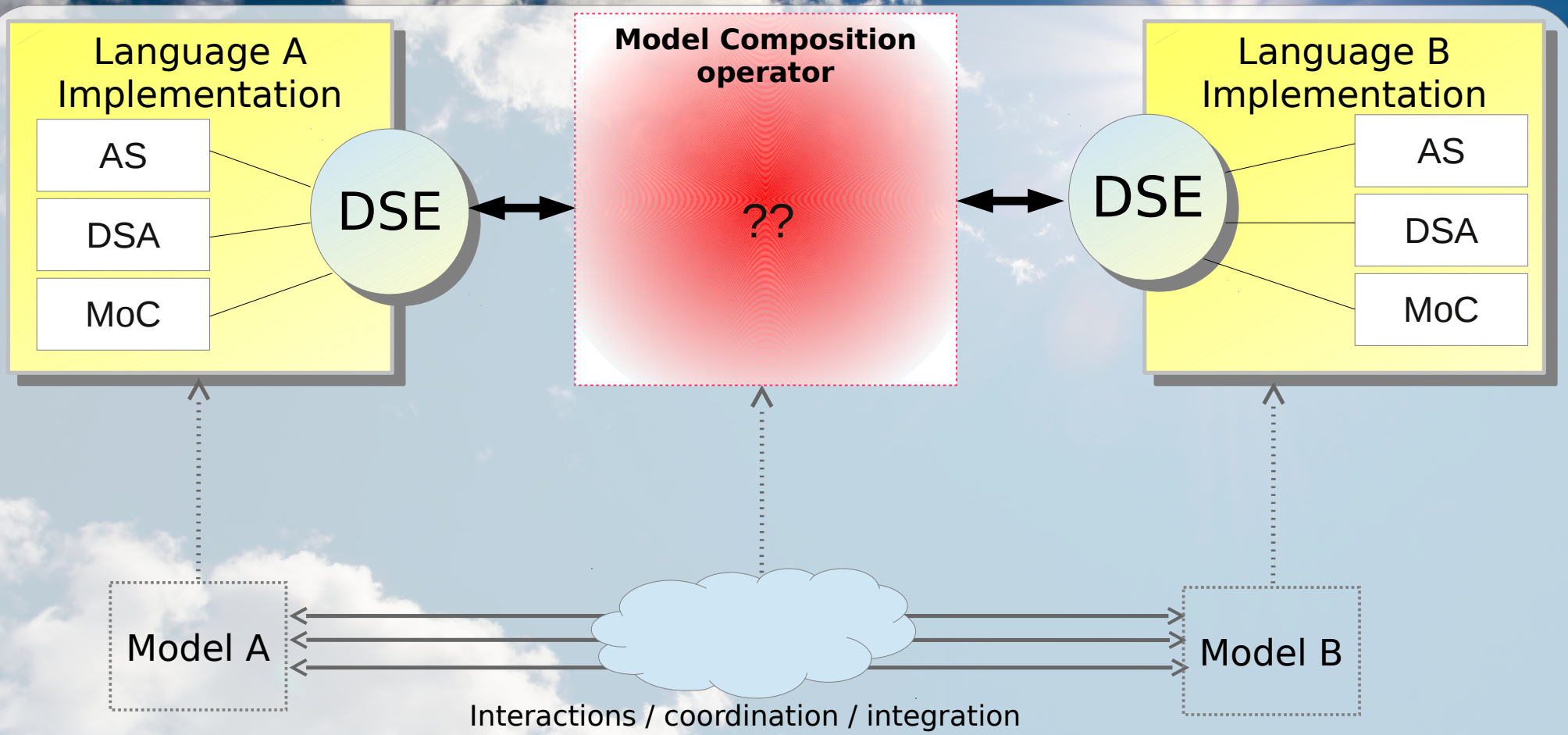
Global Approach



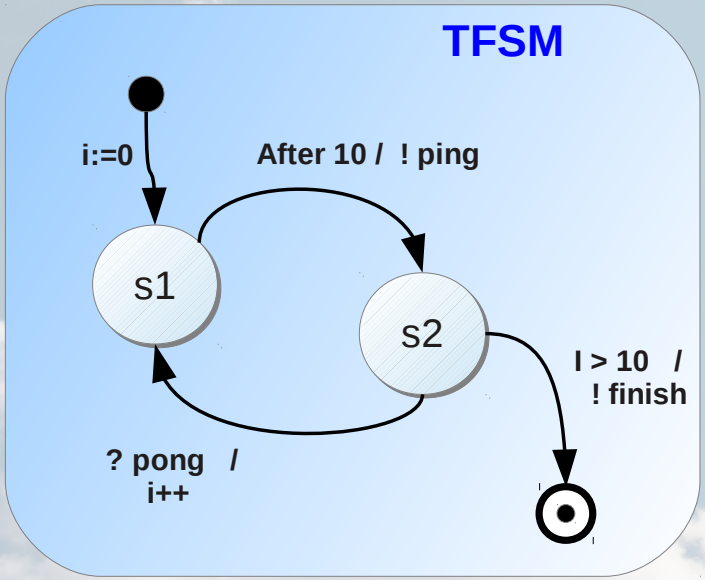
Actual Approach

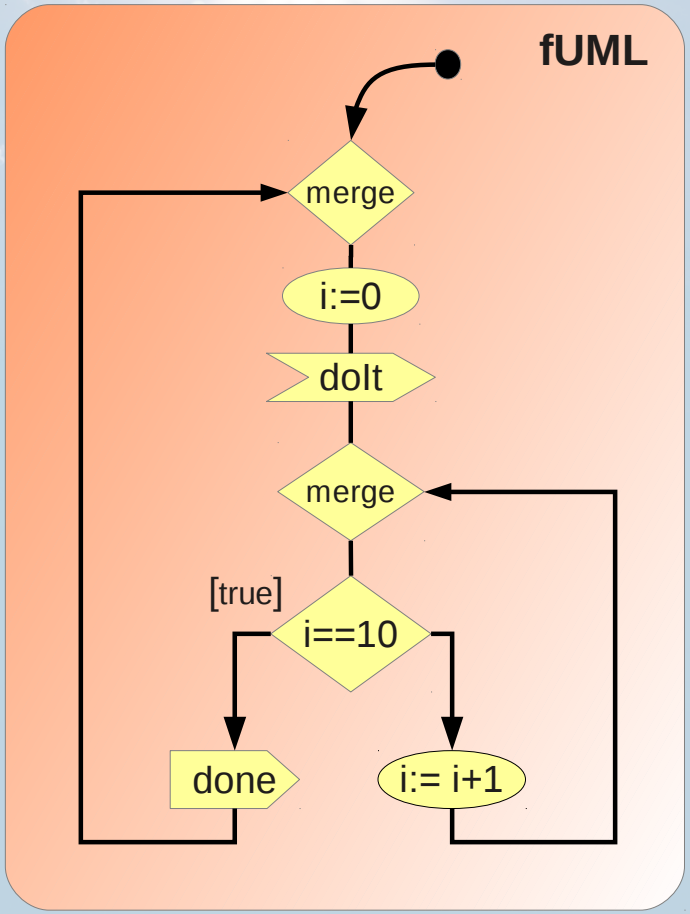


DSE acts as an interface of the language for the "coordination" of its models

model behavioral composition

- DSML $\stackrel{def}{=}$ < AS, DSA, Domain Specific Events , MoC >





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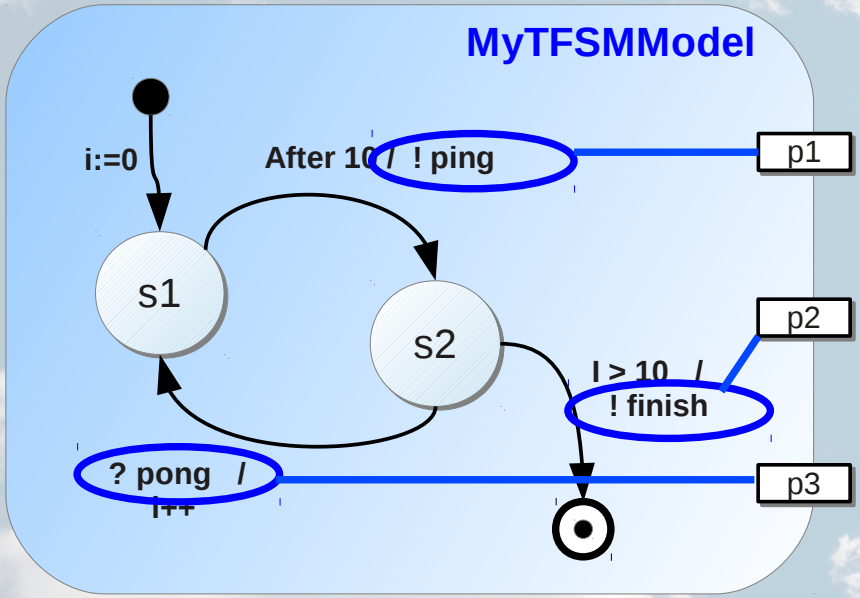

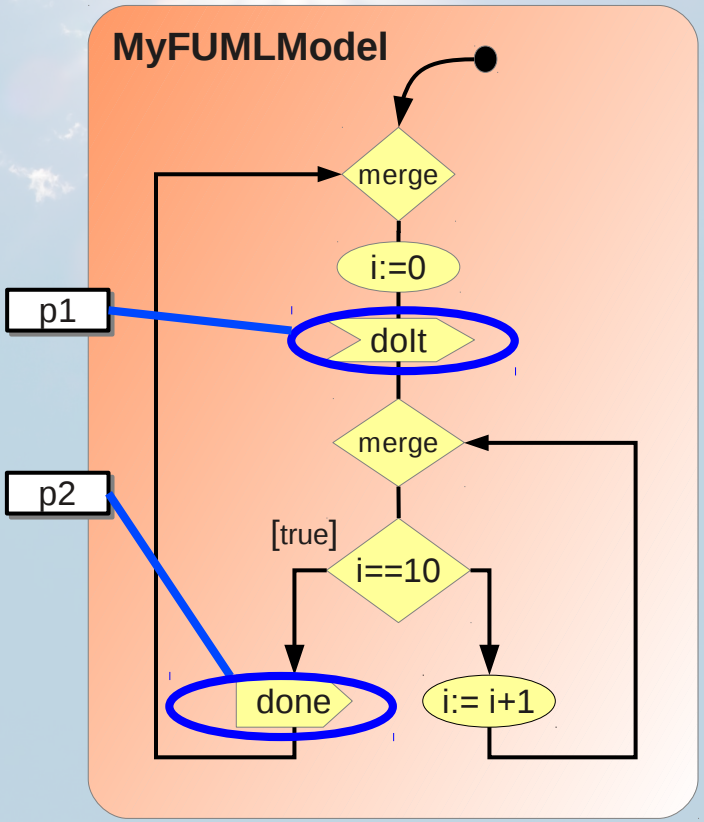

Instances of Domain Specific Events acts as coordination interfaces

model behavioral composition

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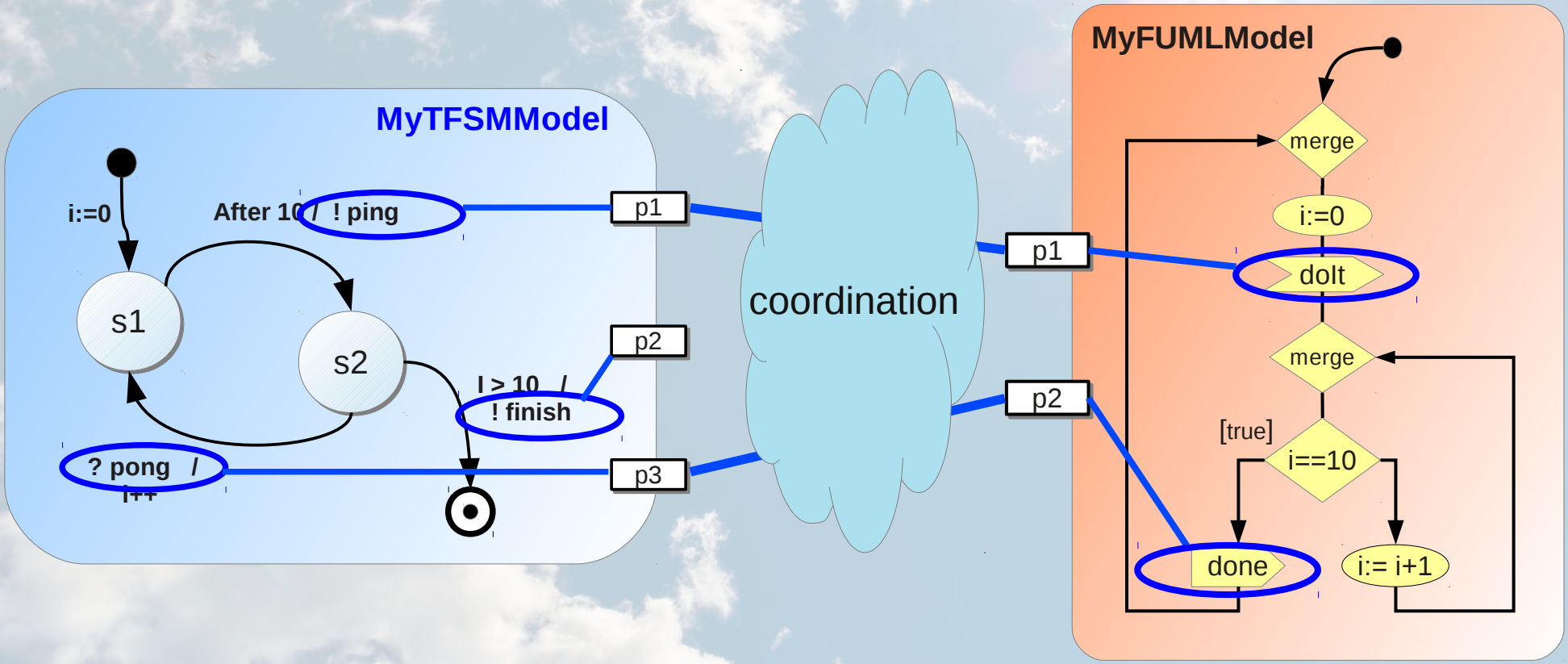

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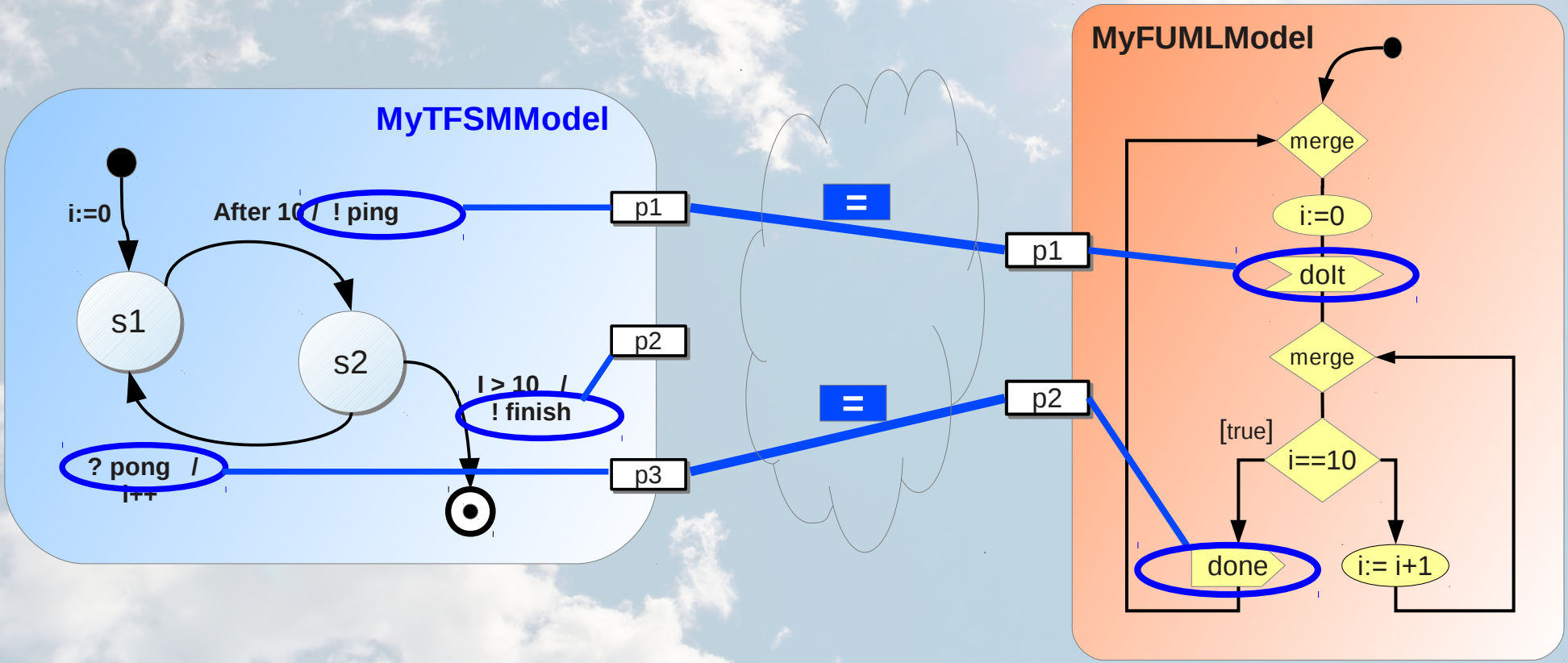

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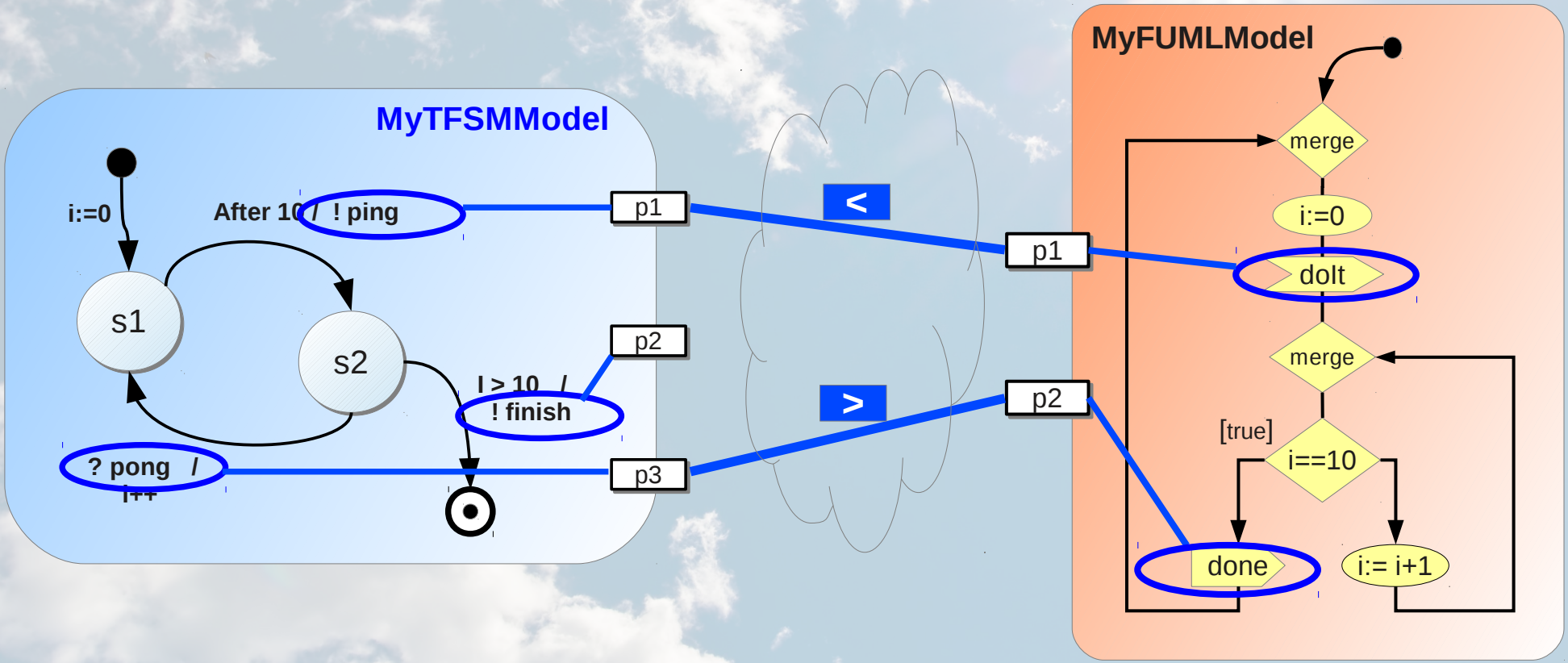

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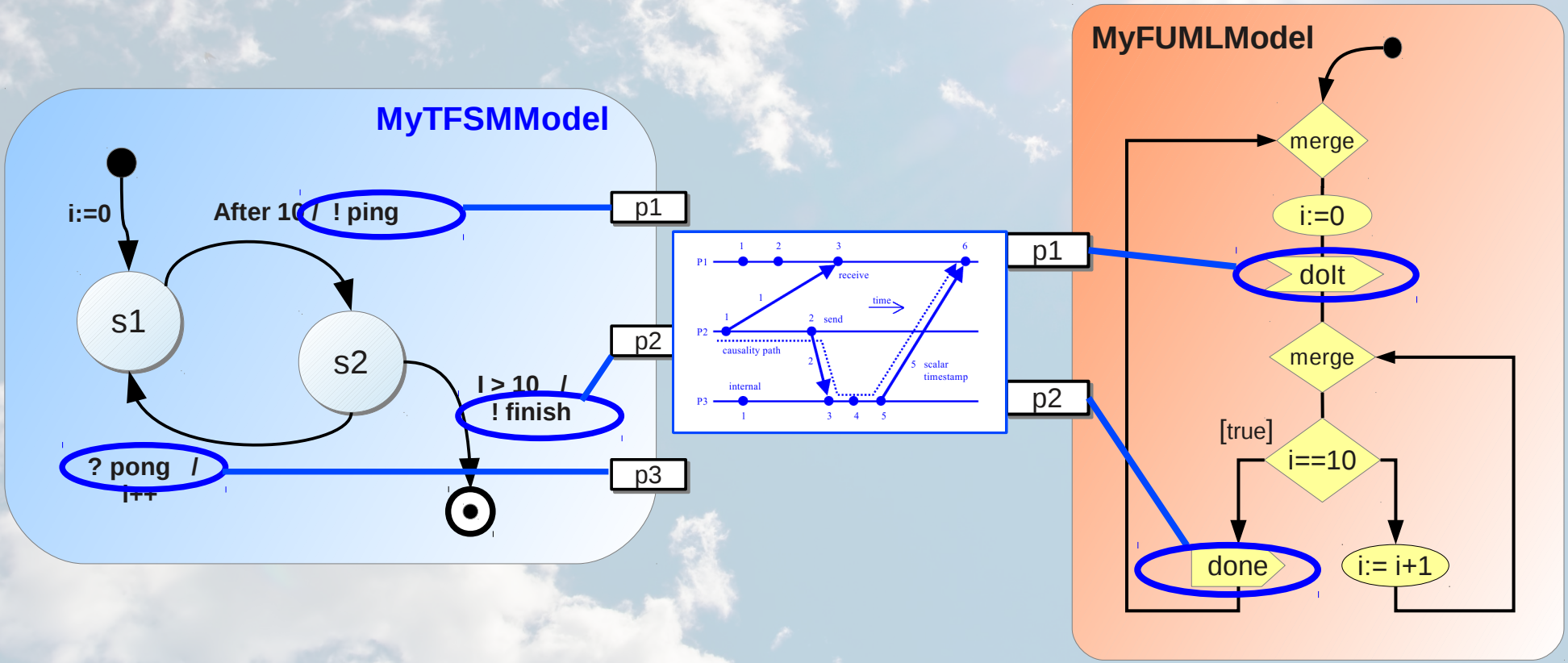

Instances of Domain Specific Events acts as coordination interfaces

Thank you
http://gemoc.org/ins/

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SUPPORTED BY
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