

# An EMF Framework for Event-B

Developed by:

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**Deploy**

Integrated Project IST 214158

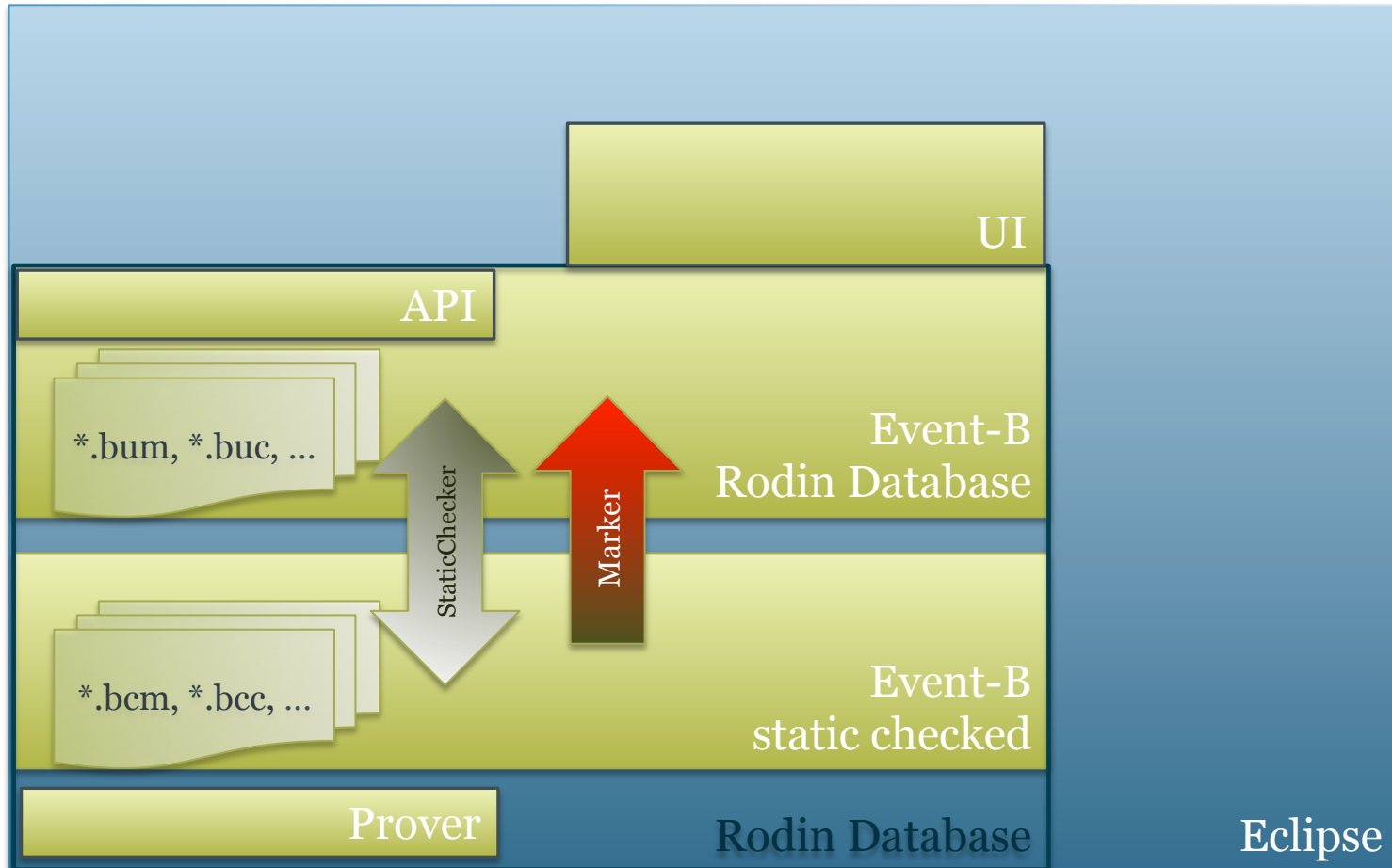
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# EMF

- Eclipse Modelling Framework (Ed Merks et al.)
- Meta-modelling notation (abstract syntax)
- Code Generator
  - Model repository (database)
  - Edit support (providers)
- Runtime Support for building tools:
  - Command framework, Persistence, Dynamic (programmatic) EMF
- Lots of related technologies
  - Compare/merge, M2M, M2Text

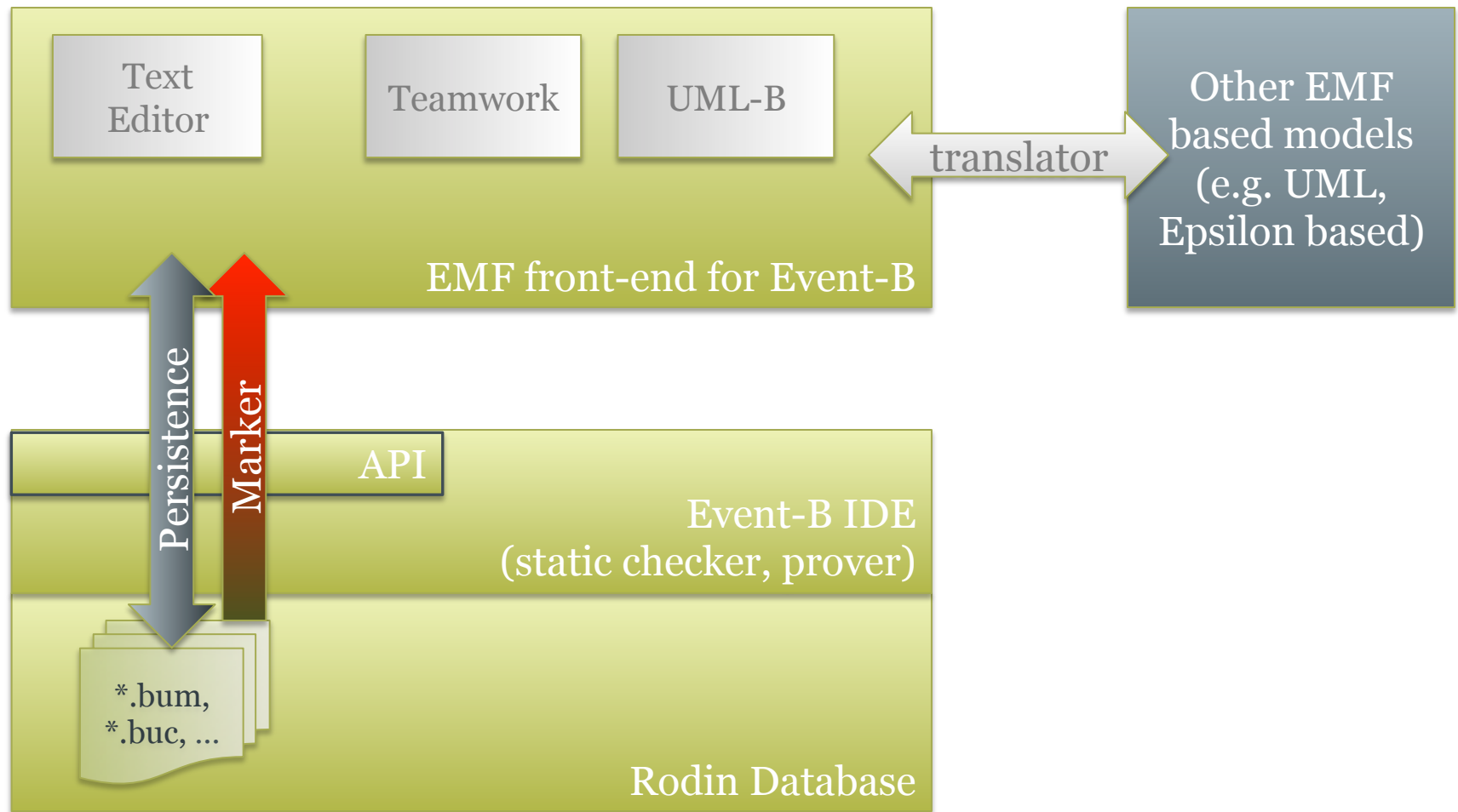
# Rodin platform for Event-B



# Motivation for Event-B EMF

- UML-B – reimplementation to give tighter integration
- Text editor
- Teamworking – EMF Compare/Merge
- Model transformations
- Code generation

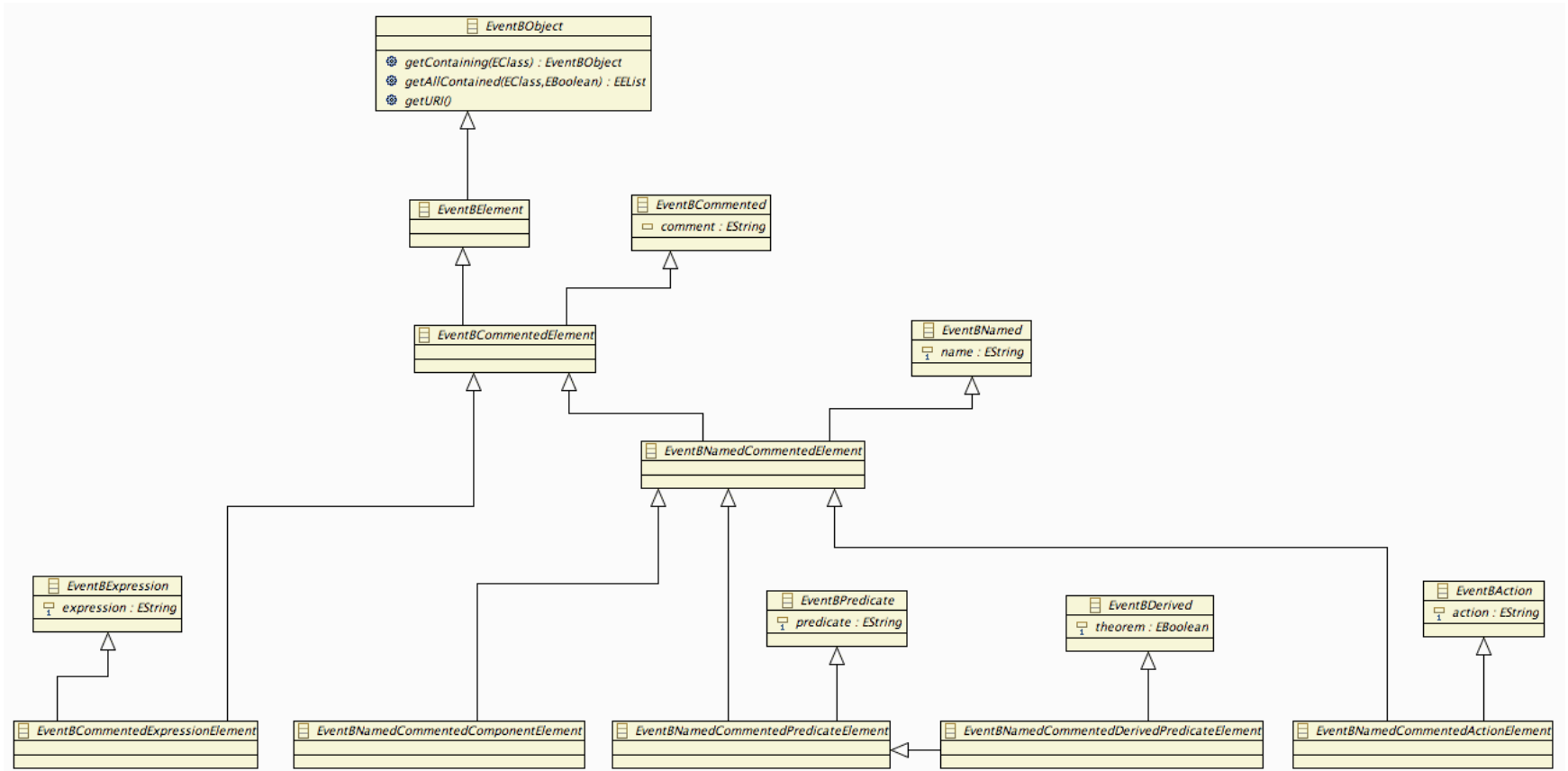
# Front-End Approach



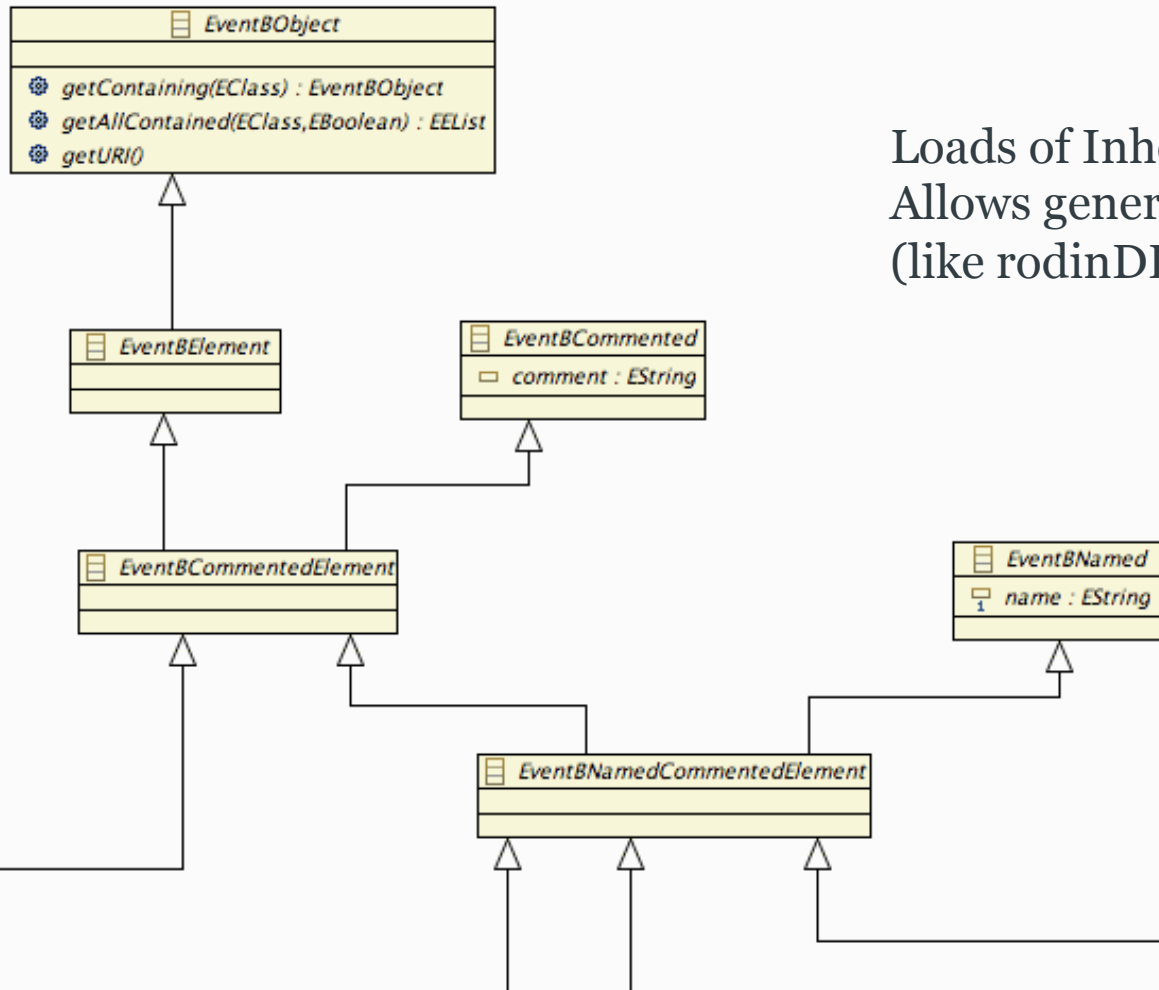
# Event-B Metamodel

- Core package
  - Abstract basis
  - Extension mechanism
  - Project
- Machine package
- Context package

# Abstract Core



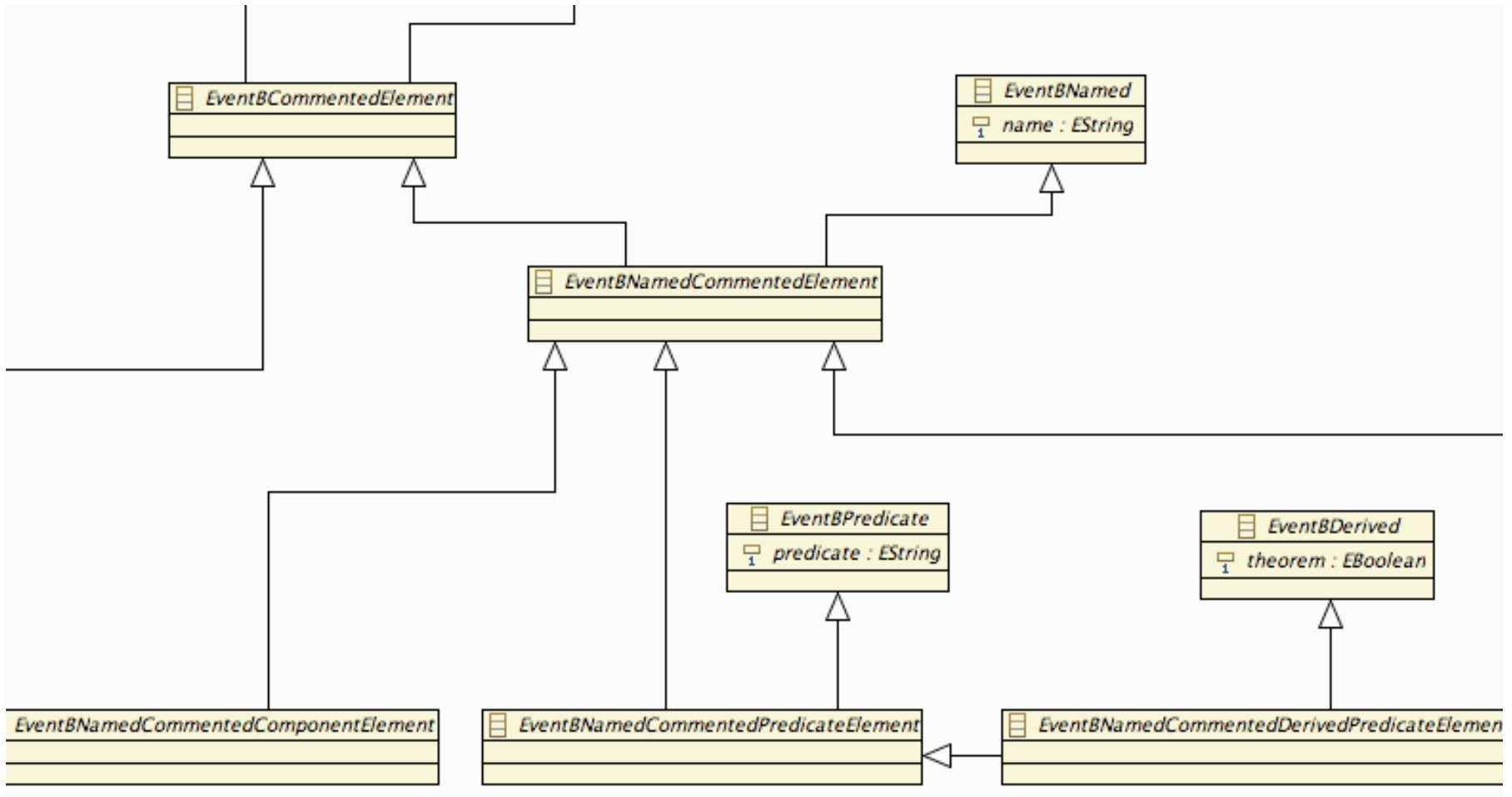
# Abstract Core



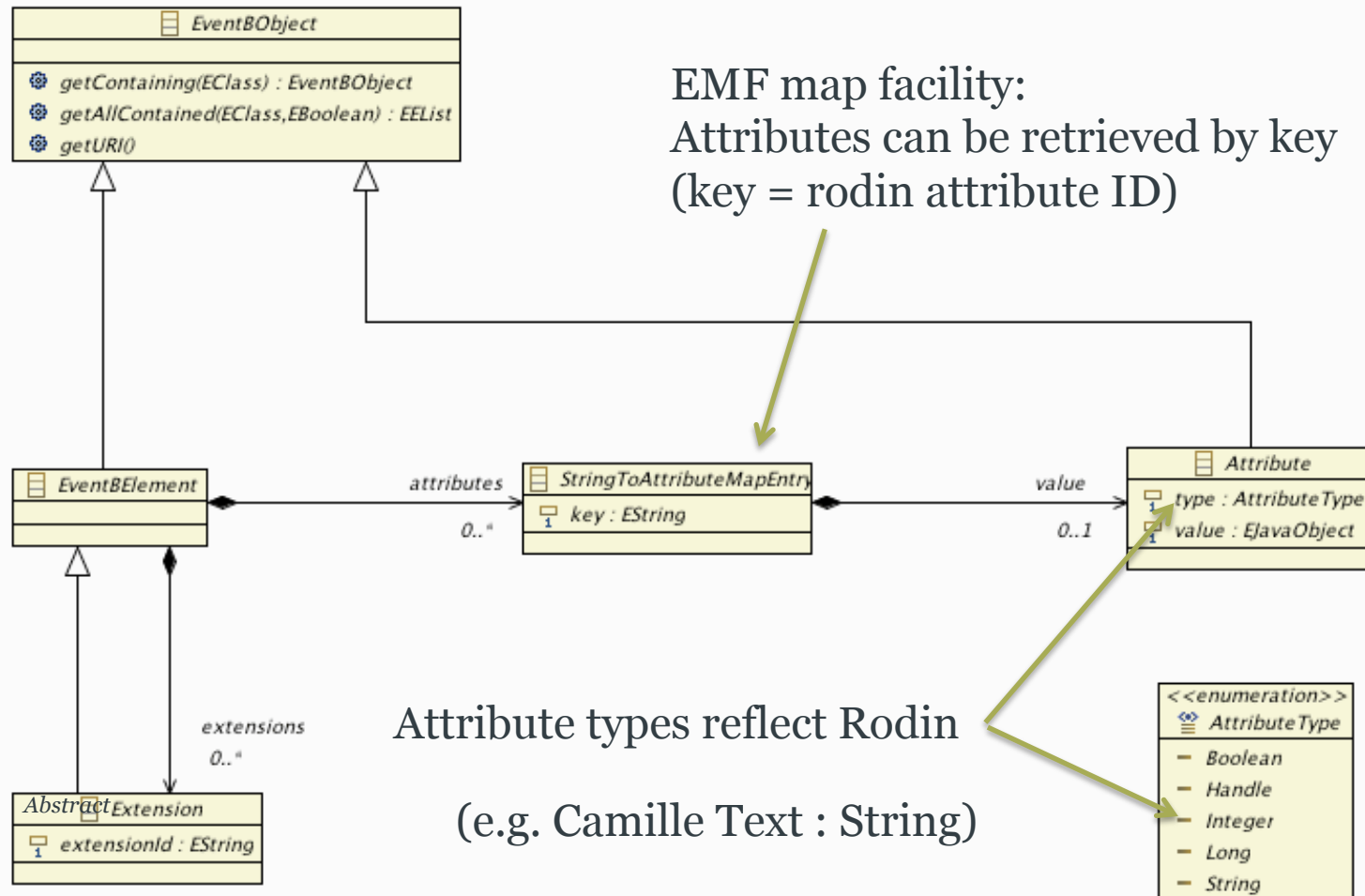
Loads of Inheritance!  
 Allows generic code  
 (like rodinDB does)



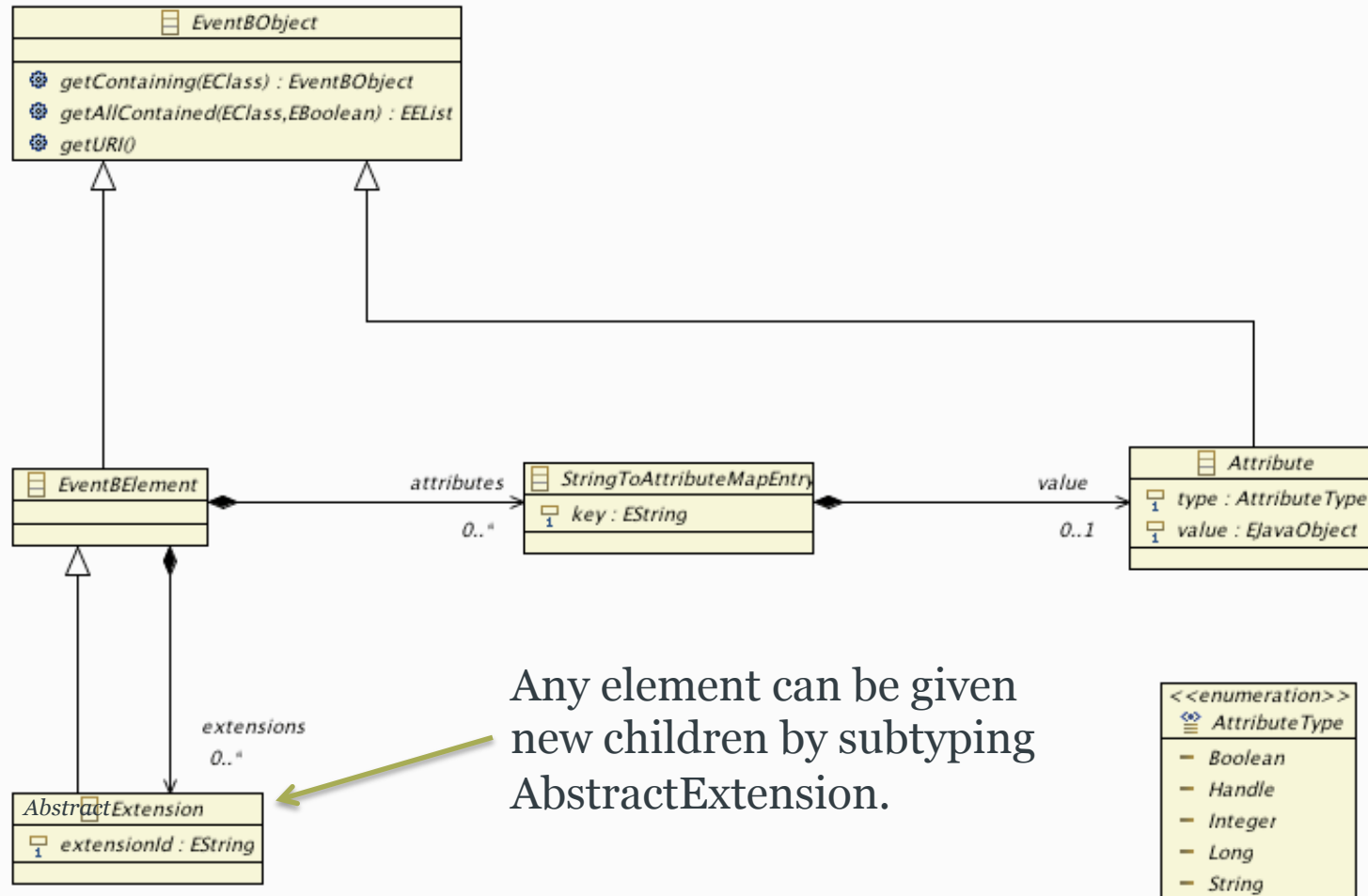
# Abstract Core



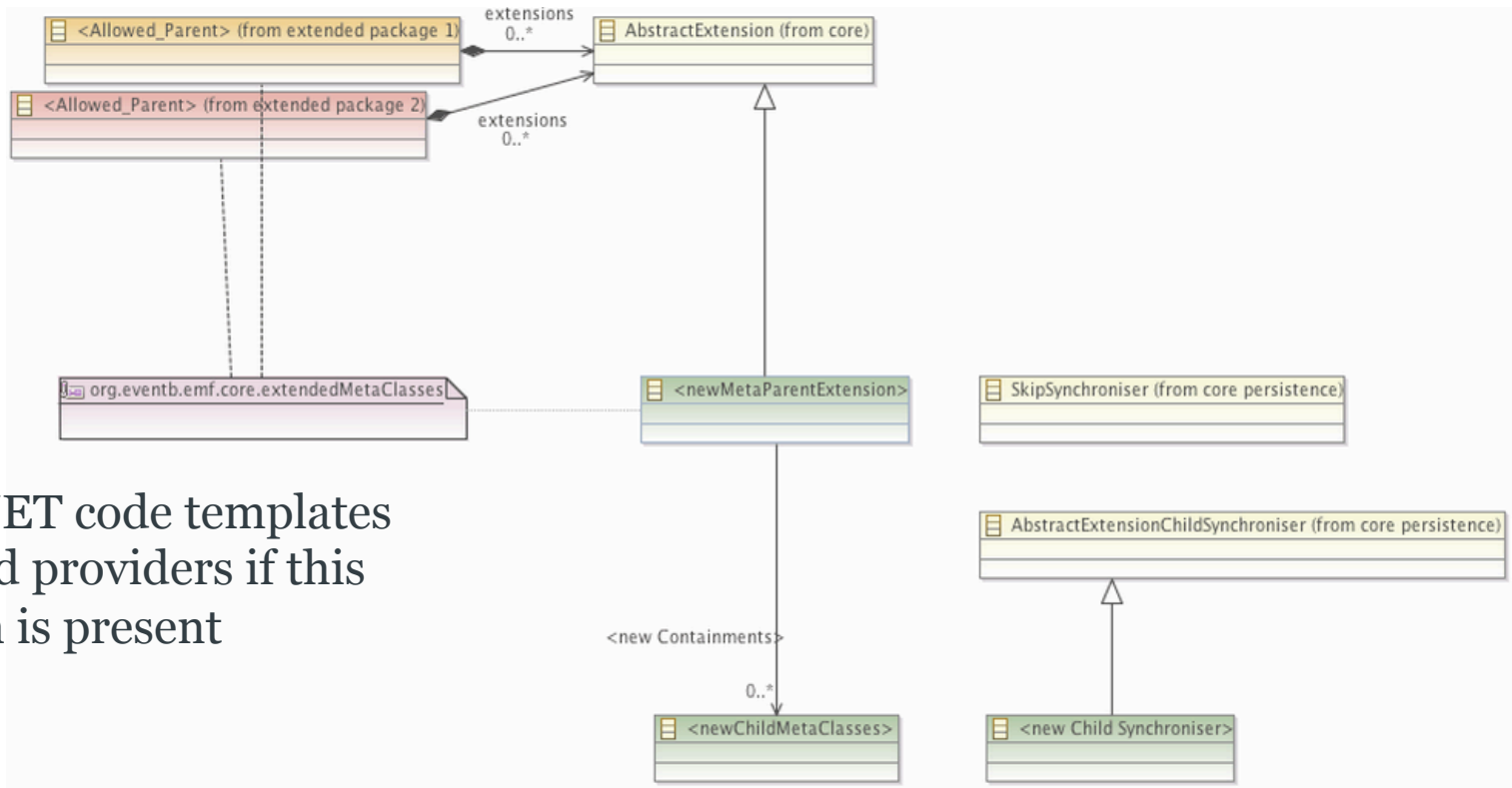
# Extension Mechanism



# Extension Mechanism

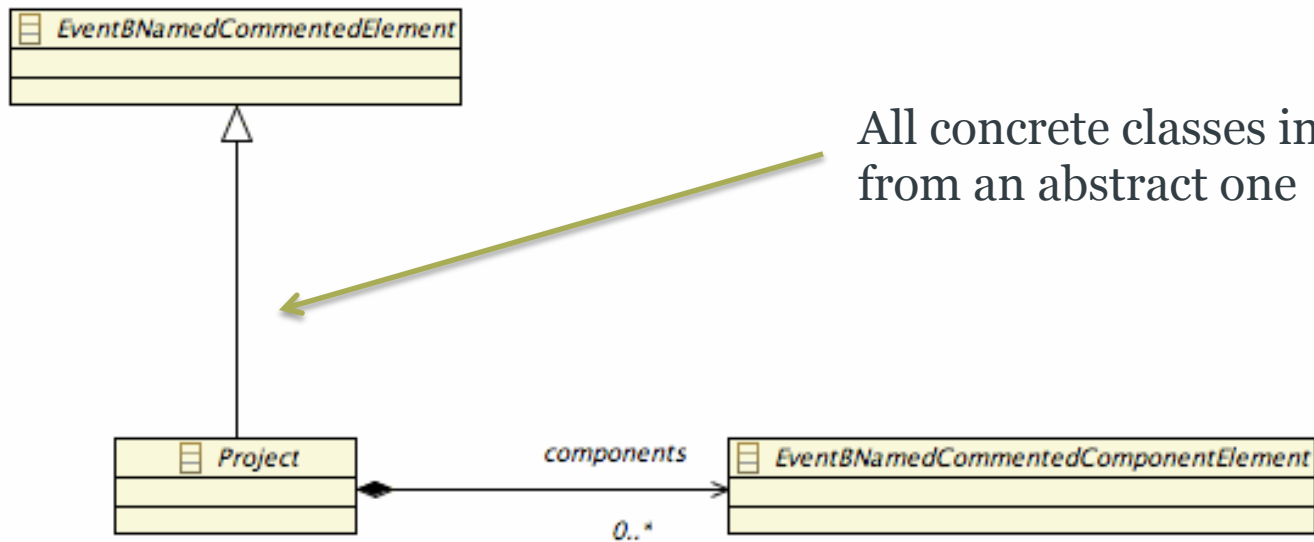


# Extension Mechanism - restricting new children's parents



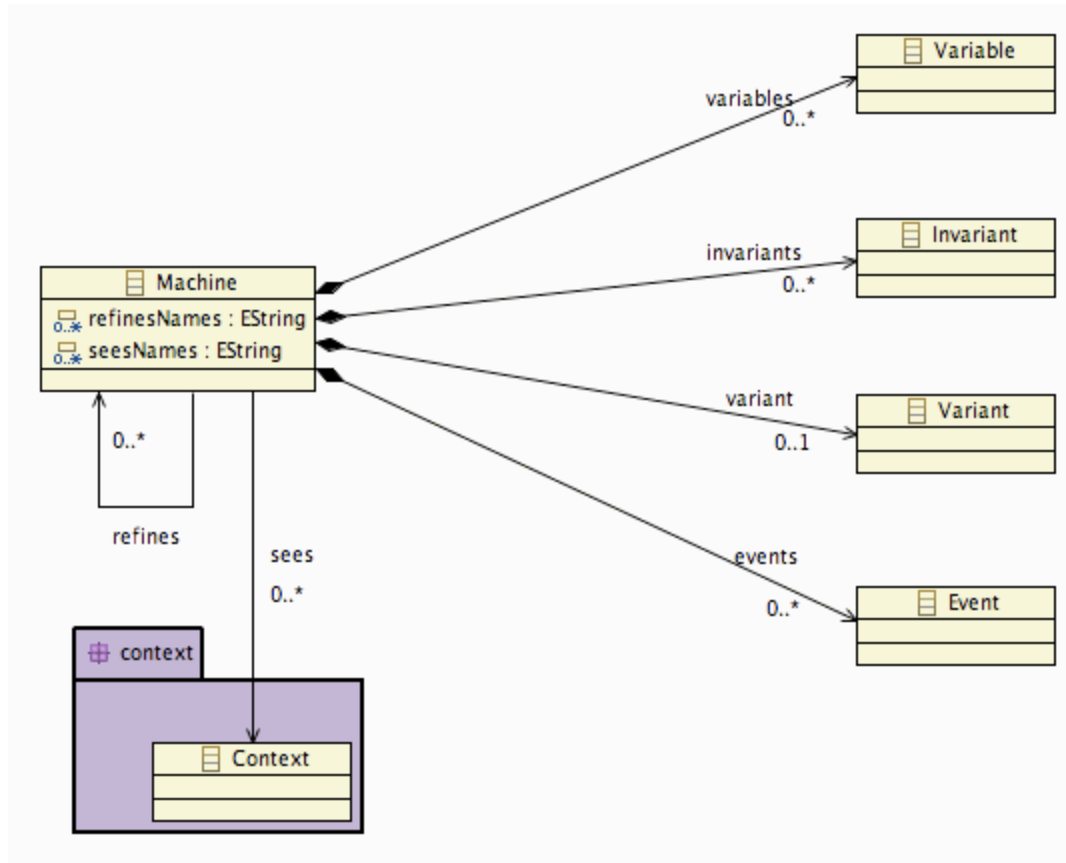
Modified JET code templates  
 adjust child providers if this  
 annotation is present

# Project

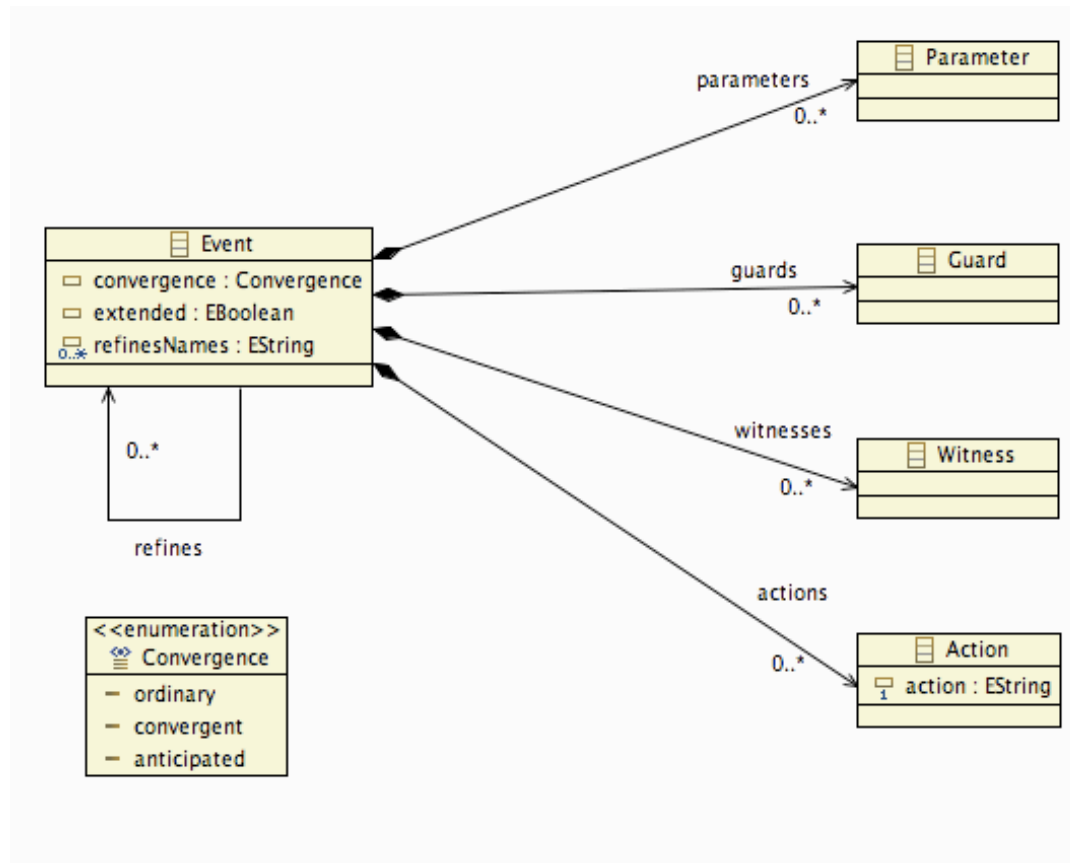


All concrete classes inherit from an abstract one

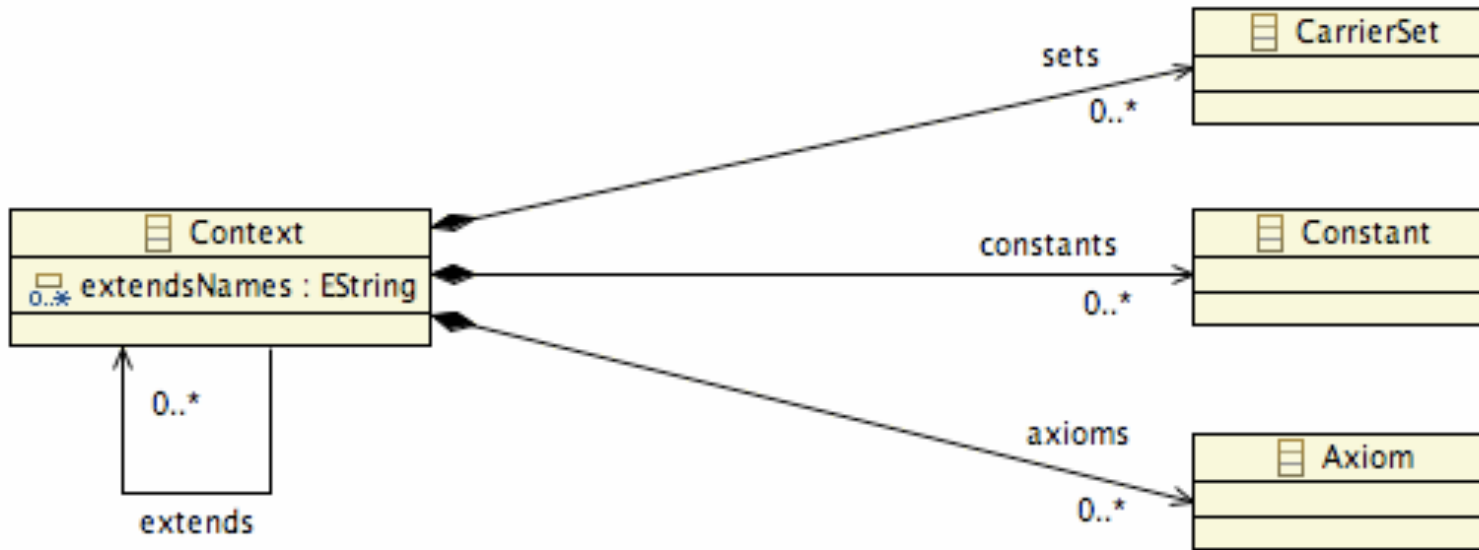
# Machine



# Event



# Context





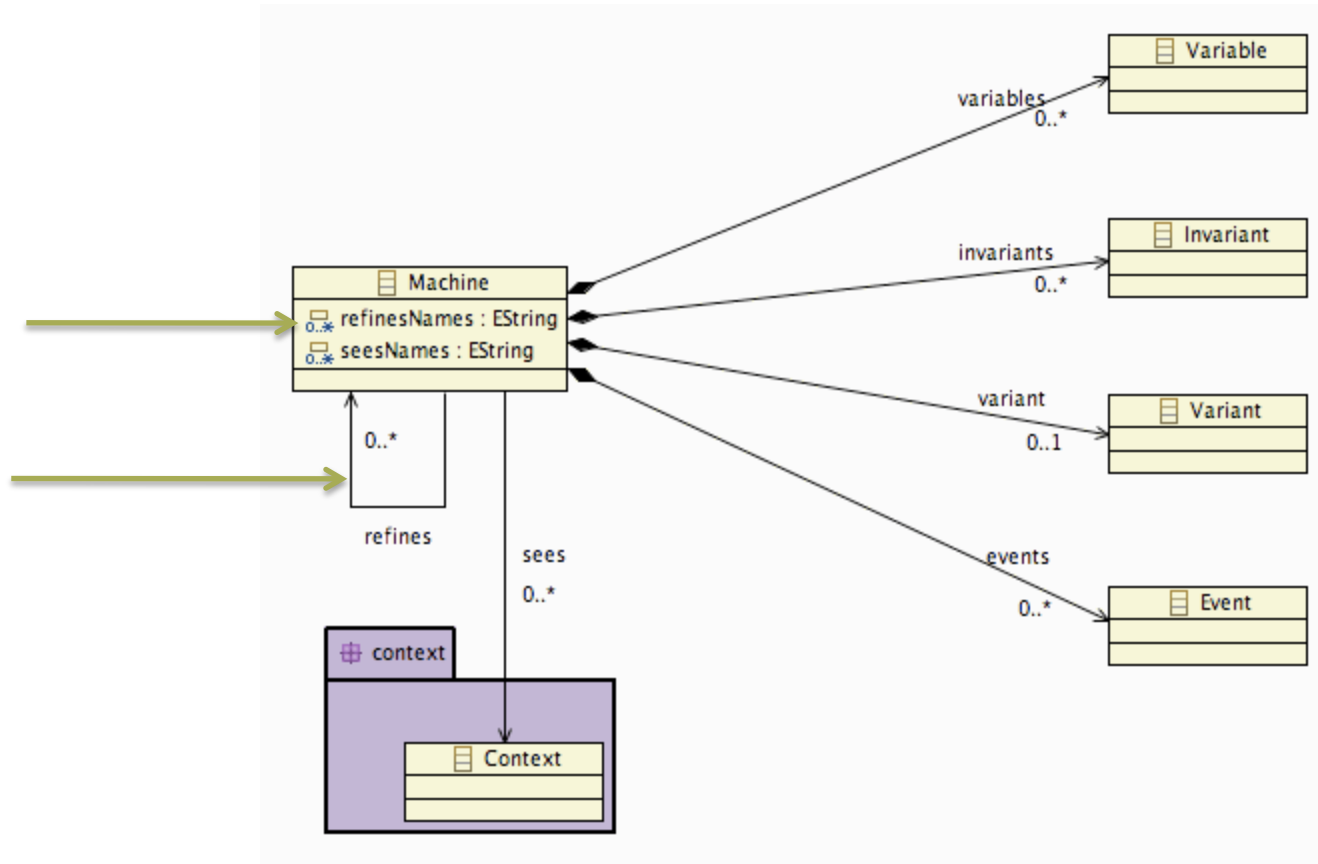
# Inter-Resource References

- Refines Machine, Refines Event, Sees Context
- Some tools work on multiple resources
  - Need direct model references
  - EMF proxy facilities for resolving/loading when needed
- Some tools work on a single resource
  - Don't want to load referenced resources
  - Leave proxies unresolved
  - Often they are un-resolvable (i.e. do not exist)

# Solution – Dual Representation

- List of References (EMF proxies)
  - Use Lazy proxy construction
  - URI fragment = reference name (persisted)
  - When resolve attempted....
  - ... Automatically construct rest of URI ...
    - Project/resource from containing component
- List of Names
  - Transient (no storage)
  - Derived from proxy fragments (by getter)
  - Can be edited .. Notifies parent ...
  - .. Proxy fragments kept in step (even if not resolvable)

# Machine



# Persistence

- Overrides EMF's default XMI persistence
- Load and Save into Rodin DB via API
- Synchronisers for each element type
  - Registered via extension point
  - Allows for new elements to be defined by plugins
  - Volatile extensions (no synchroniser)
- Attributes
  - Can be Dealt with explicitly in Synchroniser... or
  - Left to Generic Attribute handler
  - Nothing is lost

# Persistence – to XMI

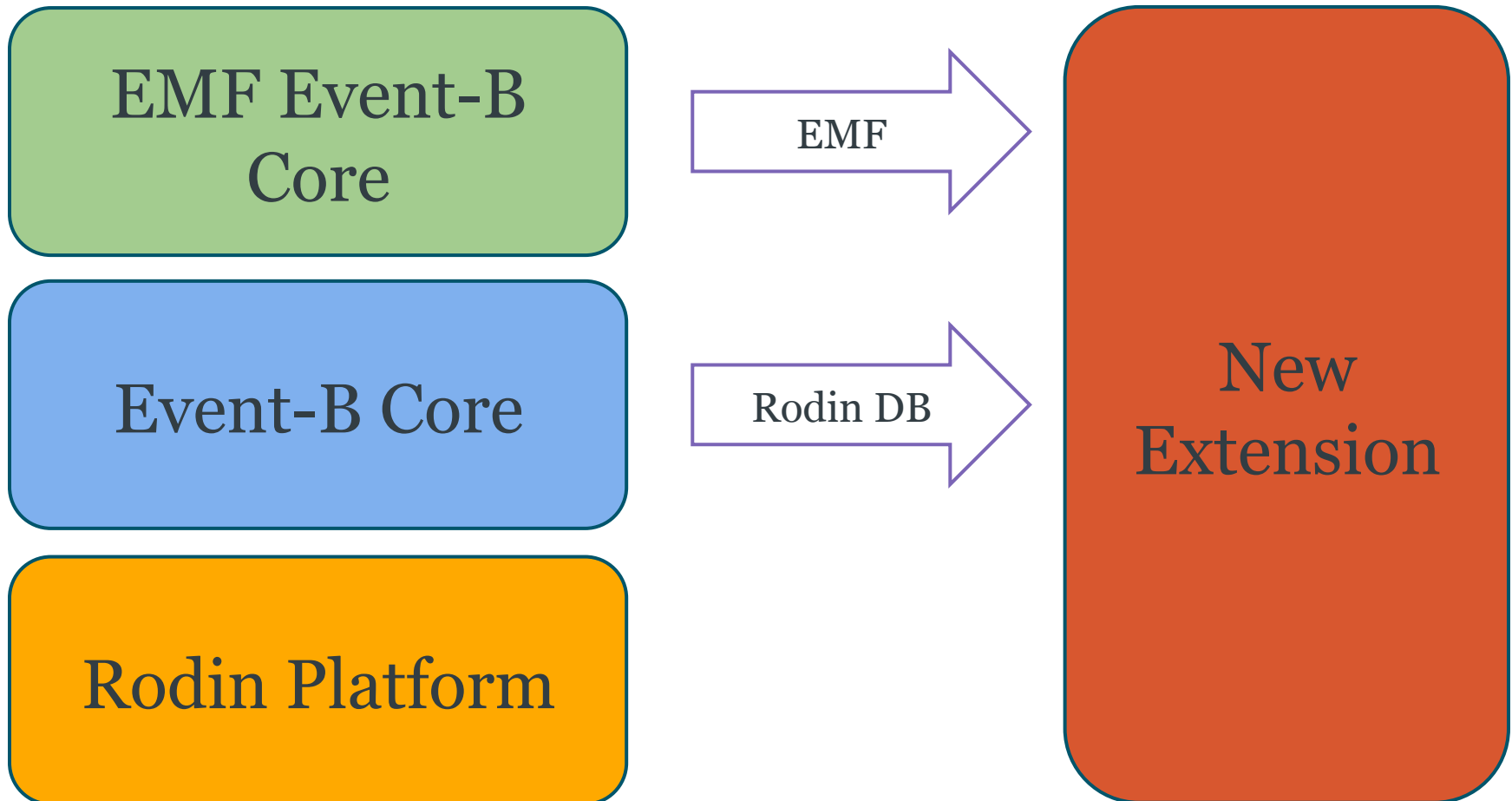
- May wish to store components outside of Rodin DB
- Option to load/save using EMF's XMI serialisation
- E.g. copy in SVN for teamworking

# A Framework for Diagrammatic Modelling Extensions in Rodin

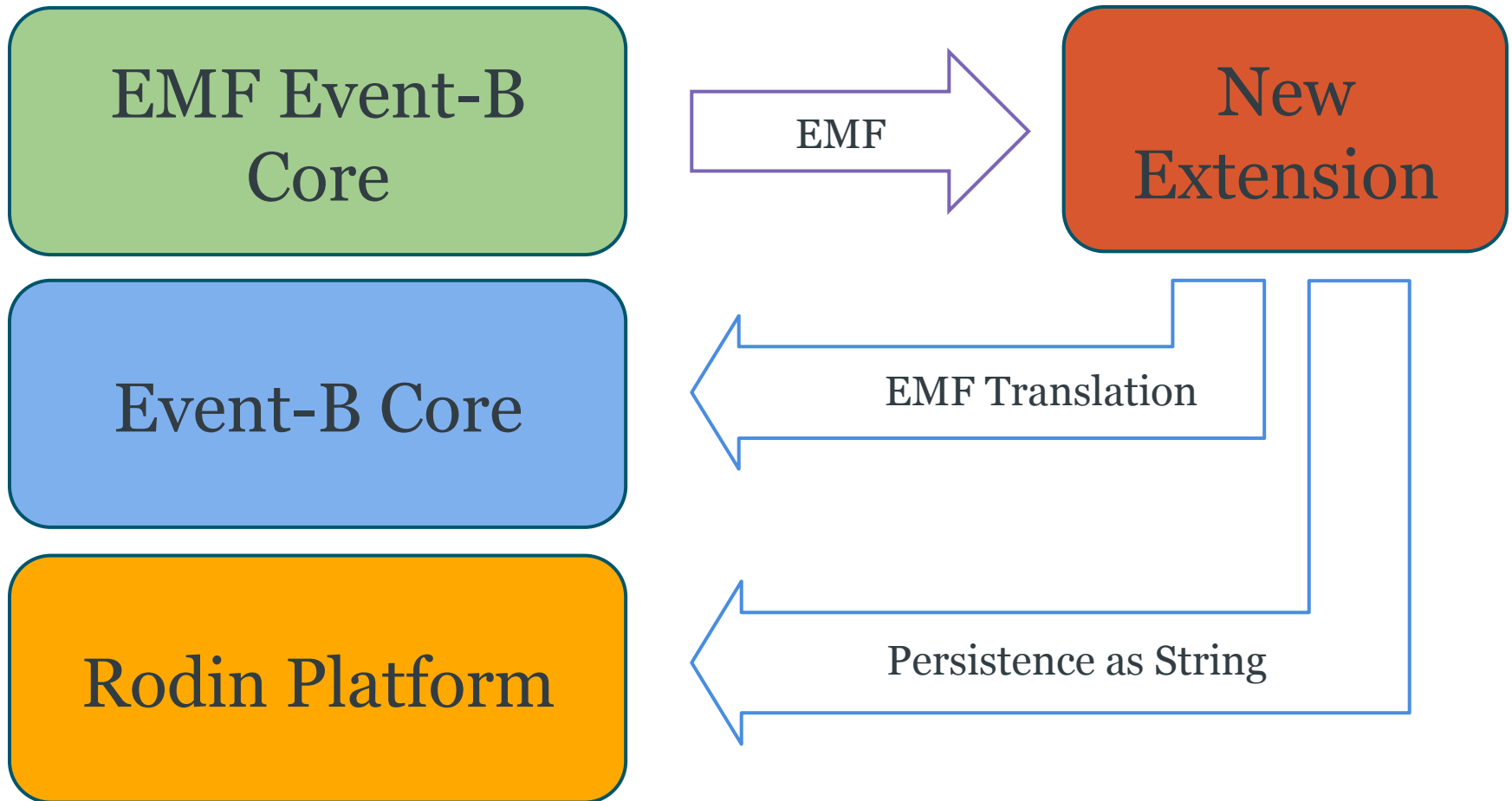
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# Extending Event-B (1)

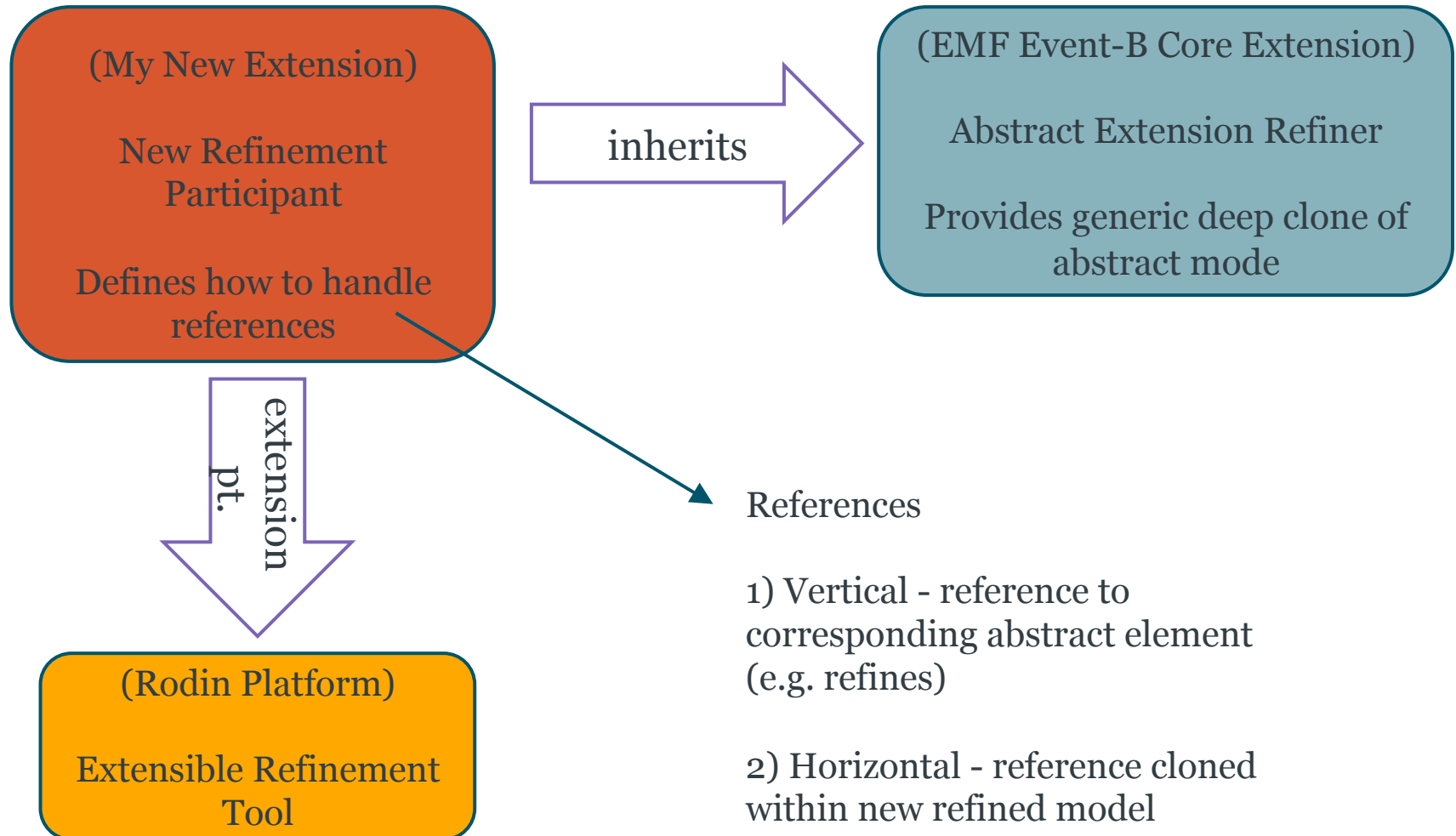


# Extending Event-B (2)





# Refinement Participant

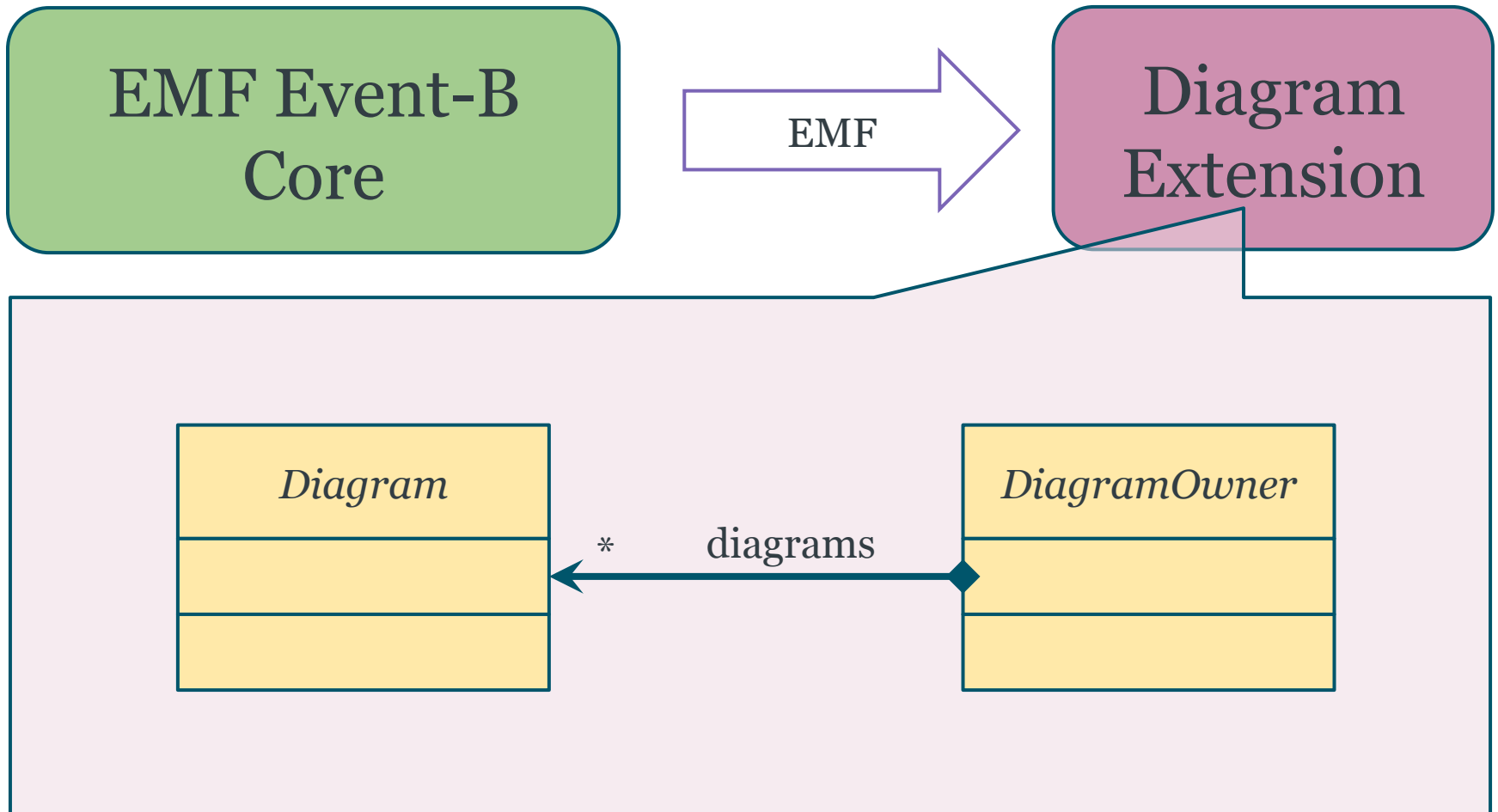


# A Framework for Diagrammatic Modelling Extensions in Rodin

Developed by:

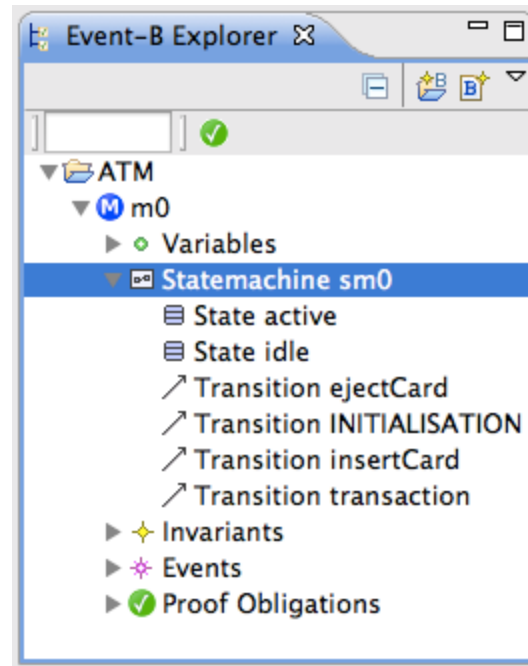
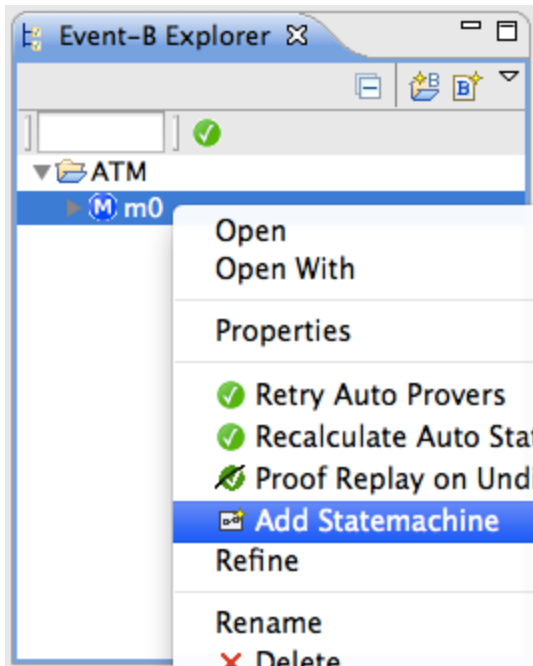
Colin Snook and Vitaly Savicks – University of Southampton,

# Now we want Diagrams!



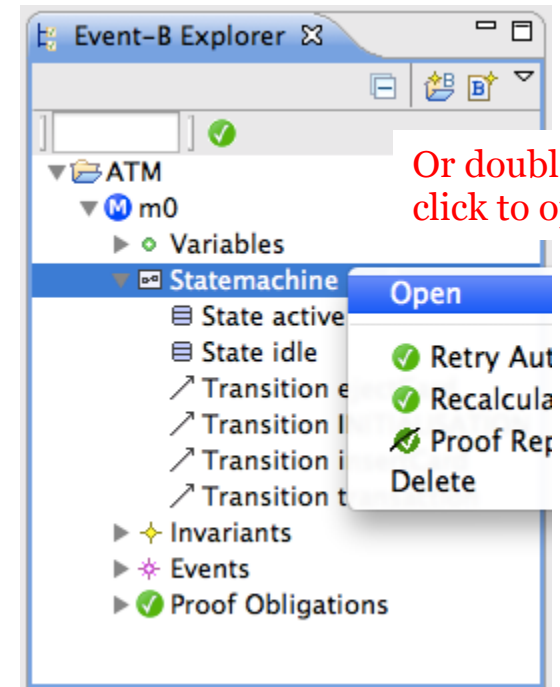


# Contributes to Event-B Navigator



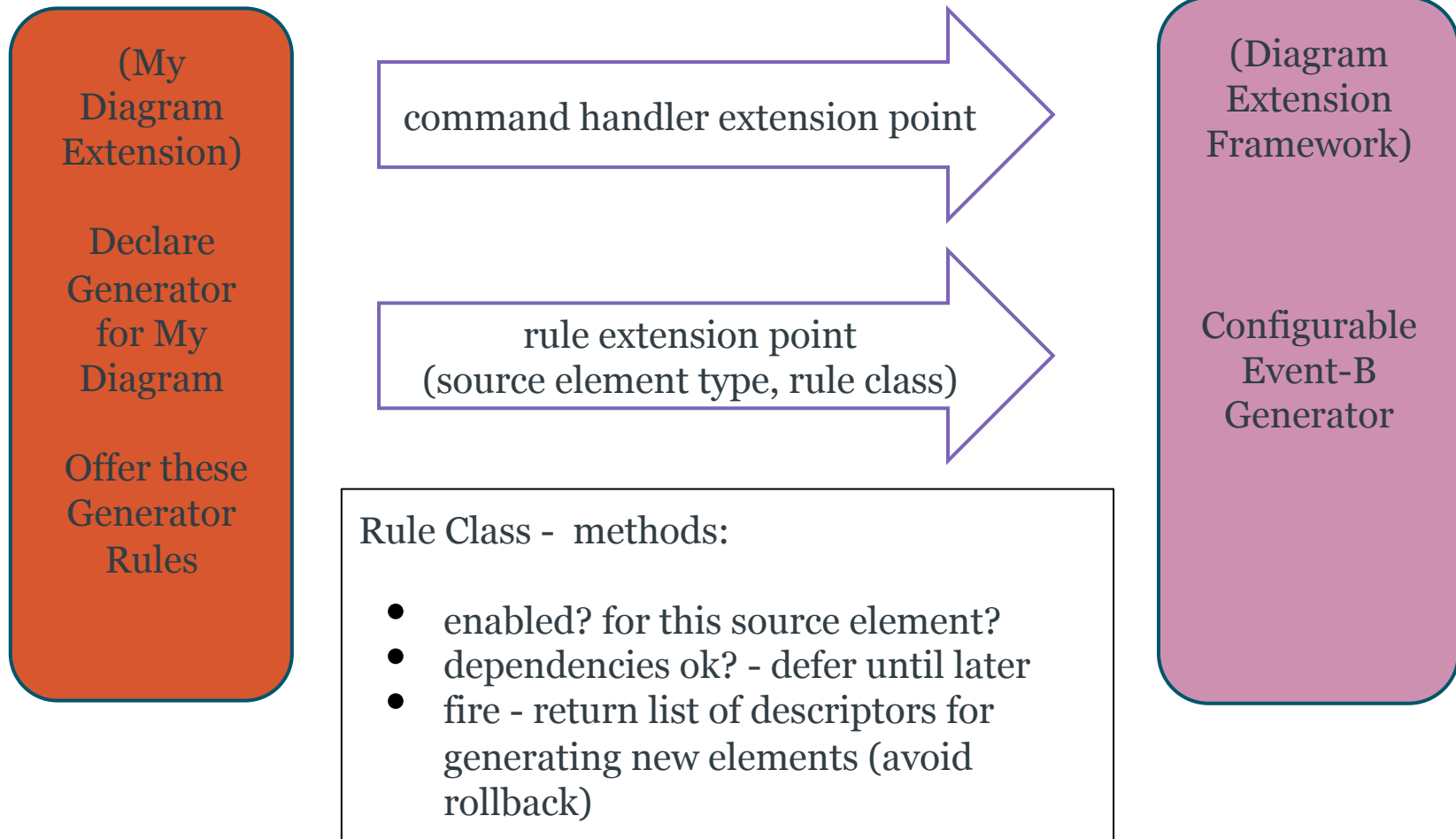
EMF Event-B Core  
Extension

Diagram  
Extension



Or double  
click to open

# Translation to Event-B





# Diagram Copier - Refinement Participant

- Model is already refined by the previous Refinement Participant
- But diagram layout is lost
- Diagram Copier Refinement participant
  - Finds all the diagram layout files relevant to a Machine/Context
  - Copies them,
  - Updates their file name for the new machine/context
  - Updates references within them to the corresponding refined elements



**End**