

 A decorative vertical bar on the left side of the slide, featuring a blue-to-purple gradient. At the top, there is a small image of the Earth. At the bottom, there is a small image of a desert landscape with mountains.

# ADeS – AADL Simulator

## Presentation

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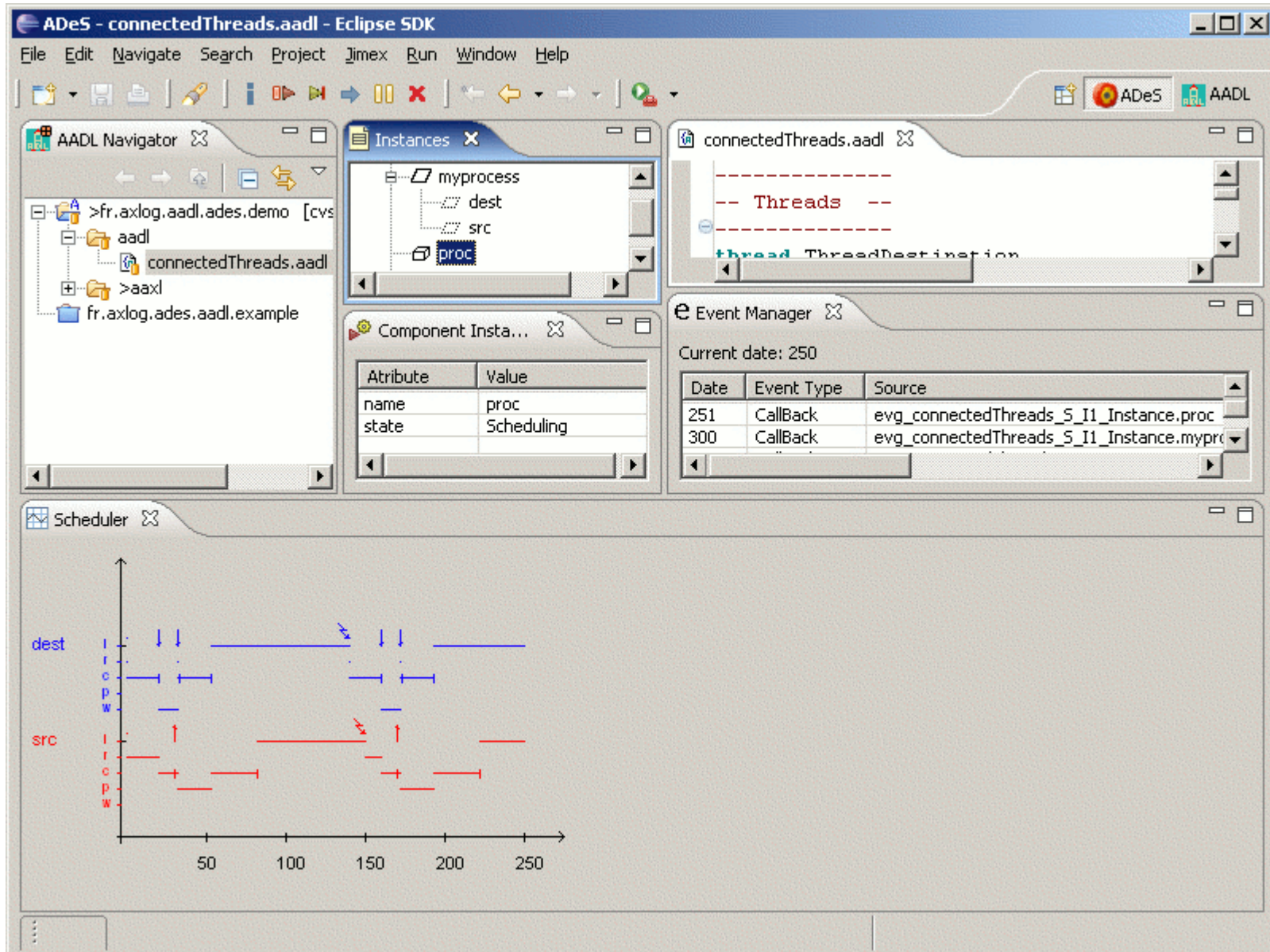
# Interest of simulation

- Evaluation of the behavior of an AADL description
  - compatibility of deadlines, WCET, periods with schedulability
  - determination of mode changes
  - dimensionning
- Prototyping
- Validation of AADL models as soon as possible

# ADeS overview (1/2)

- 1<sup>st</sup> version developed before AADL v1.0
- Current version
  - event-driven simulator
  - developed in Java for Eclipse
  - based on OSATE

# ADeS overview (2/2)



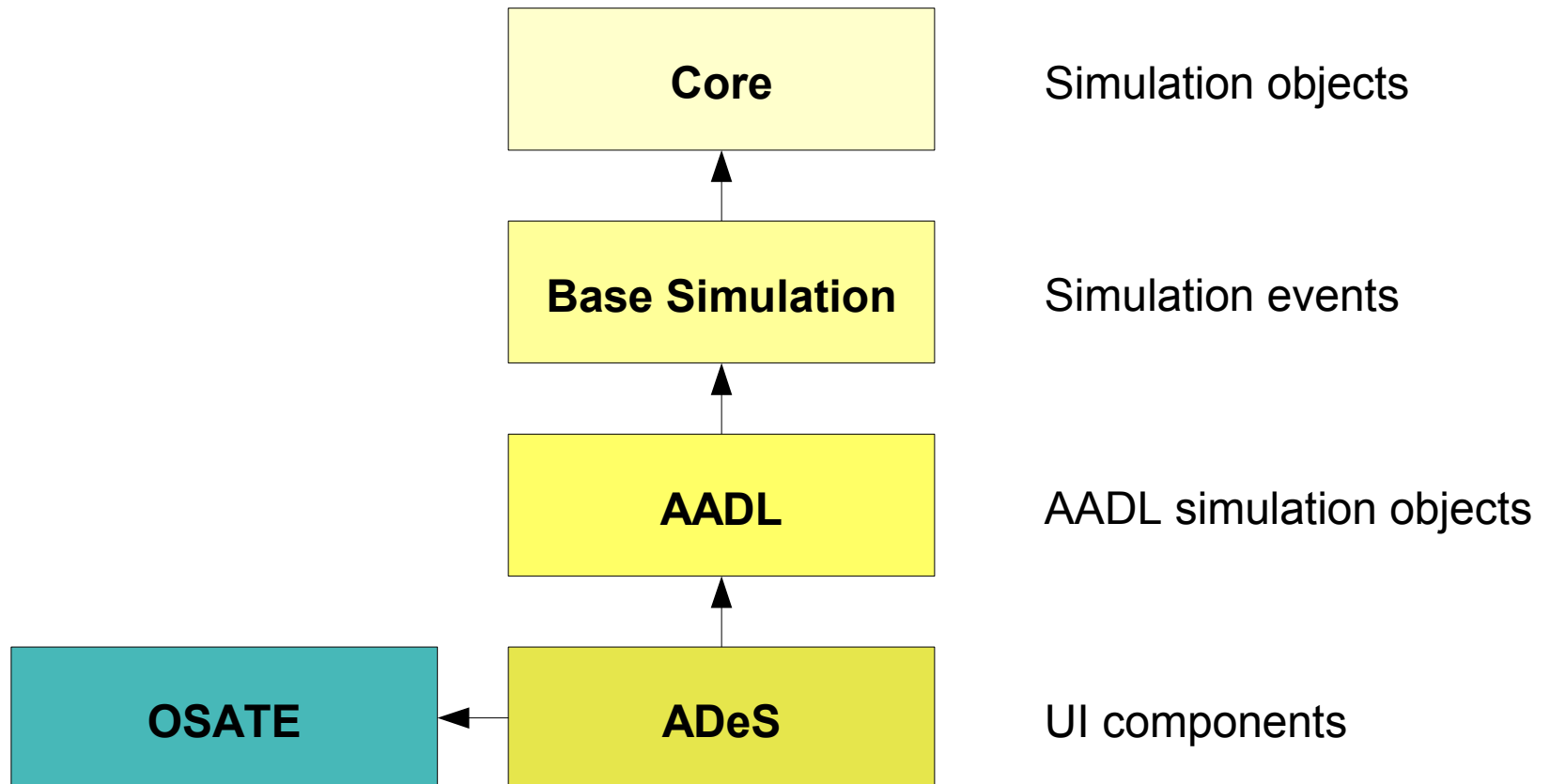
The screenshot displays the ADeS Eclipse SDK interface for the project 'connectedThreads.aadl'. The interface is divided into several panes:

- AADL Navigator:** Shows the project structure with folders for 'aadl', 'connectedThreads.aadl', and 'aaxl'.
- Instances:** A tree view showing the hierarchy: 'myprocess' containing 'dest' and 'src' components, and a 'proc' component.
- Component Insta...:** A table showing the current state of the selected component 'proc'.
 

Atribute	Value
name	proc
state	Scheduling
- Event Manager:** Shows a log of events. The current date is 250.
 

Date	Event Type	Source
251	CallBack	evg_connectedThreads_S_I1_Instance.proc
300	CallBack	evg_connectedThreads_S_I1_Instance.myproc
- Scheduler:** A Gantt chart showing the execution timeline of components 'dest' (blue) and 'src' (red). The x-axis represents time from 0 to 250. Vertical lines indicate process execution, and horizontal bars indicate waiting periods. Arrows show the flow of control between components.

# ADeS structure





# Currently supported AADL components

AADL category	Supported by AdeS	
	YES	Not yet
Components:		
Bus	X	
Data	X	
Memory	X	
Process	X	
Processor	X	
Subprogram		X
System	X	
Thread	X	
Features:		
Bus Access	X	
Data Access		X
Port	X	

# AADL properties

- Every AADL properties are supported
- For each property used in ADeS, a default value is set in a configuration file
- Used properties:

Category	Property name	Default property value
Thread	Period	1
	Compute_Execution_Time	20..20
	Deadline	1
Processor	Preemption_Period	1
Bus	Propagation_Delay	1..1
Data	Source_Data_Size	1
Memory	Read_Time	10..10, 10..10
	Write_Time	10..10, 10..10

# Behaviour description

- Use of an AADL annex mechanism
- Current: simple keywords "compute", "pend", "post"
- Future: support of the standard behavior annex

```
thread ThreadDest
  features
    input: in event port;
  properties
    Period => 140ms;
    Compute_Execution_Time => 41 ms .. 45 ms;
end ThreadDest;
```

```
thread implementation ThreadDest.impl
  annex behaviour {**
    compute(20);
    pend(input);
    compute(20);
  **};
end ThreadDest.impl;
```

# Behaviour description check

- The feature a "post" or a "pend" refers to must appear in the features list of the component type.
- The sum of the action durations must be smaller than the compute execution time property value.

# Current state and perspectives

- Simulation kernel and bases completely done
- Details to be added (some states of component...)
- AADL modes management under development
- Graphical user interface to be adapted and completed depending on industrial needs
  - Graphical representation of the simulated system
  - Display of the simulation result

# Coordination with end users

- Too many things may be imagined (graphical representations, extraction of data, verifications, import/export with other tools...)
- For efficiency, we will **adapt the development of ADeS to actual needs of industrial partners**
- Advantages:
  - More effort for what is important
  - Adaptation of the GUI for end users
  - Adaptation with the industrial context and needs
- => **Interest for partnership to support the development** (contact: [aadl@axlog.fr](mailto:aadl@axlog.fr))