



TECHNISCHE
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A Close Look at Composition Languages

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ACoMM 2008

- **Many different approaches to modularisation exist**
 - Packages
 - Aspect orientation
 - Feature-Driven Development
 - Model Weaving
 - ...

 - **Comparison is difficult: Each approach uses its own terminology**
- A unifying terminology is needed**

- **Medvidovic, Taylor**

- Elements of Architecture Description Languages:
 - Components
 - Connectors
 - Configurations

- **Aßmann**

- Elements of Composition Systems:
 - Component Model
 - Composition Technique
 - Composition Language

→ Here: elements of the composition language

- Black-box components à la CORBA, EJB, or .NET
- Aspects (in particular, AspectJ style)
- Invasive Composition
- Variability by IfDef

- **Binary format components**
- **Inner structure hidden from component users**
- **Run-time infrastructure to establish compositions**
 - Deployment Descriptors
 - Name Service
 - Names of used components explicitly embedded in using components



- **Components: Advice and core code**
- **Inner structure partially exposed for expressing compositions**
 - Based on language structure (e.g., method entry/exit)
 - Expressions mapped to code/execution points
 - Mapping hard coded in weaver
- **Composition description (pointcuts) provided separately from components**

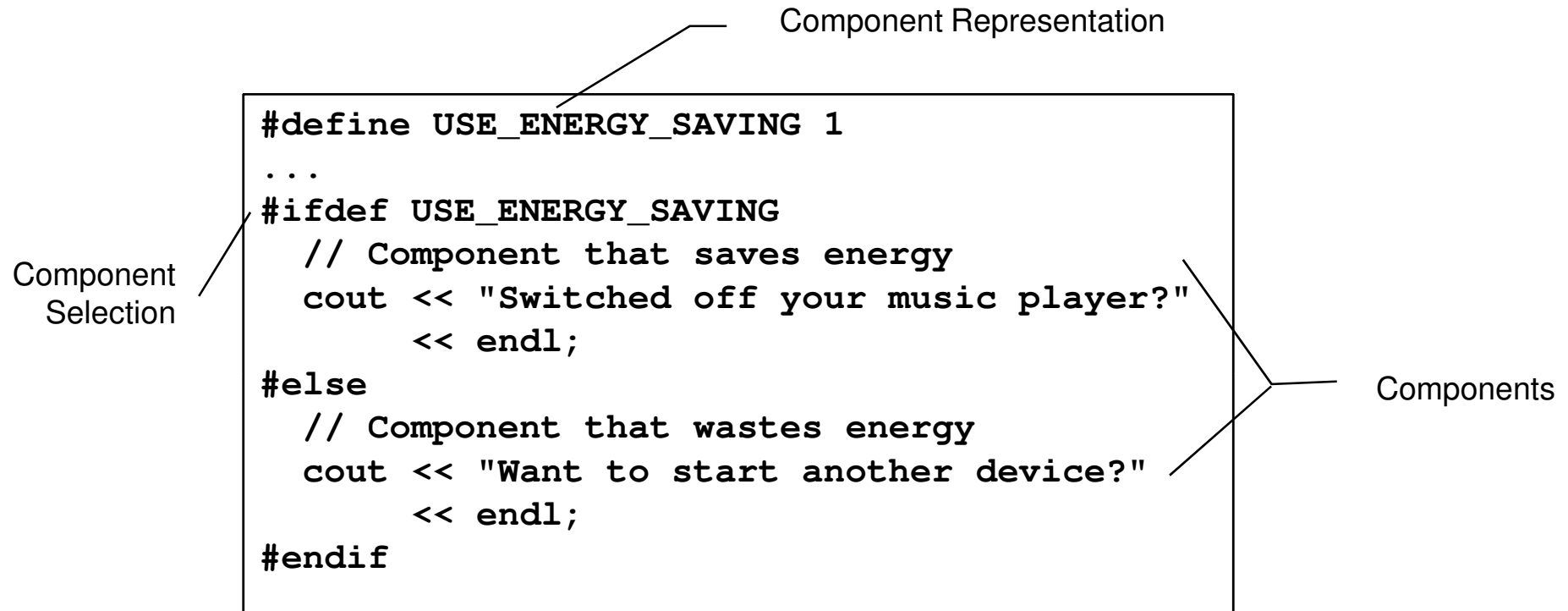
```
public aspect Example {
    pointcut mypoints: call (public * *Example.do* (..));

    before mypoints: {
        System.out.println („Some do method was called“);
    }
}
```

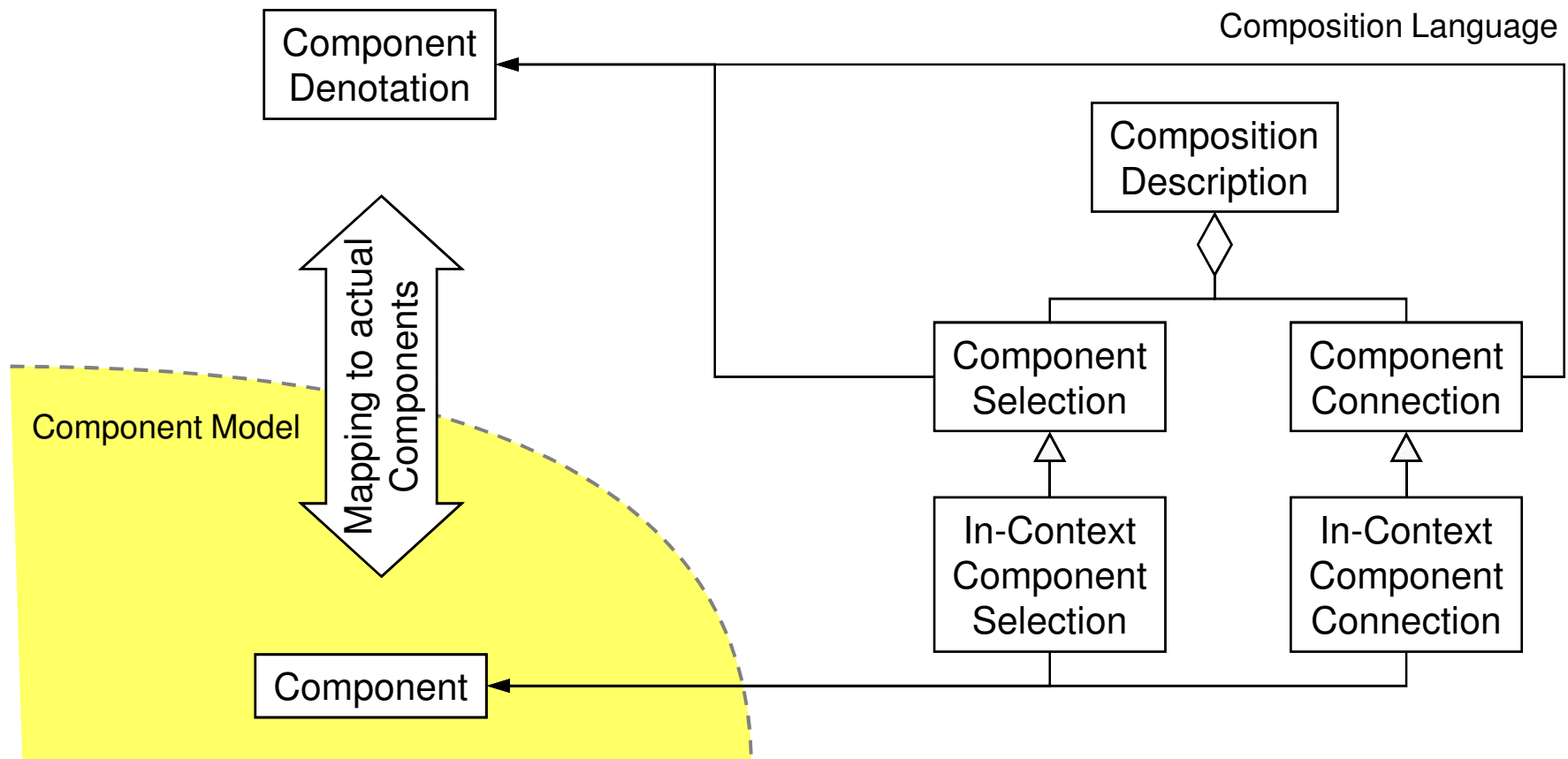
- **Components: Program or model fragments**
 - Represented by composition interfaces
 - Composition implemented through transformation

- **Composition interfaces derived from markup within component code**

- **Language-independent**
 - But: Can specialise for particular languages
 - Compositions expressed within components (e.g., import, provides, requires, ...)



- Component composition implicitly given through text sequence



- **Implicit/explicit/meta explicit mapping**
- **In-Context vs. Out-of-context selection/composition**
- **Relation composition/selection**

?? Questions ??