PHILIPS

Bootstrapping Domain-Specific Model-Driven Software Development within Philips

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Philips Research

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- VAMPIRE Approach
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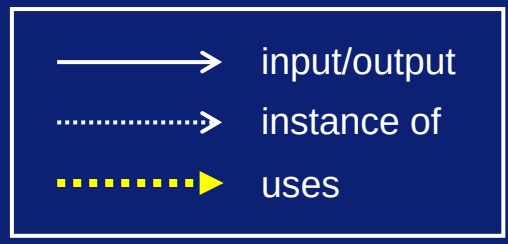
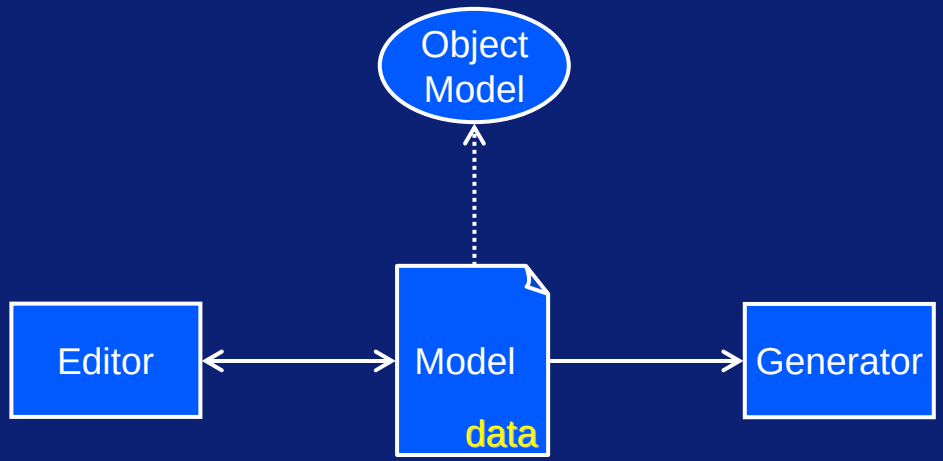
Background

- Research started in 2002
- First working environment in 2003 based on:
  - Microsoft Visual Studio .NET 2002 – C#
  - Altova XML Spy – Authentic – XML
- Developed incrementally: current version 6
- Applications
  - Interface Specification (CBA, ISpec)
  - Documentation generation
  - Strongly-typed C# code generation (performance, memory-footprint)
  - Graphical application design

VAMPIRE Approach

Visual **A**gile **M**odel-driven **P**roduct-development
an **I**ntegrated **R**esearch **E**nvironment

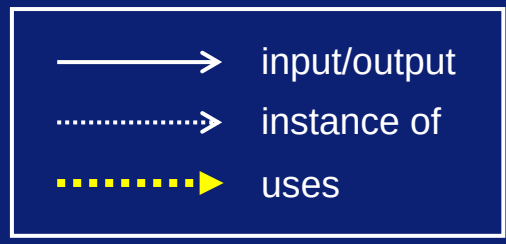


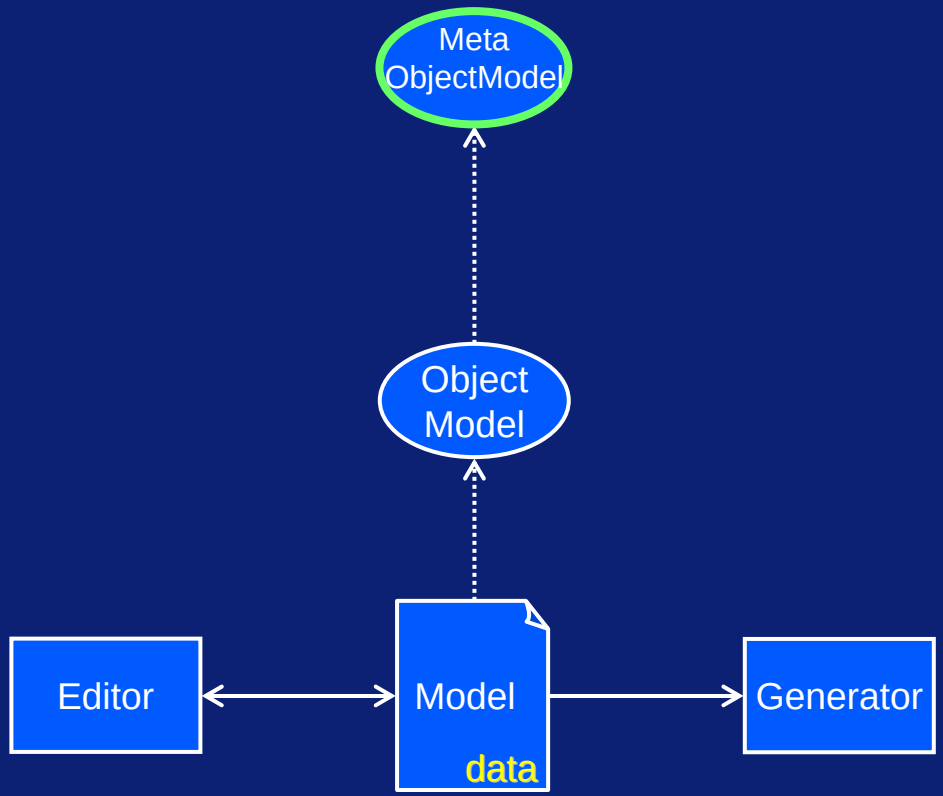


Basic Design Pattern

(ObjectModel = DSM)

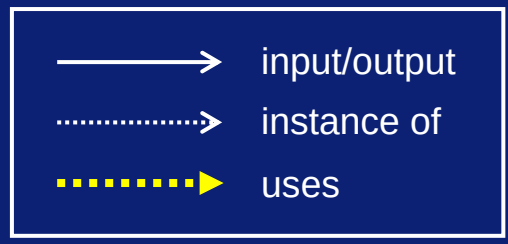
VAMPIRE Approach

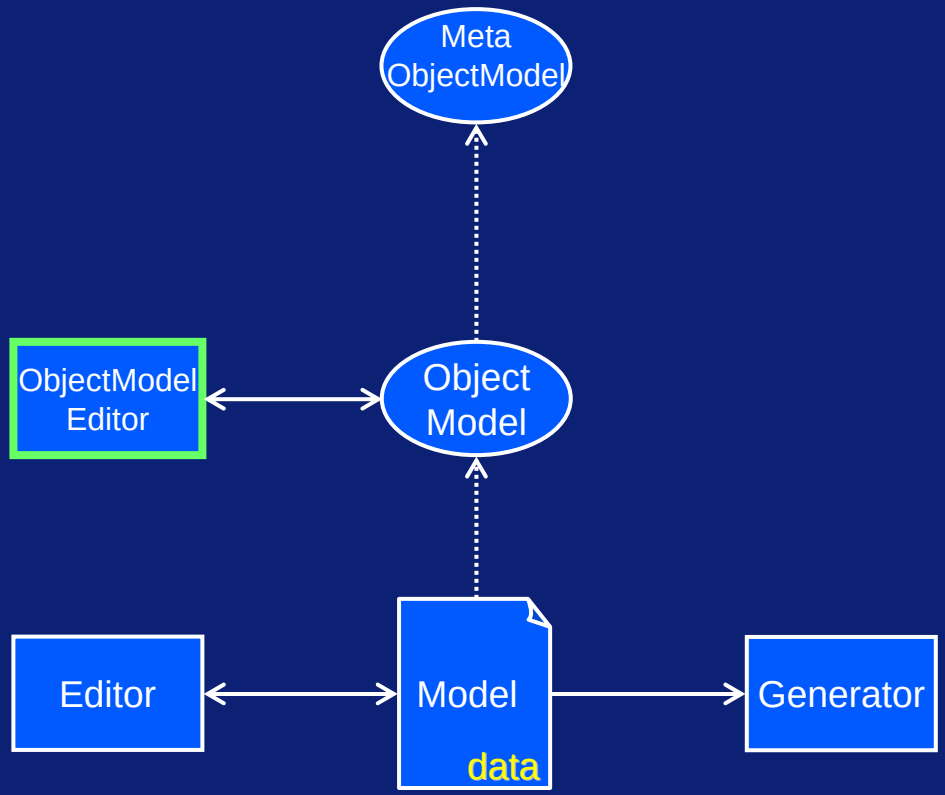




ObjectModel as instance of a MetaObjectModel (metametamodel)

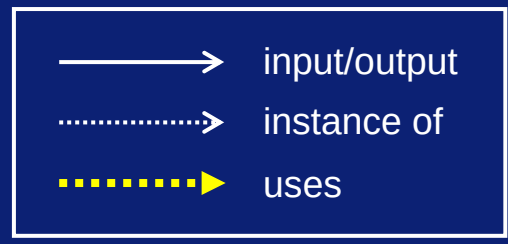
VAMPIRE Approach

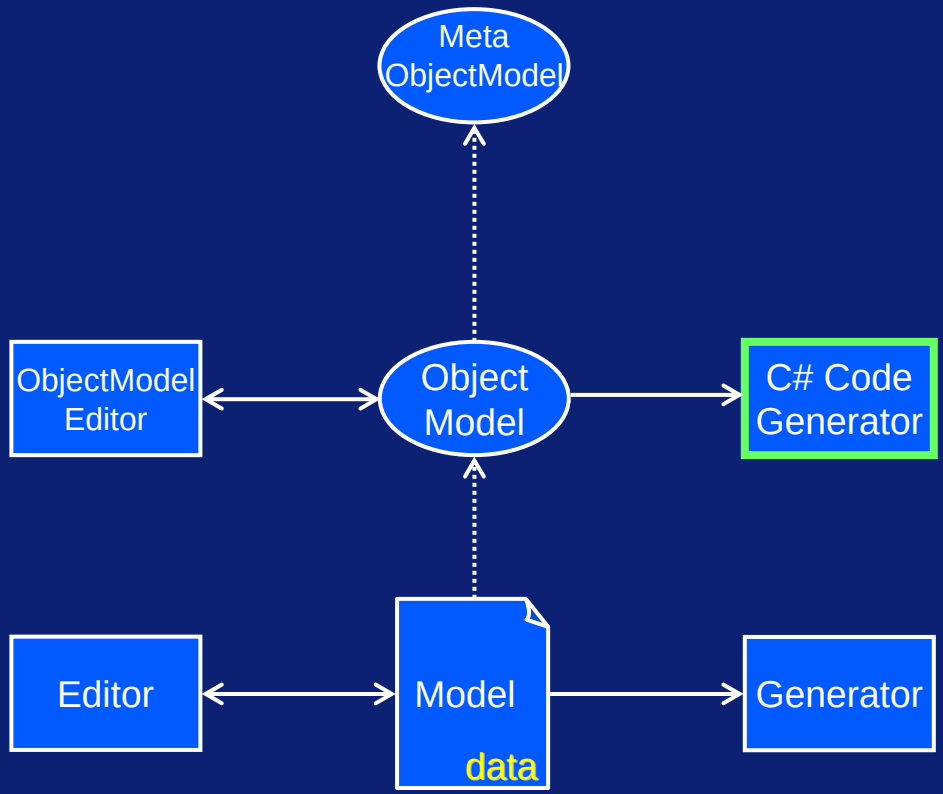




ObjectModel Creation

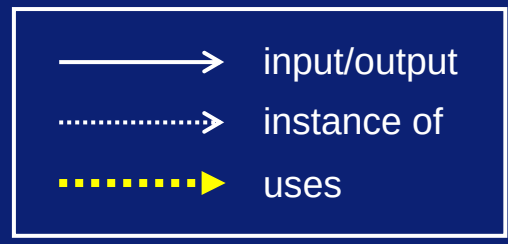
VAMPIRE Approach

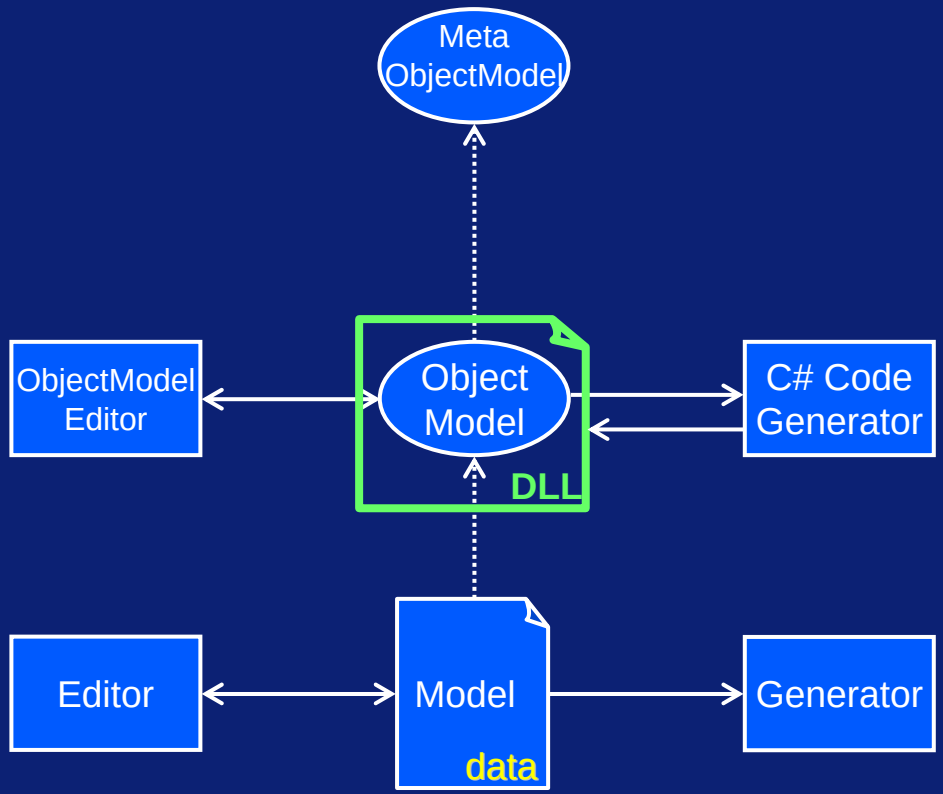




Code Generation

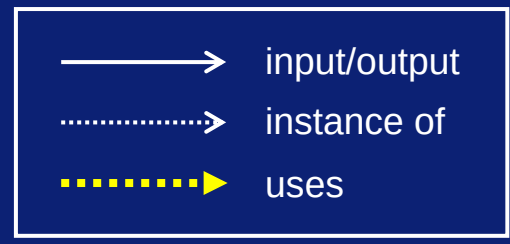
VAMPIRE Approach

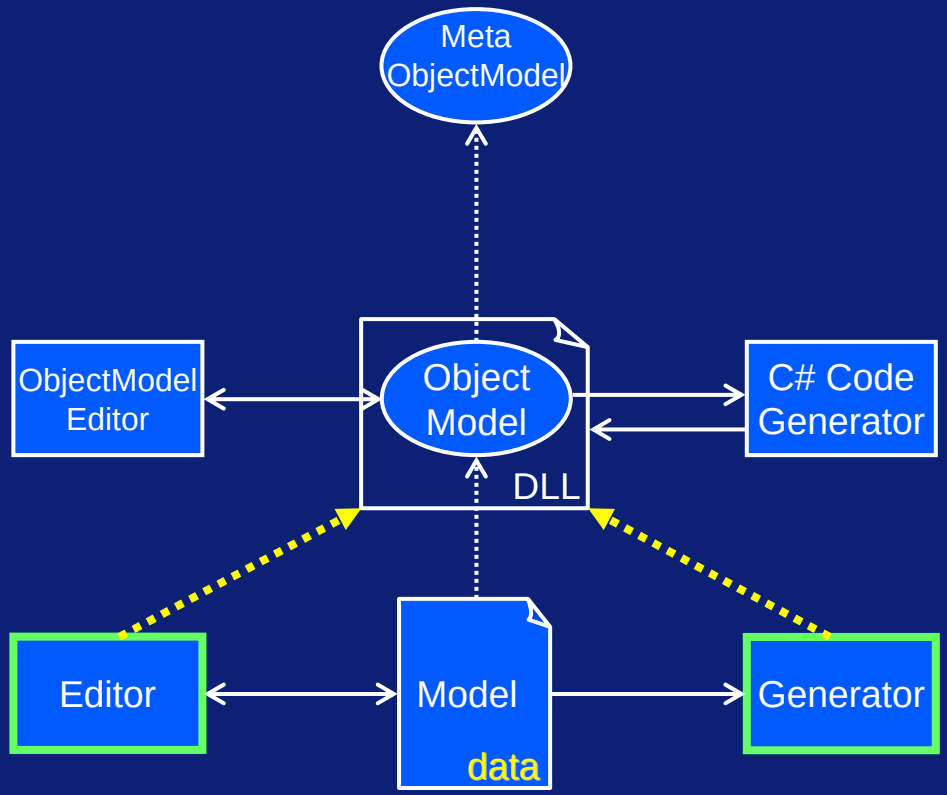




ObjectModel DLL

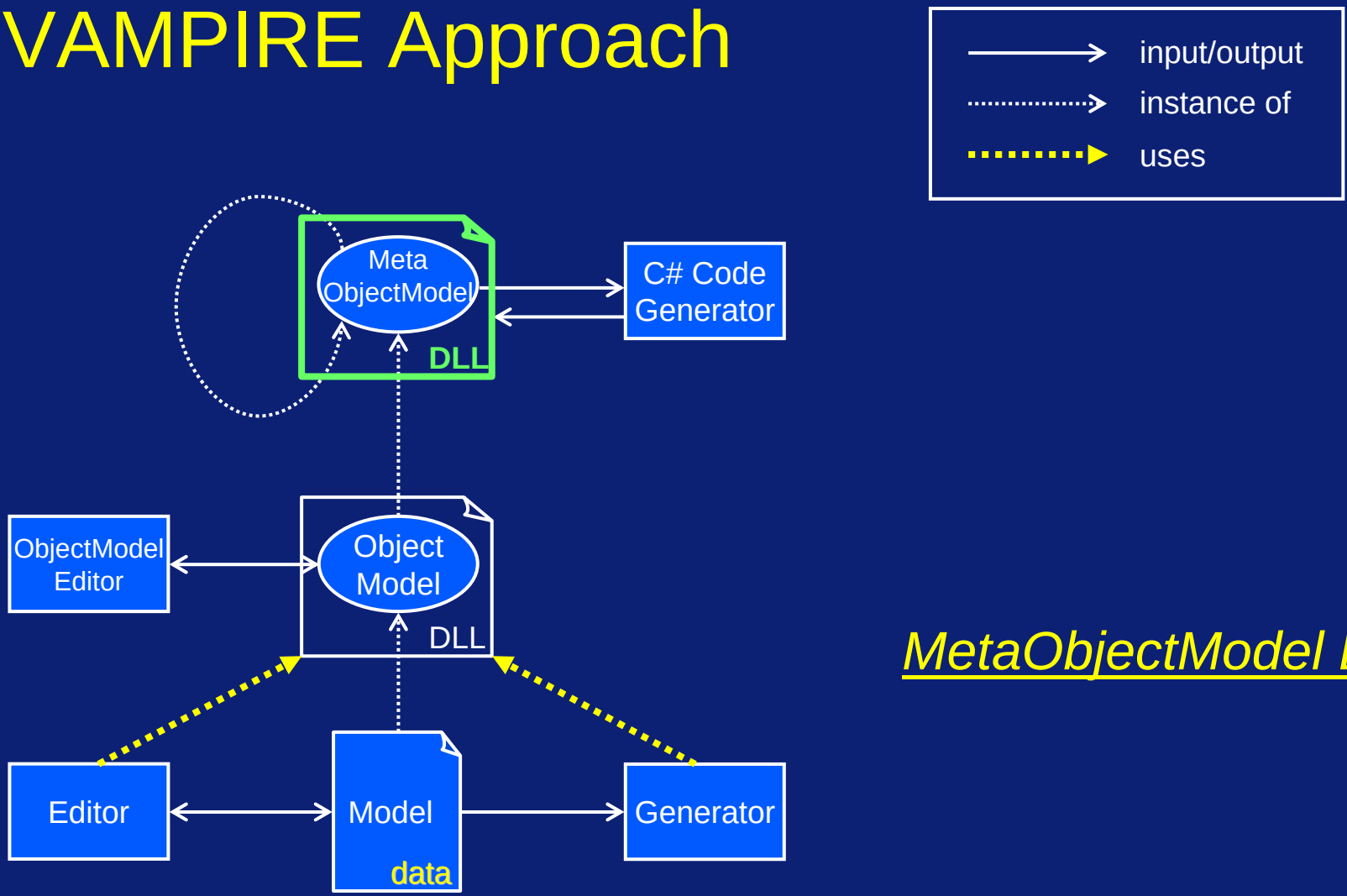
VAMPIRE Approach





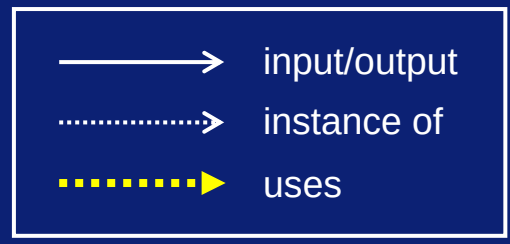
Editor/Generator Implementation

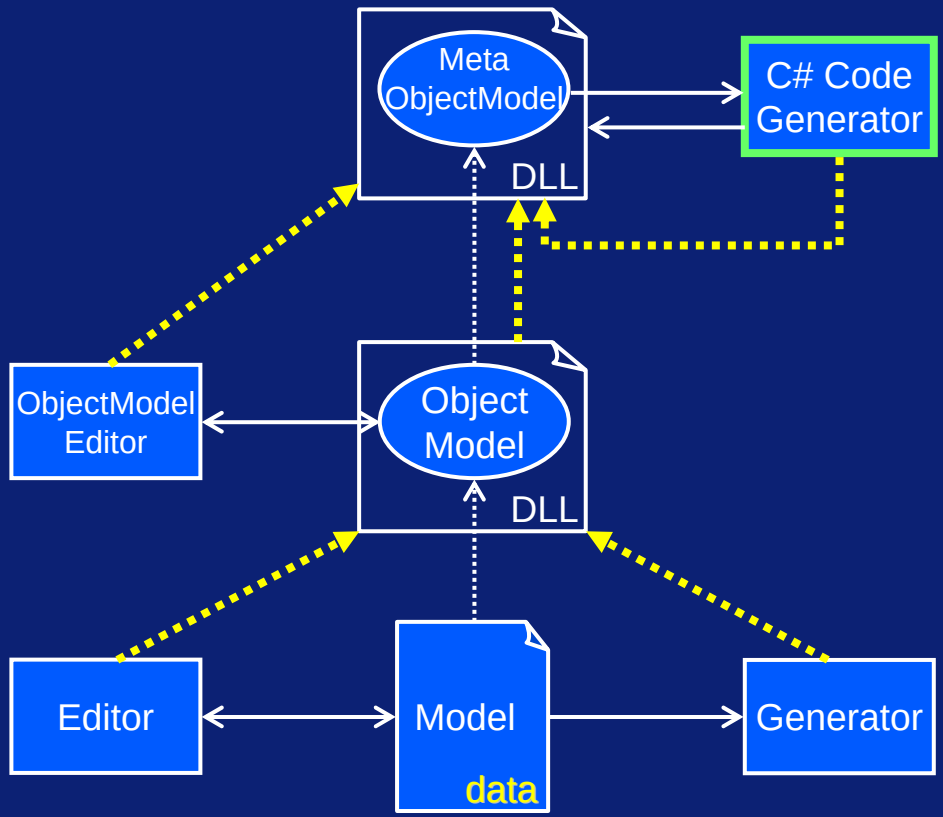
VAMPIRE Approach



MetaObjectModel DLL

VAMPIRE Approach

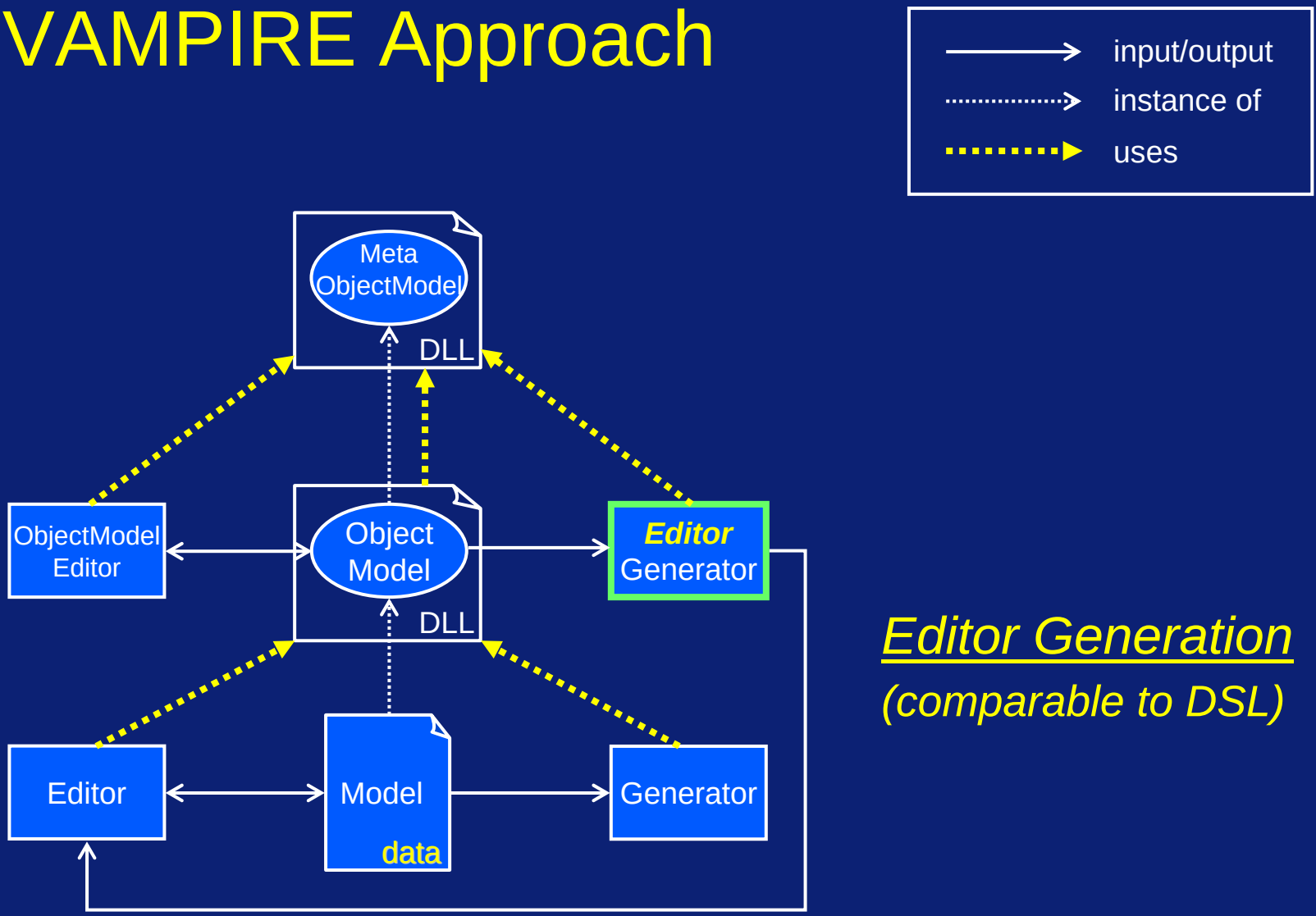




Bootstrapping problem

Code generator both creates and uses the MetaObject-Model DLL

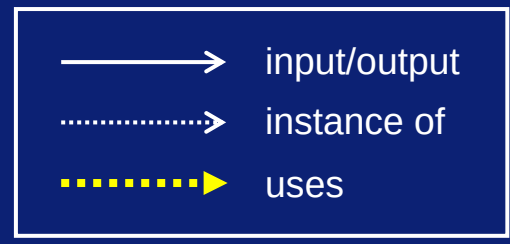
VAMPIRE Approach

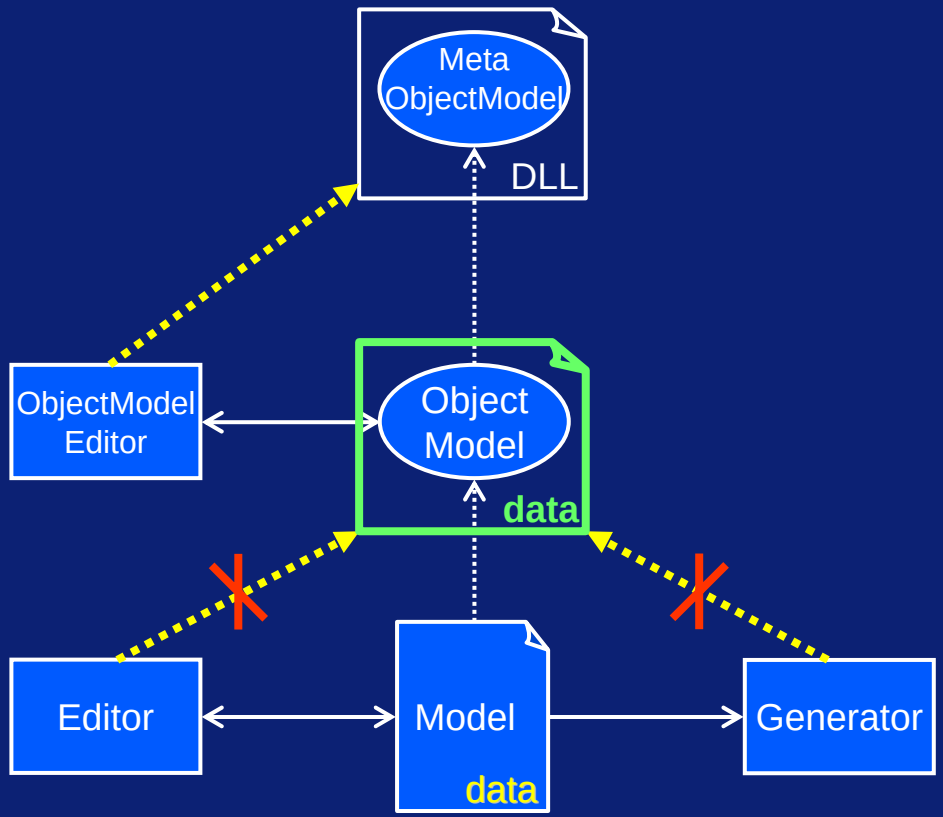


Editor Generation

(comparable to DSL)

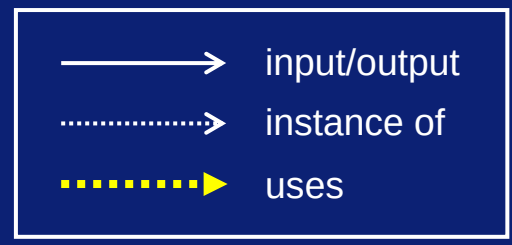
VAMPIRE Approach

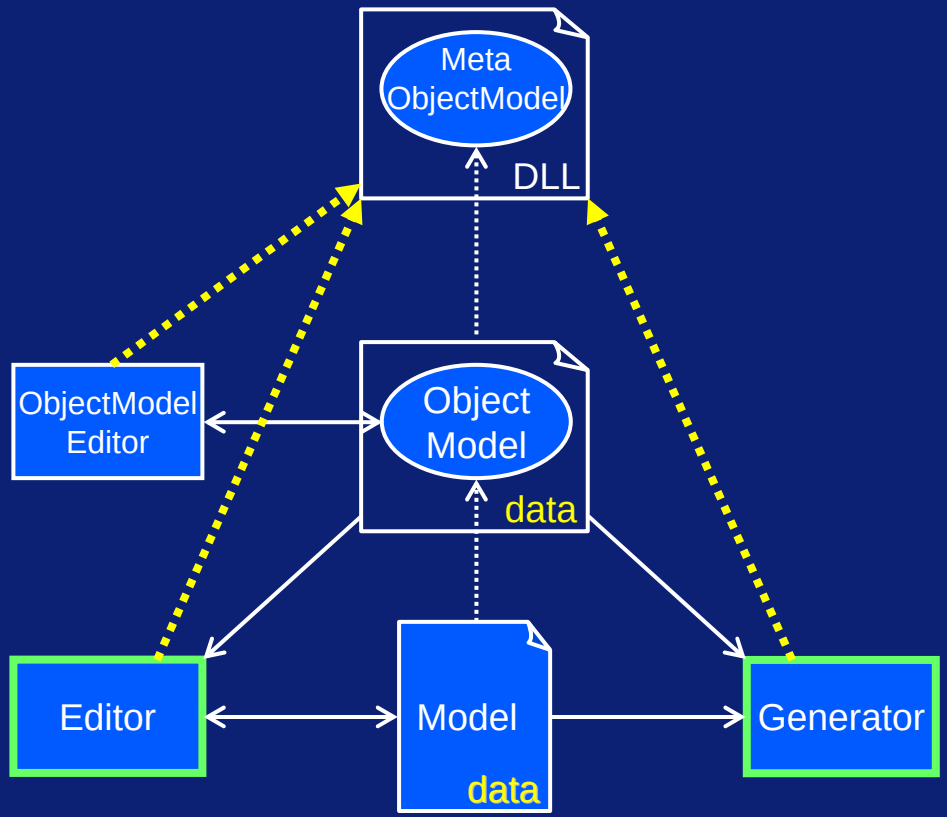




ObjectModel as Data

VAMPIRE Approach

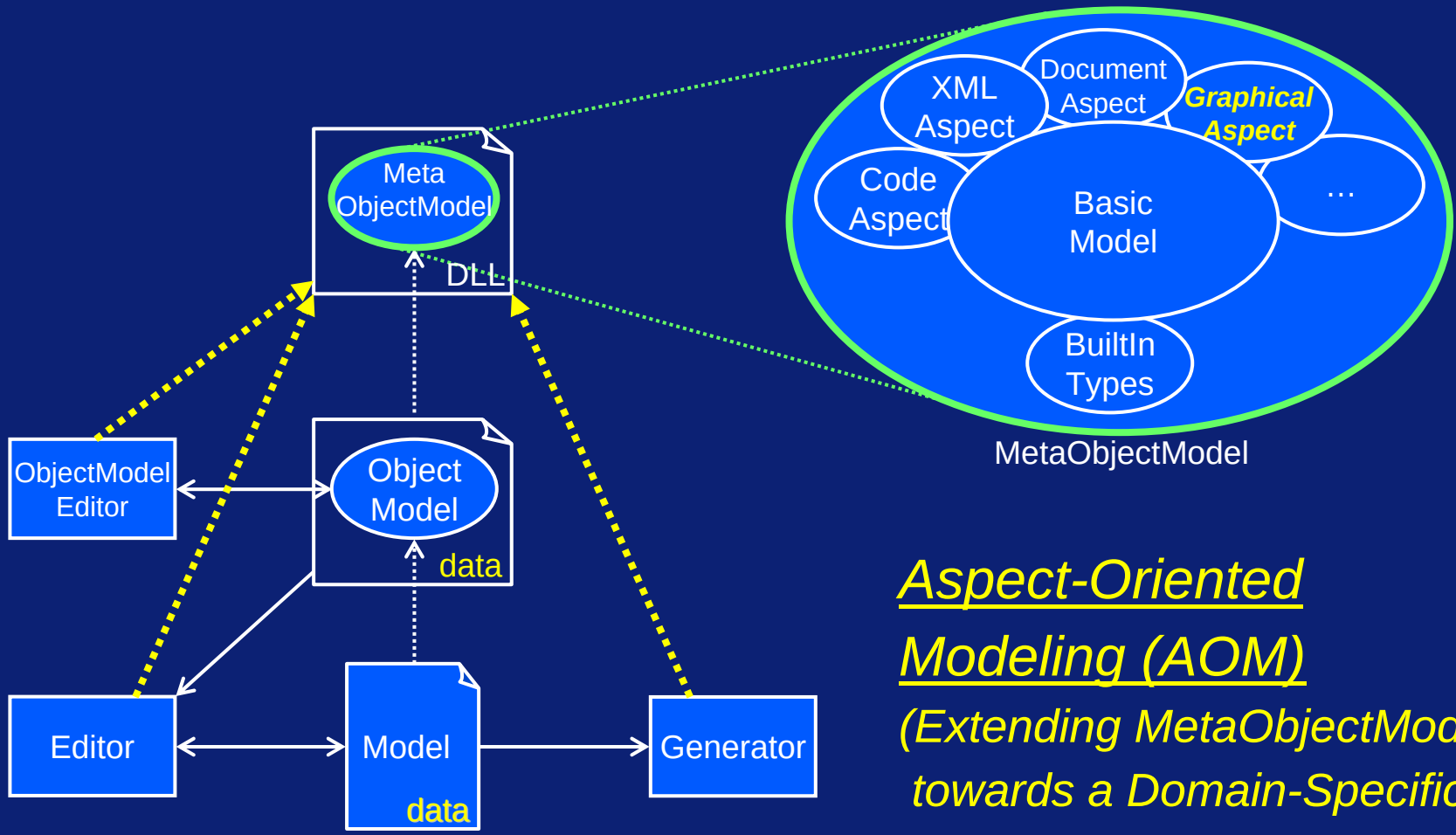




Interpretive WoW

(New Editor/Generator Implementations using Model Reflection)

VAMPIRE Approach

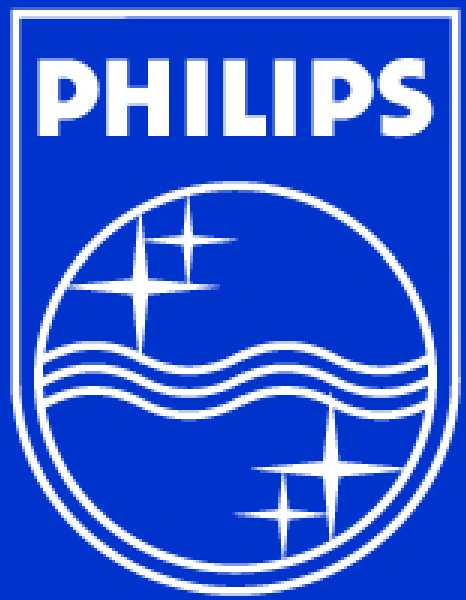


Aspect-Oriented Modeling (AOM)

(Extending MetaObjectModel towards a Domain-Specific Metametamodel)

Requirements for MDD

- Fast development of models, editors, generators (days)
- Easy programming model (e.g. no intermediate formats)
- Customizable code generation (performance, memory)
- ➢ *XML configurability (legacy), not limited to one root*
- ➢ *Loosely coupled tools*
- ➢ *Easy generator composition (networks)*
- ➢ *Metamodels as objects*
- ➢ *Model reflection vs. programming language reflection*
- ➢ *Metametamodel extension (bootstrapping)*
- ➢ *Aspect-oriented modeling (AOM) and model composition*
- ➢ *Interpretive way-of-working vs. code generation*
- ➢ *“Unknown” attributes*
- ➢ *Multiple inheritance*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