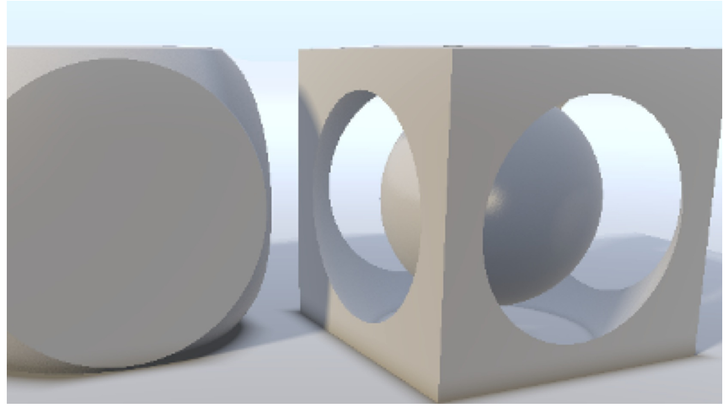
QDE — A visual animation system

Software architecture



Student: Sven Osterwalder (ostes2@bfh.ch)
Advisor: Prof. Clauder Fuhrer (fuhrer@bfh.ch)
Date: 2016-08-11

ECHTZEIT DIGITALE KULTUR

Bern University of Applied Sciences

C. Larman, *Applying UML and Patterns*, 2004

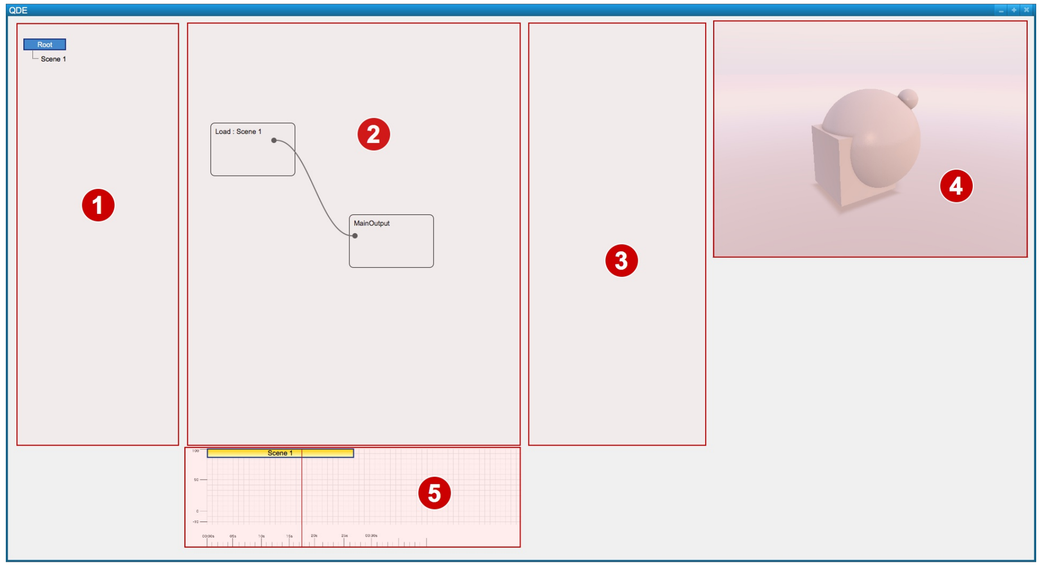
Vision

- Software
  - Real-time animations
    - Sphere-Tracing
    - Managing and editing
    - Allow export and import
    - Easily playable
  - Be intuitive
  - Modular

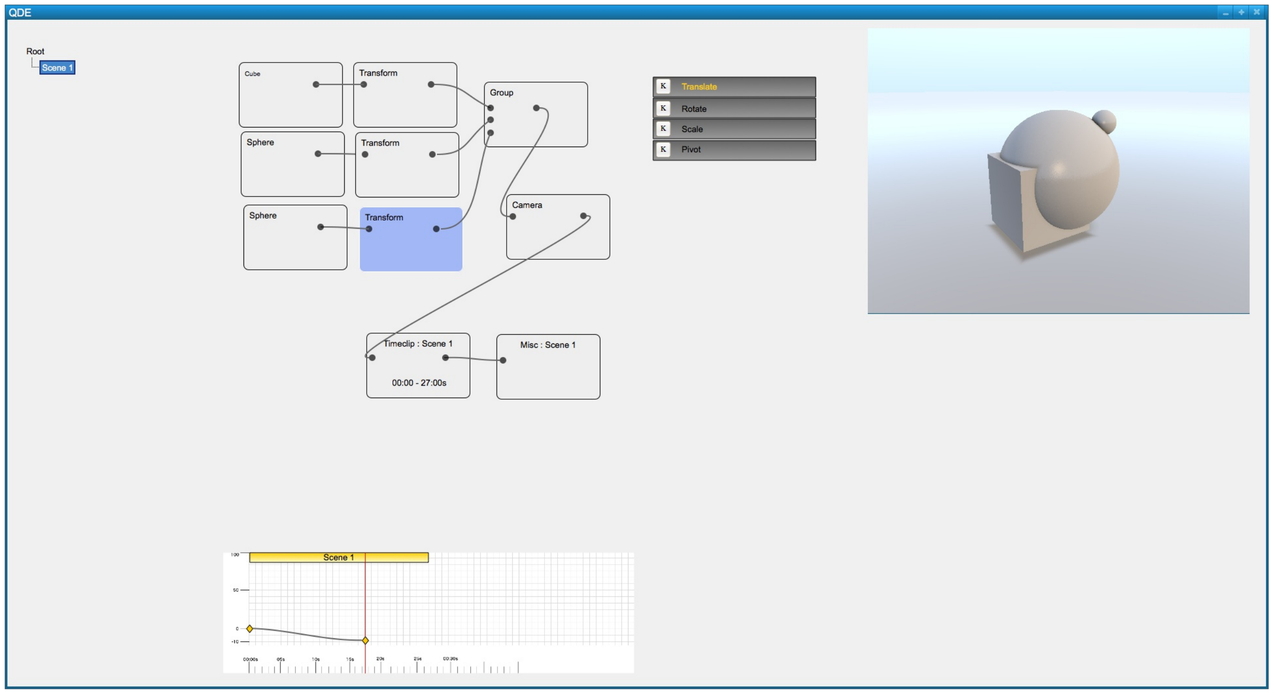
⇒ 2 components

- Editor
- Player

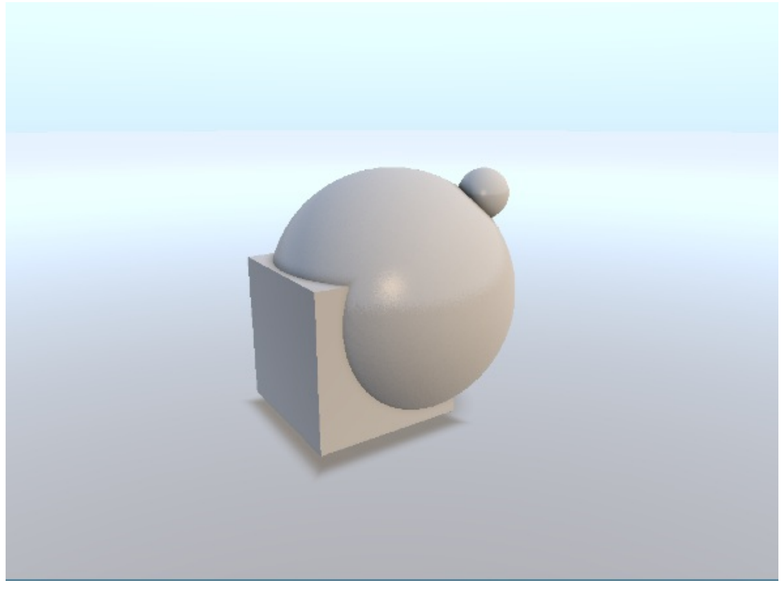
Vision Envisioned



Vision Envisioned



Motivation
Possible outcome



Motivation

Why?

- Powerful GPUs
- "Real-time" ray tracing
  - Sphere-Tracing
- Quality / Realism
- Easy modeling

Motivation
Problems..

- Easy modeling
  - In code.. not that easy
- "Conventional" models
- Performance

⇒ Solve them.. or at least a part

Software Architecture
A definition

- Set of significant decisions
- Big ideas
  - Motivations
  - Constraints
  - Organization
  - Patterns
  - Responsibilities
  - Connections

Software Architecture Procedure

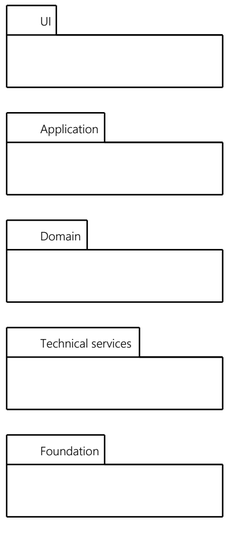
- Unified Process: Iterative
  - Extreme Programming
    - Test-driven development
    - Refactoring
    - Continuous integration
  - Scrum

From vision..
..to architecture

- Requirements
  - Actors
  - Use Cases
  - Additional
- Domain model
- Sequence diagrams
- Logical architecture
- Class diagrams

Logical Architecture

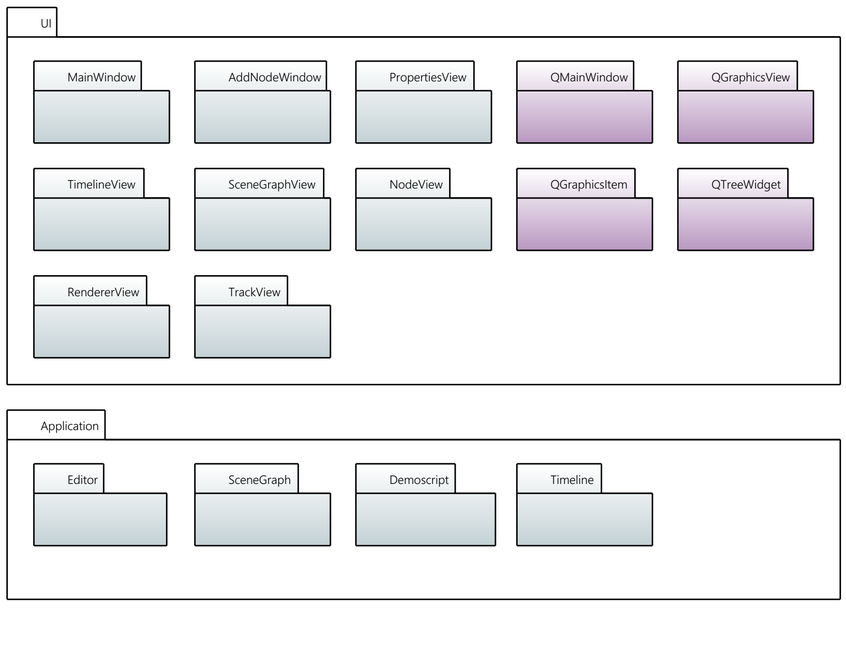
Layers



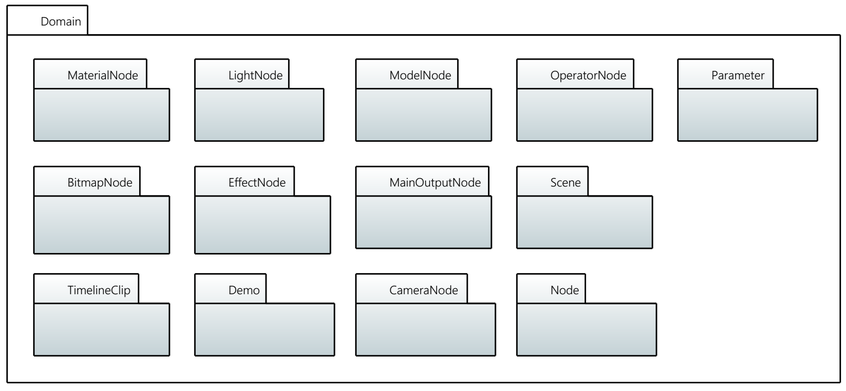
- UI: Views
- Application: Controllers
- Domain: Models
- Technical Services
- Foundation

⇒ Relaxed layered architecture

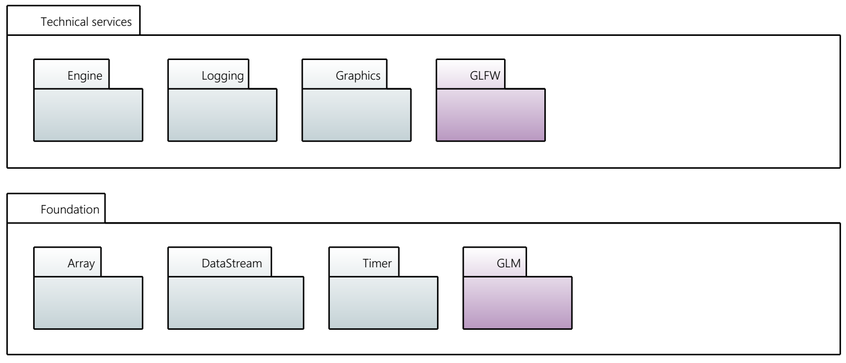
Logical Architecture
Layers: UI & Application



Logical Architecture
Layers: Domain

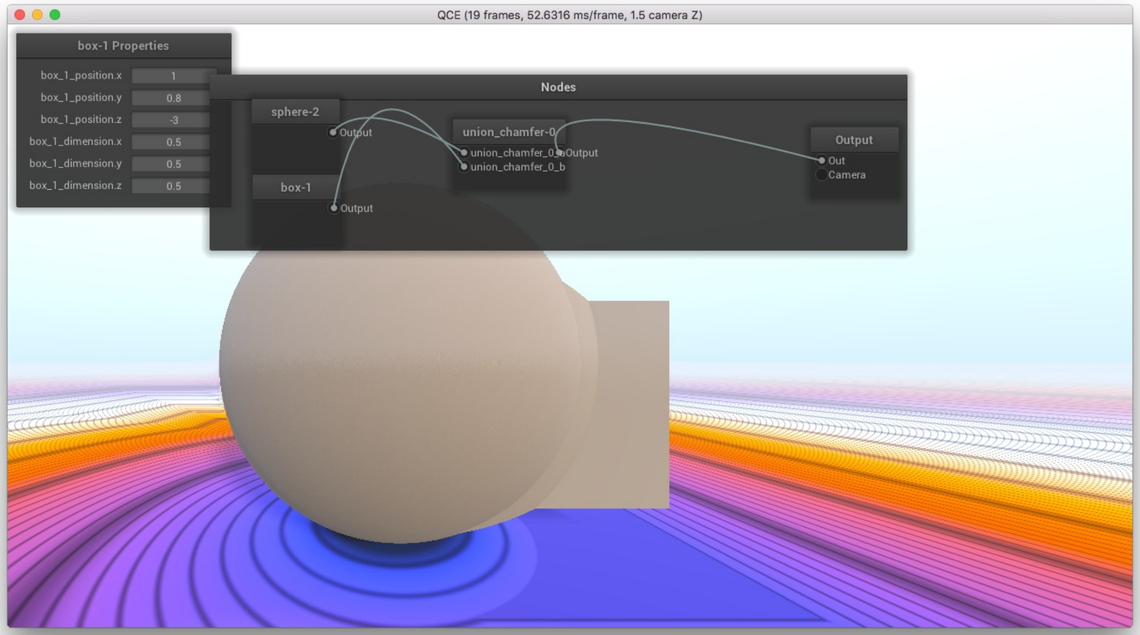


Logical Architecture
Layers: Technical services & Foundation



From theoretical..

..to practical: Prototype



Prototype Goal

- Model simple scenes
- Provide primitives
- Graph

Prototype
Procedure

- Re-compilation of shaders
- Dynamically loading of shader files
- Shader-template
- Graph

Lessons learned & outlook

- Iterations
- Simplicity
- Patterns
- Document

Thank you..

Questions?