

The Architecture of the Kapow Systems Engine

by

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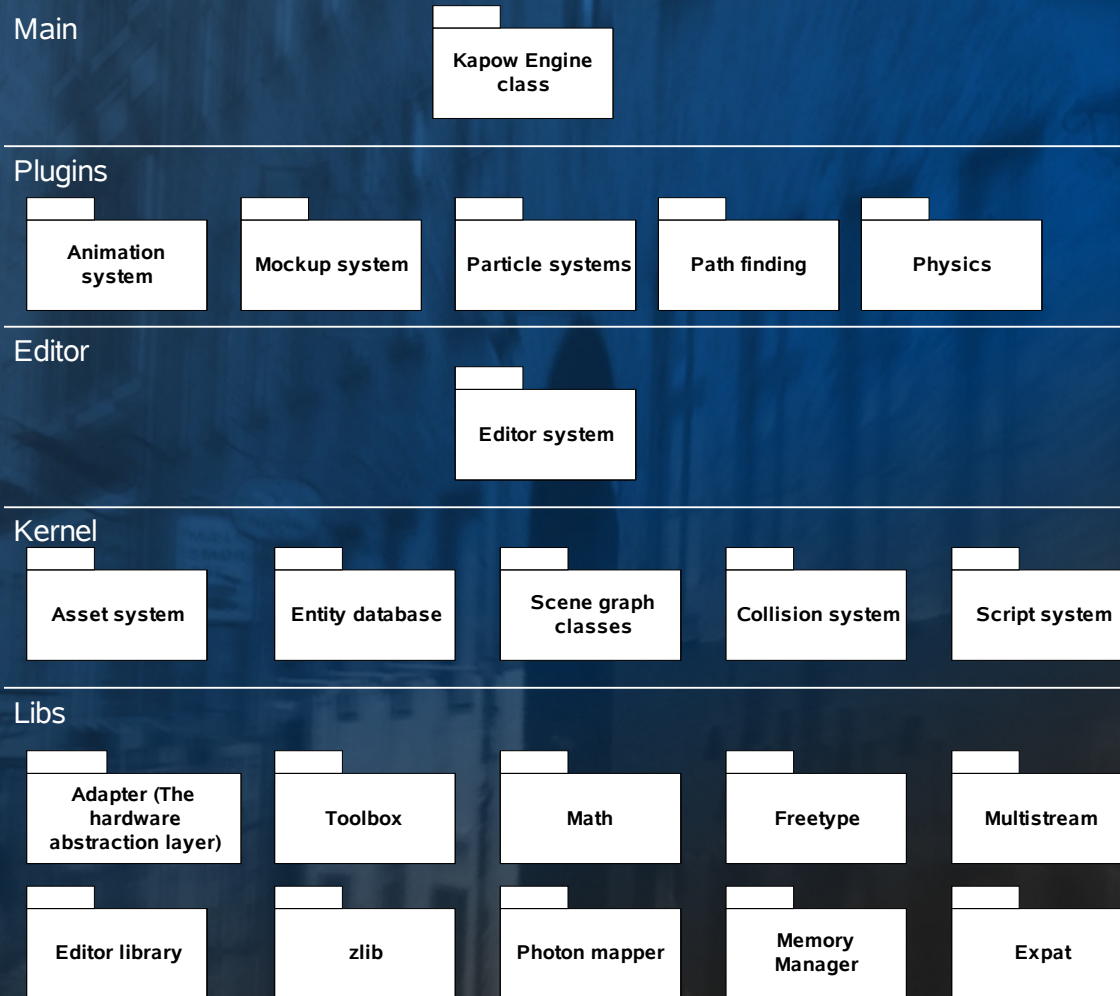
What is Kapow Systems?

- Production tool for making games
 - A sand box
- Cross platform run-time system
 - Supports PC, Xbox and PlayStation 2
- Box of tools for making game
 - No game specific components
- Was used to create Total Overdose

Key Features

- Integrated editor
- Fragments
- Entity type Database
- Memory management system
- Cross platform asset generation
- TNT script language

Layered Architecture

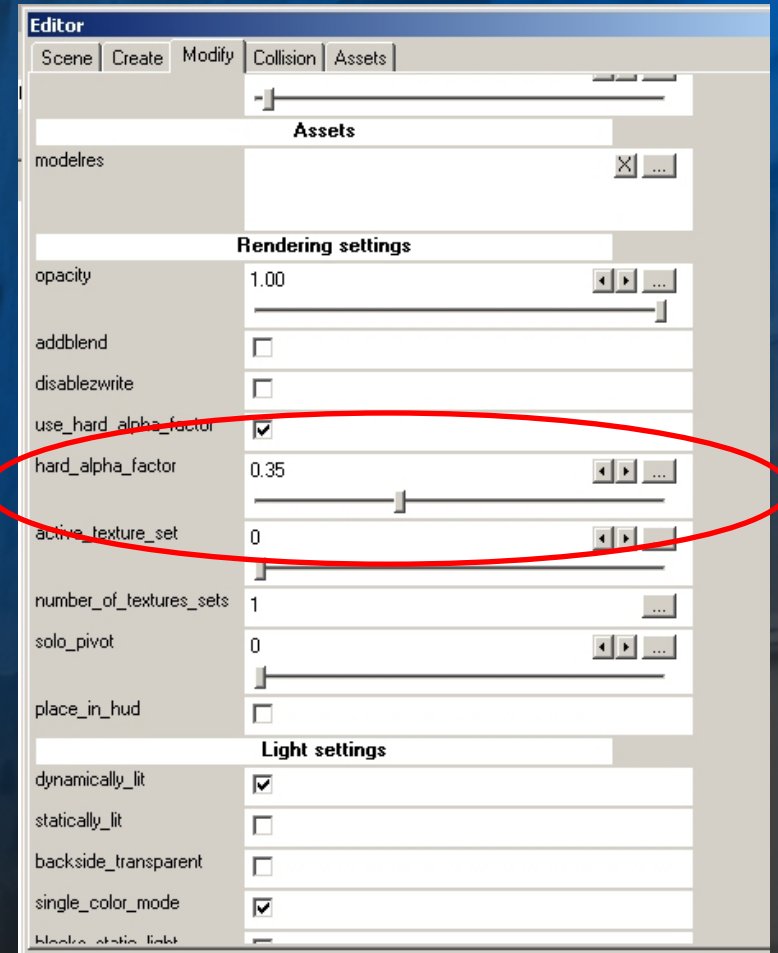


Entity type Database

- Run time type information (RTTI) system
- Used for multiple purposes:
 - Automatic GUI generation
 - Saving and loading scenes / fragments
 - Script interface
 - Saved games
 - Rewind system
 - Later: Undo in editor

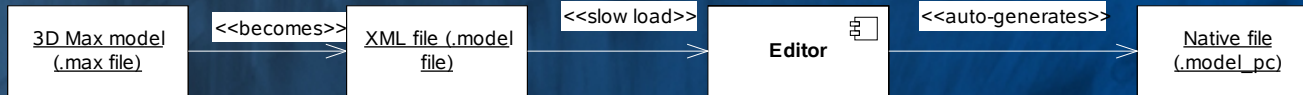
Entity type Database, cont.

```
class Model : public Node {  
    ...  
  
    void Register() {  
        tModel = new EntityType("Model");  
        tModel->InheritFrom(tNode);  
        tModel->SetCreator((CREATOR)Create);  
        ...  
        tModel->RegisterProperty(  
            "hard_alpha_factor", tNUMBER,  
            FLOAT_GETTER(Model::GetHardAlphaFactor),  
            FLOAT_SETTER(Model::SetHardAlphaFactor),  
            "control=slider|min=0|max=1");  
        ...  
    }  
    ...  
};
```

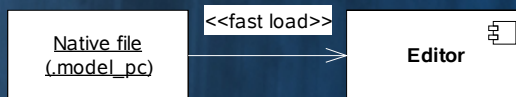


Asset Generation

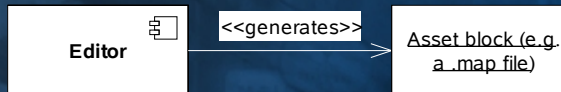
First use of asset after change of original version (in editor)



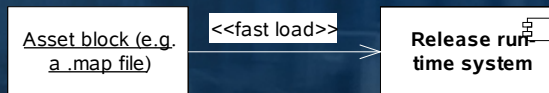
Subsequent uses (in editor)



Asset path for Asset block generation



Release build Asset path



Memory Management

- Consoles have no virtual memory!
Fragmentation is a big problem.
- We segment memory and make a separate allocator for each:
 - Frame based allocator for game levels
 - First fit allocator for small temporary things
 - Best fit allocator with flushing for renderlists.
 - Best fit allocator with defragmenting support for script objects.
 - The system malloc() for the rest.

Questions?



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