



DelphiDay

italian conference

Castle Game Engine

Let's make games using Pascal!

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Castle Game Engine

<https://castle-engine.io/>

PasDoc

<https://pasdoc.github.io/>

Modern Pascal Introduction

https://castle-engine.io/modern_pascal

Involved in 3D standards

X3D (Web3D), glTF (Khronos), new: IFC



DelphiDay
italian conference

19-20 Giugno 2025
Piacenza



wintech
italia



AGENDA

1. Castle Game Engine introduction

- features
- editor
- coding - handle input, log, handle button click, change translation

2. Physics

- setup physics, test in editor
- apply force from code

3. Walking and creatures - full game

4. IFC support

5. mORMot integration demo - network integration

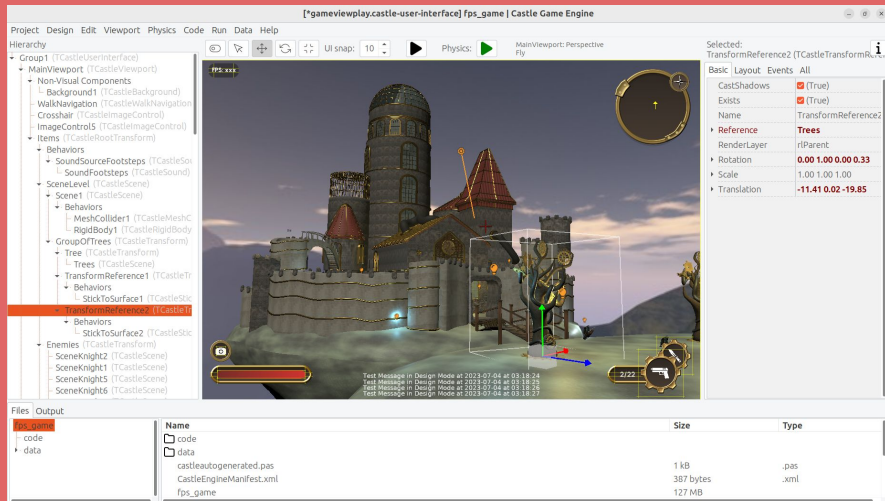


Castle Game Engine Introduction

1



Open-source game engine. Design 3D applications. Code using Pascal.





Features

- Game engine - design and code your game
 - Editor
 - Powerful API using modern Pascal
- Open-source and free (also to develop proprietary applications)
 - Get it from <https://castle-engine.io/> right now
- Delphi, C++ Builder and FPC
- Actually used to release games on Steam, Google Play, Nintendo, AppStore.
 - Worked with amazing professional people at Cat-astrophe Games.

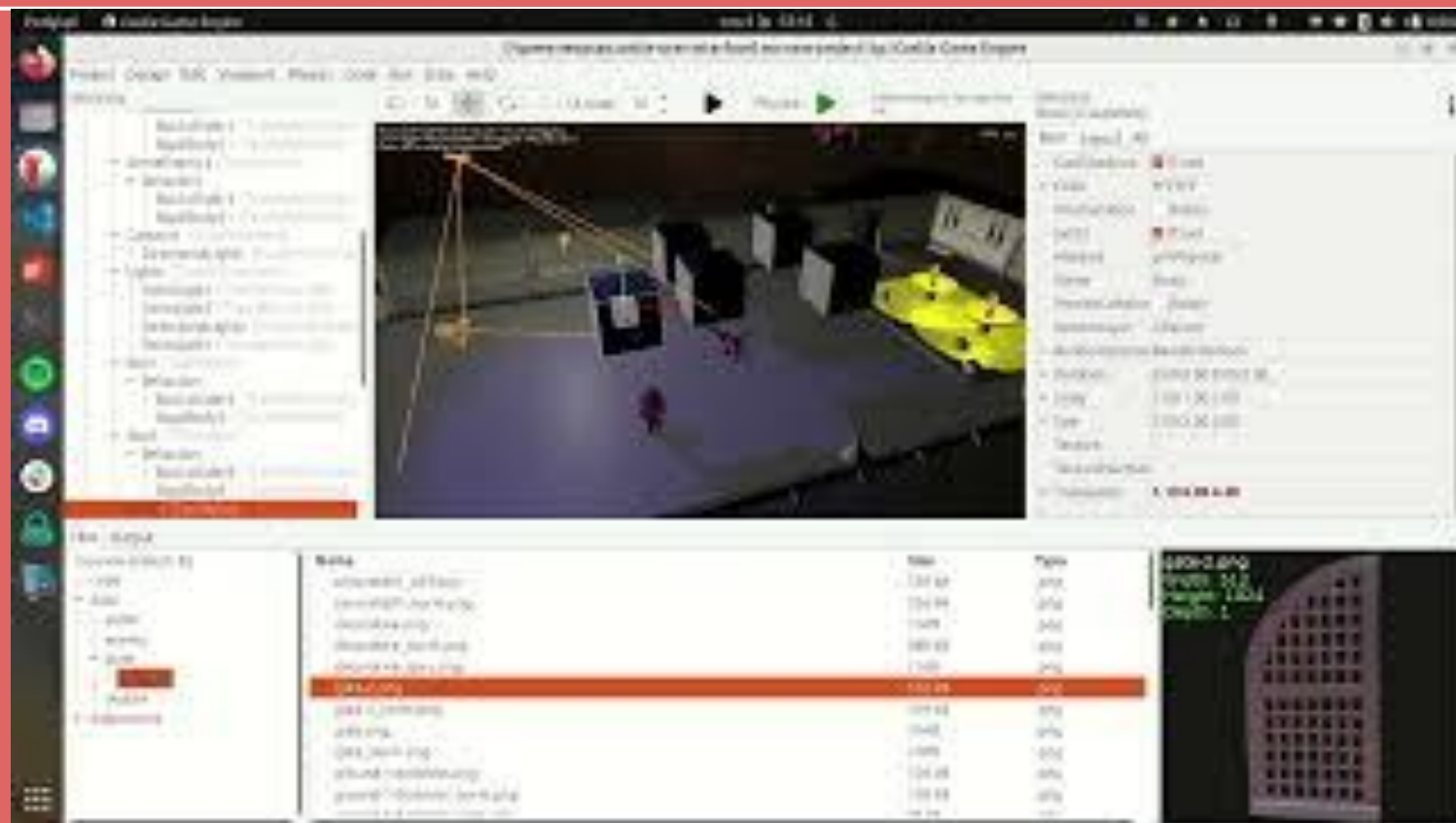


Features, 2

- 3D and 2D
- Cross-platform
 - Desktop, mobile, console (Switch), web
 - With Delphi: Windows and Linux; Android is coming soon
- Data from anywhere, thanks to these *3D standards* that I love so much
 - Blender, Maya, 3ds Max...
 - Ready from Sketchfab, Quaternius, OpenGameArt...
- Graphics: shader effects, shadows, mirrors, PBR...
- Own UI components (and/or surround with FMX or VCL UI)



Editor demo



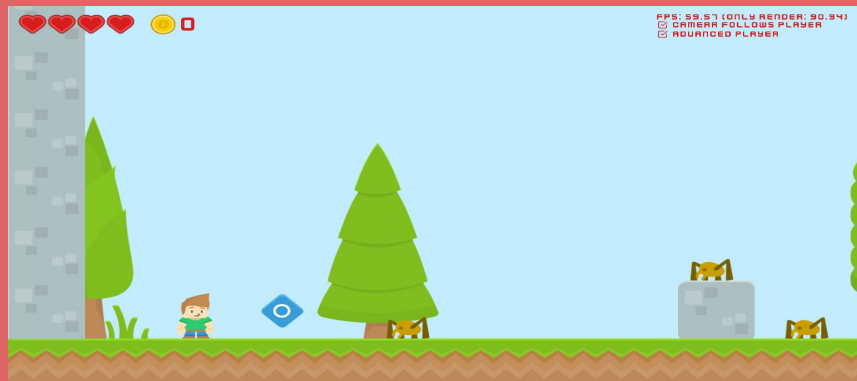
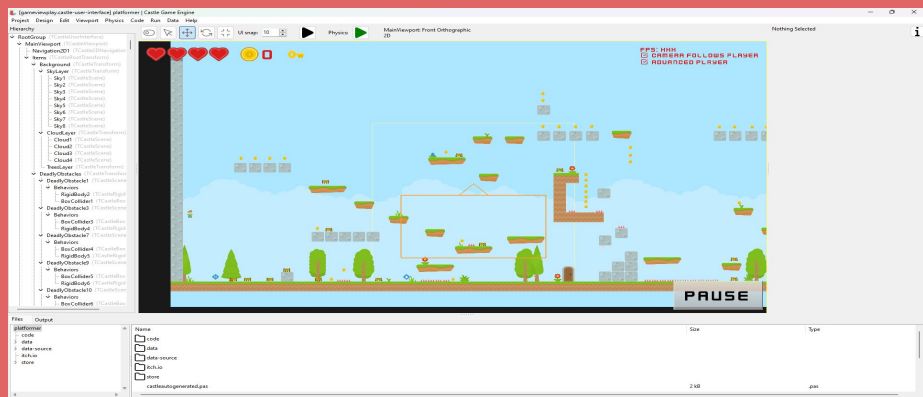


Coding

- Views are a bit like forms
- Handle key
- Make log
- Handle button click
- Change `SomeScene.Translation`
 - everything in editor is class instances + their properties



Design a 2D game level in editor





Physics

2



Design and test physics components in editor

The screenshot shows the Castle Game Engine editor interface. The main viewport displays a 3D scene of a castle courtyard with a stone wall, a small table with two chairs, and a character. A physics simulation is running, showing a blue cube with a red arrow indicating its velocity. The interface includes a Hierarchy panel on the left, a Properties panel on the right, and a Files/Output panel at the bottom.

Hierarchy Panel:

- behaviors
 - SoundSource2 (TCastleLiving)
 - Living2 (TCastleLiving)
 - MoveAttack2 (TCastleLiving)
- SceneSkeleton3 (TCastleLiving)
 - Behaviors
 - SoundSource3 (TCastleLiving)
 - Living3 (TCastleLiving)
 - MoveAttack3 (TCastleLiving)
- SceneSkeleton4 (TCastleLiving)
 - Behaviors
 - SoundSource4 (TCastleLiving)
 - Living4 (TCastleLiving)
 - MoveAttack4 (TCastleLiving)
- SceneSkeleton5 (TCastleLiving)
 - Behaviors
 - SoundSource5 (TCastleLiving)
 - Living5 (TCastleLiving)
 - MoveAttack5 (TCastleLiving)
- Box1 (TCastleBox)
 - Behaviors
 - RigidBody1 (TCastleLiving)
 - BoxCollider1 (TCastleLiving)
- Box2 (TCastleBox)
 - Behaviors
 - RigidBody3 (TCastleLiving)
 - BoxCollider2 (TCastleLiving)
- Box3 (TCastleBox)
 - Behaviors
 - RigidBody4 (TCastleLiving)
 - BoxCollider3 (TCastleLiving)
- Box4 (TCastleBox)

Properties Panel:

Selected: Box4 (TCastleBox)

Basic	Layout	All
CastShadows	<input checked="" type="checkbox"/> (True)	
Color	FFFFFF	
Direction	0 0 1	
DoubleSided	<input type="checkbox"/> (False)	
Exists	<input checked="" type="checkbox"/> (True)	
Material	pmPhysical	
Name	Box4	
PreciseCollisions	<input type="checkbox"/> (False)	
RenderLayer	riParent	
RenderOptions	RenderOptions	
Rotation	0 0 0 deg(0)	
Scale	1 1 1	
Size	2 2 2	
Texture		
TextureNormalMap		
Translation	0 4.42 0.02	
Up	0 1 0	

Files/Output Panel:

Name	Size	Type
flaunch.wav	96 kB	.wav

Output Log:

```
flaunch.wav  
Exception "Exception"  
Sound engine is not initialized  
Sound backend initialization failed:  
OpenAL library is not available  
Volume: 1.00
```



Apply force from code

- We have API to detect collisions, cause forces, query raycasts etc.
- Example to apply impulse on key press:

```
if Event.IsKey(keyZ) then
begin
    HitTransform := MainViewport.TransformHit(MainViewport.RenderRect.Center, true);
    //HitTransform := MainViewport.TransformUnderMouse;
    if (HitTransform <> nil) and
        (HitTransform.RigidBody <> nil) then
    begin
        HitTransform.RigidBody.ApplyImpulse(
            MainViewport.Camera.WorldDirection * 5,
            MainViewport.Camera.WorldTranslation);
    end;
    Exit(true);
end;
```




Walking and creatures - full game

3

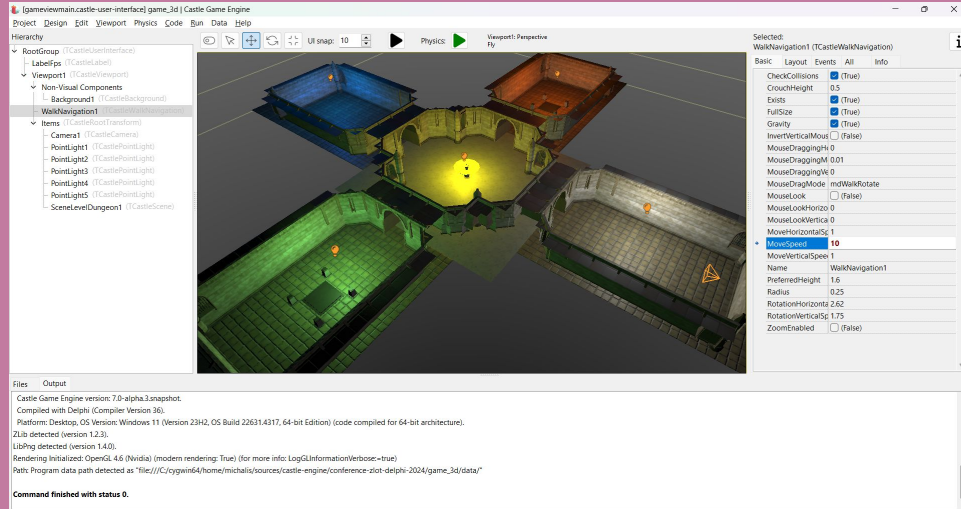
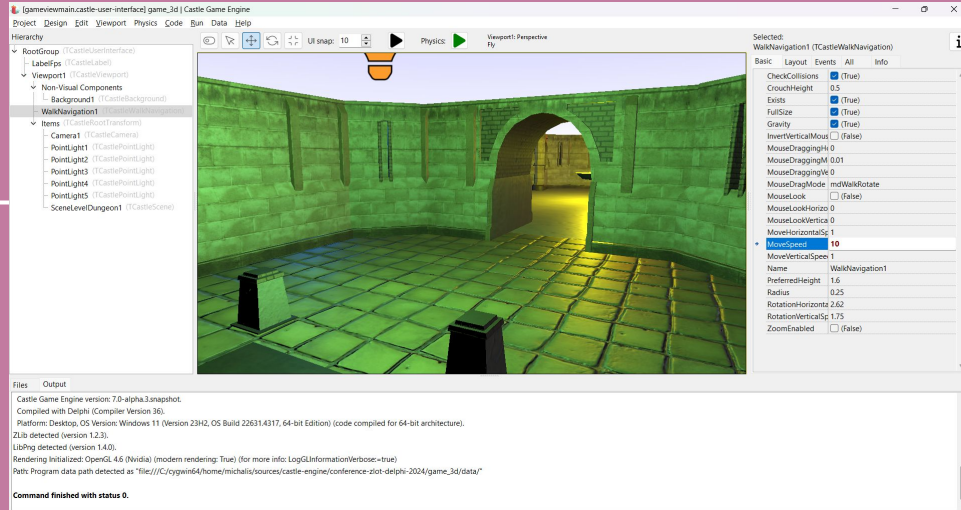
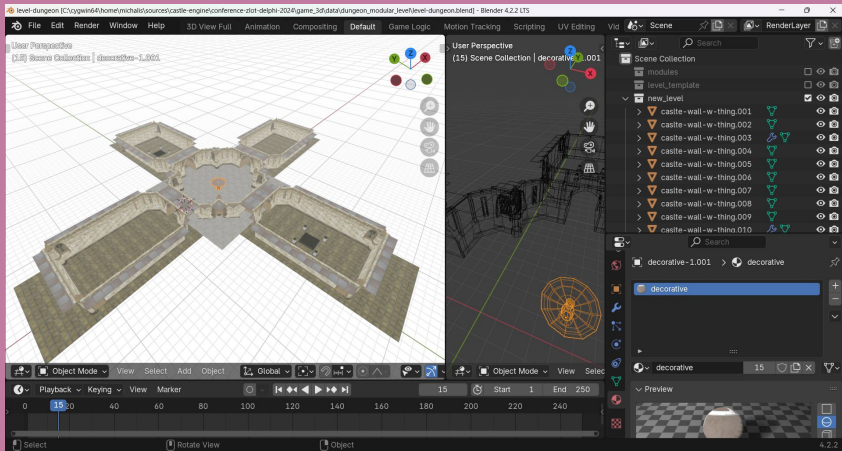


Get modular assets, design level in Blender and our engine editor

- Protip: search "modular" assets on open-source 3D assets sites
 - <https://castle-engine.io/assets.php>
 - These are your lego blocks to design levels, in Blender and/or our engine editor
- Enhance them with props and creatures, in our engine editor

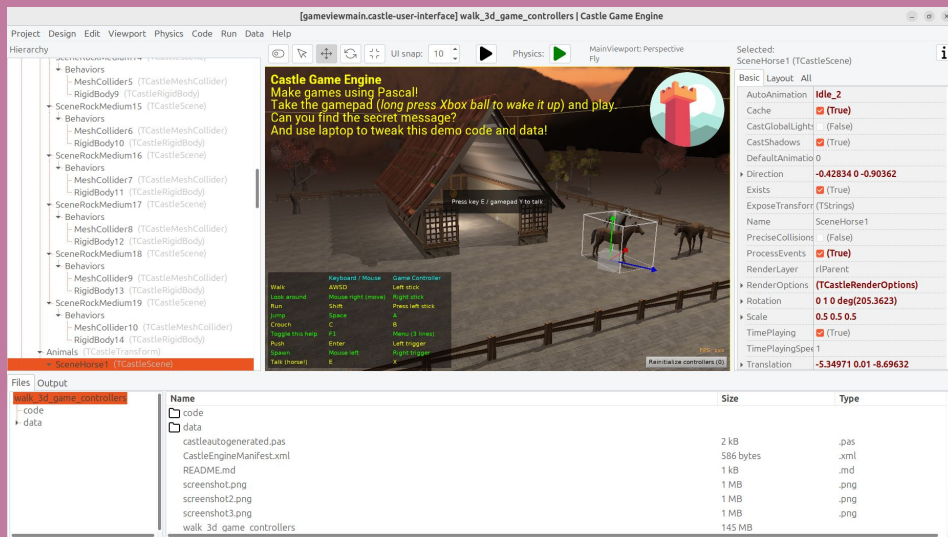


Example





Example 2





IFC support

4

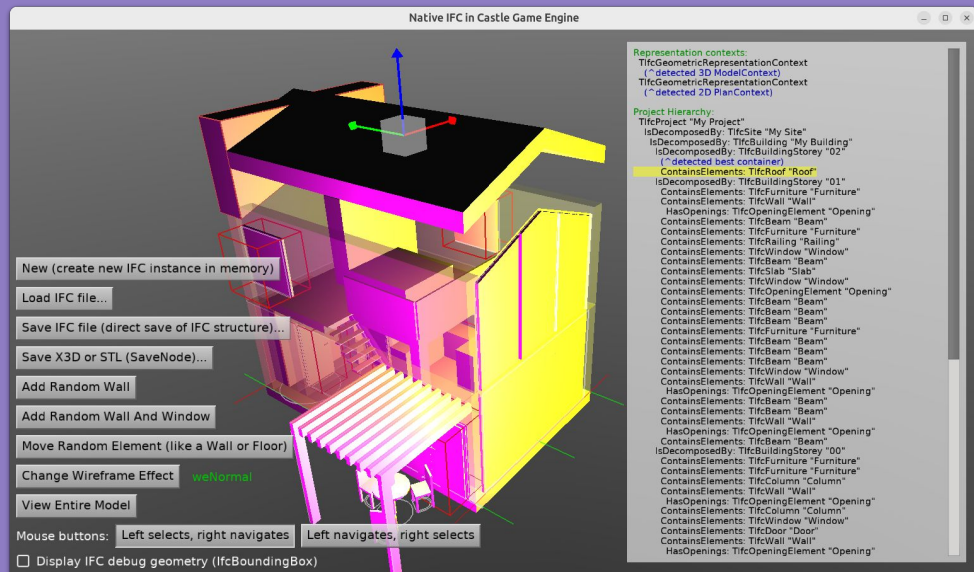
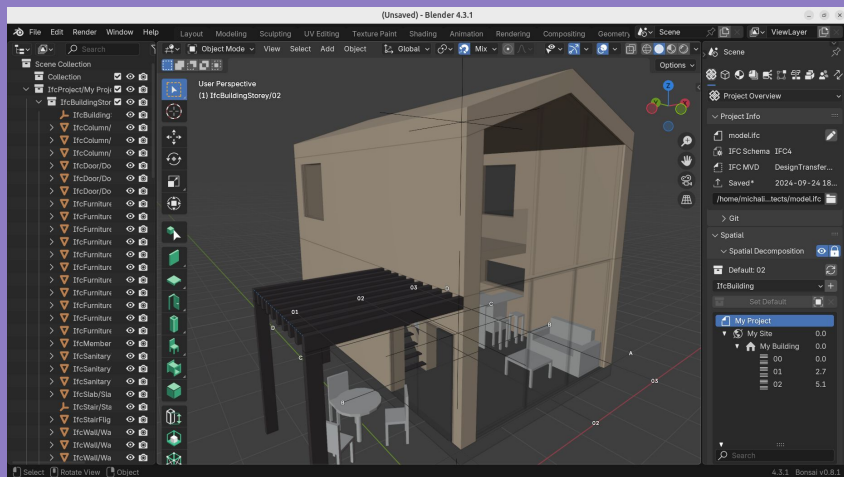


IFC

- Interoperability with IFC, standard for BIM (Building Information Modeling)
 - Layman terms: Designing in 3D **Real Things**
- Blender + BonsaiBIM
- FreeCAD
- Our engine can render IFC, and also "*think*" using IFC classes
 - You can add, translate things like IfcWall, IfcWindow and ~800 more IFC concepts



Demo





mORMot integration

5

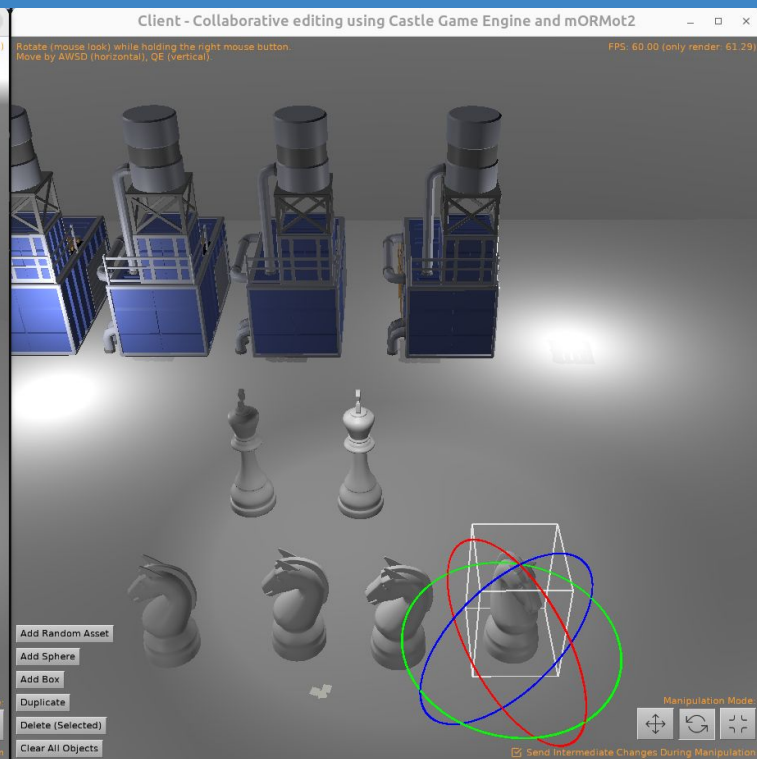
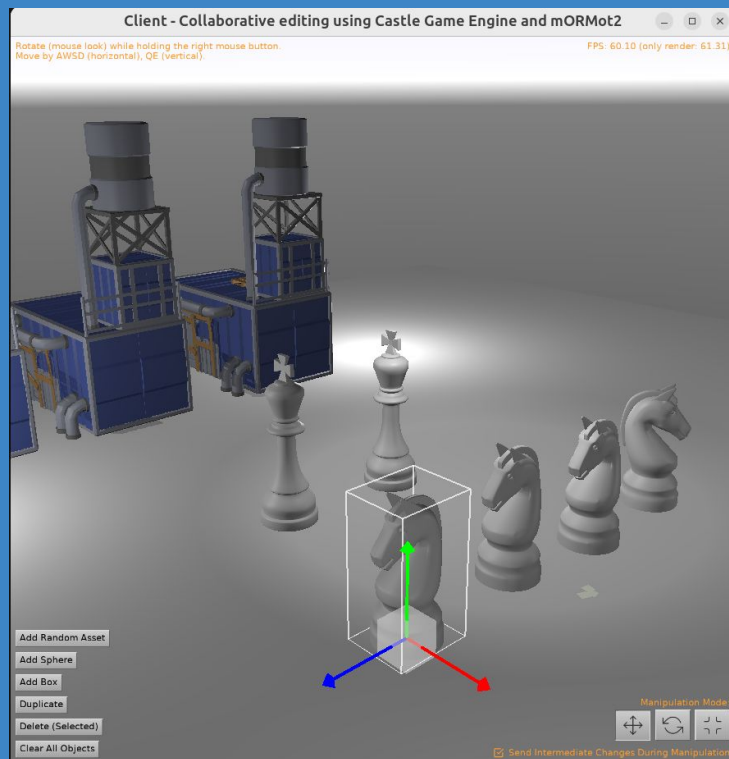


Engine is just Pascal units

- Engine is really just a collection of Pascal units
- Integrate it with any existing codebase or library you like
- (This also includes possible integration on VCL or FMX form!)
- Here, a demo you can use CGE + mORMot
 - to make **collaborative 3D world editing**
 - CGE does frontend, display and edit
 - mORMot does ORM, so network communication + persistence



Demo





Looking to cooperate

- Community support: <https://www.patreon.com/castleengine>
- Cooperation with companies (consulting, dedicated features, platforms...)
 - <https://castle-engine.io/donate>
- See what we plan: <https://castle-engine.io/roadmap>
- Talk to me: michalis@castle-engine.io



THANK YOU!

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<https://castle-engine.io>

