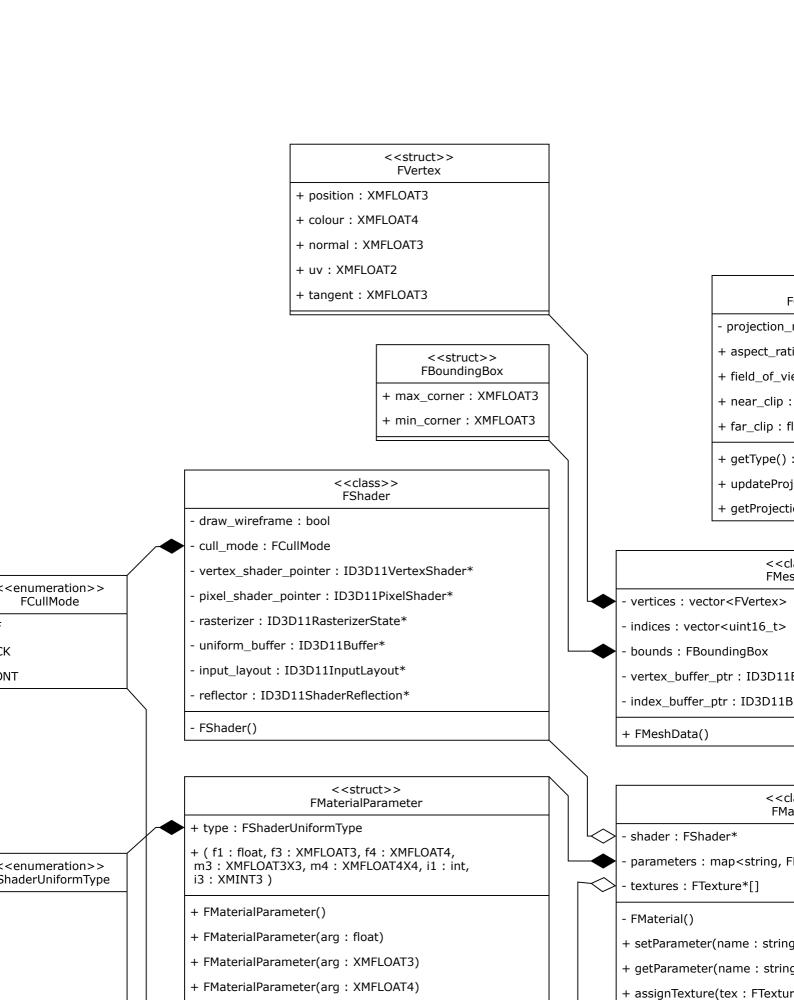
OFF

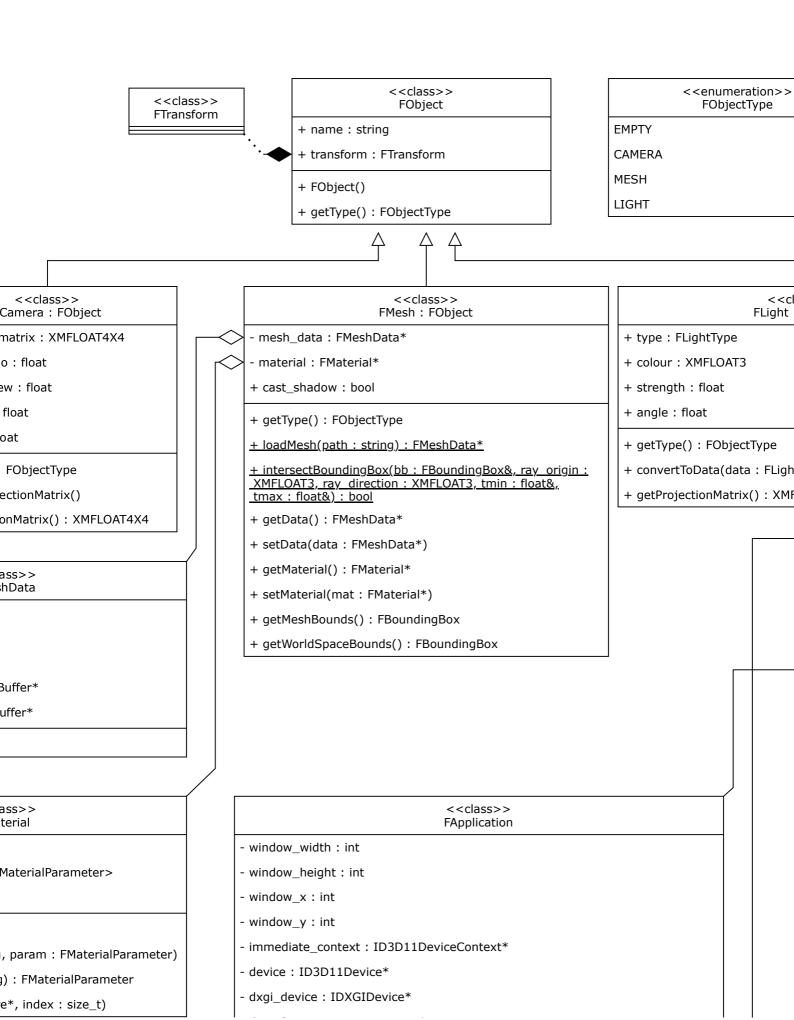
BAC FRC

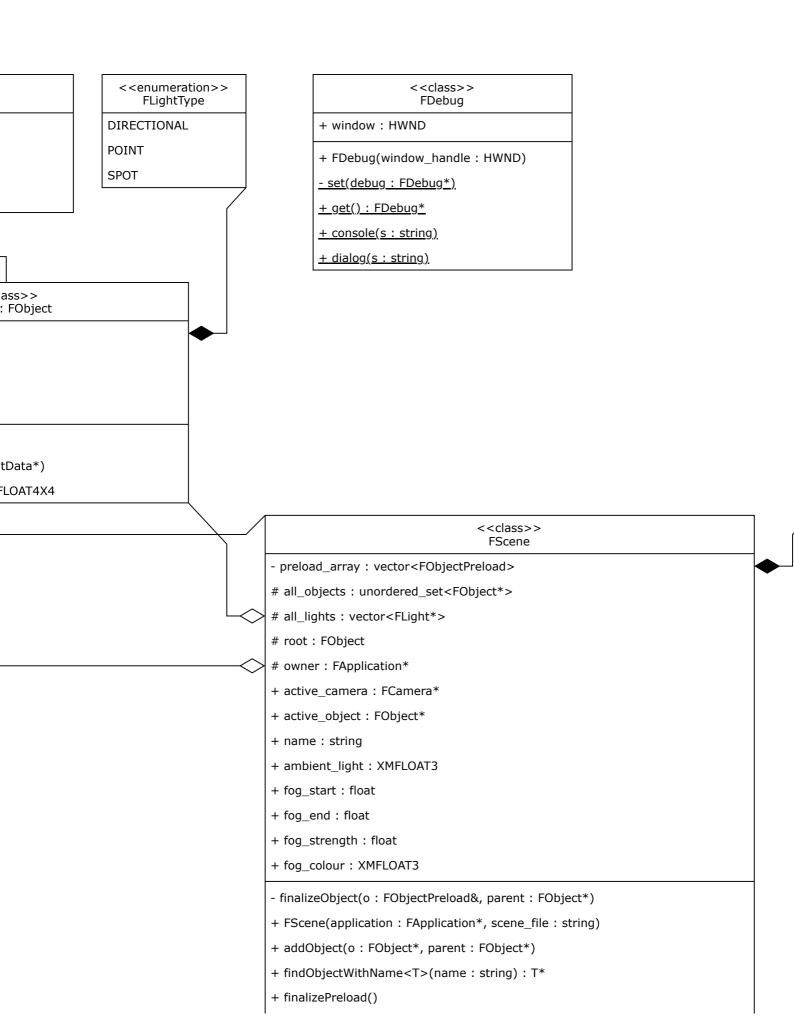
F1

F3 F4

M3







<<struct>> FObjectPreload

+ object_type : FObjectType

+ name : string

+ position : XMFLOAT3 + rotation : XMFLOAT3

+ scale : XMFLOAT3

+ children : vector<FObjectPreload>

+ data_name : string

+ material_name : string

+ float1 : float + float2 : float + float3 : float

+ float4 : float

+ colour : XMFLOAT3

+ strength : float

+ angle : float

+ cast_shadow : bool

I1

13

INV

+ FMaterialParameter(arg : XMFLOAT3X3) + FMaterialParameter(arg : XMFLOAT4X4) + FMaterialParameter(arg: int) <<st ALID + FMaterialParameter(arg: XMINT3) **FMateri** + shader : string + parameters : map<string, F <<class>> + textures : vector<string> **FTexture** + wireframe : bool - buffer_ptr : ID3D11ShaderResourceView*

FTexture()

<<class **FGraphicsE**

- application : FApplication*

- viewport : D3D11_VIEWPORT - swap_chain : IDXGISwapChain1*

+ culling : FCullMode

- nearest_sampler_state : ID3D11Sa

- bilinear_sampler_state : ID3D11Sa

- alpha_blend_state : ID3D11BlendS

- blank_texture : ID3D11ShaderRes

- depth_stencil_state : ID3D11Deptl colour_buffer : ID3D11Texture2D*

- colour_buffer_intermediate : ID3D

- colour_buffer_view : ID3D11Rende

- colour_buffer_intermediate_view:

- colour_buffer_resource : ID3D11S

- depth_buffer : ID3D11Texture2D*

- depth_buffer_view : ID3D11Depth

- depth_buffer_resource: ID3D11Sh

- normal_buffer : ID3D11Texture2D

normal_buffer_view : ID3D11Rend

- normal_buffer_resource : ID3D115

- ao_buffer : ID3D11Texture2D*

- ao_buffer_view : ID3D11RenderTa

- ao_buffer_resource : ID3D11Shade

- postprocess_shader : FShader*

- quad_vertex_buffer : ID3D11Buffe

- quad_index_buffer : ID3D11Buffer

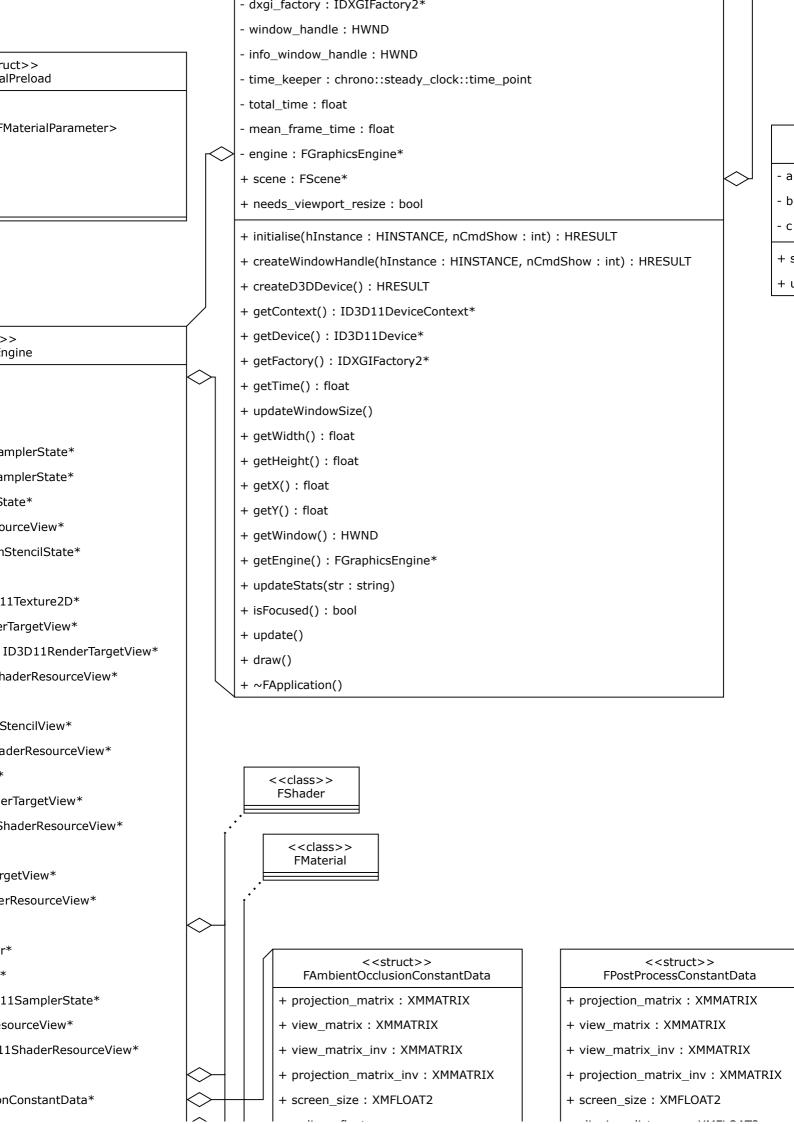
- postprocess_sampler_state : ID3D

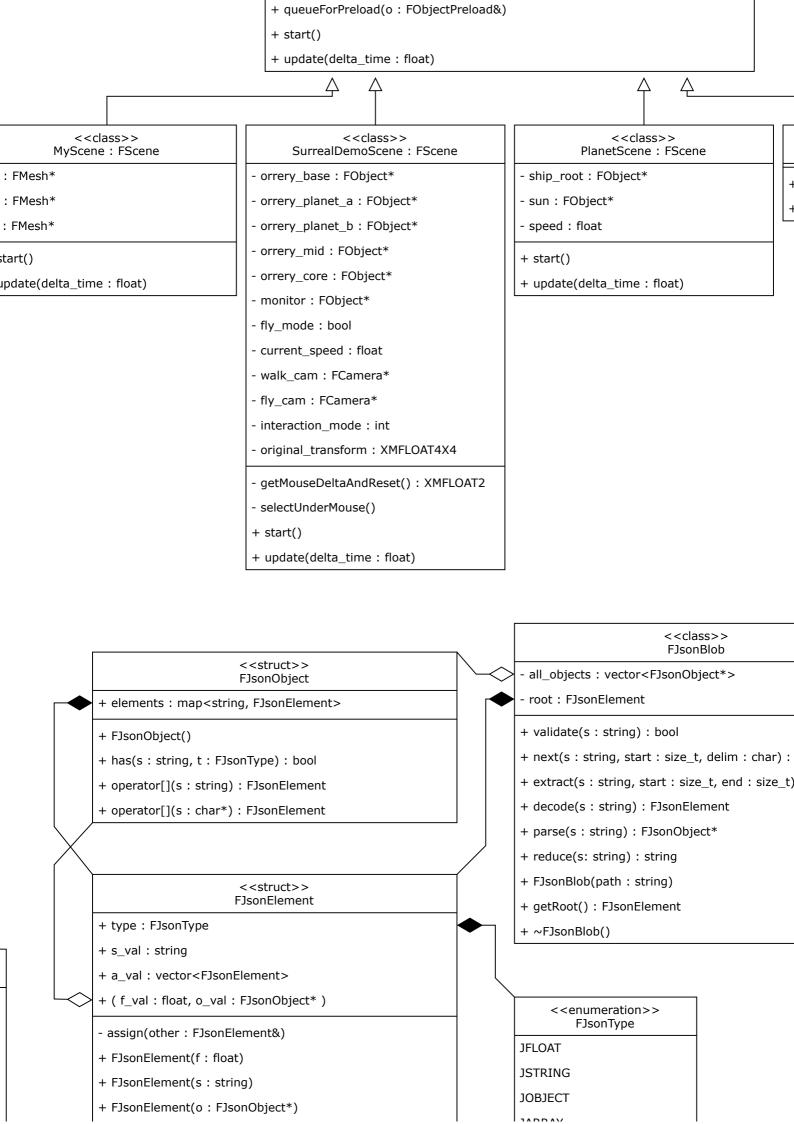
skybox_texture : ID3D11ShaderRe

- post_process_text_texture : ID3D3

- ao_shader : FShader*

- ao_buffer_data : FAmbientOcclusio





<<class>>
ShadowDemoScene : FScene

- start()

- update(delta_time : float)

size_t

: string

<<class>> **FMeshData**

- gizmo_vertex_buffer : ID3D11Buff - gizmo_index_buffer : ID3D11Buffe - box_shader : FShader* - box_vertex_buffer : ID3D11Buffer - box_index_buffer : ID3D11Buffer* - active_mesh : FMeshData* active_shader : FShader* - active_material : FMaterial* - shadow_map_view : ID3D11Depth - shadow_buffer_data : FShadowMa - lights: int - tris: int - loadDefaultResources(): HRESULT

<<enumeration>> FOutputMode

POST_PROCESS SCENE_COLOUR

SCENE_NORMAL

SCENE_DEPTH

SHARPENED

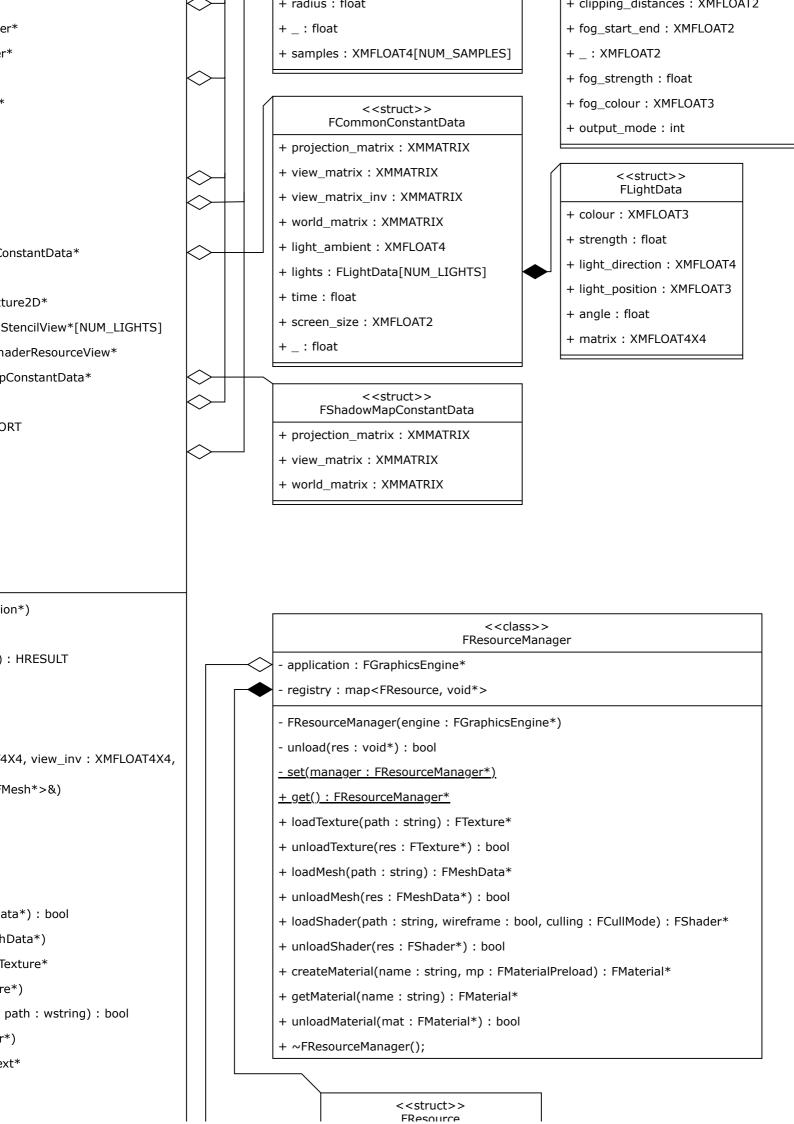
AMBIENT_OCCLUSION

- uniform_buffer_data : void* - common_buffer_data : FCommonC - common_buffer : ID3D11Buffer*

- gizmo_shader : FShader*

- shadow_map_texture : ID3D11Tex
- shadow_map_resource : ID3D11Sl
- shadow_map_data : FShader*
- shadow_viewport : D3D11_VIEWP
- placeholder_material : FMaterial*
- meshes: int
- + output_mode : FOutputMode
- + draw_gizmos : bool
- FGraphicsEngine(owner: FApplicat
- initialise(): HRESULT
- createSwapChainAndFrameBuffer()
- initPipelineVariables(): HRESULT
- resizeRenderTargets()
- frustrumCull(projection: XMFLOAT
- bounds: FBoundingBox): bool
- sortForBatching(objects : vector<F
- drawObject(object : FMesh*)
- performPostprocessing()
- drawGizmos()
- renderShadowMaps()
- registerMesh(mesh_data: FMeshD
- unregisterMesh(mesh_data: FMes
- registerTexture(path : wstring) : F
- unregisterTexture(texture: FTextu
- registerShader(shader : FShader*, - unregisterShader(shader: FShade
- getContext(): ID3D11DeviceConte
- getFactory(): IDXGIFactory2*

- getDevice(): ID3D11Device*



| JARRAY

```
+ FJsonElement(a : vector<FJsonElement>)

+ FJsonElement(other : FJsonElement&)

+ FJsonElement(other : FJsonElement&&)

+ operator=(other : FJsonElement&) : FJsonElement

+ operator=(other : FJsonElement&&) : FJsonElement

+ ~FJsonElement()
```

```
<<class>>
                                FTransform
local_to_parent : XMFLOAT4X4
local_to_world : XMFLOAT4X4
- local_position: XMFLOAT3
local_quaternion : XMFLOAT4
local_scale : XMFLOAT3
- parent : FTransform*
- children: unordered_set<FTransform*>
updateWorldFromLocal()
updateLocalFromWorld()
updateLocalFromParams()
- updateParamsFromLocal()
- propagate()
+ FTransform(position: XMFLOAT3, quaternion: XMFLOAT4, scale: XMFLOAT3)
+ FTransform(position: XMFLOAT3, eulers: XMFLOAT3, scale: XMFLOAT3)
+ FTransform()
+ FTransform(other : FTransform&)
+ FTransform(other: FTransform&&)
+ operator=(other : FTransform&) : FTransform
+ operator=(other : FTransform&&) : FTransform
+ getTransform(): XMFLOAT4X4
+ setTransform(t : XMFLOAT4X4)
+ getLocalTransform() : XMFLOAT4X4
+ getPosition(): XMFLOAT3
+ setPosition(p : XMFLOAT3)
+ getLocalPosition(): XMFLOAT3
+ setLocalPosition(p : XMFLOAT3)
+ getQuaternion(): XMFLOAT4
+ setQuaternion(p : XMFLOAT4)
+ getLocalQuaternion(): XMFLOAT4
+ setLocalQuaternion(p : XMFLOAT4)
+ getEuler() : XMFLOAT3
+ setEuler(e : XMFLOAT3)
+ getLocalEuler(): XMFLOAT3
+ setLocalEuler(e : XMFLOAT3)
```

+ getScale(): XMFLOAT3

+ getLocalScale(): XMFLOAT3

- getScene() : FScene*

- getTime() : float

- getAspectRatio() : float

- getWidth() : float

getHeight(): floatgetWindow(): HWND

- ~FGraphicsEngine()

+ draw()

+ name : string
+ type : FResourceType
+ operator<(b : FResource&) : bool

<<enumeration>>
FResourceType

TEXTURE
MESH_DATA
SHADER
MATERIAL

```
+ setLocalScale(s : XMFLOAT3)
+ translate(v : XMFLOAT3)
```

+ rotate(axis : XMFLOAT3, angle : float, about : XMFLOAT3)

+ scale(s : XMFLOAT3, about : XMFLOAT3)

+ faceForward(forward : XMFLOAT3, up : XMFLOAT3)

+ lookAt(target : XMFLOAT3, eye : XMFLOAT3, up : XMFLOAT3)

+ reset()

+ getRight() : XMFLOAT3

+ getUp(): XMFLOAT3

+ getForward() : XMFLOAT3

+ getLocalRight() : XMFLOAT3

+ getLocalUp() : XMFLOAT3

+ getLocalForward() : XMFLOAT3

+ getParent() : FTransform*

+ countChildren(): int

+ addChild(o : FTransform*)

+ removeChild(o : FTransform*)