Unreal Engine 4.12.5 Sequencer API Notes

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The following is a brief summary of how the sequencer API appears to work. My primary interest is in accessing the parts of an artist created sequence, not a full interface to build up sequencing via Python, though that would be excellent to have in future.

The relevant page in the online docs is https://docs.unrealengine.com/latest/INT/API/Runtime/MovieScene/index.html

An overview:

- a movie scene has
    - **objects** it can *spawn* or *possess*
    - **bindings** relating these objects to tracks
- **tracks** are *specialized by what aspect of the object they drive* (skeletons, visibility, etc.)
    - (tracks can also be "unbound" or organized into folders)
- tracks contain **sections**
- each section is *one "clip" of animation* from some media appropriate to the track + section's specialization
- *media is referenced by sections*, e.g. an anim sequence for a skeletal mesh animation section

In addition, tracks and sections have appropriate start and end time in float seconds.

Please pardon the loose notation below.

class LevelSequence
    has one MovieScene

The Unreal Python API begins with MovieScene (as of this document date).

class MovieScene - contains tracks either a) bound to spawed or possessed objects, or b) not bound (master track)
    // retrieve all the possessables to which tracks are bound
    MovieScenePossessable **GetPossessable**(Index);
    int32 **GetPossessableCount**();

    // retrieve all the spawnables to which tracks are bound
    MovieSceneSpawnable **GetSpawnable**(Index);
    int32 **GetSpawnableCount**();

    TArray<MovieSceneTrack> **GetMasterTracks**(); // retrieve all otherwise unbound tracks
    TArray<MovieSceneBinding> **GetAllBindings**(); // all Guid to track bindings

TArray<MovieSceneFolder> **GetRootFolders**(); // folders at top level

class MovieScenePossessable
    FGuid **GetGuid**();
    FString **GetName**();
    UClass **GetPossessedObjectClass**();
    Fguid **GetParent**(); // if applicable

class MovieSceneSpawnable
    UObject **GetObjectTemplate**();
    FGuid **GetGuid**();
    FString **GetName**();
    TArray<FGuid> **GetChildPossessables**();
    ESpawnOwnership **GetSpawnOwnership**();

class MovieSceneBinding // relate Guid to track
    FString **GetName**();
    FGuid **GetObjectGuid**();
    TArray<MovieSceneTrack> **GetTracks**();

class MovieSceneFolder // organize tracks
    FName **GetFolderName**();
    TArray<MovieSceneFolder> **GetChildFolders**();
    TArray<MovieSceneTrack> **GetChildMasterTracks**();
    TArray<Fguid> **GetChildObjectBindings**(); // bindings (and thereby tracks) in this folder

class MovieSceneTrack // abstract base
    FName **GetTrackName**();
    FName **GetDisplayName**();
    bool **IsEmpty**();
    TArray<MovieSceneSection> **GetAllSections**();

MovieSceneTrack derivations of interest:

- **class** MovieSceneAudioTrack
    - TArray<MovieSceneAudioSection> **GetAudioSections**();
- **class** MovieSceneCameraAnimTrack // animates the camera
- **class** MovieSceneCameraCutTrack // cuts between cameras
- **class** MovieSceneSkeletalAnimationTrack
- **class** MovieSceneCinematicShotTrack // contains MovieSceneSequence subtracks

class UMovieSceneSection // abstract base
    float **GetStartTime**();
    float **GetEndTime**();

```
    int32 GetOverlapPriority();
    TRange<float> GetRange();
    bool IsInfinity();
    MovieSceneSection OverlapsWithSections(TArray<MovieSceneSection>, int32
TrackDelta, float TimeDelta);
```

MovieSceneSection derivations of interest:

- **class** MovieSceneAudioSection
  - SoundBase GetSound();
- **class** MovieSceneCameraAnimSection
  - float **BlendInTime**;
  - float **BlendOuttime**;
  - bool **bLooping**;
  - float **PlayRate**;
  - float **PlayScale**;
  - CameraAnim **GetCameraAnim**();
- **class** MovieSceneCameraCutSection
  - FGuid **GetCameraGuid**();
- **class** MovieSceneSkeletalAnimationSection // derivation for skeleton mesh data
  - AnimSequence **GetAnimSequence**()
  - float **GetDuration**()
  - float **GetEndOffset**()
  - float **GetPlayRate**()
  - bool **GetReverse**()
  - float **GetSequenceLength**()
  - float **GetStartOffset**()

Media to include (all derived from UObject, have GetName() but: sufficient to discover source?):

- **class** SoundBase
- **class** CameraAnim
- **class** AnimSequence

So how does one use this to traverse the sequencer starting from MovieScene?

- MovieScene.GetSpawnable(index), .GetPossessable(index) provide Names and Guids.
- MovieScene.GetAllBindings()
- MovieSceneBinding.GetObjectGuid(), .GetTracks()
- MovieSceneTrack.GetAllSections()
- MovieSceneSection.GetStartTime(), .GetEndTime()

From these we should be able to find the SoundBase, CameraAnim an AnimSequence for each type of section.