D7.3 Virtual Studio Pipeline Report

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Abstract	Works on the Virtual Studio pipeline have focused on the adaptation of InfinitySet for the incorporation and use of Unreal Engine and on the implementation of the required modules in Unreal Engine to allow communication between the two graphic engines. This document details the architecture design for this integration, the functionality of each of its modules, and the final implementation required to cover the requirements and needs identified in the broadcast use case described in WP2.
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0.1 02-02-2021	Document created by Javier Montesa
0.2 05-02-2021	Introduced abstract, executive summary, structure, and table of contents
0.3 12-02-2021	System architecture section edited
0.4 19-02-2021	Unreal Engine Launcher, InfinitySet Adaptations, and Unreal Engine Plug-in edited.
0.5 23-02-2021	Conclusions, next steps, and document revision
0.9 24-02-2021	Version for internal review
1.0 26-02-2021	Revisions in response to review: final version submitted to Commission
1.1 22-07-2021	Removed depth buffers: there is not needed
1.5 07-01-2022	Preparation of the final version of the deliverable, D7.3, based on the already existing D7.1 containing the interim developments status.
1.6 26-01-2022	All modifications and updates of modules added.
1.7 02-02-2022	Module's modifications, updates and extras, improved organisation in the existing sections of the document.
1.8 04-02-2022	New figures, PoC images and diagrams added.
2.0 09-02-2022	Grammar correction, text formatting, and final touches.
2.1 23-02-2022	Final version after peer review proposed modifications.

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1. EXECUTIVE SUMMARY

This deliverable covers the activities related to task 7.1, the first and second phases of development where the integration of InfinitySet and Unreal Engine has been carried out. The two main objectives in this task were first to prepare both engines so they can run together in an easy and seamless way for the operator, and second to connect them so they can share parameters, events, and stream their renders in real time and in both directions through shared memory.

The document first introduces the main concepts and overall architecture of the system, then the aforementioned two main challenges are presented along with details on how they have been achieved, then the final functionalities of the system are presented along with new updates and fine tuning implemented during the second phase on T7.1. Finally, a brief manual on how to make use of them is also added as an annex to the document. The conclusions section, apart from presenting the interim developments of the system, also summarises the specific improvements and adjustments that completed the system functionality.

2. BACKGROUND

Two of the most important outcomes of WP2 were the description of the different use cases and scenarios and the overall architecture of the system and its different implementations for each use case, including a reference implementation to facilitate the technology providers to implement and integrate their modules.

Depending on the specific use case requirements, the Present general architecture may involve different modules and functionalities, but for the development and integration of each of its modules, a reference implementation including all the possible functionalities and requirements was proposed.

Figure 1. First proof-of-concept visual.

Based on this information, the broadcast use case has been based on the said reference implementation, and the activities and developments carried out in task 7.1 have been oriented to the integration of InfinitySet and Unreal Engine in such a way that along with the developments carried out in task WP7T2, the resulting piece of software finally assures compatibility with the rest of systems in Present, while providing all the required functionality to perform the final proof-of-concept tests, some of them already performed and the rest coming shortly in the project time plan.