

Tiber: Managing Shot Setup Data Complexity

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1 Introduction

Tiber is a production scene management tool that supports interactive shot setup and asset configuration for increasingly complex sets in use at DreamWorks Animation. It supports the fast, graphical, and sequence-based editing of shot configurations based on a novel sparse shot and asset data management system that leverages Maya Scene Assemblies for improved scalability along with direct artist management of scene complexity.

Tiber has been deployed within Layout on a number of upcoming feature animation productions, resulting in meaningful gains in artist efficiency. Adoption of the toolset and supporting asset data model has also opened the door for broader Tiber technology deployment within the studio, with potential inter-departmental workflow and organizational improvements across front end production departments.

2 The Challenge

One of the Layout department's key responsibilities at DreamWorks Animation is asset installation and configuration for shots. As production data sets have increased in size and complexity and schedules have tightened, effective data management has become increasingly important in improving the efficiency of supported artist workflows. The previous Layout toolset at DreamWorks included an ever-expanding and disparate collection of task-specific command line tools built around a general pipeline data model that was not optimized for the departments needs. The resulting artist workflows were non-interactive, non-intuitive, and inefficient.

Tiber was developed as a Maya-integrated, sequence based platform to address these challenges for Layout with a focus on efficient data management, enabling fast, artistically oriented workflows for the configuration of assets across the context of multiple shots. The Tiber platform consists of lightweight asset and shot data models and associated scene management capabilities, built as an extension to Maya's Scene Assembly functionality. Tiber supports intuitive and visual workflows for Layout artists managing shots, sets, and models of increasing complexity.

3 Managing Scene Complexity

Tiber's asset data model supports the assembly of hierarchical assets, each with multiple geometric representations. The data model was designed to help artists logically organize massive sets, such as cities into neighborhoods into blocks into buildings, and easily disable or switch geometric representations for entire regions of a set across shots. The availability of multiple geometric asset representations also helps artists in managing task-based interactive performance. Asset representations range from bounding boxes,



Figure 1: The Tiber Application and Maya

to hardware optimized caches, to fully editable geometry and rigs, while also supporting Studio pipeline LODs and geometric and surfacing variations.

The Tiber asset data model is represented within the Maya runtime via Scene Assembly APIs, which provide the base mechanism for swapping geometric representations of hierarchical assets while additionally maintaining asset configurations via edit tracking. The artist-facing Tiber toolset builds on top of the data model by providing intuitive workflows for artist management of scene complexity, enabling Maya to host large amounts of geometric data encapsulated through a common asset interface.

4 Sequence Based Workflows

While Maya Scene Assembly provides the base mechanics for management of a single scene, Maya's singular editing context is not well suited for a sequence-based workflow. Tiber expands upon Maya Scene Assembly by hosting multiple shots simultaneously, enabling multi-shot and cross-shot editing, as well as shot to shot edit propagation.

The Tiber shot data model is comprised of sparse sets of unresolved modifications of asset properties per shot. The modifications are managed across a shot hierarchy supporting asset property inheritance and overriding. For example, asset properties that are shared across multiple shots, say within a sequence, can be set within the context of a corresponding shot group, and then overridden within child shots of the group as needed. The data is lightweight enough to allow the simultaneous pre-caching of hundreds of shots, with a full set of shot modifications being resolved on demand. The data's sparse nature and resolution mechanics also allow edits to be easily copied or propagated shot to shot, as well as promoted up and down the shot hierarchy.

The artist-facing Tiber toolset supports intuitive sequence-based workflows supporting direct and interactive editing of the shared shot group configurations, fast switching between active shot contexts, and visualization of deltas between shots via context-based highlighting. Collectively, Tiber enables native, intuitive, and fast WYSIWYG management of massive amounts of pipeline data at the sequence level within a familiar and robust Maya-based editing environment, enabling nimble and efficient workflows for Layout artists.

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