The Runtime Asset Format for GL-based Applications

July 2016
3D Needs a Transmission Format!

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A widely adopted media format ignites previously untapped commercials opportunities

Scene geometry and hierarchy

Materials and textures

glTF is used for NORAD’s Santa Tracker Web Page

Animations and skins
glTF = “JPEG for 3D”

- ‘GL Transmission Format’
  - Runtime asset format for WebGL, OpenGL ES, and OpenGL applications

- Compact representation for download efficiency
  - Binary mesh and animation data

- Loads quickly into memory
  - GL native data types require no additional parsing

- Full-featured
  - 3D constructs (node hierarchy, materials, animation, cameras, lights)

- Runtime Neutral
  - Can be created and used by any tool, app, or runtime

- Flexible Extensibility
  - E.g. payloads with compression and streaming
glTF Internals

- JSON describes node hierarchy
  - Includes cameras
  - References geometry, animations, skins, shaders, textures

- Vertices
  - Uses native typed array format
  - Includes key-frame animations and skinning

- Shaders
  - With extensions for materials

- Textures
  - Use existing standard image compression formats e.g. JPEG

- Extras
  - For app-specific data (metadata)
glTF Example

JSON Node (the truck) with three children (sets of two wheels)

Visualization of Node Hierarchy

Three animations - one for each set of wheels
glTF Ecosystem Request for Quotations (RFQ) to create glTF Validator is open!

Tools

Translators

Validator

Engines

Import

Export

Convert | Optimize

Blender DIRECT export

Autodesk FBX -> glTF
AssImp
OBJ2GLTF
glTF Pipeline
COLLADA2GLTF
Cesium converter

Drag and Drop FBX -> glTF
(coming soon)
http://gltf.autodesk.io/

Drag and drop COLLADA -> glTF
http://cesiumjs.org/convertmodel.html

xeoEngine

babylon.js

three.js

PEX

CESIUM

glTF Ecosystem Page
https://github.com/KhronosGroup/glTF#gltf-tools
Khronos AR/VR Standards

WITHOUT Standards

Tools import/export custom 3D formats and so do not interoperate

Mix and match tool pipelines through common 3D asset import/export

Every service/app stores 3D assets in a custom format -> Silo’d content

3D assets are easily understood and used by any application and device

Long download times and proprietary code to unpack received 3D assets

3D assets packed into efficient formats with streaming and compression

Apps have to be ported to each device and often don’t use acceleration

WITH Standards

Khronos standards useful for AR

AR/VR Will Need Many, Many Standards
3D is About to Go Social!

Object & scene capture

Social Loop
Photos -> JPEG -> Facebook
Videos -> H.264 -> YouTube
3D -> glTF -> ?

Upload, View, Share and Comment

Inspire and Motivate

Print

3D Printing Service

3D Descriptor Database

Manufacturers provide 3D Object Descriptors - much more information than 2D search

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