Ecosystem Forum
SIGGRAPH, August 2018
Neil Trevett, Khronos President
Welcome! And Logistics!

- WiFi: “DonnellygGroupPubs-Guest”
  - Sign in as ‘Guest’

- Snacks and Bar are open through the session
  - Including beer and wine - use the Bar wisely!

- We will break at 4-4:30PM
  - Hot snacks and hotter networking

- We will finish group discussions at 6PM
  - But the bar will stay open - need to leave latest 8PM :}
Agenda

- glTF State of the Union
  - Patrick Cozzi, glTF Working Group Chair

- Review of Discussion Topics
  - We have some speakers who have volunteered to initiate some topical discussions
  - Any additional suggestions from the group are welcome!

- Topic Discussions
  - Bulk of the time today

- Review and Actions

- Beer!
Structure for Today’s Discussion

• We sincerely appreciate your time and input!
  - Community engagement is one of glTF’s greatest strengths
  - This session will be pivotal in steering the evolution of glTF

• Brainstorming rules apply
  - ALL feedback welcome - good and bad
    - You will NOT hurt any feelings!
  - ALL ideas are welcome - open mic!
    - There are no ‘stupid’ questions - ask anything!

• Keep things at a high-level
  - Not get lost in the details with this larger group

• Goals for today
  - High bandwidth discussion on key topics
  - Decide on key next steps and actions - with Designated Champions

• Quick round-the-room Introductions
  - Name and company
State of the Union
SIGGRAPH, August 2018
Patrick Cozzi, glTF Chair
glTF - Cross-Platform 3D Asset Transmission

- Audio: MP3
- Video: H.264
- Images: JPEG
- 3D: glTF

Efficient, reliable transmission
Bring 3D assets into 1000s of apps and engines - NOT an Authoring Interchange Format

GlTF 1.0 - December 2015
Primarily for WebGL
Uses GLSL for materials

GlTF 2.0 - June 2017
Native AND Web APIs
Physically Based Rendering
Metallic-Roughness and Specular-Glossiness

GlTF spec development on open GitHub - get involved!
https://github.com/KhronosGroup/glTF
glTF Ecosystem

Creation Tools
- blender
- SketchUp
- Pixyz
- Archilogic
- Dn
- Substance Painter
- Adobe
- Sony 3D Creator
- medium
- Paint 3D
- Simplygon
- Collada2glTF
- FBX2glTF
- glTF-validator
- glTF-asset-generator

Repositories
- Sketchfab
- Remix 3D
- Poly
  poly.google.com

Discover

Create

Experience

Drive Demand

Users

Apps and Engines
- Unreal Engine
- Office
- three.js
- ARCore
- worldviz
- Windows Mixed Reality Home
- Cesium
- GODOT
- Unity
- A-Frame
- Autodesk Forge
- UX3D Engine
- Xeogl
- React VR
- JanusVR
- 3D Builder
- Instant3Dhub
- Mixed Reality Viewer

Let us know if your logos is missing and you want to add it!

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Ensuring glTF Ecosystem Robustness

- If you are creating glTF Files
  - Ensure generated files are validator clean
    - https://github.com/KhronosGroup/glTF-Validator
- Help the community understand what your exporter supports
  - https://github.com/KhronosGroup/glTF/issues/1271
- If you are loading glTF files
  - Ensure loader can correctly load all sample models (integration tests)
    - https://github.com/KhronosGroup/glTF-Sample-Models
- Ensure loader can correctly load all asset generator models (unit tests)
  - https://github.com/bghgary/glTF-Asset-Generator

AVOID DIALECTS AT ALL COSTS!
How are we doing? Need more testing/validation? Where are the issues?
Tool Ecosystem Updates

- Focus on creating reliable paths in and out of key tools
  - **Blender**
  - Bringing importer and exporter into single project
    - [https://github.com/KhronosGroup/glTF-Blender-IO](https://github.com/KhronosGroup/glTF-Blender-IO)
  - **3DSMax Exporter**
    - Microsoft looking for collaborators
    - [http://doc.babylonjs.com/resources/3dsmax_to_gltf](http://doc.babylonjs.com/resources/3dsmax_to_gltf)
  - **Maya2glTF by Wonder Media Productions**
    - [https://github.com/WonderMediaProductions/Maya2glTF](https://github.com/WonderMediaProductions/Maya2glTF)
  - **Unity Importer & Exporter**
    - Microsoft & Unity looking for collaborators
    - [https://github.com/KhronosGroup/UnityGLTF](https://github.com/KhronosGroup/UnityGLTF)
  - **FBX2glTF by Facebook**
    - [https://github.com/facebookincubator/FBX2glTF](https://github.com/facebookincubator/FBX2glTF)

How are we doing? Where are the tooling gaps?
glTF Roadmap

- glTF manages its roadmap very carefully - complexity is the enemy
  - Mission #1: ensure widespread, consistent, reliable usage

- Rollout new functionality first as extensions
  - Bring into core only when apps and engines are enabled
  - Graceful extension fallback can ease smooth adoption

- New extensions...
  - Texture transform (texture atlases), Unlit Materials have shipped
  - Punctual lights is close

Integration extensions into new core spec only when:
1) Widespread need is confirmed by the industry
2) Widespread reliable implementation is enabled (e.g. open source)
Texture Transmission Extension in Progress

Encoding decoupled from target device. One encode pass per texture asset.

Transcodable, supercompressed textures for efficient transmission
25% size of the equivalent native GPU encoding.
Rate-distortion optimization (RDO) for fine-grain control over quality vs bitrate.
Optional LZ/ANS lossless codec stage for maximized compression efficiency.
Support for both low precision and high-precision transcoding modes to support the full range of industry standard GPU formats.

Transcode to a format that is natively GPU-accelerated on platform:
BC1-5, ETC1/2, ASTC, BC6H/7, PVRNC

Extension in design - welcome industry feedback
https://github.com/KhronosGroup/gltf-Texture-Transmission-Tools
Initial Roadmap Discussion List

- Cross-platform visual consistency - challenges and requirements - Martin Enthed, IKEA
- PBR roadmap and open source release of MDL - Lutz Kettner, NVIDIA
- Texture Transmission Extension - progress and feedback - Mark Callow
- Large models and asset linkage - Johannes Behr, Fraunhofer
- glTF for social Web - Pär Winzell, Facebook

- What are YOUR key hot issues?
  - What topics should we add to the agenda for today?
Forum Outcomes - See you on GitHub!

- Materials: Nodes + Algebra, OSL/MaterialX Interop - Champion: Lutz (NVIDIA)
  - Baseline + Links to higher order material representations for scalability

- Links to enable extension fallbacks in general
  - E.g. if Draco compressed assets not understood, link to uncompressed assets

- Rendering definitions and accuracy, Reference viewer/images - Champion: Martin (IKEA)
  - Define Ground Truth, Confirm implementations are correct

- Metadata
  - Standard fields for Attribution, licensing, positioning/geotagging

- Asset linkage and libraries - Champion: Johannes (Fraunhofer)
  - Including cross-domain linkage

- Classification of models

- Public Table of communication on progress for extensions

- Up axis and orientation, fix software tools?

- Lifetime supply of glTF T-Shirts for Mark at Autodesk
Future Topics

- Topics we didn’t have time for this Forum - in *rough* interest order
- LOD +3
- Progressive Texture loading
- Advanced Animations
  - Avatars and Facial animations
  - ‘must be as good as Apple Facial anime animations using USD with blending’
- Video Textures
- Storing segmentation data
- Point clouds, height maps, terrain
- File security and encryption
- Compressed Animations
Calls to Action

• Engage on GitHub to help drive the ecosystem forward
  - Share ideas, issues, problems, proposals
  - If you have products that use glTF - let us know so we can help promote!
    - [https://github.com/KhronosGroup/glTF](https://github.com/KhronosGroup/glTF)

• Join Khronos!
  - Get directly involved in the glTF Working Group