

3D Asset Interoperability using USD and glTF

Domain Exploratory Group Proposal

FINAL

Approved by Oversight Committee September 28, 2022

1. Proposers (alphabetical by last name)

- Eric Bourque, Autodesk
- Patrick Cozzi, Cesium
- Guy Martin, NVIDIA
- Maxime van Noppen, Microsoft
- Marc Petit, Epic Games
- Guido Quaroni, Adobe

2. Exploratory Group Scope

Build consensus and draft a proposed charter for a 3D Asset Interoperability Domain Working Group.

3. Potential Working Group Goals (and non-Goals) and Deliverables

The proposed charter would set out goals and key activities to generate insights into leading 3D interoperability initiatives and to foster their evolution to meet prioritized industry use cases. Special attention would be paid to opportunities for cooperation between USD and glTF to increase synergy and reduce duplication of effort, gaps, fragmentation and confusion, for the good of the industry.

Early examples of possible activities to be captured in the charter include:

- **Investigations**
 - Collect and organize metaverse use cases for real-time 3D asset interoperability, including authoring, delivery, and hybrid/integrated experiences including end-user created 3D content, individual assets, and scene containers of assets. Explore the requirements for the scope of 3D assets from geometry and material to sound, physics, composition, etc.
 - Identify current capabilities and fitness-for-purpose of USD, USDZ, and glTF to meet these use cases. USD was originally designed for authoring and glTF was originally designed for delivery, and now there appears to be interest for USD to be used for delivery and for glTF to add capabilities such as composition and behaviors.
 - Identify current material format capabilities including glTF PBR materials, USD materials, MaterialX, and MDL.
 - Identify the key subsets and roadmap gaps to advance USD and glTF, and enable robust authoring/delivery workflows using either USD or glTF or both in combination, e.g., USD distillation to glTF, USD to USD delivery, glTF re-mixing using USD-based tools
 - How do real-time use cases compare to offline use cases, and how may this evolve?
- **Projects**
 - Curate or create benchmarking assets to be made freely available, and to be used in the projects below
 - Prototype to understand USD and glTF performance and engineering complexity for delivery on a range of platforms
 - Survey and testing of format import and export robustness with key authoring tools
 - Prototype distillation of USD, including composed scenes and behaviors, to glTF/glXF
 - Prototype use of USD/glTF assets and behaviors in a wide variety of run-time engines, DCC tools, and the web, e.g., JavaScript and/or the DOM.

- **Engagement**
 - Collaborate with and complement existing USD and glTF open standards and open source efforts
 - Reach out to diverse engine vendors to experiment with benchmark assets and report back findings and issues

4. Coordination

- Create engagement and communication cadence with
 - Proposed Metaverse Standards Forum [Digital Asset Management Domain Exploratory Group](#)
 - Khronos 3D Formats Working group (for glTF)
 - ASWF [USD Working Group](#) (for USD library)
 - Pixar
 - [Web3D Consortium X3D Working Group](#)
 - [IDEA ITMF](#) (derived from OTOY XML/[ORBX](#) scene graph wrapper supporting USD, glTF, FBX, obj, EXR, etc.)
 - [Open Metaverse Alliance for Web3](#) (perhaps this should be a broader collaboration via Metaverse Standards Forum)

5. Risk Factors

- Sizing initial scope to ensure something achievable.
- Lack of engagement from SDOs or companies driving 3D format specifications.
- Lack of funding for prototype projects.

6. Target timeline to create proposed Domain Working Group charter

8 weeks

7. Additional Contributors (Participants contact Main Contact to be added)

<Forum members who wish to **proactively contribute** to this activity>

Alphabetical by last name

- Tamrat Belayneh, Esri
- Imed Bouazizi, Qualcomm
- Kevin Bjorke, Intel
- Jiten Dajee, RVC
- François Daoust, W3C
- Pete Daukintis, [Microsoft](#)
- Henrik Edstrom, Autodesk
- Mike Festa, Super DNA 3D Lab
- Jatinder Kukreja, SuperDNA 3DLab
- Dylan Fox, XR Access
- Daniel Frith, Avataar
- Rama Harihara, Intel
- Arianne T. Hinds, Ph.D., Tencent America
- Alexandra Hussenot, Immersion
- Mathew Kemp, Hadean Studio
- Marcus Koh, GPNFTS
- Aleissia Laidacker, Open Meta Association
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- Nicolas PERRET, Fora Ante (former member of Collada standard definition at Khronos)
- Mark Peters, OTOY
- Jules Urbach, OTOY
- Nicholas Polys, [Web3D Consortium](#), Virginia Tech
- Zeno Saviour, Character Labs
- Scott Simmons, OGC
- Ashish Singh, Meta
- Alan Smithson, MetaVRse
- Nelly V. Tacheva, TANGRA
- Elijah Tai, zesty.market, zesty.xyz & web3xr.com
- Marco Tillmann, NVIDIA, Open AR Cloud
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- Matt White, Berkeley Synthetic (coordination with Digital Asset Management WG)
- Lulu Zhou, Bluefocus
- Gurcan Serbest, Negentra
- Alex Turner, Microsoft
- Stephen Hauer, Poliigon
- Norbert Nopper, UX3D
- Antonio De Cicco, Showefy

8. References

Forum Topic Brainstorm Sheet: 3D Asset section