

# Request for Quotations

## glTF Validator

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# 1. Background

glTF™ (GL Transmission Format) is a royalty-free specification defined and maintained by the Khronos Group for the efficient transmission and loading of 3D scenes and models by applications. glTF minimizes both the size of 3D assets, and the runtime processing needed by applications using WebGL™ and OpenGL®-family APIs to unpack and use those assets. glTF defines a common publishing format for 3D content tools and services that streamlines authoring workflows and enables interoperable use of content across the industry.

In order to ensure reliable interoperability between glTF exporters, importers and converters, Khronos wishes to create a Validator Tool to verify that an asset conforms to the glTF specification for free use by the industry and a set of freely usable assets to test the correct operation of run-times.

## 2. Goals

The **primary** goal of this project is to create a **glTF Asset Validator**: a tool to validate that a glTF asset conforms to the glTF spec. This will be used to validate pipeline tools such as converters, exporters, and optimizers.

The **secondary** goal is to create a library of **Sample Models for Runtime Validation**: a set of sample assets to verify that a runtime engine correctly renders valid glTF assets.

The **tertiary** goal is to integrate any discovered **updates to the glTF schema and specification** to enable more rigorous validation.

Upon project completion the Validator will be made available under the standard Khronos open source free-use license for vendors to use to detect conformance issues in their tools. Vendors will also be able to import and render the Sample Models in their run-time to compare against reference renderings. In the future Khronos may integrate the tests into a web-hosted conformance testing and reporting program.

## 3. Scope

Our scoping estimate for this project is five person-weeks. Expected project work consists of the following tasks:



1. Create Validator Tool/library to verify that an asset conforms to the glTF specification, including the simple rules enforced by the schema and the more involved rules detailed in the specification. The entire specification must be supported including separate and embedded resources, geometry, materials/textures/shaders, animations, skins, and cameras. Validation will be divided into four areas:

- a) Geometry: buffer, bufferView, accessor, mesh/primitive, node, asset/scene/camera;
- b) Material: shader, program, image, sampler, texture, technique, material;
- c) Animation: animation;
- d) Skins: skin.

Tests from the four areas should be combinable to test typical glTF use cases.

2. Augment existing glTF [sample models](#) to cover all reasonable corner cases in the glTF specification:

- a) Include source asset, e.g., in .dae;
- b) Include the following variants of glTF:
  - glTF (.gltf) with separate resources: .bin (geometry, animation, skins), .glsl (shaders), and image files
  - glTF (.gltf) with embedded resources;
  - Binary glTF (.glb) using the KHR\_binary\_glTF extension;
  - glTF (.gltf) using the KHR\_materials\_common extension;
- c) assist in designing the storage of these sample assets if needed. See [#502](#).

3. Additional features - if you want to include any of the following optional features in your proposal, please provide schedule and cost for each separately:

- Support for [KHR binary glTF](#) in the glTF Asset Validator;
- A REST web service for the glTF Asset Validator, including documentation;
- A drag-and-drop web front-end validator built either on the above web service or using the client-side validator. Include a mockup UI in the proposal;
- Three.js drag-and-drop glTF viewer similar to how the [Cesium COLLADA-to-glTF converter](#) allows drag-and-drop viewing of glTF assets.

## 4. Deliverables, Methodology and Acceptance Criteria

Deliverables will include:

1. glTF Asset Validator code;
2. Documentation for using and contributing to the Validator, including documentation for the output JSON format;
3. Sample Models for Runtime Validation under a license that at a minimum allows unlimited free use for glTF testing and demos, and ideally unrestricted general use;
4. Documentation for each Sample Model including a reference description, screenshot and video;
5. Updates to glTF specification.

The Validator shall be created in the Khronos GitHub repository and shall be written to be cross-platform across Windows, Linux, and Mac using Node.js, and made available in the following form factors:

- a) Command-line tool, e.g., the input is a glTF file and the output is JSON with any errors, including detailed error messages, links to the relevant part of the spec, and the line number;
- b) Node.js library published on npm for integration with other Node.js apps;
- c) Client-side JavaScript library, built using browserify or a similar tool, for integration with JavaScript apps.

You are welcome to build on the infrastructure in [gltf-pipeline](#).

The Validator will be unit tested with 95%+ code coverage using Jasmine or another unit testing framework.

The Contractor will be required to work with the glTF working group to clarify and resolve any glTF specification and other issues.

## 5. Selection Schedule and Process

Khronos will follow the schedule below to select a Contractor:

1. **March 16<sup>th</sup>** – Khronos Releases RFQ;
2. **March 31<sup>st</sup>** – RFQ responses received by Khronos;
3. **April 15<sup>th</sup>** – Contractor selected and notified;
4. **April 29<sup>th</sup>** – Contract executed and start of work.

The contractor will be selected from any received bids by the Khronos 3D Formats working group. The selected contractor will be required to execute the standard Khronos Membership Agreement (with membership fees waived) if they are not already a Khronos member, and execute the standard Khronos Contractors Agreement with milestones and costs entered into Exhibit B and Contractor Disclosures entered into Exhibit C.

No work shall begin, and Khronos shall be liable for no costs or expenses, until the selected contractor is in receipt of an executed contractor's agreement.

## 6. RFQ Responses

The RFQ responses will form the basis for detailed milestone and cost negotiations for the final contract with the selected vendor(s). Vendors are encouraged to quote for a subset of the deliverables if they feel they are able to specifically address that subset as Khronos will consider splitting this project between multiple respondents.

Please provide the following information in the format of your choice:

1. Identification of which elements of the Project Scope outlined in Section 3 on which you wish to bid;
2. A description of your familiarity with 3D graphics, WebGL, glTF, Node.js, JavaScript, unit testing, Git and art asset creation experience;
3. Proposed system architecture and sample output JSON from the glTF Validator;
4. Proposed schedule to complete deliverables, including when you are available to commence work and incremental milestones;
5. Whether you are bidding a fixed cost or a T&M contract. Fixed cost responses are strongly preferred;
6. Confirmation that you are willing to work under the Khronos Contractor Agreement and execute the Khronos Membership Agreement for the duration of the project;
7. Any particular issues or risk factors that you wish to highlight;
8. Supporting materials, including background materials about your company, highlighting relevant experience and expertise for this project, personnel backgrounds (e.g., resume and GitHub profiles), in particular success in delivering projects requiring close attention to detail and strong writing and communication skills.

Responses and all subsequent communication regarding this RFQ should be sent to [3dformats-rfq@khronos.org](mailto:3dformats-rfq@khronos.org).