



glTFTM 2.0 Specification

The Khronos[®] 3D Formats Working Group

Version 2.0.1, 2021-10-11 23:01:57Z: from git branch: main commit:
8e798b02d254cea97659a333cfcb20875b62bdd4

Table of Contents

1. Foreword	1
2. Introduction	2
2.1. General	2
2.2. Document Conventions	2
2.2.1. Normative Terminology and References	2
2.2.2. Informative Language	2
2.2.3. Technical Terminology	3
2.2.4. Normative References	5
2.2.4.1. External Specifications	5
2.2.4.2. Media Type Registrations	6
2.3. Motivation and Design Goals (Informative)	7
2.4. glTF Basics	8
2.5. Versioning	8
2.6. File Extensions and Media Types	8
2.7. JSON Encoding	9
2.8. URIs	11
3. Concepts	13
3.1. General	13
3.2. Asset	13
3.3. Indices and Names	14
3.4. Coordinate System and Units	15
3.5. Scenes	15
3.5.1. Overview	15
3.5.2. Nodes and Hierarchy	16
3.5.3. Transformations	17
3.6. Binary Data Storage	19
3.6.1. Buffers and Buffer Views	19
3.6.1.1. Overview	19
3.6.1.2. GLB-stored Buffer	21
3.6.2. Accessors	22
3.6.2.1. Overview	22
3.6.2.2. Accessor Data Types	23
3.6.2.3. Sparse Accessors	24
3.6.2.4. Data Alignment	25
3.6.2.5. Accessors Bounds	28
3.7. Geometry	28
3.7.1. Overview	28
3.7.2. Meshes	28

3.7.2.1. Overview	28
3.7.2.2. Morph Targets	32
3.7.3. Skins	35
3.7.3.1. Overview	35
3.7.3.2. Joint Hierarchy	36
3.7.3.3. Skinned Mesh Attributes	37
3.7.4. Instantiation	39
3.8. Texture Data	41
3.8.1. Overview	41
3.8.2. Textures	42
3.8.3. Images	42
3.8.4. Samplers	44
3.8.4.1. Overview	44
3.8.4.2. Filtering	44
3.8.4.3. Wrapping	45
3.8.4.4. Example	45
3.8.4.5. Non-power-of-two Textures	46
3.9. Materials	46
3.9.1. Overview	46
3.9.2. Metallic-Roughness Material	47
3.9.3. Additional Textures	49
3.9.4. Alpha Coverage	51
3.9.5. Double Sided	52
3.9.6. Default Material	52
3.9.7. Point and Line Materials	52
3.10. Cameras	53
3.10.1. Overview	53
3.10.2. View Matrix	53
3.10.3. Projection Matrices	53
3.10.3.1. Overview	53
3.10.3.2. Infinite perspective projection	54
3.10.3.3. Finite perspective projection	55
3.10.3.4. Orthographic projection	55
3.11. Animations	55
3.12. Specifying Extensions	61
4. GLB File Format Specification	63
4.1. General (Informative)	63
4.2. Structure	63
4.3. File Extension & Media Type	63
4.4. Binary glTF Layout	63
4.4.1. Overview	63