Features Comparison X3D 4.0 and glTF 2.0

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References	
X3D 4.0 specification	https://www.web3d.org/specifications/X3Dv4Draft/ISO-IEC19775-1v4-DIS/Part01/Architecture.html
glTF 2.0 specification	https://github.com/KhronosGroup/glTF/tree/master/specification/2.0
IEEE 3D Body Processing Paper	https://standards.ieee.org/downloads/3DBPWhitePaper.pdf
IEEE 3DBP Features	https://docs.google.com/spreadsheets/d/15wCQ8CHJnQD_tmwaRPFfZqBe6KJzE1CzOKd2XOIPL4M/
IEEE 3DBP Working Group	https://standards.ieee.org/develop/wg/3DBP.html

Value Proposition

X3D is a file format allowing 3D scenes to be used by a wide variety of applications.
X3D can be used by Web browsers and other viewers, authoring tools, 3D Printing applications, text editors, and XML tools.
X3D is the appropriate choice if the primary goal is saving your interactive 3D scenes for use over time and multiple applications.
glTF™ (GL Transmission Format) is a specification for efficient transmission from server to client.
glTF is the appropriate choice if the primary goal is viewing 3D scenes in a Web browser.

Technology Comparison Summaries

X3D: A royalty-free open ISO standards file format and run-time architecture to represent and communicate 3D scenes and models.
X3D: Data Interchange and Rendering format, useful for both general Web deployment and diverse 3D applications.
X3D: Interoperability with other "vertical" functional domains and international Web standards.
X3D: Metadata Support is thorough, working groups are currently mapping to external metadata vocabularies.
X3D: Stable long-term archival stability and re-usability, two decades of proven capability.
X3D: Ensure portability and consistency across multiple file formats, programming languages and platforms.
X3D: Forward/backward compatibility and extensibility are specification goals that have been demonstrated successfully for 20 years.
X3D: Strong intellectual property rights (IPR) policy, no cost-bearing patents allowed, IPR fully aligned with W3C Web standards.
X3D: Strong community, wide industry compatibility, many importers/exporters, many standards-organization liaisons.
X3D: Full Inline support for glTF features, especially compressed geometry plus advanced lighting model planned for X3D version 4.

glTF is a royalty-free specification for efficient transmission and loading of 3D scenes and models.
glTF: Transmission format designed for applications rendering using WebGL or OpenGLES.
glTF: A run-time delivery system for highly optimized mesh data for rendering, delivered from source to client.
glTF: Always changing to support the fast changing GPU, a delivery system for highly optimized mesh data for rendering.
glTF: Backward compatibility, archivability, are not listed as specification goals.
glTF: Strong community, good industry support.

Feature	X3D Support v4.0	glTF Support (v2.0 binary + ASCII)
Triangular meshes	Yes	Yes
Points and lines	Yes	Yes
Quad meshes	Yes	No
Primitive shapes: box, sphere, cone, cylinder, text	Yes	No
NURBS curves and surfaces	Yes	No
CAD Structure (assemblies)	Yes	No
Animation (general)	Yes	Yes
Picking (touch/over TouchSensor, PickableGroup)	Yes	Yes
Clipping planes	Yes	Yes
Human animation: skeleton, skin, motion	Yes, including anatomically correct humans	Yes, ad hoc anatomy
Morph targets	HAnim displacers	Yes
Skin/joint animation	Yes	Yes
Scripting	Yes	No
Extensibility by authors (prototype mechanism)	Yes	No
Metadata Structures	Complete support, now mapping vocabularies	Partial, in separate files

Annotation	Planned X3D v4.1; experimental support now	No
Material	Yes	Yes
Physically Based Rendering, advanced lighting	X3D v4.0, matching glTF	Yes (e.g. metallic-roughness model)
Custom Shader	Yes (multiple shader languages supported)	No
Bump mapping	Yes	Yes
Occlusion map	Yes	Yes
Emissive map	Yes	Yes
Normal map	Yes	Yes
Image (2D) texturing	Yes (image files or embedded pixel map)	Yes
Texture mapping	Yes	Yes
Volume (3D) textures, imaging	Yes	No
Movie (2D + time) texturing	Yes (optional support for streaming)	No
Audio	Yes (optional support for streaming)	No
Spatial 3D Audio	Yes	No
Inline	Supports X3D, scripts, glTF	?
Formats/encodings	ASCII (XML, ClassicVRML, JSON, languages)	Binary & ASCII (JSON based)
	Binary: .x3db, Efficient XML Interchange (EXI)	
	Inline glTF	
Security	Yes (optional signature and encryption in XML)	No inherent encryption
(X3D note: collection of animation displacers equivalent to HAnim morph target)		