X3D: THE INTERACTIVE 3D SOLUTION FOR THE WORLD WIDE WEB

What is X3D?

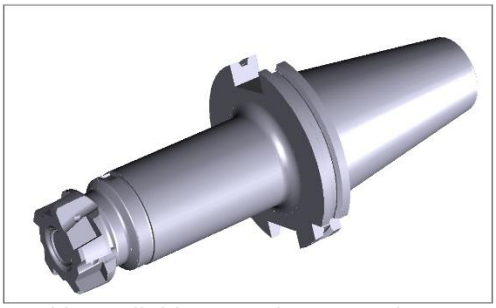
X3D (E**X**tensible **3D**) is a royalty-free and openly published file format standard and runtime architecture to represent and communicate 3D objects, events and environments on the Web. The X3D suite of ISO (International Standards Organization) ratified standards provide a robust abstraction for the storage, retrieval and playback of 3D graphics content across platforms and players including desktop applications, mobile apps, web browser plugins, and direct rendering in HTML5 pages using JavaScript libraries using WebGL.

X3D scene graphs may be stored and transmitted in several standardized encodings, including Classic VRML, XML, and binary format. A common API is specified, allowing the scene graph to be queried and manipulated through multiple programming languages. The development has evolved from its beginnings as the Virtual Reality Modeling Language (VRML) and Humanoid Animation (H-Anim) ISO standards to the considerably more mature and refined X3D.

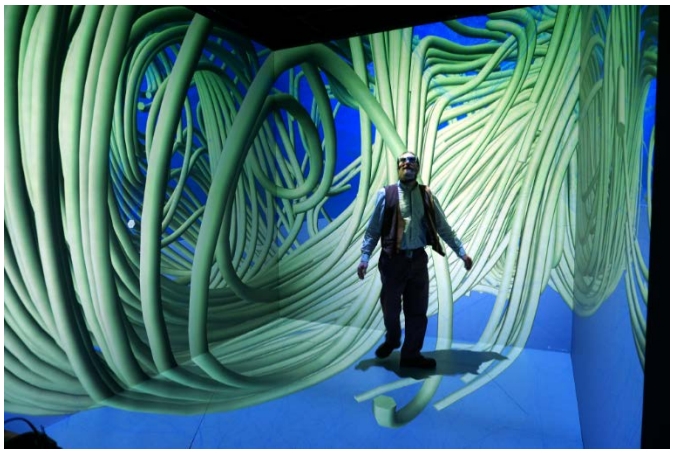
Whose product is X3D?

X3D is a royalty-free open ISO standard of the **Web3D Consortium** (www.web3d.org). The X3D specifications are developed by members and freely available to the public. The Web3D Consortium continues to design, extend and promote X3D to meet new market and technology needs.

Through its Working Groups, Special Interest Groups, and Chapters, the Web3D Consortium provides an international support network for software developers and content authors who wish to achieve interoperability and durability through an open international standard.



X3D is supported by a number of commercial and open source players, format conversion utilities, and authoring tools; and is available as an import and export option in several modeling and CAD packages.



Through cooperative development and membership agreements, the Web3D Consortium works closely with the ISO, DICOM, OGC, Khronos, IMS and W3C standardization bodies to harmonize diverse technologies for **Deep Media convergence and interoperability**. Leveraging the extensible scene graph model of X3D unlocks the full value of virtual and mirror worlds across the web today and tomorrow.

Why is X3D important?

- It allows applications to communicate over the Web using an ISO-certified scene graph model, encoded in multiple formats (XML, ClassicVRML, JSON, Compressed Binary) and also programmable in multiple languages including Java and JavaScript.
- It is modular and extensible, saving development time and money and providing value to vendor and consumer. Models remain viewable and runnable.
- It is free for use – not relying on proprietary formats and upgrades – for an unlimited 3D content lifecycle.
- Because it is an open and stable standard it encourages development of new tools to meet the changing needs of content authors.
- It is a project designed and developed through community involvement and industry, with both commercial and open-source software support.

What features are in X3D?

The X3D object model and node set all support graphics features that modern 3D interactive applications need from object interchange to animation and sensors to immersive environments. The standard is organized into functional components which provide extensive functionality including multiple geometry types, material appearances, textures, lighting, shaders, animation, touch-based user interaction, scripting, volume rendering methods, rigid body physics, CAD assembly structure, and metadata.

Standardized Profile definitions allow authors and developers to coordinate required and supported functionality, allowing X3D to be used over the range of thin to immersive clients. Through scripting and a prototype mechanism, developers can themselves extend the functionality of X3D nodes and components.

What is an X3D Application?

X3D is an open documented standard and is usable as a scene graph storage and transmission format for any application that requires interactive and dynamic 3D content. Standalone X3D players are available for desktop and mobile platforms and as web browser plugins. JavaScript libraries allow X3D content to be rendered within a web page using HTML5. There are open source implementations of X3D rendering engines available under permissive licensing, easing the pathway for developers to incorporate X3D into their application. X3D has been used for cross-platform interactive deployment of virtual environments, with extensions now being considered for WebVR and VR/AR applications.

How can you start using X3D?

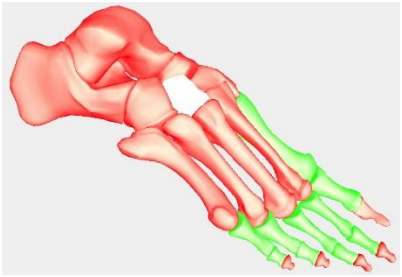
Several 3D content authoring tools, including Blender, support importing and exporting X3D scene graphs. A variety of commercial and open source applications and libraries allow for the conversion of common 3D formats, X3D. VRML97 files can be easily converted into the Classic VRML encoding of X3D. VRML, XML and JSON text encodings may be directly edited in text editors, converters or transformation engines.

There are open source X3D editors that make it easy for a content author to modify geometry, lighting, and navigation; add animation and interactivity; and document the content with metadata.

A list of tools and suggested workflows for preparing your 3D content for publication with X3D can be found at: **www.web3d.org/UseX3D**

Who uses X3D?

X3D with its rich set of componentized features can be tailored for use on many different platforms. X3D is being used by governments such as the EU, US, and AU, agencies such as NIH, NASA, US Navy, NSF, top universities and labs worldwide, and Fortune 500 companies - from manufacturing to energy to information systems! X3D is the *greatest common denominator* for describing and deploying Engineering, CAD and Architecture, Geospatial Visualization, Training and Simulation data and scenarios. Recently, we see significant momentum emerging in deploying X3D across mobile and collaborative platforms for Virtual Reality (VR), 3D printing and 3D scanning applications



Why should you use X3D?

With over a decade of innovation, X3D continues to grow and provide unprecedented value for the capability, longevity, and ownership of 3D content. By using the royalty free ISO standard X3D, your company preserves its assets. X3D acts as a unifying platform through which numerous products can be developed and the entire industry can grow. Supporting X3D instantly gives you access to more tools, content, and compatibility with other applications, all with minimal effort.

X3D is open and royalty-free. Protect your 3D content investment for a lifetime.

Join us!

web3D CONSORTIUM

Please contact:

Anita Havele, Executive Director
Web3D Consortium
Email:
anita.havele@web3d.org
Phone: (248) 342 7662

650 Castro Street
Suite 120490
Mountain View, CA, 94041

www.web3d.org

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