Web3D and X3D Overview and Highlights

X3D: Your Hub for Interactive 3D Applications

www.web3d.org

X3D Version 4 - HTML Integrated - Hub for 3D Applications

Web3D 2020 Member Meeting - 3 August 2020

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About Web3D Consortium

International, non-profit, member funded, standards development organization

Promoting deployment of X3D and HANIM ISO standards

- Offering robust 3D functionality
- Supporting interoperability with other industry standards
- Allowing 3D scenes to be used by a wide variety of applications
- Long-term stability for 3D enterprise solutions

Engaging a community of technologists, enterprise and artists

Spanning member from academia, Industry, Government and Professionals

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X3D

Next Generation VRML

H|anim HUMANOID ANIMATION WORKING GROUP

www.web3d.org/about

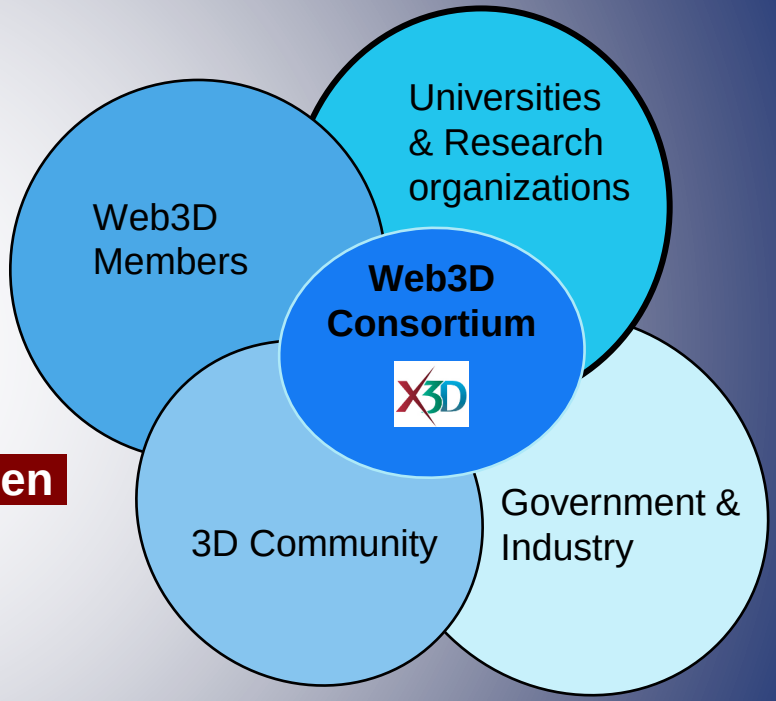
Web3D Consortium Goals

Evolve open Web3D based 3D technologies

Empower 3D/VR Developers

Guide Policy Makers

Encourage enterprises and industry to use open 3D standards



Active ISO Web3D Standards

X3D Version 3.3

File Format and Rendering Engine

HAnim Version 2.0

Humanoid Animation

X3D standards and HANIM Ratified by ISO/IEC JTC 1/SC 24 WG 6

Version 4.0 Public Draft

Integrate X3D to HTML5

Join and Participate in Web3D Working Groups

www.web3d.org/standards

What is X3D?

Extensible 3D (X3D) Graphics is the royalty-free open standard for publishing, viewing, printing and archiving interactive 3D models on the Web

A language to add 3D models, geospatial and imagery into one system (3D application)

A Hub for 3D Applications

X3D: Next Generation VRML

X3D started as an XML encoding of VRML.

VRML is a subset of X3D (where the X stands for Extensibility).

X3D has superseded VRML. X3D added shaders, geo-location, and other cutting-edge 3D features along with support for medicine, CAD, GIS, AR/VR, 3D Printing and Scanning application domains.

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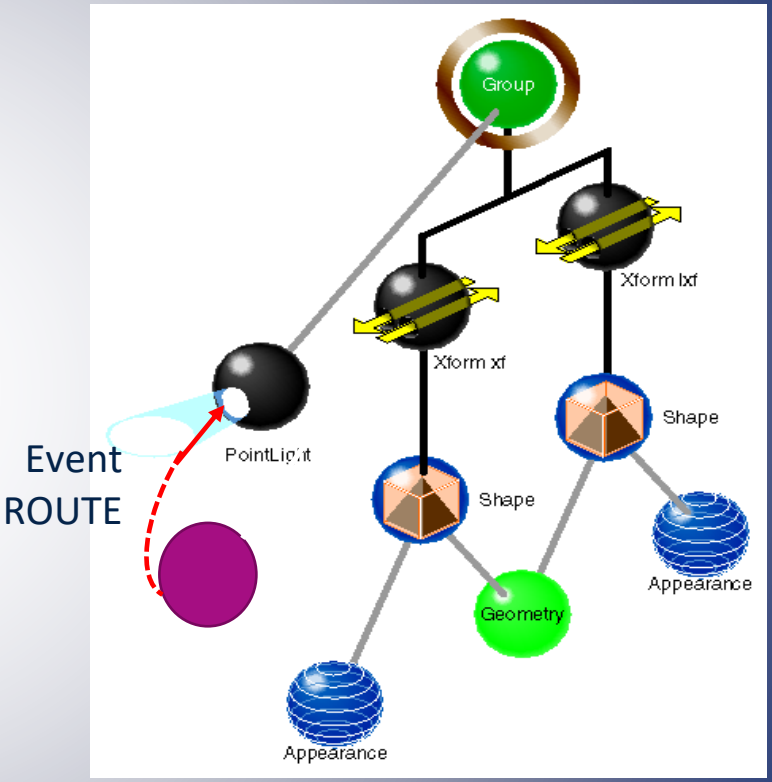
X3D: Scene graph for real-time interactive 3D

Delivery of virtual environments over the web

X3D is a logical event driven representation of a graphical scene. A collection of nodes in a graph or tree structure.

X3D is a higher-level scene graph that describes many geometry types, lights, interactions, animations, etc.



X3D: Scene graph for real-time interactive 3D

Multiple Encodings
- XML (.x3d)
- Classic VRML (.x3dv)
- Compressed Binary (.x3db)
- JSON (.json)

Multiple APIs
- JavaScript, Java, C#, C++, C, Python

HTML5 and CSS Compatible

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X3D: Publishing 3D with interactivity

Interactive 3D

A language to add 3D models, geospatial and imagery into one system (3D application)

Profile and Component structure to promote interoperability

Meshes * Lights * Cameras * Materials * Textures * Shaders * Annotation * Volume * Audio/Video * AR/VR * Security * Metadata

Interactive 3D Web applications

www.web3d.org/x3d/why-use-x3d

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Web is our platform

X3D Anywhere

- 3D + VR + AR Capable
- Runs on multiple devices (Phones, tablets, desktops, caves)
- Used in multiple domains (Medical, Geospatial, 3D printing/scanning, CAD and more)
- Interaction
- Animation

www.web3d.org/x3d/why-use-x3d

Open Source Implementations:

X3DOM and X_ITE

- JavaScript API X3D browsers: X3DOM and X_ITE use WebGL for native rendering. No plugins required!

- Standalone X3D browsers: Instant Reality, BS Contact

www.web3d.org/x3d/why-use-x3d

Comparing 3D Technologies

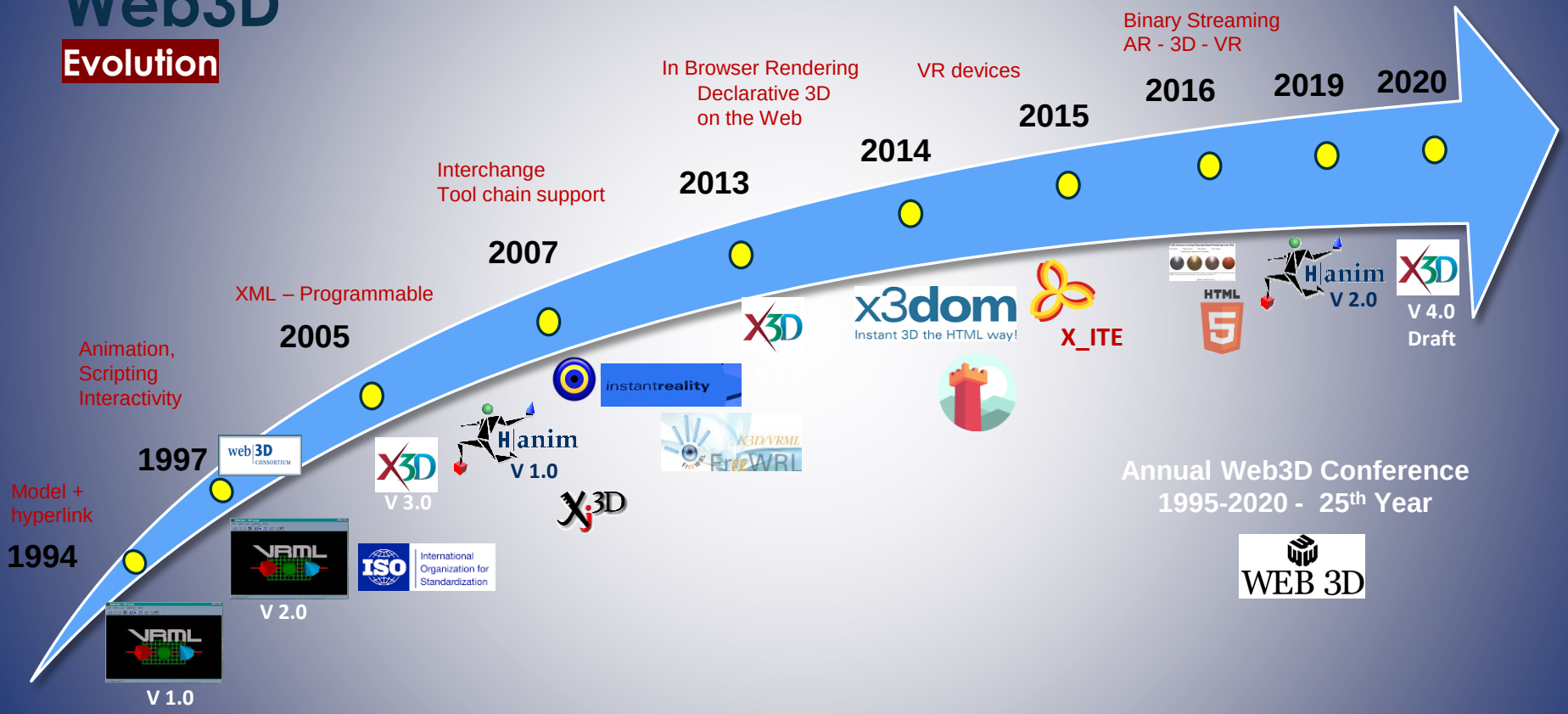
- X3D – Declarative 3D for web programmers
  Declare a box
  * X3DOM or X_ITE (WebGL supported browsers)
  * Instant Reality (Stand alone browser)
- WebGL – Imperative 3D for graphics programmers
  Define a box
  * Render in WebGL
- glTF – 3D geometry + materials rendering(PBR)
  An efficient transportable 3D assets

You need X3D to compose several 3D asset into a meaningful 3D Web applications

www.web3d.org /x3d/why-use-x3d

Web3D

Evolution



Evolution Collaboration Standardization Democratization 3D Printing HTML5 VR/AR

Web3D Standardization Process

Volunteers and Members work together on Standards

Web3D Working Groups:

- X3D
- Medical
- Geospatial
- Mixed Reality
- Heritage
- Semantics
- Design Printing & Scanning
- Web3D UX

www.web3d.org/about/liaisons

SDO Partnerships:

W3C World Wide Web consortium

ISO

OGC Open Geospatial Consortium, Inc.

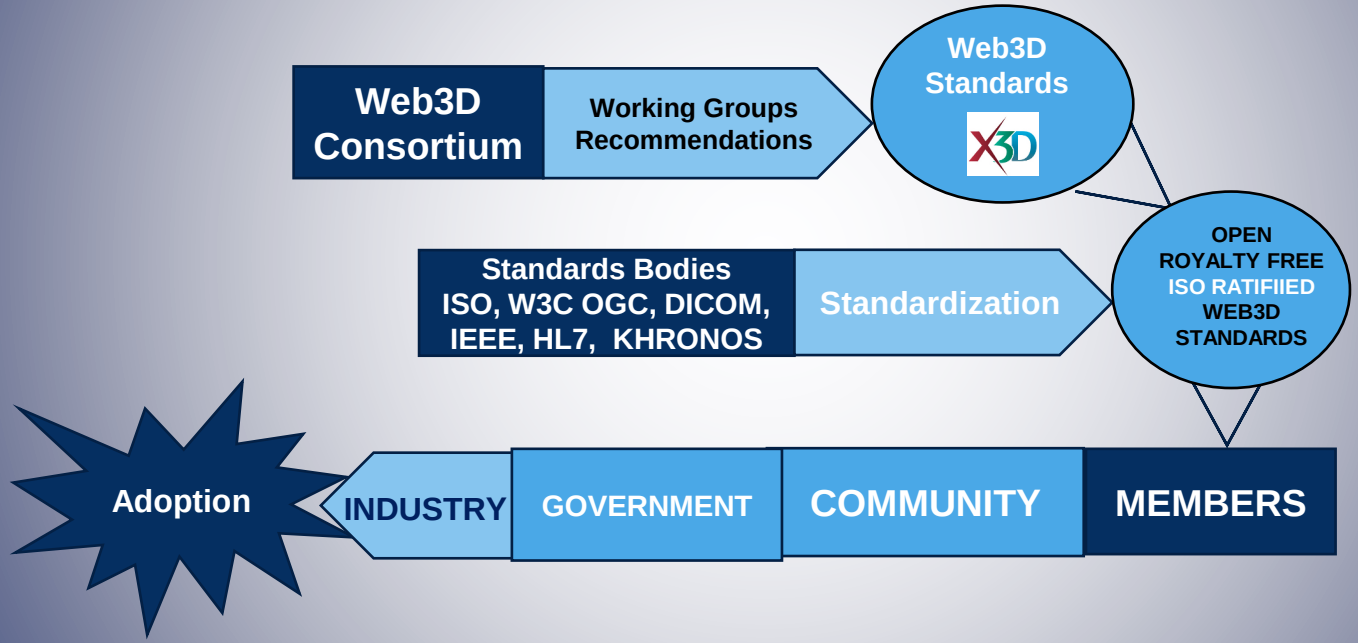
HL7 International

Khronos Group

DICOM Digital Imaging and Communications in Medicine

IEEE

Bringing open Web3D Standards to ALL



Who is using X3D?

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Web3D: 2019-2020 Highlights

Covid-19 Spotlight

Our members NIH and NPS are providing helpful 3D Printing X3D resources in this crisis.

Standard: X3D Version 4.0

X3D Version 4.0 - Released public draft
HANIM 2.0 Released

SDO

HL7 – Keynote Speaker
IEEE 3D Body Processing – 3D Body Tech Conference Key Presenters

Events:

SIGGRAPH 2019
Web3D 2019
Collaborative 3D Visualization Workshop with DOD

www.web3d.org/news-events

X3D is Evolving - X3D version 4.0

Always backward compatible

Highlights

- HTML5 Integration
- X3D Unified Object Model (X3DUOM)
- 3D printing of models
- 3D scanning of objects, and support for point clouds
- Model structure with complete metadata.
- Volume visualization
- Annotation
- Inlining glTF assets
- Physical Based Rendering (PBR)
- Archival publishing of cultural and natural heritage

x3dom
Instant 3D the HTML way!

X_ITE

Open-source implementations, X3DOM and X_ITE

www.web3d.org/x3dv4-highlights

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X3D is Evolving - X3Dv4

Always backward compatible

X3Dv4 is available in all browsers

Timeline - Draft 2020 - ISO Ratification

https://github.com/Web3dConsortium

Released public draft

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Authors have the archival stability of a well-tested long-lasting specification to build upon

www.web3d.org/x3dv4-highlights

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New SDO Collaborations

Extensions that are relevant to IEEE 3D Body Processing
open standard enabling metadata exchange and visualization for 3d body model

Developing examples using X3D to visualize healthcare data.
Demographics and distribution of illness in a hospitable system
Test results of CPET exercises tests, X3D enables interactive 3D charting.

www.web3d.org/about/liaisons

Web3D: Working Groups Highlights

X3D: Is shipping the second public working draft (WD2) of the X3D Version 4 specification (X3D4).

Design, Printing and Scanning (DPS): Developing standards and practices for robust and secure visualization of STEP Product Data, with valuable collaboration with other visualization formats such as JT and 3D-PDF.

Geospatial: Workflows and systems to support glTF and a Cesium Tiles-type approach for dealing with large and complex scenes.

Medical: Through our HL7 Liaison relationships, the Medical WG has developed several examples using X3D to visualize healthcare data.

Heritage: Creating a Web3D library from their world-class insect collection.

Join us and participate in building X3D

WWW.Web3D.org/X3D/working-groups

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Web3D: New Working Groups

Semantic Web: Web interoperability and enable intelligent 3D applications, feature-based 3D model querying, and reasoning over 3D scenes.

Web 3D User Experience: Supporting rich user experiences (UX), intuitive navigation, and effective interaction techniques for a variety of 3D Web technologies.

Now is the time to join Web3D!

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www.web3d.org/join

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Web3D Consortium Member Benefits

www.web3d.org/join

Marketing	Business Opportunities	Drive Web3D Standards	Networking	Web3D Talent Bank
▪ Promote products ▪ Conference participation ▪ Booth partnership	▪ Business partnership ▪ Joint grants	▪ Working Group participation ▪ Early access to spec ▪ Board Seat	▪ Industry Leaders ▪ Research experts ▪ 3D companies	▪ Access to Web3D experts

www.web3d.org/member-benefits

Join Web3D Consortium as we build open interactive 3D standards

Web3D Resources

About:	www.webx3d.org/about
Membership:	www.web3d.org/join
Learn X3D:	www.webx3d.org/learn-x3d
Web3D Standards:	www.web3d.org/standards
Work Groups:	www.web3d.org/working-groups
Case Studies:	www.web3d.org/case-studies
Workshop:	www.web3d.org/Web3d-quickstart
Examples:	www.web3d.org/x3d/content/examples/Basic
News & Events:	www.web3d.org/news-events

Upcoming Events

Web3D Webinars 3-6 August 2020
Learn X3D, X3D Browsers, X3D Tools
www.web3d.org/webinars

Web3D Virtual booth at SIGGRAPH 2020 Starting August 17, 2020
https://s2020.siggraph.org/conference/

WEB 3D

FREE Virtual Web3D 2020 Conference 9-13 November 2020

www.2020.web3dconference.org

www.web3d.org/news-events

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Join Web3D and Participate

Join us in building X3D

Participants always welcome

- http://www.web3d.org/join

suggestions are always welcome

- x3d-public@web3d.org

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