

3D Web Interoperability Domain Working Group Charter

FINAL

Approved by Oversight Committee on August 23, 2023

1. Status and Change History

First Draft - April 20, 2023

First Oversight Review - May 4, 2023

Response to Oversight and Working Group Comments - August 21, 2023

2. Chairs

The Exploratory Group interim co-chairs are:

Nicholas Polys [Virginia Tech Advanced Research Computing](#)

Anita Havele [Web3D Consortium](#)

Johannes Behr [Threedy](#)

The Working Group will follow the standard election process as in section 3, of the [Cohort Process Policy](#) with a minimum of 3 and maximum of 4 elected co-chairs, with election balloting after at least three Working Group meetings so that Members can establish good standing, but before the sixth meeting.

3. Mission

The mission of the 3D Web Interoperability Working Group is to enable metaverse capabilities and content to be deployed on the web through informing and encouraging the web standards ecosystem to evolve to support metaverse use cases and for the web to support and leverage broader metaverse interoperability initiatives.

4. Goals

The goals and key activities of this Working Group are to generate insights into leading 3D web interoperability initiatives and to encourage their evolution in order to meet prioritized use cases. Special attention will be paid to opportunities for cooperation to increase synergy and avoid duplication of standardization efforts, reduce gaps and fragmentation, and minimize confusion for the good of users and the industry. The Working Group's specific goals will include informing and fostering cooperative standardization on:

4.1 Asset Interoperability

Driving clarity and convergence on how the web will achieve interoperability of networked 3D assets including geometry, materials, lighting, animations, interactions, behaviors and multimedia.

4.2 Tooling

Documenting robust patterns for interoperable metaverse content authoring and delivery workflows across the web to enable mixed-use of a diversity of asset formats in a single virtual world.

4.3 Browser Capabilities

Building consensus on how browser capabilities should evolve to support 3D experiences.

4.4 Networking and the Internet Protocol Stack

Exploring what networking services will be required and whether layers in the Internet Protocol Suite will need upgrading.

5. Deliverables

The list of Working Group's deliverables below is not intended to be exhaustive. Additional deliverables that fall within the scope of this Charter to fulfill the Working Group mission and goals may be initiated without additional Oversight approval.

5.1 Blog Updates

A blog announcing the formation of the working group and its goals to encourage participation. Regular subsequent blogs to update the industry on achieved goals and milestones.

5.2 Speaker Series

The Working Group will invite guest speakers from key organizations to foster insights, discussion, and engagement. These guest lecture sessions will be made available on the Forum Portal and Youtube speaker library.

5.3 Scenario/Use Case Register

Capture key use cases into a searchable database, working with the Register Working Group that plans to provide the necessary infrastructure. Use cases will provide a common reference for requirements including: portability, interoperability, privacy, ownership, authentication, encryption and monetization in the web ecosystem.

Considerations will include:

- a. Multiple application domains, including geospatial and medical visualization.
- b. Synchronous vs. asynchronous use cases among multiple agents, including large crowd sizes.

5.4 Technology Pattern Inventory

Document technology patterns for the web-based metaverse and match with use cases (scenarios) in the Forum Register. Considerations will include:

- a. Information addressing, content models, and lossy/lossless publishing pipelines
- b. Secure, correct, trustworthy, and reliable access to 3D web assets in the context of virtual environments
- c. Spatialized multimedia: audio, video, images.

5.5 Gap Analysis

Create a gap analysis and catalog to inform and guide standardization at relevant SDOs. Considerations will include:

- a. **Web 3D Content** including model geometry, translations, rendering, views, appearance, lighting, composability of spatial data, streaming/LOD management, and content negotiation for 3D services.
- b. **Web Spatial Multimedia Content** including how traditional 2D formats such as SVG, H.264/AV1 video, WebAudio, and MIDI would be integrated into a 3D virtual environment
- c. **Browser Capabilities** including how will current HTML/DOM/CSS capabilities need to be expanded or replaced? Do existing web APIs such as X3D, WebGL, WebGPU, and WebXR have sufficient functionality to support metaverse applications? Is JavaScript sufficient for advanced metaverse applications?
- d. **Networking and the Internet Protocol Stack**, including whether DIS, for distributed user experiences and QUIC as transport layer network protocol are sufficient to support massive multi-user metaverse environments.

5.6 Research and Experimentation

Initiate test bed projects to investigate and exercise proposed and prototype standardization initiatives, in order to provide timely use case and implementation feedback to relevant SDOs. Considerations will include:

- a. Linking metaverse worlds and objects through Semantic Web strategies
- b. Seamless portaling between web-based worlds on the metaverse
- c. Integration and use of relevant standards from domain SDOs such as 3D Tiles from the Open Geospatial Consortium (OGC), DICOM from NEMA, and medical informatics standards from HL7.

6. Milestones

The Working Group will release staged deliverables to demonstrate sustained progress and build increased interest and participation while building consensus. The group will also report its findings to the Forum membership, and publish public reports on the Forum website on an annual basis. The [timeline](#) below covers the first 24 months of activities. This Charter should be re-visited in the 2025 calendar year and renewed / revised as appropriate.

	3Q23	4Q23	1Q24	2Q24	3Q24	4Q24	1Q25	2Q25	3Q25	4Q25	Key	
Blogs	Final Release											Beta Release
Speaker Series Library												Final Release
Scenario/Use Case Register		Beta Release		Final Release								Precise Timing TBD
Technology Pattern Inventory			Beta Release		Final Release							
Gap Analysis					Beta Release			Final Release				
Annual Reports				Final Release					Final Release			
Testbed Reports												

7. Forum Domain Group Coordination

Our success depends on clear communications and education. This Working Group welcomes collaboration with other Forum Domain Groups and will work to inform and complement their efforts. Based on our Exploratory Group process, the [table](#) below captures a current snapshot of some potential shared interests. The top row identifies technology topics that may be relevant to one or more Domain Groups as indicated by green cells. Columns with more than one green cell indicate the need/opportunity for inter Domain Group cooperation. This cooperative matrix is expected to evolve and eventually be managed by Oversight as more Domain Groups are formed and the scope of Domain Groups evolve and are refined.

Domain Groups	Standards and Use Case Register	3D Asset Formats and Display	3D Compression & Streaming	Asset Rights and Security	Online Identity	Network Capabilities	Web Architecture
3D Web Interoperability							
Standards Registry							
3D Asset Interoperability using USD and glTF							
Digital Asset Management							
Network Requirements and Capabilities							
Real/Virtual World Integration							
Digital Fashion Wearables for Avatars							
Interoperable Characters/Avatars EG							
Privacy, Cybersecurity & Identity EG							
Technical Interoperability and End-User Troubleshooting							

8. Key Standards Organizations

The Working Group will encourage the active participation of the following SDOs, and others as they are identified to have an interest in the Working Group mission. If any SDO is not a current Forum member, they will be invited to join to enable effective cooperation.

1. [World Wide Web Consortium](#) (W3C) including the [Immersive Web Working Group](#)
2. [Khronos](#)
3. [Web3D Consortium](#) including the [X3D Working Group](#) and [Semantic Working Group](#)
4. [Open Geospatial Consortium](#) (OGC)
5. [IEEE](#) including the Metaverse Working Group, 3D Body Processing, and Distributed Interactive Simulation (DIS)
6. [MPEG](#) (ISO/IEC SC29) Coding for 3D graphics and haptics (ISO/IEC JTC 1 SC 29 WG 7)
7. [IAB Tech Lab](#) producing technical standards to build and support a sustainable digital media and advertising industry
8. [OMA3](#) including the [Inter-World Portaling System \(IWPS\) project](#)
9. [IETF](#) for cooperation on lower-levels of the Internet Protocol Stack

9. References

1. [Scenario Based Design](#)
2. [Forum Standards Registry](#)
3. [Semantic Web Article](#)