



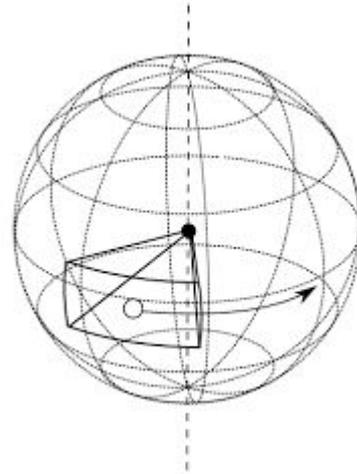
INDUSTRY FORUM

**Coffee and Dessert with The VR Industry Forum:
Defining VR360**

The VRIF

Our mission is to further the widespread availability of high-quality VR experiences for the benefit of consumers

- Focused on Cinematic and Live VR
 - Also known as
 - 360-degree video
 - VR360
 - 360 VR
 - 360°
 - VR/360



The VRIF

Not a standards group...

- Advocates for consensus around common technical standards for the VR360 ecosystem
- Fosters the development and adoption of interoperable standards
- Works with standards development organizations to develop voluntary guidelines that describe best practices

Our members



VR360: A Definition

“VR/360-degree video is content that is created, downloaded, or streamed, which allows the viewer to be immersed in a complete 360-degree projection either through a mobile device, digital player, or head mounted display (HMD).”

“In the opinion of the Streaming Video Alliance, the industry is in an “experimentation” phase. There is just no clear decision on the best approach.”

- Streaming Video Alliance, The State of VR/360-Degree Video
September 2018

VR360: The Use-Cases



- Entertainment
 - Baobab Studios “Invasion”
- Marketing
 - Mission Impossible: Fallout
- Tourism and Travel
 - Visit Mammoth California
- Training
 - Walmart
- Specialized Applications
 - Robots
 - Manufacturing
 - Law enforcement
 - Journalism
 - Security



VR360: The Challenges

“There are several issues limiting adoption and demand for these kind of video experiences that include: complexity, hardware, bandwidth, content preparation (encoding), latency, data plans, and cost.”

“VR technology, in its current state is ill-suited to provide the level of quality needed to render a high-enough bitrate video, especially when the rendering device is a mobile phone. This limitation is significant to increasing consumption of VR/360-degree video.”

- Streaming Video Alliance, The State of VR/360-Degree Video
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Standards



Why does the industry need standards?

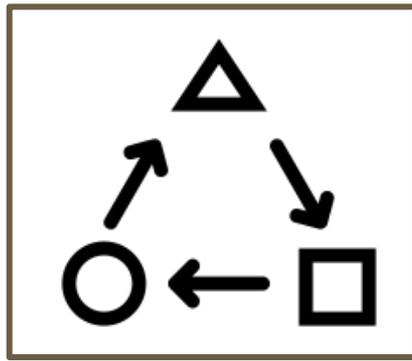
- Standards are crucial to ensure that consumers have a broad choice of great content on affordable and easy-to-use devices. Standards reduce costs for the industry and consumers.

What are the most important current standards?

- MPEG finished Omnidirectional Media Format (OMAF)
- 3GPP approved first set of media profiles for VR360 Streaming in September 2018. Includes VR in the first Release of 5G



Interoperability



What is interoperability?

- Interoperability in a VR ecosystem ensures that content and devices are compatible across service and device platform offerings.

Why is interoperability important for the industry?

- Reduces content production and distribution costs by defining common formats.
- Device makers get access to a premium quality content pipeline
- Consumers benefit from a high-quality, cross-platform experience

The VRIF Guidelines



- 78 page roadmap for high-quality VR360
- Major updates annually
- Continuously improved and expanded
- Emphasizes interoperability
- Covers
 - Production, capture, distribution, presentation, security
- Accompanied by a lexicon of industry terminology



From the Lexicon: Flash definitions

<https://www.vr-if.org/lexicon/> in collaboration with MovieLabs

- 3DoF: Ability of a viewpoint to change orientation by rotating through three perpendicular axes, often termed pitch, yaw, and roll, but not change position on those axes
- 6DoF: Ability of a viewpoint to change orientation by rotating through three perpendicular axes, often termed pitch, yaw, and roll, and also change position by moving on three perpendicular axes forward/backward (surge), up/down (heave), left/right (sway).

From the Lexicon: Flash definitions

- Presence: A subjective measurement of the extent to which a subject is unaware of being immersed in a Virtual Reality experience. Nearly every aspect of a VR system contributes to or detracts from the sensation of Presence, including video, audio, latency, ability to interact with the environment. Synonymous with Immersiveness
- Vertigo: The sensation of falling caused by either a disruption of the vestibular system or discrepancies between the vestibular and visual/audio senses.

From the Lexicon: Flash definitions

- Ambisonics: A system for encoding directional information in a 3D sound field by capturing x-, y-, z-, and omnidirectional components using special microphones. This allows a soundfield to localized when rendered through (e.g.) headphones to match the FOV being displayed on an HMD.
- Diegetic & Non-Diegetic Sound: Sound elements that are understood to originate from within a scene being depicted in a cinematic, theatrical, or VR experience. They may be off-screen, but if so would be audible to the characters in the scene. Dialog spoken by a character would be an example of Diegetic Sound. Conversely, soundtrack music heard only by the audience would be an example of non-Diegetic sound. Also known as "Diegetic Audio" or "Source Music".

The Future of VR360

- Success depends on the availability of great content on affordable, easy-to-use devices
- Needs standards to build a sustainable ecosystem
- Will require to align VR service offering with traditional media distribution channels
- Needs many applications in the entertainment and non-entertainment sector
- In 2019, VRIF will focus on expanding its VR360 guidelines toward Live VR, HDR, Watermarking, Text & Fonts, Presentation APIs

Join VR now and drive the ecosystem



For more information on VRIF, please visit www.vr-if.org/join or email us at info@vr-if.org

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