

# Fraunhofer FOKUS Position statement for W3C Workshop on Web5G

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Fraunhofer FOKUS<sup>1</sup> is highly active in the area of Web and 5G technologies development (with some focus on Media and Entertainment scenarios). The activities comprise research and development, standardization, as well as test beds and trials with industrial partners.

The media and entertainment related use cases include new scenarios and “media formats” such as 360° and Virtual Reality (VR) content, ultra-high fidelity video (HDR, HFR, 4k, 8k and beyond), multiple video streams converging on a single device and the convergence of VR and video content.

This type of new media will require high bandwidth, high reliability and low latency to improve the overall user experience. It is expected that these new media services are accessible from anywhere and from any device. We see the Web browser as the common app platform on any device (TV sets, smartphones, tablets, wearables, watches, and virtual reality devices). Therefore, one of the questions to be answered in the context of Web5G, is what a Web browser’s network API needs to support for 5G use cases. 5G promises to seamlessly integrate different network technologies – unicast and multicast. Client-side streaming metrics, which are collected through the Web app and with the help of network APIs will be used to decide when to switch between the different network technologies. Further, rapidly varying traffic conditions in dense use case scenarios (stadium sports, music festivals, train etc.) benefit from accurate and comprehensive network information. This enables 5G network technology, which heavily relies on virtualizable software functions (e.g. slicing), to make real-time decisions based on the Web clients’ streaming metrics. On a Web protocol level – what is the appropriate W3C Web protocol to support Evolved Multimedia Broadcast Multicast Services (eMBMS) - QUIC? Are current Web protocols sufficient for low latency streaming (WebRTC, HTTP/2)?

Furthermore, it is likely that in a 5G environment individual devices will connect directly to the Internet, without taking the detour via a household-specific local router or connection point. This changes the connectivity landscape significantly. While, ultimately, it removes the need for every home user to be a system administrator for the home network and allows device manufacturers to pre-configure their devices to allow connectivity “out of the box”, it also adds the need for functionality that is taken as given, or at least easier addressable, in a household environment, namely device access, discovery and security with a household. How do I discover “my” TV from my smartphone (already an issue if the smartphone is on a cell connection and the TV is in the local WLAN). How can I define what devices are in “my” personal network, my “professional” network or in “my family” network? How to I (virtually) connect “my” car(s) with my home? And do it safely?

No doubt - solutions will appear on the market soon, but there is a high risk that these will be proprietary solutions, similar to many fitness devices now, which are designed and able to communicate well in their own ecosystem, but are difficult to use in other contexts.

To avoid a fragmentation of 5G solutions, especially in the areas of device discovery and the handling of virtual private networks of 5G devices, early, standardized solutions are

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<sup>1</sup> <https://www.fokus.fraunhofer.de/en>

required, for which work in a W3C context is the best option for creating a widely used and accepted solution.

And this only covers one, albeit important, aspect of 5G in a web context. Other issues that need to be addressed (and, again, W3C provides a good place to address these) are the handling of (decreasing) web neutrality on a 5G world standardized APIs for the use of 5G in the AR, VR and 360° and the mobile entertainment domains, where addressing latency and edge-computing topics becomes more important to end-user devices and applications than previously, where such issues were often more in the operator domain and did not (directly) affect users.