

Wi-Fi® drives immersive XR experiences



Wi-Fi® empowers XR capabilities

[Extended Reality \(XR\)](#) represents the convergence of experiences in both the physical and digital world. XR, along with augmented reality (AR), virtual reality (VR), and mixed reality (MR) is used to describe the immersive applications that enhance or simulate real-life experiences. XR technologies extend the reality we experience by merging virtual effects with real-world applications or by creating fully immersive virtual experiences.

Premium XR experiences demand high performance, and the inherent strengths of Wi-Fi enable the full potential of XR use cases:

- Wi-Fi's advanced features deliver the low latency and high reliability needed for responsive and lag-free experiences
- Wi-Fi enables the power efficiency required for rapid, efficient data transfers needed for XR applications
- Wi-Fi unlocks the multi-gigabit speeds that allow for the instantaneous, massive data exchange XR applications demand



Wi-Fi enables XR across market segments

The global XR market is predicted to grow significantly in the coming years, and the expected total available market (TAM) for all XR system markets is projected to rise over \$250 billion USD by 2028¹. The XR market can be divided into the following market segments:

- Consumer: residential use cases that include VR and social gaming
- Enterprise: supporting collaborative tools in small and medium businesses as well as large campuses
- Industrial: technologies that support commercial and military use cases

Within each market segment, XR technologies are redefining the way users interact with each other and their environments, enabling powerful experiences and opening new expansive markets. Wi-Fi is the preferred method of connectivity in these markets and is ideally suited to enable wireless XR systems for immersive, untethered experiences for end users across a variety of use cases.

Collaboration and workplace productivity

XR allows enterprises to reimagine the way we collaborate and communicate in the modern workplace with applications like immersive presentations, collaborative brainstorming, and whiteboarding. A significant accelerator for collaboration through XR was the COVID-19 pandemic. Many organizations transitioned to remote or hybrid work, and XR technologies delivered more immersive meetings and events, allowing teams from different locations to connect and collaborate remotely. XR technologies are also being rapidly adopted in education for applications such as guided instruction, virtual field trips, immersive 3D training, and intent-based gaming. Some collaborative environments encompass multiple rooms and spaces, accommodating many wireless XR devices over multiple generations of Wi-Fi. Wi-Fi supports the requirements for XR collaboration use cases by

¹ Statista, July 2022

delivering sustained high throughput, bounded latency and jitter, and high reliability within a dense environment like large campuses, enterprises, or industrial deployments.

VR gaming

VR gaming refers to the new generation of computer games using XR technology to give players a truly immersive, first-person perspective of in-game action. Participants both experience and influence the game environment through a variety of VR gaming devices and accessories including VR Head Mounted Displays (HMD), sensor-equipped gloves, and hand controllers. VR games can be played on individual devices or online and enable individual or multiplayer experiences using specialized game consoles or advanced PCs. Wi-Fi delivers the full potential of VR gaming applications by providing low power consumption and low latency data transfer for VR devices, driving sustained and immersive VR experiences.

XR in healthcare

VR and AR applications in healthcare create a safe and comfortable environment for caregivers and patients and offer clinical caregivers an immersive environment for real-time procedures. XR technologies are also facilitating the deployment of robotics and AR/VR-based solutions to remotely perform surgical procedures and medical training, advanced diagnostics, patient monitoring, and telemedicine to make quality healthcare available in the most remote environments. Wi-Fi technologies enable low latency data transfer for high bandwidth real-time imaging applications delivered with high reliability while facilitating low power consumption for XR devices.



Social VR

Social VR refers to social connections among users in virtual realities through shared and immersive experiences. Users who are geographically distributed can meet, explore, interact, and participate in shared activities like watching movies, playing games, visiting virtual worlds, and attending live concerts and sporting events with their family, friends, and extended VR communities. Social VR experiences are evolving and will be a key part of the Metaverse experiences for end-users, allowing users from across the world to come together and have shared experiences. Wi-Fi is enabling Social VR use cases with low power consumption for HMDs and low latency data transfer with bounded jitter for real-time, conversational, and interactive media transport.

Wi-Fi CERTIFIED™: Trusted technologies for XR

Since 2000, Wi-Fi Alliance® has been driving the adoption and evolution of Wi-Fi through the Wi-Fi CERTIFIED™ program. Wi-Fi Alliance certification programs already deliver technologies to meet the XR requirements of high data rates, high reliability, low latency, and low power consumption enabling novel XR technologies and use cases. Next-generation Wi-Fi certification programs in development promise to further enhance the overall Wi-Fi performance. Wi-Fi CERTIFIED™ ensures that the devices providing XR experiences will meet the high standards for QoS performance, interoperability, and security.



Learn more: <https://www.wi-fi.org/discover-wi-fi/xr>