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WIGIG AND WI-FI 6 TECHNOLOGY IN WIRELESS COMMUNICATION: A COMPARATIVE STUDY

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Abstract

This comparative analysis explores WiGig and Wi-Fi 6, two high-speed wireless communication technologies that offer distinct advantages and disadvantages. It is essential to examine the functionality of these two standards under various circumstances given the increasing popularity of these technologies. This study aimed to address the lack of a comprehensive comparison between these two technologies and to provide useful information for researchers, engineers, and decision-makers in the field of wireless communication technology. The methodology utilized in this paper involved a comprehensive review of the existing literature on WiGig and WiFi 6 technologies in wireless communication, a comparative analysis of their performance was reviewed based on speed, power consumption, distance covered, areas of application, security, standardization and adoption. WiGig provides significantly faster data transfer rates than Wi-Fi 6, particularly over short distances, but has limitations in terms of coverage and interference. Wi-Fi 6, on the other hand, offers broader coverage, greater capacity, and lower power consumption, but lower peak data transfer rates than WiGig. Both technologies have their strengths and weaknesses, and the choice between them will depend on the applications' specific needs and location. It is also important to consider other factors, such as standardization, adoption, and security, when choosing between WiGig and Wi-Fi 6. This analysis provides real-world examples of applications that can benefit from each technology, highlights the challenges in terms of security, and offers recommendations for choosing between WiGig and Wi-Fi 6 for high-speed wireless communication.

Keywords: WiGig, Wi-Fi 6, high-speed wireless communication, data transfer rates, coverage

INTRODUCTION

With the rise of data-intensive applications like video streaming, virtual reality, and online gaming, the need for high-speed wireless communication has risen dramatically in recent years. Other wireless technologies have arisen to satisfy this demand, such as WiGig and Wi-Fi 6, which claim to provide faster speeds, reduced latency, and greater capacity than current Wi-Fi (Jindal *et al.*, 2020). Yet, as they have various technical requirements, use scenarios, and performance traits, choosing amongst these technologies might be difficult. The best technology for a high-speed wireless connection must therefore be determined through a comparison of WiGig and Wi-Fi 6.

WiGig is a wireless technology that can transmit data at up to 10 Gbps over short distances (up to 10 meters) and works in the unlicensed 60 GHz frequency spectrum (Hassan *et al.*, 2019). With speeds of up to 9.6 Gbps and a longer range than WiGig, Wi-Fi 6, also known as 802.11ax, uses the 2.4 GHz and 5 GHz frequency bands (Qayyum *et al.*, 2021). A newer technology called Wi-Fi 6 is based on the IEEE 802.11ax standard. Next-generation Wi-Fi will be able to connect thanks to this technology. The capacity, coverage, and performance of Wi-Fi 6 will successfully fulfil the growing and changing demands of Wi-Fi technology. The new language for Wi-Fi network devices and their connectivity is known as Wi-Fi 6 (Krishan, 2019). Depending on the use case and environment, these technologies have different strengths and weaknesses Therefore, a comparative analysis of WiGig and Wi-Fi 6 can help determine which technology is better suited for high-speed wireless communication in different scenarios.

In this paper, WiGig and Wi-Fi 6 for high-speed wireless communication will be compared and contrasted. This analysis will include a thorough explanation of both technologies, a comparison of how well they performed in various situations, an assessment of their benefits and drawbacks for various use cases, a review of their security capabilities, and a prediction of their future advancement and uptake. This study intends to provide insights into which technology is better

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suited for high-speed wireless communication in various contexts and to make advice for choosing between them by contrasting the advantages and disadvantages of WiGig and Wi-Fi 6.

Technology Overview

WiGig is a wireless communication system that uses millimeter-wave frequencies to achieve high-speed data transfer over short distances. It works in the unlicensed 60 GHz frequency spectrum. It is based on the IEEE 802.11ad standard and has a 10 Gbps maximum transmission throughput (Hassan *et al.*, 2019). WiGig is perfect for usages like wireless docking, virtual reality, and wireless displays because it uses beamforming and directional antennas to boost signal strength and cut down on interference (Qayyum *et al.*, 2021). By allowing the usage of a third 60GHz band, WiGig goes beyond the limitations of the dual-band 802.11ac standard. With the WiGig band, data is sent into a broader channel, enabling extraordinarily high-frequency transmissions. Users encounter broken connections and slower information retrieval when too many broadcasts from always-connected devices are competing for bandwidth.

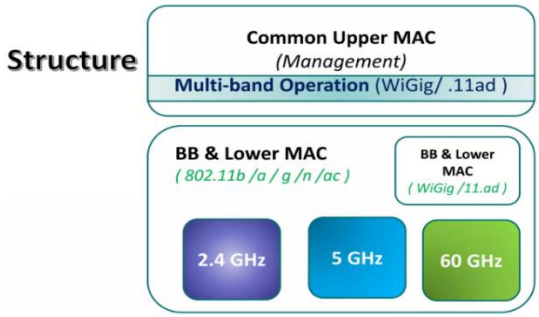


Figure 1: WiGig architecture enables tri-band communication.
(Source: https://www.bogotobogo.com/ WebTechnologies/WiFi.php)

The relatively untapped 60GHz band is used by WiGig. Because of its ability to utilize broader channels than ordinary Wi-Fi, it can transmit data at rates of up to 8 Gbps, which is substantially quicker. It employs beamforming to provide a precisely directed signal up to 10 meters between devices. With the help of this targeted broadcast, any interference from surrounding devices is removed, and good performance is maintained even in locations where the 60 GHz spectrum may be heavily utilized (Moubadir, 2018).

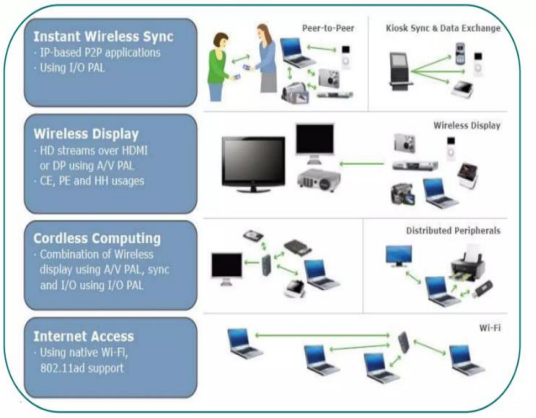


Figure 2: WiGig usage model
(Source: http://www.iitk.ac.in/nerd/web/ articles/wigig-the-new-generation-wifi/#.ZBThKHbMK00)

In contrast, Wi-Fi 6, commonly known as 802.11ax, uses both OFDMA and MU-MIMO technologies to allow high-speed data transfer over further distances than WiGig. Wi-Fi 6 runs in the 2.4 GHz and 5 GHz frequency bands (Jindal *et al.*, 2020). Wi-Fi 6 can manage more devices and traffic than earlier Wi-Fi standards since it can offer data rates of up to 9.6 Gbps and supports up to 8 spatial streams (Qayyum *et al.*, 2021). The next-generation High-Efficiency Wireless (Wi-Fi) communication standard, Wi-Fi 6, intends to address congestion caused by the overuse of the available spectrum as a result of an increase in the number of connected devices by providing faster network speeds and greater throughput. Orthogonal Frequency Division is used. To effectively utilize the bandwidth allotted for each transmission, it employs Orthogonal Frequency Division Multiple Access (OFDMA). The same method has been applied to 4G cellular LTE transmission systems, for example. Unlike earlier standards, which required that each device connected to a network have its own communication channel, OFDMA allows all connected devices to share a single channel for transmission across several frequency bands. With this solution, there is no bandwidth lost with each transfer, and efficiency is increased by a factor of 4.

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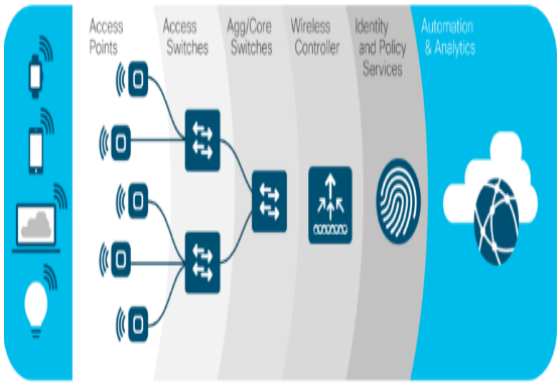


Figure 3: Wi-Fi 6 enables unified operations and pervasive segmentation across the entire network (Source: https://blogs.cisco.com/developer/wi-fi-6-for-developers)

Although WiGig and Wi-Fi 6 employ distinct frequency bands and modulation techniques, they have several technical features in common. For instance, both technologies offer many channels and use QAM modulation to increase data speeds and boost spectral efficiency. Both technologies additionally include cutting-edge security features including WPA3 encryption and AES-CCMP, which offer a strong defence against illegal access and data theft (Hassan *et al.*, 2019).

PROBLEM STATEMENT

Comparison of WiGig and WiFi 6 technology performance in wireless communication is important as these two cutting-edge technologies have the potential to improve wireless communication reliability and deliver larger data rates at high speed. The study aimed to address the lack of a comprehensive comparison between these two technologies and to provide useful information for researchers, engineers, and decision-makers in the field of wireless communication technology.

METHODOLOGY

Data collection: Data were gathered by reviewing existing literatures on WiGig and Wi-Fi 6; the review was conducted using various academic databases and search engines, peer-reviewed articles, conference proceedings, and other scholarly resources.

Data analysis: The efficiency of WiGig and Wi-Fi 6 were thoroughly examined in terms of speed, power consumption, distance covered, areas of application, security, standardization and adoption.

Performance evaluation: Comparative analysis between WiGig and Wi-Fi 6 were made based on their efficiency in terms of speed, power consumption, distance covered, areas of application, security, standardization and adoption. Notable differences and similarities between these two technologies were deduced.

Result and discussion: Results of the study were presented and recommendations were made.

The methodology utilized in this paper involved a comprehensive review of the existing literature on WiGig and WiFi 6 technologies in wireless communication, a comparative analysis of their performance was reviewed based on speed, power consumption, distance covered, areas of application, security, standardization and adoption.

Table 1: The notable differences between Wi-Fi 6 and WiGig

	WI-FI 6	WIGIG
IEEE Standard	802.11ax	802.11 ad
Range	Around 30-45 meters	Around 10-15 meters
Latency	2.4 ms	0.8 ms
Bit Rate	9.6 Gbps	7 Gbps
Security Mechanism	WPA2, WPA3, OWE, enhanced open, AES-CCMP	WPA2, WPA3, AES-GCM
Modulation	OFDMA, BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM, and 1024-QAM.	OFDMA, SC, MCS, BPSK, QPSK, 16-QAM, and 64-QAM
Advanced Antenna Technology	Does not require but supports MIMO, Beamforming and spatial reuse	MIMO, Beamforming, Beam steering and directional antenna
Band Communications	2.4 GHz and 5 GHz	2.4 GHz, 5 GHz, and 60 GHz

Similarities

Both WiGig and Wi-Fi 6 use unlicensed frequency bands to conduct wireless communication. To speed up data transfers and lessen interference, they both employ modulation techniques known as orthogonal frequency division multiplexing (OFDM).

Moreover, both systems feature beamforming, which enhances signal quality and coverage. Multiple Input Multiple Output (MIMO) antenna technology is also supported by WiGig and Wi-Fi 6, which further improves their capacity for swift data transmission over considerable distances.

Additionally, to ensure safe communication, WiGig and Wi-Fi 6 both implement the most recent security standards, including WPA3. In order to prioritize important traffic and decrease latency, both technologies include Quality of Service (QoS) methods.

Performance Comparison

Due to its usage of the 60 GHz frequency spectrum, which permits bigger channel bandwidths and more advanced modulation methods, WiGig has the potential to reach faster data transmission rates than Wi-Fi 6. WiGig, for instance, can reach data rates of up to 10 Gbps, whereas Wi-Fi 6 can reach data rates of up to 9.6 Gbps (Jindal *et al.*, 2020). Nevertheless, due to its vulnerability to signal attenuation and obstruction by objects like walls and furniture, WiGig's high-speed performance is restricted to short distances, usually within a few meters (Hassan et al., 2019). In contrast, Wi-Fi 6 is better suited for coverage of a larger region since it can deliver high-speed data transfer over greater distances.

Due to the use of beamforming and directional antennas, which help to reduce interference and increase signal strength, WiGig has lower latency than Wi-Fi 6. As a result, WiGig is ideal for low-latency applications like virtual reality and augmented reality, where real-time response is critical (Qayyum *et al.*, 2021). Wi-Fi 6 is also capable of low latency, but its performance may be hampered by interference and congestion from other Wi-Fi devices and networks (Jindal *et al.*, 2020).

Based on the use of lower frequencies and sophisticated power management tools like Target Wake Time (TWT) and spatial reuse, Wi-Fi 6 consumes less power than WiGig (Qayyum *et al.*, 2021). As a result, Wi-Fi 6 can offer longer battery life for gadgets like laptops and smartphones, which may need to run on battery power for prolonged periods of time. The points explained above are highlighted below:

- WiGig can achieve higher data transfer speeds than Wi-Fi 6 due to its use of the 60 GHz frequency band, with potential rates of up to 10 Gbps compared to Wi-Fi 6's 9.6 Gbps.
- However, WiGig's high-speed performance is limited to short distances of a few meters due to its susceptibility to signal attenuation and blockage by obstacles such as walls and furniture.
- Wi-Fi 6 can provide high-speed data transfer over longer distances, making it more suitable for wider area coverage.
- WiGig has lower latency than Wi-Fi 6 due to its use of beamforming and directional antennas, making it ideal for low-latency applications such as virtual reality and augmented reality.
- Wi-Fi 6 also has low latency capabilities, but its performance may be affected by interference and congestion from other Wi-Fi devices and networks.
- Wi-Fi 6 is more power-efficient than WiGig due to its use of lower frequencies and advanced power management features such as Target Wake Time (TWT) and spatial reuse.

Advantages of Wi-Fi 6 over WiGig

While WiGig offers a number of advantages over Wi-Fi 6, Wi-Fi 6 also has a number of advantages over WiGig. First of all, Wi-Fi 6 has a wider range of coverage than WiGig. WiGig's maximum coverage range is about 10 meters, compared to Wi-Fi 6's maximum coverage range of 50 meters. As a result, Wi-Fi 6 is better suited for uses like home or office Wi-Fi networks that call for wider coverage.

Secondly, Wi-Fi 6 provides more capacity than WiGig, which is crucial for applications that demand several devices to connect at once. While WiGig can accommodate up to 256 devices, Wi-Fi 6 can support up to 1024. As a result, Wi-Fi 6 is better suited for uses that call for enormous capacities, including congested public venues or sizable events.

Finally, WiGig uses more power than Wi-Fi 6, which uses less. A study found that Wi-Fi 6 can save up to 67% more energy than earlier Wi-Fi standards while WiGig uses more power because of its faster data transfer speeds. Because of this, Wi-Fi 6 is better suited for battery-operated devices and low-power applications (Lee *et al.*, 2019).

Advantages of WiGig over Wi-Fi 6

WiGig is superior to Wi-Fi 6 in a number of ways. First, WiGig greatly outperforms Wi-Fi 6 in terms of data transfer rates, especially for close proximity. While Wi-Fi 6 has a maximum data transfer rate of 1.2 Gbps, WiGig can reach data transfer rates of up to 8 Gbps. WiGig is hence well suited for high-speed data transfer applications like wireless VR or AR.

Secondly, compared to the sub-6 GHz bandwidth utilized by Wi-Fi 6, the millimeter wave (mmWave) frequency, where WiGig works, is less congested. This has the effect of reducing interference and increasing reliability, especially in metropolitan settings. WiGig can deliver fast wireless connection even in highly cluttered situations.

Finally, WiGig offers a low latency, which is crucial for applications like gaming or teleconferencing that call for real-time communication. WiGig has an average latency of 0.8 ms, while Wi-Fi 6 has an average delay of 2.4 ms (Tao *et al.,* 2020).

Areas of Applications

High-speed file transfer: WiGig and Wi-Fi 6 can both be used for high-speed file transfer between devices such as smartphones, laptops, and tablets. WiGig's high-speed performance makes it ideal for quickly transferring large files like videos and images over short distances, whereas Wi-Fi 6 is better suited for transferring files over longer distances with wider area coverage. However, the range of WiGig is limited, and its performance can be hampered by obstacles and signal attenuation, whereas Wi-Fi 6 may experience congestion and interference in congested areas (Jindal *et al.*, 2020).

Virtual and augmented reality: Because of WiGig's low latency and high-speed performance, it is ideal for real-time applications such as virtual and augmented reality, where low latency and high bandwidth are critical for an immersive experience (Qayyum *et al.,* 2021). WiGig's range, on the other hand, is limited, and it may not be suitable for larger-scale VR/AR applications that require wider coverage. Although Wi-Fi 6 can provide low latency and high bandwidth for VR/AR applications, its performance may be hampered by interference and congestion from other Wi-Fi devices and networks (Jindal *et al.*, 2020).

Smart homes: Smart home applications including home automation, security, and entertainment can be deployed with WiGig and Wi-Fi 6. While Wi-Fi 6 is better suited for controlling a large number of devices over greater distances with reduced power consumption thanks to its larger area coverage and power economy, WiGig's low latency and high-speed performance make it perfect for real-time control and monitoring of smart home devices (Hassan *et al.,* 2019).

Video streaming: WiGig and Wi-Fi 6 can both be used to stream high-quality video. WiGig's high-speed performance enables seamless 4K and 8K video streaming, whereas Wi-Fi 6's wider area coverage and power efficiency make it more suitable for streaming videos over longer distances while consuming less power (Jindal *et al.,* 2020).

WiGig maybe better suited for short-distance high-speed, low-latency applications, whereas Wi-Fi 6 may be better suited for wider area coverage and power efficiency.

Standardization and Adoption

Standardization of WiGig: WiGig is based on IEEE 802.11ad, which was approved in 2012. The Wi-Fi Alliance has also created a certification program for WiGig devices called WiGig CERTIFIED, which ensures interoperability and standard compliance (Hassan *et al.,* 2019).

Adoption of WiGig: WiGig has mostly been used in niche markets like wireless docking stations, virtual reality headsets, and wireless displays. However, due to its short range and line-of-sight requirement, as well as a lack of WiGig-enabled devices and infrastructure, its adoption has been limited (Qayyum *et al.,* 2021)

Standardization of Wi-Fi 6: The IEEE 802.11ax standard, which was ratified in 2019, serves as the foundation for Wi-Fi 6. The Wi-Fi Alliance has also created a certification program for Wi-Fi 6 devices called Wi-Fi CERTIFIED 6, which ensures interoperability and standard compliance (Jindal *et al.*, 2020).

Adoption of Wi-Fi 6: Wi-Fi 6 is widely used in consumer and business markets, with many devices and access points supporting the standard. The growing demand for high-speed and dependable

wireless connectivity, as well as the growing number of Wi-Fi-enabled devices and applications has fueled its adoption (Jindal *et al.,* 2020).

Broadly speaking, various factors such as technology maturity, market demand, and ecosystem readiness have influenced the standardization and adoption of WiGig and Wi-Fi 6. WiGig has primarily been adopted in niche markets, whereas Wi-Fi 6 has been widely adopted in consumer and enterprise markets due to its wider area coverage and backward compatibility with existing Wi-Fi devices.

Security

WiGig Security: The high frequency of operation is one of the most difficult challenges in securing WiGig networks. WiGig operates at a frequency of 60 GHz, with a very narrow beamwidth and high attenuation. WiGig signals are thus highly directional and cannot pass through walls or other obstacles. However, if there is line-of-sight access to the communication channel, WiGig signals can be easily intercepted or disrupted (Ahmad *et al.,* 2021).

To address these issues, WiGig employs a number of security mechanisms, including the WPA2-PSK and WPA3-PSK authentication and encryption protocols. These protocols are intended to keep unauthorized access and eavesdropping at bay. They may, however, be insufficient to protect against more sophisticated attacks, such as man-in-the-middle attacks or insider threats.

Wi-Fi 6 Security: Wi-Fi 6 includes several new security features that improve its security over previous Wi-Fi versions. Wi-Fi 6, for example, includes WPA3-Enterprise protocol support, which provides stronger authentication and encryption for enterprise networks. The Opportunistic Wireless Encryption (OWE) protocol, which provides unauthenticated encryption for public Wi-Fi networks, is also included in Wi-Fi 6.

Wi-Fi 6 supports the most recent encryption standards, such as AES-CCMP and AES-GCMP, which are more secure than previous encryption standards. Wi-Fi 6 also improves the secure key exchange process, which aids in the prevention of key leakage and other types of attacks (Zhang *et al.*, 2020).

Security Challenges: WiGig and Wi-Fi 6 face several security challenges that must be addressed to ensure their security. For example, both technologies need to protect against rogue access points, which can be used to launch attacks or steal sensitive information. Additionally, both technologies need to protect against man-in-the-middle attacks, which can intercept and modify data transmitted over the network. Finally, both technologies need to protect against insider threats, which can involve employees or other insiders who abuse their access to the network to steal or modify data (Rasheed *et al.,* 2020).

Overall, WiGig and Wi-Fi 6 security is critical for ensuring wireless communication confidentiality, integrity, and availability. While both technologies use similar security mechanisms, Wi-Fi 6 includes several new features that improve security over previous Wi-Fi versions. However, both technologies continue to face a number of security challenges that necessitate ongoing attention and improvement.

Security is an important consideration for any wireless communication technology, including WiGig and Wi-Fi 6. Both technologies provide faster speeds and lower latency than traditional Wi-Fi, but they also introduce new security challenges that must be addressed to ensure wireless communication's confidentiality, integrity, and availability.

Interception of signals is one of the most difficult challenges for WiGig. WiGig signals can be intercepted and disrupted due to their high frequency and directional nature if there is line-of-sight access to the communication channel. This makes protecting WiGig signals from eavesdropping or unauthorized access difficult (Khan *et al.,* 2018).

Wi-Fi 6 is also vulnerable to security threats such as insider threats, rogue access points, and man-in-the-middle attacks (Jain *et al.,* 2020). Insider threats are the risks of employees or other insiders abusing their network access to steal or modify data. Rogue access points, on the other hand, have the potential to launch attacks or steal sensitive data. Man-in-the-middle attacks, in which an attacker intercepts and modifies network data, are also possible (Kumar *et al.,* 2019).

Both WiGig and Wi-Fi 6 networks are only as secure as the devices that connect to them, adding another layer of complexity to device security. If a device is compromised or vulnerable to attack, the security of the entire network may be jeopardized (Sarwar *et al.*, 2021).

Finally, legacy devices present a security challenge for Wi-Fi 6 networks because they must be compatible with older devices that may not support the most up-to-date security protocols or encryption standards. This can lead to network vulnerabilities that attackers can exploit (Jain *et al.*, 2020).

Generally, securing WiGig and Wi-Fi 6 networks is a complex and ongoing process that necessitates ongoing monitoring and improvement. While these technologies provide many advantages in terms of speed and performance, their security challenges must be carefully managed to ensure wireless communication confidentiality, integrity, and availability.

Future Directions

WiGig and Wi-Fi 6 are rapidly evolving technologies that will only improve in the coming years. Future developments are likely to have a significant impact on these technologies in several areas.

Integration of WiGig and Wi-Fi 6 is one area of future development. Both technologies complement one another and can be used in tandem to provide a seamless wireless experience. WiGig is suitable for high-speed data transfer, whereas Wi-Fi 6 is suitable for broader coverage and lower power consumption (Ghosh *et al.*, 2019). The combination of these technologies has the potential to improve the efficiency and effectiveness of wireless communication in a variety of applications.

Another area of advancement is the application of machine learning and artificial intelligence (AI) to wireless communication optimization. These technologies can be used to improve wireless communication efficiency and reliability, as well as detect and respond to security threats (Sun *et al.*, 2020). Machine learning algorithms, for example, can be used to detect and mitigate interference between WiGig and Wi-Fi 6 networks.

Furthermore, another area of development for WiGig and Wi-Fi 6 is the use of millimetre-wave (mmWave) frequencies. MmWave frequencies provide even faster speeds than the current WiGig and Wi-Fi 6 frequencies, but they also present significant technical challenges such as limited coverage and interference (Ghosh *et al.*, 2019). However, research in this area is ongoing, and mmWave frequencies are expected to play an increasing role in future wireless communication technology.

Finally, work to improve the security of WiGig and Wi-Fi 6 networks is ongoing. This includes the creation of new security protocols and standards, as well as the incorporation of machine learning and artificial intelligence (AI) to detect and respond to security threats (Sarwar *et al.*, 2021).

CONCLUSION

In conclusion, this comparison of WiGig and Wi-Fi 6 has revealed several key findings. WiGig provides significantly faster data transfer rates than Wi-Fi 6, especially over short distances, but it has coverage and interference limitations. Wi-Fi 6 offers greater coverage, greater capacity, and lower power consumption than WiGig, but lower peak data transfer rates.

Both technologies have advantages and disadvantages, and the choice between them will be determined by the application's specific requirements. WiGig has several advantages, including faster data transfer rates and lower latency. WiGig, for example, maybe the better option for applications that require high-speed data transfer over short distances, such as wireless VR or AR. It also operates in the less congested 60 GHz band, which has more bandwidth. WiGig, on the other hand, has limitations in terms of range and penetration through obstacles. Wi-Fi 6 may be more appropriate for applications that require broader coverage and lower power consumption, such as home and office networks, IoT devices, or smart homes. Its data transfer rates might not be as fast as WiGig's, and the 2.4 GHz and 5 GHz frequency bands might be more crowded.

While deciding between WiGig and Wi-Fi 6, it's vital to take other aspects like standardization, adoption, and security into account. Compared to WiGig, Wi-FI 6 has a better-developed ecosystem

and higher adoption rates, but Wi-Gig provides stronger security.

For a high-speed wireless connection, choosing between WiGig and Wi-Fi 6 depends on a number of variables. WiGig is appropriate for uses like wireless VR and AR due to its many benefits, including greater data transfer speeds and minimal latency.

In summation, the decision between WiGig and Wi-Fi 6 is based on the application's specific requirements as well as the trade-offs between speed, coverage, power consumption, standardization, adoption, and security. Consequently, it is advised to carefully assess the application's requirements and take into account all of these elements before making a choice.

RECOMMENDATION

According to the comparative analysis, it is advised to carefully assess the unique requirements of the application and take into account the trade-offs between speed, coverage, power consumption, standardization, adoption, and security when deciding between WiGig and Wi-Fi 6 for high-speed wireless communication.

WiGig might be a preferable choice because of its quicker data transfer rates for applications like wireless VR or AR that need high-speed data transfer over short distances. Wi-Fi 6 might be better suited for applications that need greater coverage and less power use, such as IoT devices or smart homes.

It is also critical to consider each technology's level of standardization and adoption, as well as its security features. Wi-Fi 6 has a more established ecosystem and is more widely used than WiGig, while WiGig provides greater security than Wi-Fi 6. As a result, it is recommended that you carefully evaluate the application's requirements and consider all of these factors before making a decision.

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