



Global Economic Value of Wi-Fi® 2021 – 2025

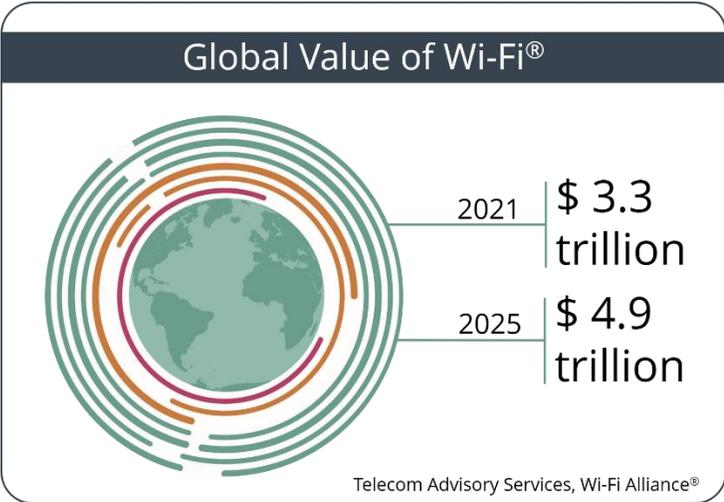
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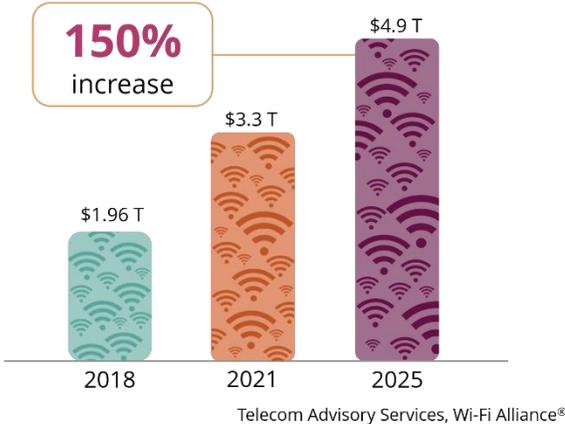
Global economic value of Wi-Fi® nears **5 trillion USD** in 2025

A study assessing the global economic [value of Wi-Fi](#) developed for Wi-Fi Alliance® by Telecom Advisory Services highlights the importance of Wi-Fi worldwide. The global value of Wi-Fi is estimated to be \$3.3 trillion in 2021, increasing to \$4.9 trillion by 2025, taking into consideration factors such as consumer and business communication needs, technology developments, access to additional spectrum, and the economic impact of a global pandemic.¹

This study updates a report originally published in 2018, which estimated that year's global Wi-Fi value at \$1.96 trillion. The current study, conducted in late 2020, analyzes 15 economies: 14 countries, plus analysis defining an overall European Union value. The study also extrapolates a global value.



Wi-Fi® Global Economic Value Growth



The results demonstrate an increase of almost \$3 trillion in value, or 150 percent growth, from 2018 to 2025, underscoring that Wi-Fi technology is one of the dominant economic engines of the digital economy.

¹ Wi-Fi Alliance® and Telecom Advisory Services, "The Economic Value of Wi-Fi: A Global View 2021-2025," 2021; all values expressed in U.S. dollars

Economic value results by country

The economic value of Wi-Fi is generated from multiple drivers, described later in this section. These are then channeled into gains for individual consumers accessing free Wi-Fi sites, residential consumers interconnecting devices at lower cost and faster speeds, enterprises saving telecommunications costs while supporting innovative use cases, and other effects as detailed in the comprehensive analysis which supports this report.

Country-specific evaluations for Australia, Brazil, Colombia, France, Germany, Japan, Mexico, New Zealand, Poland, Singapore, South Korea, Spain, the United Kingdom, and the United States, as well as a European Union analysis, were conducted by economists at Telecom Advisory Services. The results include major economic forces and Wi-Fi technology advancements to forecast the economic impact of Wi-Fi in each locale in 2021 and 2025. Overall effect and key economic factors impacting analysis are discussed below.

“Wi-Fi technology is one of the dominant economic engines in the digital economy”

AUSTRALIA	
2021	2025
\$35 billion	\$42 billion

Australia: The economic value of Wi-Fi in Australia is \$34.7 billion in 2021, expected to grow to \$41.7 billion by 2025. According to Opensignal, Australian wireless mobile users spend more than 52 percent of their time connected to Wi-Fi rather than using cellular data. Ninety percent of broadband households in Australia include Wi-Fi capability. The most important factor driving Wi-Fi value in both the consumer and enterprise areas is savings achieved by using Wi-Fi to reduce costs associated with in-building wiring installation, and the associated increase in use of Wi-Fi capable devices.

BRAZIL	
2021	2025
\$105 billion	\$124 billion

Brazil: Wi-Fi, which will contribute \$105.2 billion to the Brazilian economy in 2021, has become critical to Brazil’s telecommunications infrastructure. According to Cisco, the country has nearly nine million public Wi-Fi access points, expected to reach 23.8 million by 2023. Public Wi-Fi networks are key to providing internet to the population who cannot afford broadband service. In March 2020, Brazilians spent 70 percent of their time accessing Wi-Fi instead of using cellular

internet connections.² Brazil is one of the first countries in Latin America to authorize access of the full 6 GHz band to Wi-Fi use, securing the growth of Wi-Fi value for the future. By 2025, the economic value of Wi-Fi in Brazil is estimated to reach almost \$124.3 billion.

COLOMBIA	
2021	2025
\$19 billion	\$41 billion

Colombia: Recognizing Wi-Fi as an important part of its digital infrastructure, Colombia offers 412,000 free Wi-Fi access points to enable internet access for consumers who cannot afford broadband service. Of the homes that do have fixed broadband access in the country, 85 percent are equipped with a Wi-Fi router to support device connectivity. In 2021, Wi-Fi economic value in Colombia is nearly \$19 billion and is expected to more than double to \$41.4 billion by 2025.

EUROPEAN UNION	
2021	2025
\$458 billion	\$637 billion

European Union: The 2021 economic value of Wi-Fi in the 27 European Union countries combined is estimated at \$457.6 billion and is expected to grow to \$637.2 billion by 2025. Growth in Wi-Fi value is powered by a boost in Internet of Things (IoT) technology development, the growing adoption of augmented and virtual reality (AR/VR) use cases, and the increasing importance of free Wi-Fi. These values assume 500 MHz of unlicensed spectrum is approved for Wi-Fi use in 2021; each country in the European Union will experience greater benefits if more spectrum is allocated.

FRANCE	
2021	2025
\$63 billion	\$104 billion

France: France’s 2021 value of \$62.5 billion will grow to \$104 billion by 2025. Current estimates indicate the country has more than 1.2 million free public Wi-Fi access points for use³ and 87 percent of broadband subscribers in France have Wi-Fi access at home. Residential Wi-Fi drives the most value in 2021, but by 2025 it is expected that enterprise Wi-Fi will become a greater value contributor.

² Opensignal, Khatri, H. and Fenwick, S. (2020). "Analyzing mobile experience during the coronavirus pandemic: Time on Wi-Fi," 2020.
³ Wiman, 2020

GERMANY	
2021	2025
\$135 billion	\$173 billion

Germany: In Germany, 85 percent of homes with broadband have Wi-Fi networks, but this is expected to reach 100 percent by 2025, driving the economic value of Wi-Fi from \$134.5 billion in 2021 to \$173.3 billion by 2025. German wireless users spend approximately 65 percent of their communications time connected to Wi-Fi networks. Residential Wi-Fi is the largest contributor to Wi-Fi value in Germany, and it is expected to remain so through 2025.

JAPAN	
2021	2025
\$251 billion	\$325 billion

Japan: Nearly every citizen in Japan owns a smartphone and 94 percent access the internet,⁴ with 62 percent of smartphone connection times through Wi-Fi. Residential and enterprise broadband penetration are above 90 percent and estimates indicate more than 1.2 million free Wi-Fi sites in Japan. Wi-Fi provides residential and enterprise cost savings by avoiding paid wireless costs and spillover⁵ of IoT applications, yielding more than \$251.1 billion in economic value in 2021, and growing to \$324.9 billion by 2025.

MEXICO	
2021	2025
\$57 billion	\$118 billion

Mexico: The importance of Wi-Fi in Mexico is significant, with more than 7 million public Wi-Fi access points, nearly 1.8 million of which offer free access.⁶ Broadband penetration is approximately 65 percent,⁷ making free Wi-Fi access essential to Mexico's digital infrastructure. Of the Mexican households with broadband service, 91 percent include Wi-Fi in the home, driving a large portion of economic value. Wi-Fi value in Mexico in 2021 is \$56.6 billion, expected to more than double to \$117.5 billion by 2025.

⁴ Extrapolated from 2018 of 91.3% from the International Telecommunication Union. ITU World Telecommunications ICT Indicator Database 2020
⁵ Spillover here is defined as contribution of IoT to productivity. Example: IoT sensor networks reduce machine downtime at a manufacturing plant, thereby increasing productivity and, ultimately, producer surplus.

⁶ Wi-Fi Alliance and Telecom Advisory Services, "The Economic Value of Wi-Fi: A Global View 2021-2025", 2021

⁷ International Telecommunication Union. ITU World Telecommunications ICT Indicator Database 2020

NEW ZEALAND	
2021	2025
\$7 billion	\$10 billion

New Zealand: New Zealand places high importance on their Wi-Fi infrastructure. Ninety percent of households with broadband access in New Zealand include Wi-Fi access, and the country is transforming their educational system with Wi-Fi.⁸ New Zealand ranks seventh in the Asia Pacific region in terms of internet speed, and 27th globally.⁹ A major contributor to Wi-Fi value comes from New Zealand's enterprise sector: 71 percent of telecommunications traffic is transported through Wi-Fi networks and IoT applications. Wi-Fi value in New Zealand in 2021 is \$6.7 billion and is expected to grow to \$9.8 billion by 2025.

POLAND	
2021	2025
\$16 billion	\$22 billion

Poland: The estimated value of Wi-Fi for Poland in 2021 is \$16.1 billion and the 2025 value will reach \$21.6 billion. Public Wi-Fi drives great value in Poland: According to Cisco, there are approximately 3 million paid Wi-Fi access points based. Eighty-nine percent of the country's 12.7 million households with broadband rely on Wi-Fi routers to fulfill in-home device connectivity.

SINGAPORE	
2021	2025
\$11 billion	\$12 billion

Singapore: Singaporeans used nearly 35 petabytes of mobile data in the first half of 2018 alone,¹⁰ an astounding amount of data for a country of under six million. With an internet penetration of 90 percent¹¹ and a data hungry population, mobile users in Singapore spend more than 50 percent of their connectivity time on Wi-Fi over cellular networks. The economic value of Wi-Fi for Singapore in 2021 is \$10.6 billion, growing to an estimated \$12.4 billion by 2025. Major contributors to Wi-Fi value include enterprise Wi-Fi, which drives approximately half of the value now, and is expected to reach 57 percent by 2025.

⁸ Wi-Fi Alliance, [The Beacon](#), 2020

⁹ Glimp New Zealand, 2020

¹⁰ Singapore Tourism Board, 2018

¹¹ Extrapolated from 2019 of 88.9% from the International Telecommunication Union. ITU World Telecommunications ICT Indicator Database 2020

SOUTH KOREA	
2021	2025
\$89 billion	\$140 billion

South Korea: Wi-Fi is a pervasive feature in the advanced telecommunications landscape of South Korea. Fixed broadband penetration here is 100 percent;¹² nearly all South Korean homes contain broadband with Wi-Fi, and more than 400,000 paid Wi-Fi access points in the country. Users spend more than half their connection time on Wi-Fi networks today, driving a 2021 economic value of \$89.3 billion. South Korea's 2020 ruling to open 1200 MHz of the 6 GHz band to unlicensed access will help solidify Wi-Fi as a key component of daily life and contribute to the increase in Wi-Fi value to \$139.5 billion by 2025.

SPAIN	
2021	2025
\$40 billion	\$54 billion

Spain: Eighty-seven percent of households in Spain are equipped with Wi-Fi. Coupled with the nearly one million free Wi-Fi access points in the country, economic value of Wi-Fi is expected to reach to \$40.4 billion in 2021, and grow to \$54.1 billion by 2025. Currently, residential and enterprise value are closely aligned at \$15.8 and \$15.3 billion, respectively. By 2025, residential Wi-Fi is expected to overtake enterprise estimates, but both segments benefit greatly from savings in paid wireless service and faster Wi-Fi speeds.

UNITED KINGDOM	
2021	2025
\$99 billion	\$109 billion

United Kingdom: Wi-Fi has become a dominant component of the telecommunications infrastructure in the United Kingdom. There are approximately 2.2 million free public Wi-Fi access points in the region, and 200,000 paid Wi-Fi sites. Eighty-nine percent of homes with internet access include Wi-Fi capability. More than 65 percent of connecting time for smartphone users there takes place via Wi-Fi rather than relying on cellular networks; during lockdowns as a result of the pandemic that number reached 74 percent.¹³ Wi-Fi economic value growth in the United Kingdom is a result of the increasing importance of free Wi-Fi, faster speeds, more IoT deployments, and growing adoption of AR/VR. These bring 2021 economic value to \$98.8 billion, which is expected to grow to \$108.5 billion by 2025. The economic values assume approval of 500 MHz of spectrum approved

¹² International Telecommunication Union. ITU World Telecommunications ICT Indicator Database 2020
¹³ Ofcom, 2020

for Wi-Fi use; the United Kingdom will experience greater benefits if more spectrum is allocated.

UNITED STATES	
2021	2025
\$995 billion	\$1.6 trillion

United States: The United States remains one of the countries with the widest Wi-Fi adoption and use. Cisco estimates 33.5 million paid Wi-Fi access points, with estimates for free public Wi-Fi sites at around 18.6 million.¹⁴ Eighty-five percent of United States broadband subscribers have Wi-Fi capability at home, and mobile users connect to the internet through Wi-Fi over cellular networks more than 55 percent of the time. The United States also has a robust manufacturing ecosystem and increasing enterprise use, which have aided the rise in the value of Wi-Fi. The total economic value of Wi-Fi in 2021 is \$995 billion. With the new allocation of 1200 MHz in the 6 GHz band, as well as market penetration of Wi-Fi 6, the value of Wi-Fi will grow to \$1.58 trillion by 2025.

Key contributors to value of Wi-Fi

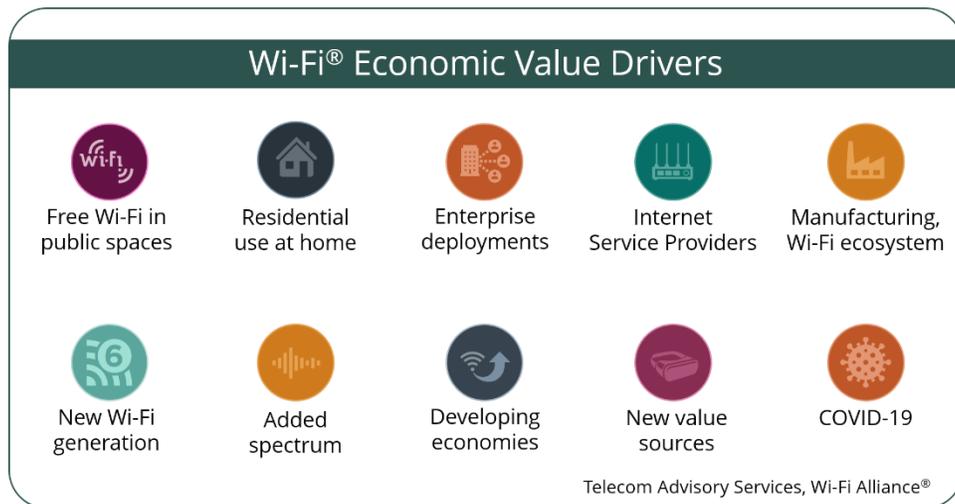
The economic value of Wi-Fi for each country was developed by assessing several key factors and global developments impacting the Wi-Fi industry that contribute to the value of Wi-Fi for 2021 and beyond. Economists combined calculations of each factor with implications specific to each country to develop the economic value, as reported in USD.

- **Free Wi-Fi:** user benefits for accessing free Wi-Fi networks in public locations, including libraries, cafés, and even [Wi-Fi buses](#)
- **Residential:** consumer savings using home internet and connecting to Wi-Fi over cellular service
- **Enterprise:** savings by using Wi-Fi to digitize business functions, reduce hardwired infrastructure, handle more data traffic, and deploy innovative applications
- **Internet Service Providers (ISPs):** traffic offload and wireless ISP services
- **Manufacturing and Wi-Fi ecosystem:** companies that bring Wi-Fi devices and equipment to market; those that provide Wi-Fi related services such as cloud analytics, personal Wi-Fi access, and streaming services
- **Wi-Fi 6:** [a new generation of Wi-Fi](#) built for demanding environments that provides speed, capacity, and performance even at the edge of a network began shipping in 2019, with huge growth projected for 2020 and beyond
- **6 GHz spectrum:** [new spectrum allocations](#) which enable further Wi-Fi innovation, reduce congestion, increase speed, and meet increasing demand

¹⁴ Wiman, 2020

- **Developing economies:** high cellular prices and lower broadband penetration results in Wi-Fi providing great value in many developing economies
- **New value sources:** new technology contributes to increasing IoT network deployments, more Wi-Fi based applications, and greater AR/VR application capability
- **Coronavirus pandemic:** unexpected disruption to the global economy due to the COVID-19 pandemic has caused economies to use Wi-Fi to keep businesses and critical functions operational, changing the way the world works, learns, entertains, and stays connected to friends and family

More details on the study's methodology can be viewed in [“The Economic Value of Wi-Fi®: A Global View \(2021 - 2025\)”](#).



Wi-Fi is critical to economic resilience

2020 was a year like no other in recent history involving a global pandemic, advancement in Wi-Fi technology with the introduction of a new Wi-Fi generation—Wi-Fi 6—gaining market adoption, and regulators worldwide considering the allocation of new spectrum for unlicensed technology use. Each of these events individually has the potential to alter the connectivity landscape; the combination of such influential factors in one year could fundamentally change the way we live, work, and learn.

“Wi-Fi is a key driver of digital resilience and innovation”

“The global economic value of Wi-Fi has increased at a faster pace than originally anticipated”

Through its [inherent strengths](#), Wi-Fi has been able to continue to drive digital resilience and innovation on a global scale. Due to these strengths, the global economic value of Wi-Fi has increased at a faster pace than originally anticipated. Wi-Fi has enabled telecommuting, distance learning, and telepresence—all of which have allowed consumers and businesses to continue many everyday functions during the pandemic. Wi-Fi has shown itself to be a key driver of digital resilience and innovation.

Wi-Fi: economic hero during COVID-19

The economic value of Wi-Fi has grown despite a global pandemic that put strain on the global economy.

A study conducted by Telecom Advisory Services found that the pandemic highlighted Wi-Fi's critical role, with Wi-Fi networks serving as a [significant contributor to national resilience in the face of COVID-19](#).

Wi-Fi demand and value will grow

Wi-Fi value may increase even more exponentially in years to come, provided that the economies studied gain access to the 6 GHz band. The combination of new technology and additional spectrum has enhanced the economic value of Wi-Fi thus far. Market penetration of Wi-Fi 6 and access to the 6 GHz band are drivers to economic value, and essential to meeting estimated value projections and Wi-Fi demand. Regulators should seriously consider giving Wi-Fi access to all 1200 MHz in the 6 GHz band to leverage maximum benefits, both economic and innovative. Wi-Fi 6 coupled with more contiguous spectrum enables advanced applications such as multigigabit video streaming, unified communications, cloud computing, and telepresence. Future generations of Wi-Fi, bolstered by access to the 6 GHz spectrum, will result in:

- **Broader scale IoT deployment:** Juniper Research estimates the number of connected IoT sensors and devices will likely surpass 50 billion by 2022
- **Great increases in video streaming:** Cisco estimates video traffic will be 82 percent of total IP traffic by 2022; Wi-Fi is expected to continue to handle more than half of all internet traffic for the foreseeable future
- **New innovations in AR/VR applications:** AR/VR goes well beyond entertainment; companies are developing applications in such areas as safety and healthcare¹⁵

“The combination of new technology and additional spectrum has enhanced Wi-Fi economic value”

Keeping pace with these trends requires **industry-wide commitment** to providing advanced connectivity. New Wi-Fi generations and sufficient spectrum access help industry to deliver high capacity, extremely low-latency, and gigabit speeds. Sufficient spectrum access is required to support advanced use cases that in prior years seemed impossible.

Wi-Fi is well established as a key complementary technology for enterprise and carrier networks, as well as an essential part of the home. Wi-Fi value will increase as next generation products and deployments become available. Globally harmonized spectrum access will enable countries worldwide to continue the growing social and economic benefits Wi-Fi provides.

¹⁵ [CES, 2021](#)

Wi-Fi powers our connected future

Wi-Fi is continuously innovating, providing solutions to meet the growing user demand and maintain quality connections wherever users go. With a global value of nearly \$5 trillion by 2025, Wi-Fi value is vitally important to everyday life. Wi-Fi enables advanced applications and is a key component in global efforts to bridge the digital divide in rural and isolated areas. It provides an important platform for free internet access in developing economies, making it critical to economic resiliency.

Wi-Fi 6 and future generations of Wi-Fi, coupled with access to 6 GHz spectrum, provide the capacity, coverage, and performance required to give quality experiences in demanding environments. Increased security through [Wi-Fi CERTIFIED WPA3™](#) and advancements in Wi-Fi network intelligence also contribute to bring the world closer to the goal of connecting everyone and everything, everywhere.

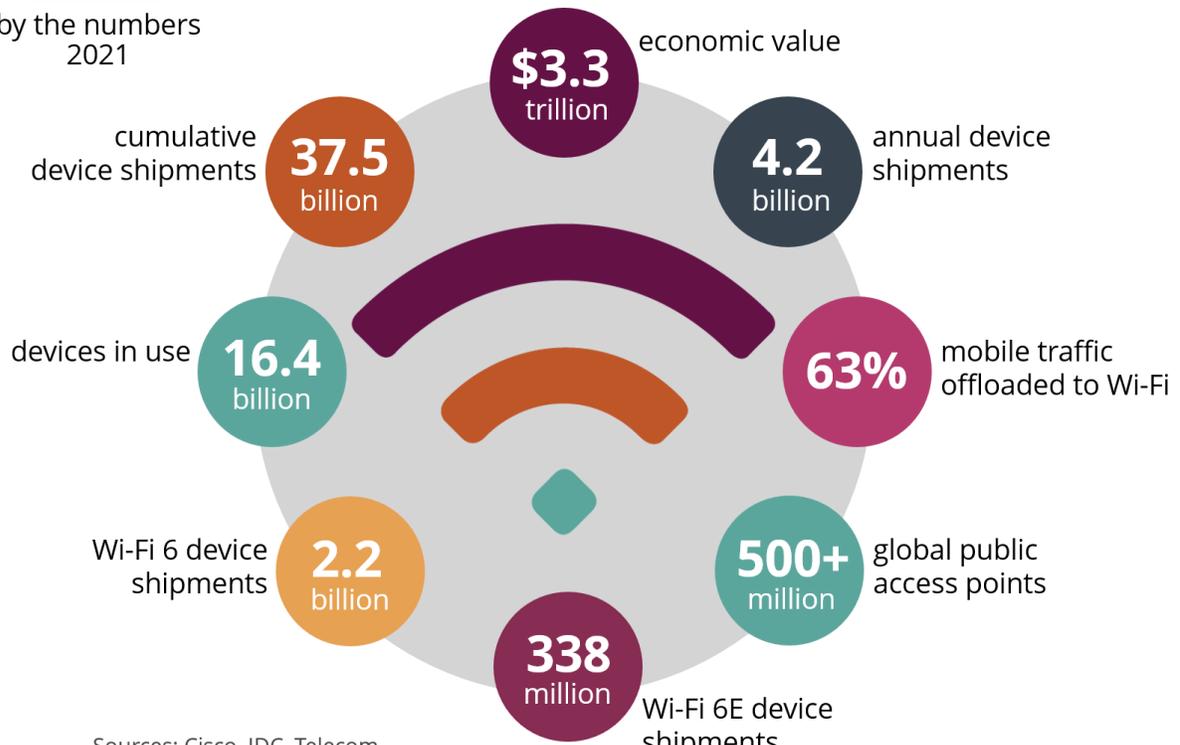
The global digital economy depends upon Wi-Fi. It is important to ensure sufficient spectrum for Wi-Fi use to continue the social and economic benefits Wi-Fi provides now into the future.

Value of Wi-Fi® GLOBAL	
2021	2025
\$3.3 trillion	\$4.9 trillion

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Wi-Fi®

by the numbers
2021



Sources: Cisco, IDC, Telecom Advisory Services, Wi-Fi Alliance®

About Wi-Fi Alliance®

www.wi-fi.org

[Wi-Fi Alliance®](#) is the worldwide network of companies that brings you Wi-Fi®. Members of our collaboration forum come together from across the Wi-Fi ecosystem with the shared vision to connect everyone and everything, everywhere, while providing the best possible user experience. Since 2000, Wi-Fi Alliance has [completed more than 65,000 Wi-Fi certifications](#). The Wi-Fi CERTIFIED™ seal of approval designates products with proven interoperability, backward compatibility, and the highest industry-standard security protections in place. Today, Wi-Fi carries more than half of the internet's traffic in an ever-expanding variety of applications. Wi-Fi Alliance continues to drive the adoption and evolution of Wi-Fi, which billions of people rely on every day.

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