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Ieee 802.11 standard 2024 download

Wi-Fi's roots can be traced back to the pioneering IEEE 802.11 series of wireless connectivity standards, which have drastically changed how we connect and access information. Billions of devices worldwide rely on Wi-Fi technology, transforming interactions between individuals, businesses, governments, and communities. The IEEE 802.11 series has made it possible for people globally to enjoy affordable and equitable internet access. To mark the Internet's 40th anniversary, we're taking a look at how the IEEE 802.11 series has driven Wi-Fi evolution and what new additions to the series will bring even more capabilities and possibilities. Wi-Fi is a wireless local area network technology that enables devices within a certain range to communicate through radio waves, making it an essential part of modern life. The first commercial Wi-Fi products were introduced by Apple in 1999 with its AirPort wireless base station and iBook, featuring the then-new IEEE 802.11b amendment for faster data rates up to 11 Mbit/s. The ongoing development of IEEE 802.11 Wi-Fi standards has led to significant improvements in data transmission speeds, range, reliability, and security. One key feature of the IEEE 802.11 family is backward compatibility, allowing devices from different generations to communicate with each other seamlessly. The Wi-Fi Alliance has also introduced a naming convention ("Wi-Fi #") to help distinguish between various implementations. The IEEE 802.11 series includes several standards, such as IEEE 802.11b (Wi-Fi 1) and IEEE 802.11a (Wi-Fi 2), which have played crucial roles in the development of Wi-Fi technology. These standards have enabled wireless communication at different speeds, ranges, and frequencies, paving the way for widespread adoption and innovation. As new additions to the series are developed, they will bring even more capabilities and possibilities to Wi-Fi technology, making it an essential part of our daily lives. 1999 saw the introduction of IEEE 802.11g, also known as Wi-Fi 3, which featured a multi-carrier modulation scheme (OFDM) to support high data rates. This was a significant improvement over Wi-Fi 1's single-carrier design. The 2.4 GHz frequency band became popular due to its lower cost compared to the 5 GHz band. In 2009, IEEE 802.11n or Wi-Fi 4 was introduced, which supported both 2.4 and 5 GHz bands with faster data rates up to 600 Mbit/s. This enabled WLAN networks to replace wired networks, reducing operational costs for end users and IT organizations. IEEE 802.11ac or Wi-Fi 5 was released in 2013, offering data rates of up to 3.5 Gbit/s. It introduced multiple input/multiple output (MIMO) technology, allowing devices to use multiple antennas for faster speeds and reduced errors. The latest standard, IEEE 802.11ax or Wi-Fi 6, published in 2021, focuses on improving network performance in areas with dense Wi-Fi traffic. It features a multi-user mechanism, allows for simultaneous data transmission from routers to multiple devices, and enables devices to schedule transmissions. Additionally, the new standard includes enhancements such as longer-range outdoor operations and mechanisms for supporting high-definition video, which is expected to be a dominant type of traffic in many upcoming Wi-Fi deployments. The development of IEEE P802.11be or Wi-Fi 7 is underway, with an estimated completion date of 2024. This standard promises 4x faster data rates of approximately 40 Gbit/s and twice the capacity compared to its predecessors. Wi-Fi 7 technology promises significant improvements over its predecessors, offering faster speeds, lower latency, and greater reliability in congested environments. The new standard enables support for multiple devices, reducing congestion and improving overall network performance. Additionally, Wi-Fi 7 has the potential to power next-generation applications such as Ambient Power-Enabled IoT Networks, Augmented Reality/Virtual Reality, and Artificial Intelligence/Machine Learning. The IEEE P802.11be standard builds upon existing technologies like Wi-Fi 6, offering enhanced multi-band/multi-channel aggregation and improved MIMO protocols. This enables more efficient use of available spectrum, leading to faster data transfer rates and lower latency. The standard also supports various special-interest groups exploring new features for emerging applications. Studies are underway to examine the technical feasibility of adding features like ambient power harvesting to support IoT devices and developing AI/ML algorithms that can analyze data at the source, reducing the amount of data transmitted over networks. These advancements aim to improve Wi-Fi performance, user experiences, and enable innovative applications in various industries, such as agriculture, smart grid, and transportation. As Wi-Fi technology continues to advance, so will IEEE standards. This progress is expected to unlock even greater potential and meet future industry and human needs. The evolution of Wi-Fi has already brought connectivity to the world, and ongoing efforts aim to continue this momentum. (Note: I removed all the technical details and dates from the original text, as they seemed to be a list of meeting minutes or updates on IEEE standards. If you'd like me to preserve some specific information, please let me know!) **Minutes of Teleconferences for TGbe MAC Ad-Hoc Group** From July to September 2021, several teleconferences were held by the TGbe MAC Ad-Hoc group. The minutes of these meetings have been documented and made available online. * In August and September 2021, Jeongki Kim (Ofinno) posted a series of minute documents detailing discussions and decisions made during the teleconferences. * These minutes cover topics such as the specification framework for TGbe and comments on reports from the AANI SC CC32-AANI group. * The minutes also highlight key issues discussed during the meetings, including input from Edward Au (Huawei) and Joseph Levy (InterDigital). Some specific dates mentioned in the text include: * 30-July-2021: Initial posting of minute documents for TGbe MAC Ad-Hoc teleconferences * August-September 2021: Ongoing posting of minute documents by Jeongki Kim (Ofinno) * January-October 2020 and January 2021: Posting of minute documents related to AANI SC CC32-AANI reports and comments Overall, the text appears to be a record of online discussions and decision-making among experts in the TGbe MAC Ad-Hoc group. A series of documents were uploaded to an online platform between 2017 and 2020. The documents are related to technical specifications for wireless communication technologies, including TGbe, TGaz, TGax, and TGM. The majority of the documents were uploaded by Edward Au from Huawei, with a focus on the TGbe specification framework. There are multiple revisions of the document, dated between July 2019 and September 2020, which indicates ongoing development and refinement of the technology. Joseph Levy from InterDigital also contributed to the series, uploading comments and reports related to the AANI SC CC32-AANI Report. Comments in August and September 2020. Other contributors include Roy Want from Google, who uploaded meeting minutes for TGaz in July and August 2018, and Alfred Asterjadhi from Qualcomm Inc., who worked on the TGax MAC-CR- Misc HE sounding specification framework between September 2017 and August 2017. Dorothy Stanley from HPE contributed a BRC Closing Report related to TGM in September 2016. The uploading dates range from July 15, 2019 to September 30, 2020, with most of the activity occurring in 2020. The document contains a list of download files from various dates between 2015 and 2008. Each file has a unique identifier, including a date (in the format "DD-MMM-YYYY") and a numerical identifier ("ET YYYY XXXX YYY"). The files are labeled as either "TGaq" or "TGas" and contain information on service identifiers and bloom filters. There are also files labeled as "TGac", which appear to be meeting agendas, and others labeled as "FILS Frame Content", which seem to relate to wireless standards. The files were uploaded by various individuals from companies such as Marvell, Huawei, STMicroelectronics, CATR, Aruba Networks, and Intel. ET 2008 1262 0 TGv Normative Text for UTC Reference Joe Kwak (InterDigital) 04-Nov-2008 11:11:38 ET Download The upcoming sessions will be held via teleconference until the next plenary meeting. Currently, no dates are set. As of now, there is no further information available. Members Jerome Henry, Brian Hart, Binita Gupta, and Malcolm Smith have developed a comprehensive guide to IEEE Std 802.11be-2024, also known as Wi-Fi 7. The IEEE SASB has approved the revised standard, which incorporates all previously published amendments and includes numerous enhancements and fixes. The approved documents will undergo publication editing and are expected to be available early in 2025. Here's a summary of our work at the March 9-14, 2025 plenary session in Atlanta, GA, USA: P802.11bf (WLAN Sensing) and P802.11bk (320 MHz Positioning) both received conditional approval to forward their draft standards to RevCom. We expect each project to complete one more SA ballot and then seek review by RevCom and approval from the SASB for publication. P802.11bi (Enhanced Privacy) recently completed their initial working group ballot on D1.0, which passed with an 89% approval rate. The task group is resolving comments from this ballot and expects to be ready for a recirculation ballot on D2.0 coming out of the July 2025 session. At the January 2025 session, TGbn (Ultra High Reliability, aka Wi-Fi 8) approved a draft D0.1. They conducted a comment collection on this early draft and have been working through those comments to improve the draft quality and prepare it for its initial working group ballot, expected out of the May 2025 session. The enhanced light communications (ELC) study group received WG and 802 LMSC approval for their P802.11br project authorization request (PAR). The PAR is being considered by NesCom, and we expect the work on P802.11br to start at the May 2025 session. The 802.11 WG and 802 LMSC approved the formation of a Post-Quantum Cryptography PAR Study Group. The PQC SG will work on a project authorization request (PAR) to harden 802.11 security for a future world in which quantum computing-based attacks are feasible. A more detailed report is available here. IEEE Std 802.11be™-2024 was approved on September 26, 2024. Publication expected soon. IEEE Std 802.11bh™-2024 was approved on September 26, 2024. Publication expected soon. IEEE Std 802.11bc™-2023 (incorporating IEEE Std 802.11-2020/Cor 2-2024) was published on February 28, 2024. IEEE Std 802.11bb™-2023 was published on November 10, 2023. IEEE Std 802.11bd™-2022 was published on March 10, 2023. IEEE Std 802.11az™-2022 was published on March 3, 2023. IEEE Std 802.11™-2020/Cor 1-2022 was published on December 27, 2022. Standards published in 2021 include IEEE Std 802.11ay-2021 (July), IEEE Std 802.11ax-2021 (May), and IEEE Std 802.11-2020 (February). Congratulations to the 802.11 members who contributed to these standards! Visit the photographs page to see leaders and major contributors receiving awards. The IEEE makes available IEEE 802 standards for free download, with some standards accessible six months after initial publication. All relevant IEEE 802.11 Standards, Amendments, and Recommended Practices are listed. Recent liaison statements and communications can be found here. Draft standards are available through various sources: For voting 802.11 members, visit the members' area and log in using provided ID and password. Attendees at an 802.11 session can access draft standards from a local fileserver. Members of other 802 groups may access the 802.11 members' area with their own group's credentials. Draft IEEE standards are occasionally available for purchase through the IEEE store or Techstreet. The Online Standards Development web site provides detailed information on the standards process, including tutorials and online forms. This site is recommended for all Members and Chairs involved. A Google calendar (embedded below) maintains 802.11 meeting schedules. You can import the calendar as an iCal file or use the "Add to Google Calendar" button at the bottom right of the calendar. The 802 calendar, which includes meetings and rolls up working group calendars, is available here.