

# APEX STANDARDS

wifi6GPT: Standard Essentiality Search vis-à-vis WiFi 6/6e (IEEE 802.11ax) Section Clauses

Fact Sheet  
wifi6GPT  
2 June 2023

**W**ifi6GPT helps identify the standard essentiality of a patent's claim elements or an application's draft claims. This crucial feature enables patent holders or applicants to determine the relevancy of their intellectual property to WiFi 6 (IEEE 802.11ax) standards. The key benefits include:

**Highly Relevant Section Clauses:** By analyzing patent claims, wifi6GPT assists researchers in identifying highly relevant sections and clauses. This capability streamlines the patent analysis process and saves valuable time and effort.

**Standard Essential Patent Claim Charting:** wifi6GPT facilitates the creation of Standard Essential Patent (SEP) claim charts. This feature allows patent holders to clearly define and outline the essential elements of their patents within the context of WiFi 6 standards.

**Licensing Opportunity Discovery:** With wifi6GPT, patent holders can uncover new licensing opportunities. By identifying potential licensing candidates and technical clauses, wifi6GPT assists in driving new revenue through patent licensing.

**Revenue Generation:** wifi6GPT empowers patent holders to generate licensing revenue. By leveraging the tool's insights and identifying licensing opportunities, patent holders can monetize their intellectual property and reinvest in next-generation innovation.

**Automation and Efficiency:** wifi6GPT utilizes advanced algorithms and machine learning capabilities to automate the patent analysis process. This automation reduces the time and effort required for analysis, allowing patent holders to focus on strategic decision-making and licensing negotiations.

**Competitive Advantage:** By utilizing wifi6GPT, businesses can gain a competitive edge by incorporating WiFi 6 capabilities into their products and services. This advantage enables them to deliver superior connectivity solutions and meet the increasing demands of customers in a rapidly evolving digital landscape.

By analyzing patent claims and identifying standard essentiality, wifi6GPT enables patent holders to determine the relevancy of their intellectual property to WiFi 6 standards. This powerful tool assists researchers in pinpointing highly relevant sections and clauses, facilitating the creation of Standard Essential Patent (SEP) claim charts.

Leveraging wifi6GPT, patent holders can uncover new licensing opportunities and generate substantial revenue streams. By identifying potential licensing candidates and technical clauses, wifi6GPT empowers patent holders to capitalize on their inventions and drive innovation in the WiFi 6 ecosystem. This newfound revenue can be reinvested in the development of next-generation technologies, fueling the cycle of progress and technological advancement.

**Apex Standards wifi6GPT** offers a comprehensive suite of features to streamline the patent analysis process. Its advanced algorithms and machine learning capabilities efficiently assess patent claims, providing patent holders with accurate and actionable insights. By automating the identification of highly relevant clauses, wifi6GPT reduces the time and effort required for patent analysis, allowing patent holders to focus on strategic decision-making and licensing negotiations. To learn more, visit our website

[www.apexstandards.com](http://www.apexstandards.com)  
or contact support@apexstandards.com

## References

- [1] Apex Standards Website [www.apexstandards.com](http://www.apexstandards.com)
- [2] Product Matrix [www.apexstandards.com/Apex.Standards.SaaS.Product.Matrix%202022-04.pdf](http://www.apexstandards.com/Apex.Standards.SaaS.Product.Matrix%202022-04.pdf)
- [3] Strategic Service Matrix [www.apexstandards.com/Apex.Standards.Strategic.SEP.Service.Matrix%202022-04.pdf](http://www.apexstandards.com/Apex.Standards.Strategic.SEP.Service.Matrix%202022-04.pdf)
- [4] Apex Standards domain specific GPT [www.apexstandards.com/apex.domain.gpt.pdf](http://www.apexstandards.com/apex.domain.gpt.pdf)
- [5] Apex Standards IEEE 802.11 Standardization Analysis Platform [www.apexstandards.com/apex.ieee.802.11.pdf](http://www.apexstandards.com/apex.ieee.802.11.pdf)

Based on:

- **802.11-2020:** IEEE Standard for Information Technology--Telecommunications and Information Exchange between Systems - Local and Metropolitan Area Networks--Specific Requirements - Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications - <https://ieeexplore.ieee.org/document/9363693>
- **Amendment 1:** Enhancements for High-Efficiency WLAN - <https://ieeexplore.ieee.org/document/9442429/>
- **Amendment 2:** Enhanced Throughput for Operation in License-exempt Bands above 45 GHz - <https://ieeexplore.ieee.org/document/9502046/>
- **Amendment 3:** Wake-Up Radio Operation - <https://ieeexplore.ieee.org/document/9570110/>
- **Amendment 4:** Enhancements for Positioning - <https://ieeexplore.ieee.org/document/10058117/>
- **Amendment 5:** Enhancements for Next Generation V2X - <https://ieeexplore.ieee.org/document/10063942/>

**Figure 1** wifi6GPT empowers researchers to explore and validate concepts by checking if they have been adopted anywhere in the WiFi 6 standards. This capability saves valuable time and institution resources, enabling them to focus on concepts that are relevant and applicable. Even when a concept, such as SVD, is not explicitly mentioned in the technical clauses, wifi6GPT delves into the underlying semantic meaning to extract procedures that either implement it without explicit mention or implicitly incorporate it.

Session 1 On Fri, Jun 2, 11:56 AM PDT, you asked about: "where is svd potentially used?" / Source: Main 802.11ax Wifi 6 / Source: Amend.1 (High-Efficiency WLAN) / Source: Amend.2 (License-exempt Bands) / Source: Amend.5 (Next Gen V2X)

wifi6GPT answered:

## Perspective 1

SVD (Singular Value Decomposition) is potentially used in the following contexts in IEEE 802.11ax-2021 Amendment 2:

- In spatial mapping method for defining spatial mapping matrix Q, which is a diagonal complex value matrix of size N TX, used in Direct Mapping and N STS N TX. [Ref 6]
- In MIMO Feedback Control element for defining beamforming feedback matrix, where SVD is used for calculating the codebook matrix. [Ref 3, Ref 9]
- In TXVECTOR and RXVECTOR parameters for EDMG format and EXPANSION\_MAT\_TYPE for NON\_COMPRESSED\_SV, where SVD is used to obtain beamforming matrices from compressed feedback matrices. [Ref 8, Ref 9]
- In BRP transmit sector sweep (BRP TXSS) for EDMG BRP-TX PPDUs transmitted in MIMO BRP TXSS, where the SVD algorithm is used in the transmit training process. [Ref 11]

Session 1 On Fri, Jun 2, 2:41 PM PDT, you asked about: "If my draft claim is as below, please find the most relevant technical clauses and connect the concepts: User entity for communicating via communication resources, on which a client (40) is operative, wherein the user entity is configured to determine a received media content throughput or buffer state of a media content retrieved by the client from a server (42) and inform a resource manager (30) responsible for assigning the communication resources to a plurality of user entities including the user entity, on the determined media content throughput or buffer state, 2. User entity according to claim 1, wherein the user entity is configured to perform the informing in a lower OSI layer than an OSI layer via which the media content retrieval is conveyed." / Source: Main 802.11ax Wifi 6 / Source: Amend.5 (Next Gen V2X)

wifi6GPT answered:

## Perspective 1

The relevant technical clauses for the given draft claim, "User entity for communicating via communication resources, on which a client (40) is operative, wherein the user entity is configured to determine a received media content throughput or buffer state of a media content retrieved by the client from a server (42) and inform a resource manager (30) responsible for assigning the communication resources to a plurality of user entities including the user entity, on the determined media content throughput or buffer state, 2. User entity according to claim 1, wherein the user entity is configured to perform the informing in a lower OSI layer than an OSI layer via which the media content retrieval is conveyed," are:

- IEEE 802.11-2020 Section 10.30.2.5: This clause talks about resource allocation within a PSMP burst and explains how a STA transmits a resource request to the AP within that PSMP-UTT by setting either the Queue Size field or the TXOP Duration Request field of the QoS Control field that is carried in a QoS Data frame.
- IEEE 802.11-2020 Section 9.4.2.234: This clause explains the Buffer Size subfield in a GLK-GCR Parameter Set element that is intended to provide guidance for the recipient to decide its reordering buffer size. It also mentions that if the transmitter has no guidance for the receiver's reordering buffer size, it sets the Buffer Size subfield to 0.
- IEEE 802.11ax-2021 Amendment 5 Section 31.2.1: This clause talks about coexistence with non-NGV STAs and explains how an NGV STA transmits either a non-NGV PPDU or an NGV PPDU. It also mentions that the Duration ID field of the Management or QoS Data frame shall be set to the sum of 4, SIFS, and the transmission time of the responding Ack frame.

The relevant technical concepts that connect the above clauses are:

- Resource allocation
- QoS Control field
- Link Measurement Request

The technical details that relate to the given draft claim are:

- The user entity is responsible for determining the received media content throughput or buffer state of the media content retrieved by the client from a server and informing the resource manager responsible for assigning the communication resources to a plurality of user entities, including the user entity, based on the determined media content throughput or buffer state.
- The user entity performs the informing in a lower OSI layer than an OSI layer via which the media content retrieval is conveyed.
- The resource allocation is communicated by setting either the Queue Size field or the TXOP Duration Request field of the QoS Control field that is carried in a QoS Data frame.

**Figure 2** wifi6GPT offers a powerful capability to associate claim elements with potentially relevant WiFi 6 standards by understanding their technical meanings. In this example, wifi6GPT provides detailed explanations and evidence of standard relevance, laying the foundation for future claim charting and establishing standard essentiality. Additionally, wifi6GPT supports searching within the primary publications of IEEE 802.11ax and across all amendments, meeting specific requirements set by Patent Pools, such as Sivel's. This comprehensive search capability ensures a thorough analysis and maximizes the value of innovators' intellectual property.