

**IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
WACO DIVISION**

PROXENSE, LLC,

Plaintiff,

vs.

INTEL CORP.,

Defendant.

Case No. 24-cv-283

JURY TRIAL DEMANDED

AMENDED COMPLAINT FOR PATENT INFRINGEMENT

Plaintiff Proxense, LLC (“Proxense” or “Plaintiff”) hereby sets forth its Complaint for patent infringement against Defendants Intel Corp. (“Intel” or “Defendant”), and states as follows.

NATURE OF THE CASE

1. This action is for patent infringement arising under the patent laws of the United States, 35 U.S.C. §§ 1, et seq. As further stated herein, Proxense alleges that Intel infringed and continues to infringe one or more claims of patents owned by Proxense. Accordingly, Proxense seeks monetary damages and injunctive relief in this action.

THE PARTIES

2. Plaintiff Proxense, LLC is a Delaware company with its principal place of business at 689 NW Stonepine Drive, Bend, Oregon 97703.

3. On information and belief, Intel is a Delaware corporation with a physical address of 1300 South MoPac Expressway, Austin, Texas 78746, and employs more than 2,000 people in Austin. Intel is registered to do business in the State of Texas and has been registered since 1989 (Texas Taxpayer Number 19416727436 and SOS File Number 0008006206). Intel may be served

through its registered agent, CT Corporation System, at 1999 Bryan St., Ste. 900, Dallas, TX 75201.

4. Defendant's past and continuing making, using, selling, offering for sale, and/or importing, and/or inducing its subsidiaries, affiliates, retail partners, and customers in the making, using, selling, offering for sale, and/or importing the accused Wi-Fi compliant devices throughout the United States impermissibly take the significant benefits of Proxense's patented technologies without fair compensation to Proxense.

JURISDICTION AND VENUE

5. This Court has exclusive subject matter jurisdiction over this case pursuant to 28 U.S.C. §§ 1331 and 1338(a) on the grounds that this action arises under the Patent Laws of the United States, 35 U.S.C. § 1 et seq., including, without limitation, 35 U.S.C. §§ 271, 281, 284, and 285.

6. This Court has general and specific personal jurisdiction over Defendant pursuant to due process and/or the Texas Long Arm Statute because, inter alia, (i) Defendants have done and continue to do business in Texas and (ii) Defendants have, directly and through intermediaries, committed and continue to commit acts of patent infringement in the State of Texas, including making, using, offering to sell, and/or selling accused products in Texas, and/or committing a least a portion of any other infringements alleged herein. Notably, Intel developed, made, used, offered to sell, and sold the Intel® Home Wi-Fi Chipset WAV600 Series in or around 2018 and continues to develop, make, use, offer to sell, and sell client-side wireless adapters. Additionally, Intel coordinated with U.S.-based and international router manufacturers in its push for Wi-Fi 6 enabled routers, as it needed such high-speed routers in the market to work with its wireless adapters in client devices. Accordingly, Defendant has placed, and is continuing to place, infringing products

into the stream of commerce via an established distribution channel, with the knowledge and/or understanding that such products are sold in Texas, including in this District. Defendant has derived substantial revenues from its infringing acts occurring within Texas and within this District. Defendant has substantial business in this State and judicial district, including: (A) at least part of their infringing activities alleged herein; and (B) regularly doing or soliciting business, engaging in other persistent conduct, and/or deriving substantial revenue from infringing goods offered for sale, sold, and imported, and services provided to Texas residents vicariously through and/or in concert with its alter egos, intermediaries, agents, distributors, importers, customers, subsidiaries, and/or consumers.

7. Exercising personal jurisdiction over Defendant in this District would not be unreasonable given Defendant's contacts in this District, the interest in this District of resolving disputes related to products sold herein, and the harm that would occur to Plaintiff.

8. In addition, Defendant has knowingly induced and continues to knowingly induce infringement within this District by coordinating in the development of and/or manufacturing WAV600 Chipsets that are pre-loaded with infringing functionality, incorporated into products sold and offered sale within this District, and that have substantially no non-infringing use. Furthermore, Defendant develops and sells Wi-Fi 6 (Gig+) and Wi-Fi 7 chipsets for laptops and PCs that when operated for their intended purpose with Intel supplied drivers facilitate, direct or encourage the use of infringing functionality with knowledge thereof.

9. With respect to the Asserted Patents, the Accused Products are devices that include, but are not limited to, Defendant's devices that support Wi-Fi 6 and above (e.g., Wi-Fi-7) and/or other devices, as well as their components and processes related to the same.

10. This Court has personal jurisdiction over Intel because Intel is a multinational technology company that has a significant presence in this District through the products and services Intel provides residents of this District.

11. Intel regularly conducts business and has committed acts of patent infringement within this Judicial District that give rise to this action and has established minimum contacts within this forum such that the exercise of jurisdiction over Intel would not offend traditional notions of fair play and substantial justice. Intel has committed and continues to commit acts of infringement in this Judicial District by, among other things, offering to sell, selling, using, importing, and/or making products and services that infringe the asserted patents. Intel has further induced acts of patent infringement by others in this Judicial District and/or has contributed to patent infringement by others in this Judicial District, the State of Texas, and elsewhere in the United States.

12. Intel describes that it is “proud to call Texas home” and has innovated and invested “in Texas for more than 20 years.” *See e.g.* <https://www.intel.com/content/www/us/en/corporate-responsibility/intel-in-texas.html>. “Intel’s Austin facility is a research and development center where more than 2,000 employees innovate at the boundaries of technology”. *Id.* “The Austin site is focused on supporting innovations in cloud computing, Internet of things, 5G connectivity, memory, and programmable solutions, which are key to driving innovation that makes the world safer, builds healthy and vibrant communities, and increases productivity.” *Id.*

13. On information and belief, Intel has authorized retailers in this Judicial District that offer and sell products on its behalf in this District, including products accused of infringement herein. On information and belief, these include the accused chipsets, wireless adapters and microprocessors.

14. Proxense's causes of action arise directly from Intel's business contacts and other activities in the State of Texas and this District.

15. Intel has derived substantial revenues from its infringing acts within the State of Texas and this District. On information and belief, Intel's revenue was more than \$2.1 billion in 2023, with much of that revenue derived from the manufacture of chipsets sold by MaxLinear and sales of its PC and laptop chipsets. On information and belief, and as relevant to this Action, Intel's annual wireless chipset sales exceed one billion dollars.

16. Venue is proper in this Judicial District pursuant to 28 U.S.C. § 1400(b). Intel is registered to do business in Texas and, upon information and belief, Intel has transacted business in the Western District of Texas and has a regular and established place of business in this Judicial District and in which Intel conducts its accused infringing acts. Intel maintains a large 61-acre office complex at 1300 South MoPac Expressway, Austin, Texas 78746 with more than 2,000 employees.

17. Among these employees are key witnesses involved in Intel's infringement concerning wireless communications and passwordless related technologies, both of which are relevant to the accused products in this action as described herein. For example:

- Cristina Rodriguez is a Vice President in the Network and Edge Group (NEX), general manager of the group's wireless access network division (WAND) and general manager of the Austin design center at Intel Corporation. Ms. Rodriguez describes on her LinkedIn profile that she "lead[s] Intel's efforts to provide innovative wireless access solutions." She is located in Austin. See <https://www.linkedin.com/in/cristina-rodriguez-8830821/>.
- Bryan Boatright is a Vice President in the Silicon Engineering Group and General Manager. Mr. Boatright describes that he "lead[s] Intel's small core development

organization responsible for RTL through tapeout including pre- and post-silicon verification.” He is located in Austin. See <https://linkedin.com/in/bryan-boatright-47b01290/>.

- Jagadeesh Nallagatla is Intel’s Director of Engineering. He is located in Austin. See <https://linkedin.com/in/jagadeesh-nallagatla/>.
- Ankit Shah is the Director of Design Engineering at Intel. He is located in Austin. See <https://linkedin.com/in/ankitks/>.
- Jonathan Devlin is a Director, Wireless Access at Intel Corporation, and he wis located in Austin. See <https://www.linkedin.com/in/jonathan-devlin-259a203/>.

18. Defendant is a member of the Wi-Fi Alliance, which has its headquarters in Austin, Texas. See [https://www.wi-fi.org/membership/member-companies](https://www.wi-fi.org/membership/member-companies;); <https://www.wi-fi.org/contact-us>. “Membership in Wi-Fi Alliance® shows [a] business is engaged in the latest Wi-Fi® technology developments.” <https://www.wi-fi.org/membership>.

PATENTS-IN-SUIT

19. On July 20, 2012, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 8,219,129 (the “129 Patent”) entitled “Dynamic Real-Time Tiered Client Access.” A true and correct copy of the 129 Patent is attached hereto as **Exhibit 1**.

20. On June 4, 2013, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 8,457,672 (the “672 Patent”) entitled “Dynamic Real-Time Tiered Client Access.” A true and correct copy of the 672 Patent is attached hereto as **Exhibit 2**.

21. On February 16, 2016, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 9,265,043 (the “043 Patent”) entitled “Dynamic Real-Time Tiered Client Access.” A true and correct copy of the 043 Patent is attached hereto as **Exhibit 3**.

22. On October 11, 2011, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 8,036,152 (the “152 Patent”) entitled “Integrated Power Management of a Client Device Via System Time Slot Assignment.” A true and correct copy of the 152 Patent is attached hereto as **Exhibit 4**.

23. Proxense is the sole and exclusive owner of all right, title, and interest to and in, or is the exclusive licensee with the right to sue for, the 129, 672, 043, and 152 Patents (together, the “Patents-in-Suit”), and holds the exclusive right to take all actions necessary to enforce its rights to the Patents-in-Suit, including the filing of this patent infringement lawsuit. Proxense also has the right to recover all damages for past, present, and future infringement of the Patents-in-Suit and to seek injunctive relief as appropriate under the law.

24. The technologies of the Patents-in-Suit were invented by John Giobbi, David Brown, and Fred Hirt. The 129, 672, and 043 Patents generally cover systems and methods for client devices in a wireless network that share timeslots in a dynamic tiered manner. The 152 Patent generally covers apparatus and methods for network devices that alternate between active and sleep modes based on assignment information.

FACTUAL ALLEGATIONS

I. PROXENSE AND ITS INNOVATIVE TECHNOLOGIES

25. Proxense was founded in 2001.¹ From approximately 2004-2012, Proxense developed, *inter alia*, wireless technologies and commercial products, employing over thirty engineers, and investing many millions of dollars in product development and other research and development efforts. Foundational capabilities of Proxense’s technologies included managing

¹ The company was formally incorporated as an LLC in 2001 under the name Margent Development LLC; in 2005, the business was renamed to Proxense LLC.

multiple client access to a wireless network whereupon the clients could efficiently share access in a dynamic, tiered manner. They also included a secure element, biometrics captured and stored thereon, retrieval of biometrics and token passing to a trusted third party, and completion of a mobile payment transaction.

26. Proxense also developed sophisticated, proprietary, proximity-based detection, authentication, and automation technology, built on the concept of wirelessly detecting, authenticating, and communicating with personal digital keys (“PDKs”). Proxense’s technology enabled PDKs to run for as long as two years on tiny batteries. “ProxPay” technology also included biometrically-based user and device authentication options, the ability to conduct biometric-verified transactions without sending or exposing the underlying biometric data or storing it anywhere except the PDK, and the incorporation of a registration for maintaining or verifying the PDK. Significant financial and engineering resources were deployed to make this possible. The resulting developments became primary differentiators of Proxense’s product line, and significant elements on which its business was built.

27. John Giobbi is the founder and CEO of Proxense. He is an experienced product designer and prolific inventor (a named inventor on approximately 200 patents, including some of the asserted patents), with over 35 years of experience as an entrepreneur and product development executive. For example, Mr. Giobbi was a Senior Vice President at WMS Gaming, and managed over 200 staff; in his six-year tenure at that company, its market capitalization soared from approximately \$80 million to about \$1 billion. Mr. Giobbi was also the founder and President of Prelude Technology Corp. and InPen.

28. The innovative, visionary nature of Proxense’s technology was recognized in the media, beginning in mid-2008, when, The Bulletin featured a story on Proxense’s mobile payment

technology, titled “A pint-sized virtual wallet.” Andrew Moore, *The Bulletin* (May 7, 2008), **Exhibit 11**. The story describes a future that greatly resembles the present-day, including a “wireless wallet” and “fingerprint” verification, including the use of such technology to pay for goods using such wireless methods protected by biometric measures like a fingerprint. In 2009, Trend Hunter ran a similar story titled “Virtual Biometric Wallets,” featuring Proxense and Mr. Giobbi. Michael Plishka, *Trend Hunter* (January 4, 2009), *See Exhibit 12*.

29. Another 2009 article, ran in DARKReading, a publication in InformationWeek’s IT Network, also featured the company and Mr. Giobbi in an article titled “Startup May Just Digitize Your Wallet.” George V. Hulme, *DARKReading* (February 8, 2009), *See Exhibit 13*. The DARKReading article described that Proxense was “in the process of bringing to market a proximity-based communications device that aims to provide a way to securely share information and conduct payments.” Proxense’s Personal Digital Keys (PDKs) were described as “carried by users, perhaps even within a cell phone, and can security hold data and manage authentication.” Mr. Giobbi explained that “the data within the PDK also can be protected by additional layers of authentication, such as biometric...”

30. It would be years until products utilizing these technologies were launched and became mainstream. Indeed, Wi-Fi 6 released in 2019. Likewise, Apple’s TouchID, which involves fingerprint recognition technology, was introduced in 2013. It would take Google until 2019 to enable biometric authentication for Android 10 phones and Google Pay. Accordingly, Proxense’s technology was years ahead of the industry.

31. Today, Proxense holds 80 patents on related technology, including digital content distribution, digital rights management, managing wireless access, personal authentication,

biometric data management, and mobile payments. Proxense continues to prosecute new patents on its proprietary technologies.

II. INFRINGEMENT ALLEGATIONS AND ACCUSED PRODUCTS

1. Intel Wi-Fi 6, Wi-Fi 6E, and Wi-Fi 7 Wireless Adapters

32. Although Intel is best perhaps known for its microprocessors, a substantial part of Intel's business relates to wireless adapters and chipsets, which are compatible with various wireless networking standards. Wi-Fi is a family of wireless network protocols based on the IEEE 802.11 family of standards, which are commonly used for local area networking of devices and Internet access. Wi-Fi 6 is also known as IEEE 802.11ax. Wi-Fi 7 is also known as IEEE 802.11be.

33. The Wi-Fi Alliance is a non-profit organization that owns the Wi-Fi trademark. Manufacturers may use the trademark to brand products certified for Wi-Fi interoperability. It is based in Austin, Texas. Defendant is a member of the Wi-Fi Alliance.

34. Intel has focused on both router and client-side wireless solutions. For example, the Intel® Home Wi-Fi Chipset WAV600 Series, including the WAV654, (Intel's Accused Gateway Products) are "Wi-Fi 6 chipsets for home Wi-Fi routers, gateways, and intelligent range extenders in cable, xDSL, and consumer retail infrastructure." **Exhibit 14** (MaxLinear WAV600 Product Brief), **Exhibit 15** (Intel WAV600 Product Brief) (listing "applications" as including "Service Provider Gateways" and "Routers, Access Points, Extenders & Repeaters."). On the side end of the spectrum, Intel's wireless adapters and Wi-Fi integrated processors are focused on the client side.

35. In or around 2018 Intel designed the Intel Home Wi-Fi Chipset WAV600 Series to comply with the IEEE 802.11ax standard and support Giga-bit Wi-Fi, which Intel described "is

future proofed for Wi-Fi 6 clients, and provides the ability to connect up to 256 clients simultaneously, enabling a high-quality user experience for a growing number of connected devices in the home.” **Exhibit 15.** Intel optimized these chipsets for the Intel AnyWAN Silicon on Chips (SoCs) and the Intel Puma 7 Family “to fully offload the wireless traffic with zero CPU utilization.” *Id.* The chipset offered support for OFDMA (uplink and download) and Target Wake Time (TWT) as described below, “thereby improving network performance and efficiency.” *Id.*

36. Intel coordinated with U.S.-based router manufacturers, such as Netgear and TP Link, to include Intel Home Wi-Fi Chipset WAV600 Series in routers sold in the U.S. Intel also coordinated with international manufacturers, like Edimax and Elecom, in its push for Wi-Fi 6-enabled routers as it needed such high-speed routers in the market to work with its Intel wireless adapters in client devices. See e.g. <https://www.mbreviews.com/netgear-rax40-ax4-review/> (teardown revealing that the Netgear AX3000 uses an Intel WAV654 chip, among other Intel silicon) and <https://www.techspot.com/news/81711-tp-link-unveils-archer-ax50-first-wi-fi.html> (describing that the TP-Link Archer AX50, the company’s first Wi-Fi 6 router, uses an Intel Home Wi-Fi WAV654 Chipset).

37. Intel dubbed the ecosystem, which included routers with its WAV600 Series chips as well as PCs and laptops with its wireless adapters, Intel Wi-Fi 6 (Gig+). After the release of its first Wi-Fi 6 router, TP-Link described that the router would pair perfectly “with new Intel Wi-Fi 6 Gig+ PCs and laptops, allowing numerous bandwidth-intensive tasks to run smoothly at the same time.” *Id.*

38. In August of 2020, Intel sold its Home Gateway Platform Division, centered around the Intel® Home Wi-Fi Chipset WAV600 Series, to the fabless semiconductor company MaxLinear. See <https://www.maxlinear.com/news/press-releases/2020/maxlinear-to-acquire->

[intel%E2%80%99s-home-gateway-platform](#) (April 6, 2020). On information and belief, MaxLinear, a fabless semiconductor company, would still have to rely on Intel's foundries to produce the acquired Home Wi-Fi Chipset WAV600 Series. Additionally, on information and belief, even after the acquisition MaxLinear and Intel would continue coordinating to ensure future proofing and high-quality user experiences with Intel Wi-Fi 6 (Gig+) enabled laptops and PCs. See **Exhibit 15** (Intel WAV600 Product Brief) (“[Intel Home Wi-Fi Chipset WAV600 Series] ... are also future proofed for PCs with Intel® Wi-Fi 6 (Gig+) for the next generation of Gigabit Wi-Fi that will enable high-quality user experiences.”); and **Exhibit 14** (MaxLinear WAV600 Product Brief) (“Routers, access points and gateways based on the Wi-Fi Chipset WAV600 Series can deliver multi-Gigabit Wi-Fi speeds to PCs with integrated Gigabit Wi-Fi or Wi-Fi 6 (Gig+) enabling high-quality user experiences” and “These Wi-Fi SoCs are optimized for the AnyWAN™ SoCs and the Puma™ 7 Family to fully offload the wireless traffic with zero CPU utilization.”).

39. In addition to its router-side business, Intel has manufactured, used, marketed, sold, offered for sale, and exported from and imported into the United States client-side wireless adapters utilizing the Wi-Fi 6, Wi-Fi 6E, and Wi-Fi 7 wireless standards (“Intel’s Accused Adapter Products”). Wi-Fi 6 or 6E, also known as IEEE 802.11ax, is an IEEE standard from the Wi-Fi Alliance, of which Intel is a member. Wi-Fi 7 is also an IEEE standard, otherwise known as IEEE 802.11be. Intel wireless adapters utilizing Wi-Fi 6 or 6E include, but are not limited to, the AX101, AX200, AX201, AX201, AX210, AX211, AX411. Intel wireless adapters utilizing Wi-Fi 7 include, but are not limited to, the BE200 and BE202.

40. Additionally, Intel released Ice Lake, “a new highly-integrated platform for laptops, combining the new ‘Sunny Cove’ core architecture and the new Gen11 graphics architecture with

both Thunderbolt™ 3 and Intel® Wi-Fi 6 (Gig+) integrated for the first time, providing best-in-class connectivity. See <https://www.edge-ai-vision.com/2019/05/intel-computex-preview-new-products-deliver-real-world-performance-up-to-2x-gaming-and-8x-ai-boost/>. Ice Lake and other processors integrating Intel Wi-Fi 6 (Gig+) (“Intel’s Accused Wi-Fi Integrated Processors”) simplify the production of connected computers. See e.g. <https://www.anandtech.com/show/14514/examining-intels-ice-lake-microarchitecture-and-sunny-cove/9> (describing that the technology “allows Intel’s partners to use different antenna ‘RF’ modules depending on what it wants to support, such as single antenna designs, dual antenna designs, or higher bandwidth mode.”). These processors include: Intel’s 10th Gen Core Processors (aka “Ice Lake”), which boast “integrated Wi-Fi 6 (Gig+) (<https://www.intel.com/content/www/us/en/products/docs/processors/core/10th-gen-processors.html>), including the Core i7, i5, i3, and Pentium 6805 processors; Intel’s 11th Gen Core Processors (aka), including the U-Series Laptop Processors, H-35 Laptop Processors, S-Series Desktop Processors, and H-Series Laptop Processors (<https://www.intel.com/content/www/us/en/products/docs/processors/core/11th-gen-processors.html>), all of which have an integrated Intel Wi-Fi 6 AX201 or an Discrete Intel Killer Wi-Fi 6E AX1675; Intel’s 12th Gen Core Processors, which include Intel Wi-Fi 6/6E (Gig+) (<https://www.intel.com/content/www/us/en/products/docs/processors/core/12th-gen-processors.html>); Intel’s 13th Gen Core Mobile Processors, which include Intel Wi-Fi 6E (Gig+) (<https://www.intel.com/content/www/us/en/products/docs/processors/core/13th-gen-core-mobile-brief.html>); Intel’s 14th Gen Core Desktop Processors, which supports discrete Intel Wi-Fi 7(5 Gig) (<https://www.intel.com/content/www/us/en/products/docs/processors/core/core-14th-gen-desktop-brief.html>); Intel’s 14th Gen Core Processors HX-Series, which supports discrete Intel Wi-

Fi 7 (5 Gig) and integrated Intel Killer Wi-Fi 6E with Intel Double Connect (<https://www.intel.com/content/www/us/en/products/docs/processors/core/core-14th-gen-mobile-brief.html>).

41. At Computex 2019, Intel pushed new Wi-Fi 6 routers from Netgear, TP Link, and Edimax utilizing the Intel® Home Wi-Fi Chipset WAV600 Series, to boost the adoption rate of Wi-Fi 6. See e.g. <https://www.notebookcheck.net/Intel-pushing-new-Wi-Fi-6-routers-from-various-manufacturers-to-boost-adoption-rate.422691.0.html>. The following is a promotional advertisement, included in Intel's 2019 Computex Press Kit, that touts the benefit of Intel-branded Wi-Fi 6 (Gig+) wireless adapters and Intel® Home Wi-Fi Chipset WAV600 Series:

INTEL® WI-FI 6 (GIG+)
FASTER GIGABIT SPEEDS + NEW WI-FI 6 FEATURES

3X FASTER¹
 than standard AC 2x2 with 80 Mhz channels

Expected Max Wireless Throughput (Mbps)

Standard AC 2x2	600 Mbps
Intel® Wireless-AC 2x2 (Gigabit)	1,200 Mbps
Intel® Wi-Fi 6 (Gig+)	1,700 Mbps

2X FASTER
~3X FASTER

75% LOWER LATENCY²
 More responsive gaming
 Seamless video conferencing

IMPROVED SECURITY³
 Simplified passwords⁴
 Improved protection vs. wireless hacking⁴

TAKE YOUR HOME WI-FI TO THE NEXT LEVEL

Faster, more responsive Intel®-based Wi-Fi 6 routers and gateways⁵

4x capacity for more devices⁶

Compatible with today's Wi-Fi standards

Ready for Gigabit home Internet
 ~1000 Mbps

Find out more by visiting us at www.intel.com/wireless

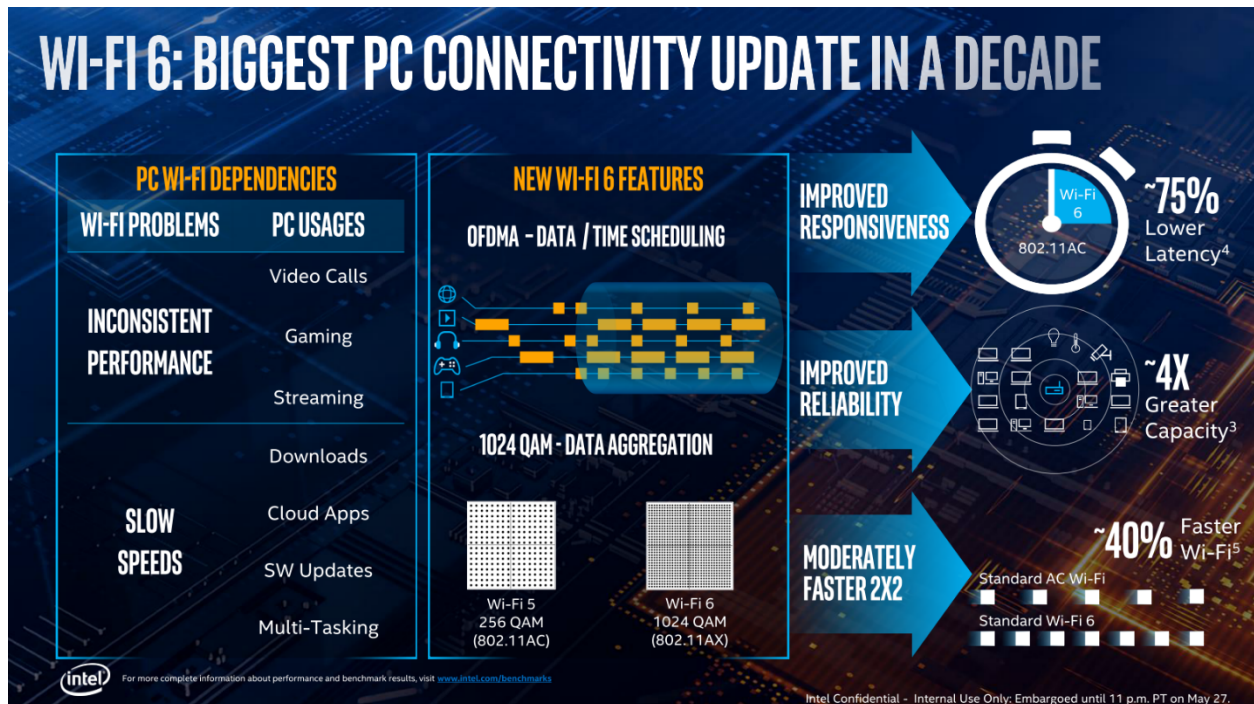
Intel technologies, features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer to learn more at intel.com.
 Tests document performance of components on a particular test, in specific systems. Differences in hardware, software and configuration will affect actual performance. Consult other sources of information to evaluate performance as you consider your purchase. For more complete information about performance and benchmark results, visit <http://www.intel.com/benchmarks>.
¹ 802.11ax 2x2 160MHz enables 2402Mbps maximum theoretical data rates, 3x faster than standard 802.11ac 2x2 80MHz (867Mbps) and nearly 5x faster than baseline 1x1ac (433Mbps) Wi-Fi as documented in IEEE 802.11 wireless standard specifications, and require the use of similarly configured 802.11ax wireless network routers.
² 10% to 70% lower latency² is based on test simulation data of 802.11ax with and without OFDMA using 8 clients. Average latency without OFDMA is 36ms, with OFDMA average latency is reduced to 7.6ms. Latency improvement requires that the AP and all clients support OFDMA.
³ Personal password security is based on IEEE requirement for 802.11ax to support WPA3 which is the latest in security and leverages SAE providing more resilient password-based authentication.
⁴ IEEE includes WPA3 security as a requirement for 802.11ax which provides the latest in security design features. Additional network protection comes from the inclusion of 192-bit cryptographic strength across an 802.11ax network.
⁵ Requires a router based on 802.11ax supporting OFDMA and multiple clients on the network with support for AX. Better in dense environments is achievable from OFDMA feature supported by 802.11ax clients and APs. 2Gbps based on assumptions of approximately 70% of IEEE 802.11 specification theoretical maximum data rates for 802.11ax 160MHz 2402Mbps.
⁶ The amendment defines operational modifications to both the IEEE 802.11 physical layer (PHY) and the IEEE 802.11 Medium Access Control layer (MAC) that enable at least one mode of operation capable of supporting at least four times improvement in the average throughput per station (measured at the MAC data service access point) in a dense deployment scenario, while maintaining or improving the power efficiency per station. For additional details visit: <https://www.intel.com/content/www/us/en/processors/core/80211/80211-14-0165-01-Show-802-11-ax-ig-proposed-pa2doc.html>.
 Intel and the Intel logo are trademarks of Intel Corporation and its subsidiaries in the U.S. and/or other countries. Other names and brands may be claimed as the property of others. © Intel Corporation.

In the lower left portion of the advertisement, Intel described “[f]aster, more responsive Intel-based Wi-Fi 6 routers and gateways”.

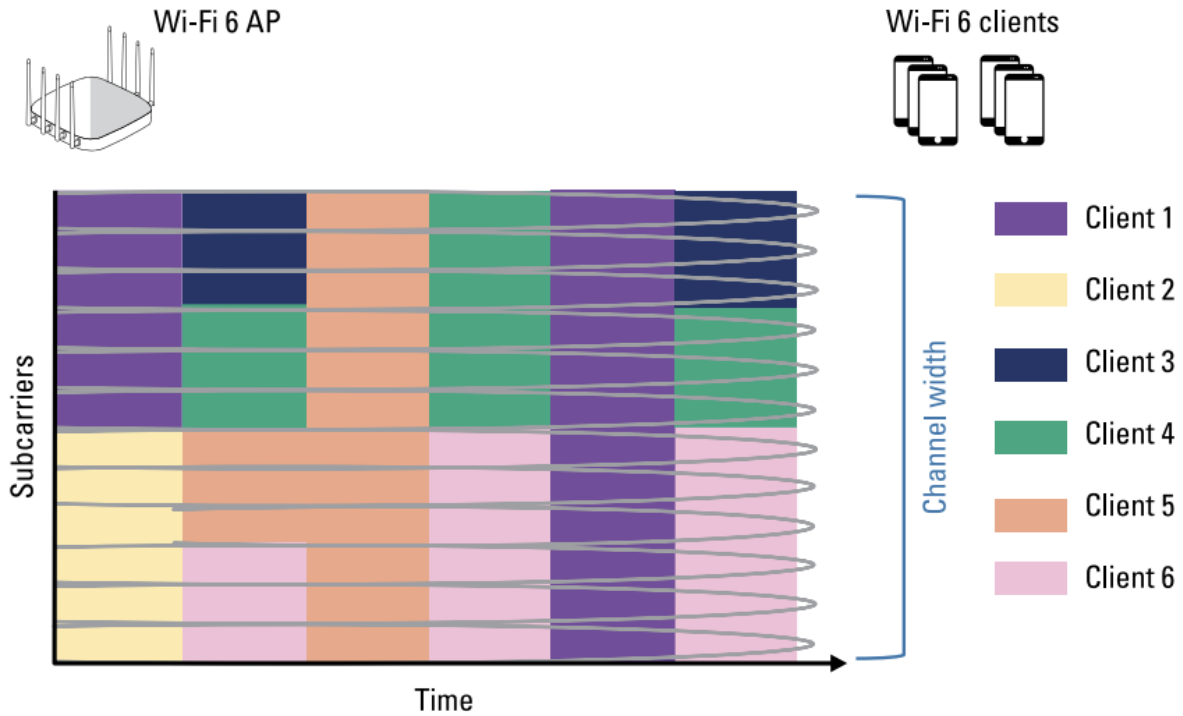
42. A key feature of Wi-Fi 6 (and later standards like Wi-Fi 7) is orthogonal frequency division multiple access (“OFDMA”). See <https://www.wi-fi.org/discover-wi-fi/wi-fi-certified-6>.

OFDMA enables wireless carriers to efficiently utilize their available frequency band by dividing the available band into sub-carriers and the transmission window into timeslots. This allows users to communicate with multiple clients and simultaneously transmit data. Assigning users into subcarriers and timeslots depends on the bandwidth needed by each user as well as other factors, which may include device constraints, quality of service, data loads, or usage patterns, among others. An example of how this works is when two phones send data over the same line. Each phone may be assigned a time interval so that they take turns sending their data at their assigned intervals. However, these time frames are small, making it seem as if both phones are sending their data simultaneously and seamlessly.

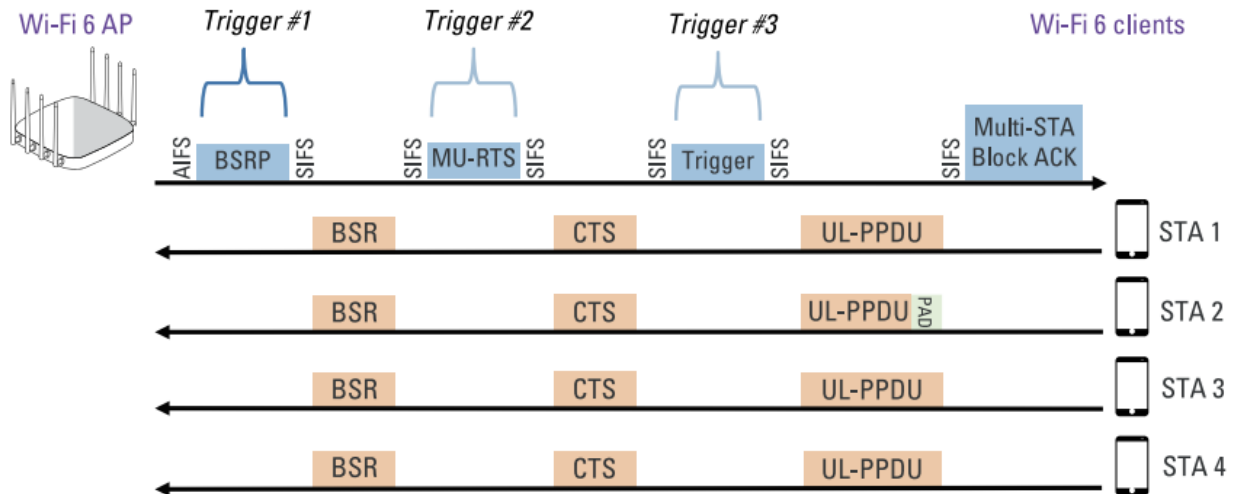
43. Intel pushed hard for the adoption of Wi-Fi 6 and its new OFDMA feature for data/time scheduling. For example, Intel’s marketing materials described that Wi-Fi 6 was the biggest PC connectivity update in a decade, as reflecting in the tile of the marketing slide below, which was released on May 27, 2019:



44. A pictorial representation of OFDMA is shown below:



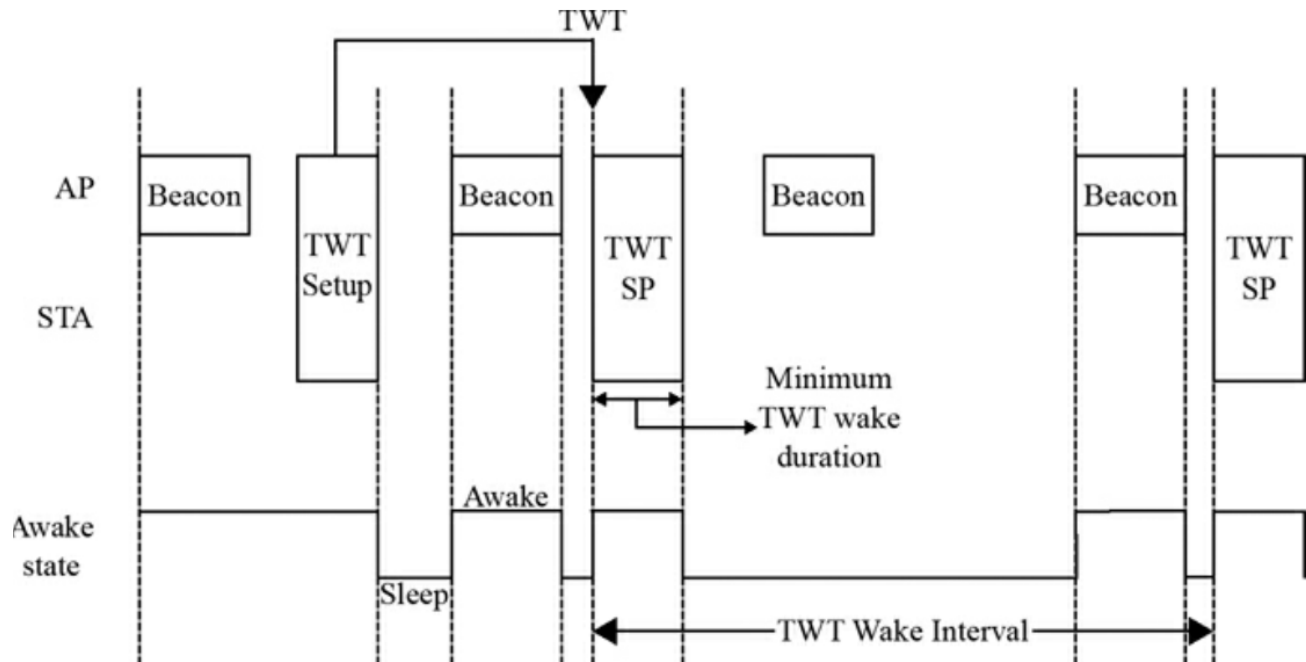
45. As can be seen, 6 cell phones (each represented by a different color) broadcast their data to the Wi-Fi 6 router during one of six timeslots and using one of twelve different subcarriers. The router determines when each device broadcasts and on which subcarrier, the procedure of which is shown below:



46. The router first sends out a buffer status report poll (BSRP) to all devices requesting they report back, among other things, the quality of service (QoS) category of the data each device needs to send. Such information is provided in each device's buffer status report (BSR). After receiving these devices' BSRs, the router determines which timeslot and on which subcarrier each device should transmit their data and then communicates this data using Trigger #3 in the above figure.

47. Wi-Fi 6 and later standards (e.g., Wi-Fi 7) also include target wake time (TWT) as a feature. TWT is a specific time or set of times for individual stations (STAs), such as a laptop, smartphone, or any internet of things device, to awaken in order to exchange frames with other STAs. A STA has a transceiver cycling between an active, or awake, mode in which power is consumed to exchange information, and a sleep mode in which power is conserved.

48. The operation of TWT is shown in the figure below:



49. As shown above, an access point (AP), such as a Wi-Fi 6 router, sends TWT setup information to a STA transceiver (such as on a laptop, phone, or other device) when to switch from sleep mode to active mode. This information is used to set a timer within the device. When the time goes off, at the beginning of each TWT session or service period (TWT SP), the STA wakes up so it can transmit or receive data.

50. As also seen on the figure, the device transceiver is also active during a beacon period. If no beacon is detected, the wi-fi router may have switched the network's channel. To facilitate reconnecting devices that were asleep during a channel switch, Wi-Fi 6 (and later) is configured such that a STA can efficiently move their activity when the absence of a beacon change is noticed. Accordingly, when a STA connects to a network, it receives a future channel guidance element informing it about the likely future channel if the router changes channels of operation. As such, when the transceiver wakes up, it will monitor the first channel for a beacon. If no beacon is detected, it utilizes future channel guidance to increase the channel number to the

second likely channel. It will then reset its timer and wait for the next expected transmission from the router.

51. With previous wireless standards, devices were either connected or they were not. Wi-Fi 6 (and later) alternates a transceiver between active and sleep modes, which frees up bandwidth and saves power.

52. Intel's Accused Gateway Products, Intel's Accused Adapter Products, and Intel's Accused Wi-Fi Integrated Processors utilizing Wi-Fi 6 (and later) infringe one or more claims of the 129, 672, 043, and 152 Patents in connection with OFDMA and TWT functionality.

53. Proxense has at all times complied with the marking provisions of 35 U.S.C. § 287 with respect to the Patents-in-Suit. On information and belief, any prior assignees and licensees have also either complied with the marking provisions of 35 U.S.C. § 287, or else were excused from the obligation to mark for the reason that § 287 does not apply.

CLAIM 1
(Infringement of the 129 Patent)

54. Proxense repeats and realleges all preceding paragraphs, as if fully set forth herein.

55. Proxense has not licensed or otherwise authorized Intel to make, use, offer for sale, sell, or import any products that embody the inventions of the 129 Patent.

56. Defendant infringes at least claims 1, 16, and 18 of the 129 Patent in violation of 35 U.S.C. § 271(a) with respect to the Intel's Accused Gateway Products, Intel's Accused Adapter Products, and Intel's Accused Wi-Fi Integrated Processors. Proxense contends each limitation is met literally, and, to the extent a limitation is not met literally, it is met under the doctrine of equivalents.

57. For example, Defendant directly infringe at least claims 1, 16, and 18 of the 129 Patent by making, using (*e.g.*, performing/executing), selling, and/or offering to sell the Intel's

Accused Gateway Products, Intel's Accused Adapter Products, and Intel's Accused Wi-Fi Integrated Processors within the United States. A key feature of Wi-Fi 6 and later standards is OFDMA, which divides the available frequency band into subcarriers and the transmission window into timeslots. Assigning users into subcarriers and timeslots depends on the bandwidth needed by each user as well as other factors, which may include device constraints, quality of service, data loads, or usage patterns, among others. In a Wi-Fi 6 or later network, devices on that network broadcast their data to the wireless router. The router first sends out a buffer status report poll (BSRP) to all devices requesting they report back, among other things, the quality of service (QoS) category of the data each device needs to send. Such information is provided in each device's buffer status report (BSR). After receiving these devices' BSRs, the router determines which timeslot and on which subcarrier each device should transmit their data. Exemplary claim charts are included herewith as **Exhibit 6**.

58. Defendant received actual notice of the 129 Patent at least as early as the filing of this Complaint. Defendant performed and continue to perform the acts that constitute infringement, with knowledge or willful blindness that the acts would constitute infringement of the 129 Patent.

59. Defendant do so knowingly and with intent to commit these infringing acts. Defendant also continue to make, use, offer for sale, sell, and/or import the accused products, despite their knowledge of the 129 Patent, thereby specifically intending to infringe the 129 Patent.

60. Proxense has been injured and seeks damages to adequately compensate it for Intel's infringement of the 129 Patent. Such damages should be no less than a reasonable royalty under 35 U.S.C. § 284.

61. Upon information and belief, Intel will continue to infringe the 129 Patent unless permanently enjoined by this Court. Pursuant to 35 U.S.C. § 283, Proxense is entitled to a permanent injunction against further infringement of the 129 Patent by Intel.

CLAIM 2
(Infringement of the 672 Patent)

62. Proxense repeats and realleges all preceding paragraphs, as if fully set forth herein.

63. Proxense has not licensed or otherwise authorized Intel to make, use, offer for sale, sell, or import any products that embody the inventions of the 672 Patent.

64. Defendant infringes at least claim 1 of the 672 Patent in violation of 35 U.S.C. § 271(a) with respect to the Intel's Accused Gateway Products, Intel's Accused Adapter Products, and Intel's Accused Wi-Fi Integrated Processors. Proxense contends each limitation is met literally, and, to the extent a limitation is not met literally, it is met under the doctrine of equivalents.

65. For example, Defendant directly infringe at least claim 1 of the 672 Patent by making, using (*e.g.*, performing/executing), selling, and/or offering to sell the Intel's Accused Gateway Products, Intel's Accused Adapter Products, and Intel's Accused Wi-Fi Integrated Processors within the United States. A key feature of the Wi-Fi 6 and later standards is OFDMA, which divides the available frequency band into subcarriers and the transmission window into timeslots. Assigning users into subcarriers and timeslots depends on the bandwidth needed by each user as well as other factors, which may include device constraints, quality of service, data loads, or usage patterns, among others. In a Wi-Fi 6 or later network, devices on that network broadcast their data to the wireless router. The router first sends out a buffer status report poll (BSRP) to all devices requesting they report back, among other things, the quality of service (QoS) category of the data each device needs to send. Such information is provided in each device's

buffer status report (BSR). After receiving these devices' BSRs, the router determines which timeslot and on which subcarrier each device should transmit their data. Exemplary claim charts are included herewith as **Exhibit 7**.

66. Defendant received actual notice of the 672 Patent at least as early as the filing of this Complaint. Defendants performed and continue to perform the acts that constitute infringement, with knowledge or willful blindness that the acts would constitute infringement of the 672 Patent.

67. Defendant do so knowingly and with intent to commit these infringing acts. Defendants also continues to make, use, offer for sale, sell, and/or import the accused products, despite their knowledge of the 672 Patent, thereby specifically intending to infringe the 672 Patent.

68. Proxense has been injured and seeks damages to adequately compensate it for Intel's infringement of the 672 Patent. Such damages should be no less than a reasonable royalty under 35 U.S.C. § 284.

69. Upon information and belief, Intel will continue to infringe the 672 Patent unless permanently enjoined by this Court. Pursuant to 35 U.S.C. § 283, Proxense is entitled to a permanent injunction against further infringement of the 672 Patent by Intel.

CLAIM 3
(Infringement of the 043 Patent)

70. Proxense repeats and realleges all preceding paragraphs, as if fully set forth herein.

71. Proxense has not licensed or otherwise authorized Intel to make, use, offer for sale, sell, or import any products that embody the inventions of the 043 Patent.

72. Defendant infringe at least claim 1 of the 043 Patent in violation of 35 U.S.C. § 271(a) with respect to the I Intel's Accused Gateway Products, Intel's Accused Adapter Products, and Intel's Accused Wi-Fi Integrated Processors. Proxense contends each limitation is met

literally, and, to the extent a limitation is not met literally, it is met under the doctrine of equivalents.

73. For example, Defendant directly infringe at least claim 1 of the 043 Patent by making, using (*e.g.*, performing/executing), selling, and/or offering to sell the Intel's Accused Gateway Products, Intel's Accused Adapter Products, and Intel's Accused Wi-Fi Integrated Processors within the United States. A key feature of the Wi-Fi 6 and later standards is OFDMA, which divides the available frequency band into subcarriers and the transmission window into timeslots. Assigning users into subcarriers and timeslots depends on the bandwidth needed by each user as well as other factors, which may include device constraints, quality of service, data loads, or usage patterns, among others. In a Wi-Fi 6 or later network, devices on that network broadcast their data to the wireless router. The router first sends out a buffer status report poll (BSRP) to all devices requesting they report back, among other things, the quality of service (QoS) category of the data each device needs to send. Such information is provided in each device's buffer status report (BSR). After receiving these devices' BSRs, the router determines which timeslot and on which subcarrier each device should transmit their data. Exemplary claim charts are included herewith as **Exhibit 8**.

74. Defendant received actual notice of the 043 Patent at least as early as the filing of this Complaint. Defendant performed and continue to perform the acts that constitute infringement, with knowledge or willful blindness that the acts would constitute infringement of the 043 Patent.

75. Defendant do so knowingly and with intent to commit these infringing acts. Defendants also continue to make, use, offer for sale, sell, and/or import the accused products, despite its knowledge of the 043 Patent, thereby specifically intending to infringe the 043 Patent.

76. Proxense has been injured and seeks damages to adequately compensate it for Intel's infringement of the 043 Patent. Such damages should be no less than a reasonable royalty under 35 U.S.C. § 284.

77. Upon information and belief, Intel will continue to infringe the 043 Patent unless permanently enjoined by this Court. Pursuant to 35 U.S.C. § 283, Proxense is entitled to a permanent injunction against further infringement of the 043 Patent by Intel.

CLAIM 4
(Infringement of the 152 Patent)

78. Proxense repeats and realleges all preceding paragraphs, as if fully set forth herein.

79. Proxense has not licensed or otherwise authorized Intel to make, use, offer for sale, sell, or import any products that embody the inventions of the 152 Patent.

80. Defendant infringe at least claims 1 and 7 of the 152 Patent in violation of 35 U.S.C. § 271(a) with respect to the Intel's Accused Gateway Products, Intel's Accused Adapter Products, and Intel's Accused Wi-Fi Integrated Processors. Proxense contends each limitation is met literally, and, to the extent a limitation is not met literally, it is met under the doctrine of equivalents.

81. For example, Defendant directly infringes at least claims 1 and 7 of the 152 Patent by making, using (*e.g.*, performing/executing), selling, and/or offering to sell the Intel's Accused Gateway Products, Intel's Accused Adapter Products, and Intel's Accused Wi-Fi Integrated Processors within the United States. A key feature of the Wi-Fi 6 and later standards is target wake time (TWT), which is a specific time or set of times for individual stations (STAs), such as a laptop, smartphone, or other device, to awaken in order to exchange frames with other STAs. A STA has a transceiver cycling between an active and a sleep mode. An access point (AP), such as a wireless router, sends TWT setup information to a STA transceiver when to switch from sleep

mode to active mode. This information is used to set a timer within the device. When the time goes off, at the beginning of each TWT session or service period (TWT SP), the STA wakes up so it can transmit or receive data. The device transceiver is also active during a beacon period. If no beacon is detected, the wi-fi router may have switched the network's channel. To facilitate reconnecting devices that were asleep during a channel switch, Wi-Fi 6 (and later) is configured such that a STA can efficiently move their activity when the absence of a beacon change is noticed. Accordingly, when a STA connects to a network, it receives a future channel guidance element informing it about the likely future channel if the router changes channels of operation. As such, when the transceiver wakes up, it will monitor the first channel for a beacon. If no beacon is detected, it utilizes future channel guidance to increase the channel number to the second likely channel. It will then reset its timer and wait for the next expected transmission from the router.

82. Exemplary claim charts are included herewith as **Exhibit 9**.

83. Defendant received actual notice of the 152 Patent at least as early as the filing of this Complaint. Defendant performed and continue to perform the acts that constitute infringement, with knowledge or willful blindness that the acts would constitute infringement of the 152 Patent.

84. Defendant do so knowingly and with intent to commit these infringing acts. Defendant also continue to make, use, offer for sale, sell, and/or import the accused products, despite its knowledge of the 152 Patent, thereby specifically intending to infringe the 152 Patent.

85. Proxense has been injured and seeks damages to adequately compensate it for Intel's infringement of the 152 Patent. Such damages should be no less than a reasonable royalty under 35 U.S.C. § 284.

86. Upon information and belief, Intel will continue to infringe the 152 Patent unless permanently enjoined by this Court. Pursuant to 35 U.S.C. § 283, Proxense is entitled to a permanent injunction against further infringement of the 152 Patent by Intel.

DEMAND FOR JURY TRIAL

Plaintiff hereby requests a jury trial of all issues so triable.

PRAYER FOR RELIEF

WHEREFORE, Plaintiff prays for relief against Defendant as follows:

- a. Entry of judgment declaring that Defendant infringes one or more claims of each of the Patents-in-Suit;
- b. Entry of judgment declaring that Defendant's infringement of the Patents-in-Suit is willful;
- c. An order awarding damages sufficient to compensate Plaintiff for Defendant's infringement of the Patents-in-Suit, but in no event less than a reasonable royalty, including supplemental damages post-verdict, together with pre-judgment and post-judgment interest and costs;
- d. Enhanced damages pursuant to 35 U.S.C. § 284;
- e. Entry of judgment declaring that this case is exceptional and awarding Plaintiff its costs and reasonable attorney fees pursuant to 35 U.S.C. § 285;
- f. An accounting for acts of infringement;
- g. Such other equitable relief which may be requested and to which the Plaintiff is entitled; and
- h. Such other and further relief as the Court deems just and proper.

Dated: September 2, 2024

Respectfully submitted,

/s/ David L. Hecht
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