

U.S. PATENT NO. 8,219,129
AMENDED PRELIMINARY INFRINGEMENT CONTENTIONS¹

DYNAMIC REAL-TIME TIERED CLIENT ACCESS

INFRINGEMENT BY INTEL'S ACCUSED GATEWAY PRODUCTS, INTEL'S ACCUSED ADAPTER PRODUCTS, AND INTEL'S ACCUSED WI-FI INTEGRATED PROCESSORS

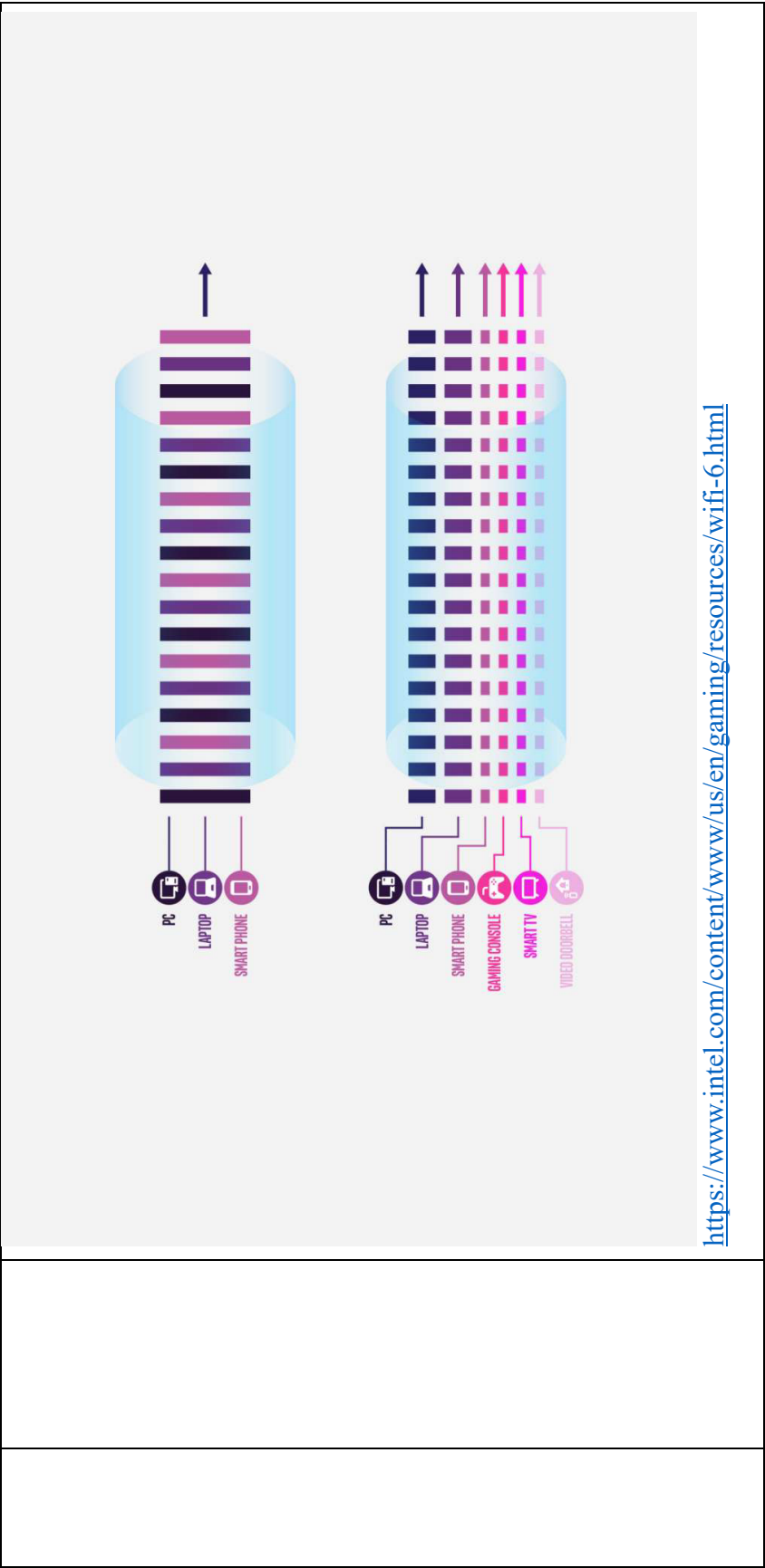
Claim²		Infringement
1	A method of facilitating data exchange, comprising:	Intel processors and wireless adapters utilizing Wi-Fi 6 and/or 6E (which operate according to the IEEE Std 802.11ax-2021 standard (the "IEEE 802.11ax Standard")) including, but not limited to, the AX101, AX200, AX201, AX210, AX211, AX411 adapters, and Intel wireless adapters utilizing Wi-Fi 7 including, but not limited to, the BE200 and BE202 adapters (collectively, Intel's Accused Adapter Products), and Intel's 10 th to current generation processors with integrated Wi-Fi 6 and above, as well as the Intel® Home Wi-Fi Chipset WAV600 Series, including the WAV654, (Intel's Accused Gateway Products) which are included in Intel-based Wi-Fi 6 routers and gateways, employ a method of facilitating data exchange by virtue of orthogonal frequency division multiple access (OFDMA).
	assigning a first specific time slot for a first client device to wirelessly communicate with a fixed	Intel processors and wireless adapters utilizing Wi-Fi 6 and/or 6E including, but not limited to, the AX101, AX200, AX201, AX210, AX211, AX411 adapters, and Intel wireless adapters utilizing Wi-Fi 7 including, but not limited to, the BE200 and BE202 adapters (collectively, Intel's Accused Adapter Products), and Intel's 10 th to current generation processors with integrated Wi-Fi 6 and above, as well as the Intel® Home Wi-Fi Chipset WAV600 Series, including the WAV654, (Intel's Accused Gateway Products) which are included in Intel-based Wi-Fi 6 routers and gateways,, assign a first specific time slot for the device in which they are installed (e.g., a laptop) by way of orthogonal frequency division multiple access (OFDMA), which divides the available band into sub-carriers and the transmission

¹ The Preliminary Infringement Contentions (PICS) provided herein are based on information obtained to date and may not be exhaustive.

Plaintiff's investigation of Defendants' infringement is ongoing. Plaintiff reserves the right to supplement and/or amend these PICS to identify additional instrumentalities and to further identify where each element of each claim is found in each accused instrumentality, including on the basis of discovery obtained from Defendant, and from third parties during the course of this litigation, pursuant to ¶2 of the Order Governing Proceedings –Patent Cases under Hon. Alan D. Albright.

² All PICS set forth herein for any independent patent claims are hereby incorporated by reference into the PICS alleged for any dependent patent claims that depend on such independent claims, as if fully set forth therein

	proximity-based reader device, the first specific time slot set according to a first class; and	window into timeslots. See e.g. What is Wi-Fi 6, Intel, available at https://www.intel.com/content/www/us/en/gaming/resources/wifi-6.html (“Wi-Fi 6 can be faster due to technologies like ... OFDMA...”) See <i>also</i> 802.11ax Standard, Section 27.3.1.2 on OFDMA. OFDMA is an OFDM-based multiple access scheme where different subsets of subcarriers are allocated to different users, and this scheme allows simultaneous data transmission to or from one or more users. In OFDMA, users are allocated different subsets of subcarriers that can change from one PPDU to the next. Similar to OFDM, OFDMA employs multiple subcarriers, but the subcarriers are divided into several groups where each group is referred to as an RU. With OFDMA, different transmit powers may be applied to different RUs. See <i>also id.</i> Section 27.3.2 on Subcarrier and resource allocation. Pictorial representations of OFDMA are shown below:
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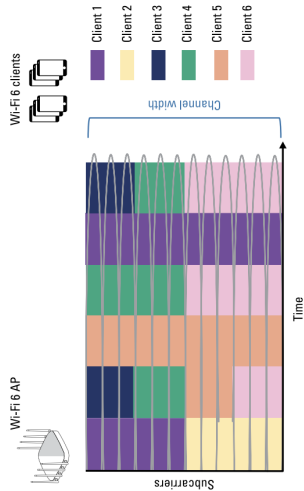


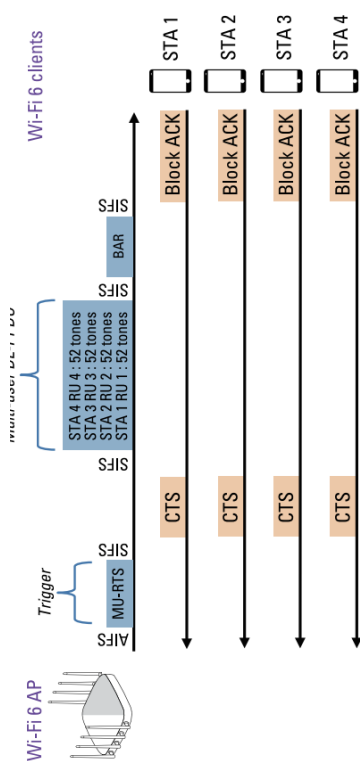
		https://www.hitchhikersguidetolearning.com/2023/03/30/resource-units-in-802-11ax/ (citing WiFi 6 for Dummies). Wi-Fi 6 (and later) compliant client devices, which utilize Intel’s Wi-Fi 6 (or later) chips/adapters (i.e., the accused products), each represented by a different color in the second figure, wirelessly broadcast their data to a fixed proximity reader device, i.e., a Wi-Fi 6 access point with an Intel wireless adapter, or Intel-based Wi-Fi 6 routers and gateways, during one of six timeslots and using one of twelve different sub-carriers. Intel describes that “OFDMA works by subdividing channels into subcarriers and allowing for transmission to multiple endpoints (devices) at the same time.” https://www.intel.com/content/www/us/en/gaming/resources/wifi-6.html. “This results in a single transmission from the [access point] being able to communicate with multiple devices, instead of each device having to wait its turn as the [access point] serves up the data across the network.” The figure below shows the procedure by which the devices broadcast and the subcarrier is determined:
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		The diagram illustrates the sequence of events for a Buffer Status Report (BSR) and subsequent uplink transmission in a Wi-Fi 6 network. It shows the interaction between a Wi-Fi 6 AP and four Wi-Fi 6 clients (STA 1, STA 2, STA 3, STA 4). The sequence includes triggers #1, #2, and #3, and the flow of BSR, CTS, UL-PPDU, and Multi-STA Block ACK frames.
		See https://cradtech.com/2018/10/25/802-11ax-ofdma-overview/. As shown, the access point (i.e., device with an Intel Wi-Fi 6 or above chip/adaptor in “access point” mode or Intel-based Wi-Fi 6 routers and gateways, utilizing Intel’s Accused Gateway Products, 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, i.e. a first class, of the data they need to send. See e.g. https://wballiance.com/wp-content/uploads/2019/07/Wi-Fi-6-Deployment-Guidelines-and-Scenarios-V1.0.pdf. This is provided in each device’s buffer status report (BSR). See e.g. 802.11ax Standard at 26.5.5 – Buffer status report operation; see also 802.11ax Standard at 27.3.2. Based on the BSR, devices with Wi-Fi 6 (and later) adapters will be assigned a subcarrier on which they will transmit data and communicate this data using Trigger #3. See e.g. 802.11ax Standard at 26.5.5 – Buffer status report operation. Thus, the first time slot of OFDMA uplink transmission of a client device, i.e. using a Wi-Fi 6, or later, adapter like Intel’s accused products, is set according to a first class of QoS. Further, notwithstanding the above figure which show a traditional router, either Intel-based Wi-Fi 6 routers and gateways, or devices utilizing Intel adapters providing Wi-Fi 6 and above with OFDMA functionality themselves may function as an access point and, for example, send out the buffer status report poll. See https://www.intel.com/content/dam/www/central-libraries/us/en/documents/2022-06/wi-fi-tutorial-long.pdf. Intel’s Wi-Fi 6, 6E, and 7 compatible devices are designed to carry out the claimed limitations.

	assigning a second specific time slot for a second client device to wirelessly communicate with the fixed proximity-based reader device, the second specific time slot set according to a second class,	Likewise, a second Wi-Fi 6 (and later) compliant client device, which utilizes Intel's Wi-Fi 6 (or later) chips/adapters (i.e., the accused products), is assigned a second time slot of the OFDMA uplink transmission to wirelessly communicate with the fixed proximity-based reader device (i.e., device with an Intel chip/adaptor in "access point" mode or Intel-based Wi-Fi 6 routers and gateways), according to a second class of QoS. This is provided in each device's buffer status report (BSR). <i>See e.g.</i> 802.11ax Standard at 26.5.5 – Buffer status report operation; <i>see also</i> 802.11ax Standard at 27.3.2.
	wherein the first and second specific time slots are determined based on synchronization information wirelessly received by the first and second client devices and	As noted above, each of the first and second client devices receive a buffer status report poll (BRSP) wirelessly from fixed proximity-based reader device (i.e., device with an Intel chip/adaptor in "access point" mode or Intel-based Wi-Fi 6 routers and gateways, and priority level data associated with priority levels known as QoS classes. <i>See e.g.</i> 802.11ax Standard at 26.5.5 – Buffer status report operation. The 802.11ax Standard, which are utilized by Intel's devices, describes the format and usage of the Trigger Frame, which comprises synchronization information necessarily for uplink transmission. It details how the frame contains the resource allocation and timing information for client devices. <i>See</i> Section 9.3.1.22; <i>see also</i> Sections 27.3.4.

	priority level data associated with the first class and with the second class, and	The class of QoS data a client device needs to send will be associated with both the device and the user. Data to be sent from a device will be associated with the device in that it originates from the device, specifically applications the device is running. See https://www.intel.com/content/dam/www/central-libraries/us/en/documents/2022-06/wi-fi-tutorial-long.pdf (“Depending on the specific use, different variants of the Trigger frame are defined,” including BSRP, which solicits reports from client stations. The data is also associated with the user in that the user is interacting with the application to create the data that needs to be sent. <i>Id.</i>
16	wherein the first class is associated with one or more of the first client device and a user of the first client device, and the second class is associated with one or more of the second client device and a user of the second client device. A system, comprising: a network device arranged to	Intel processors and wireless adapters utilizing Wi-Fi 6 and/or 6E including, but not limited to, the AX101, AX200, AX201, AX210, AX211, AX411 adapters, and Intel wireless adapters utilizing Wi-Fi 7 including, but not limited to, the BE200 and BE202 adapters (collectively, Intel’s Accused Adapter

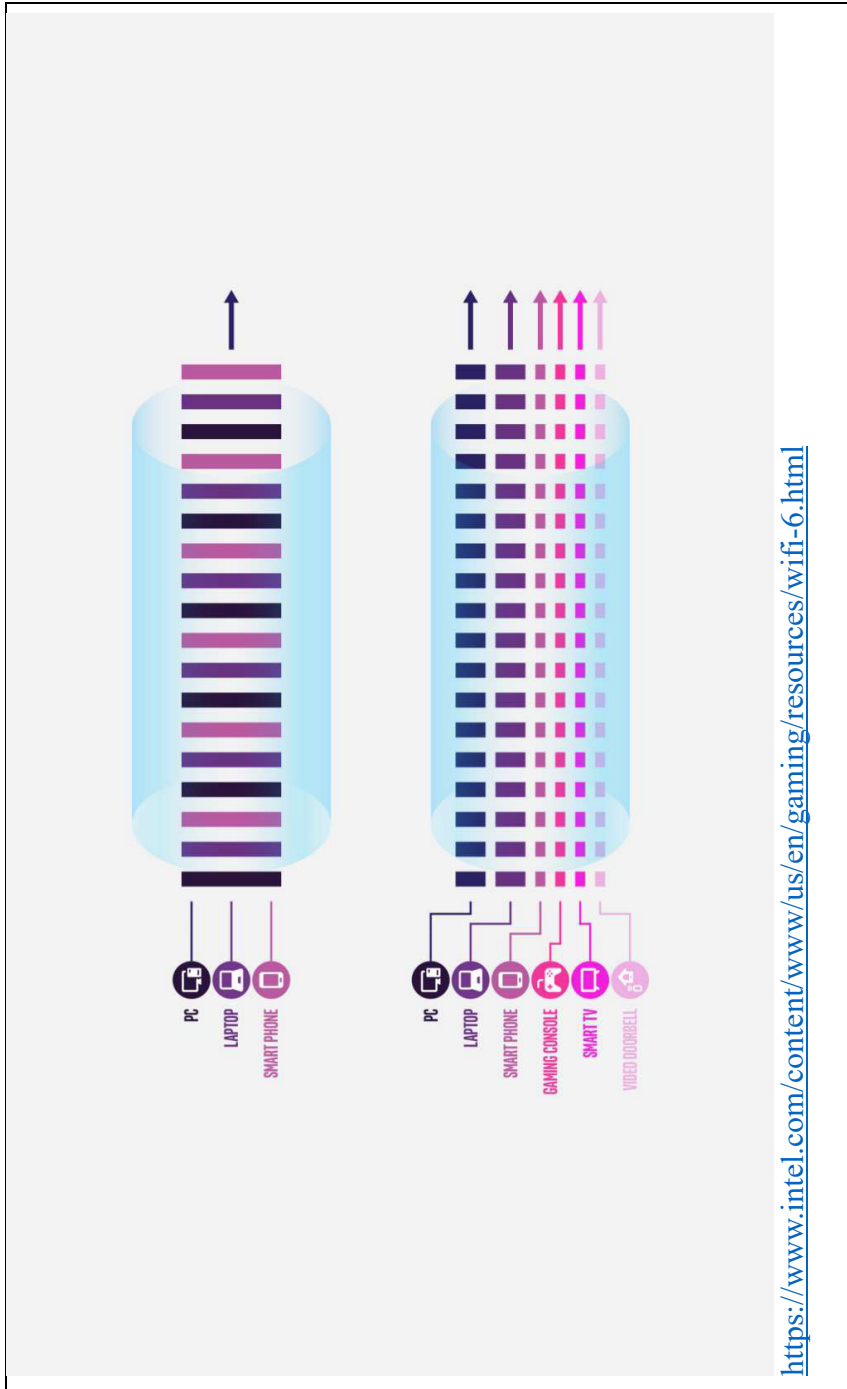
	wirelessly broadcast synchronization information; and	Products), and Intel's 10th to current generation processors with integrated Wi-Fi 6 and above, as well as the Intel® Home Wi-Fi Chipset WAV600 Series, including the WAV654, (Intel's Accused Gateway Products) which are included in Intel-based Wi-Fi 6 routers and gateways, are arranged to wirelessly broadcast synchronization information. Specifically, these devices employ orthogonal frequency division multiple access (OFDMA), which divides the available band into sub-carriers and the transmission window into timeslots. See e.g. What is Wi-Fi 6, Intel, available at https://www.intel.com/content/www/us/en/gaming/resources/wifi-6.html (“Wi-Fi 6 can be faster due to technologies like ... OFDMA...”) See also 802.11ax Standard, Section 27.3.1.2 on OFDMA. OFDMA is an OFDM-based multiple access scheme where different subsets of subcarriers are allocated to different users, and this scheme allows simultaneous data transmission to or from one or more users. In OFDMA, users are allocated different subsets of subcarriers that can change from one PPDU to the next. Similar to OFDM, OFDMA employs multiple subcarriers, but the subcarriers are divided into several groups where each group is referred to as an RU. With OFDMA, different transmit powers may be applied to different RUs. See also <i>id.</i> Section 27.3.2 on Subcarrier and resource allocation. Intel's Wi-Fi 6 (and higher) chips/adapters include orthogonal frequency division multiple access (OFDMA), which divides the available band into sub-carriers and the transmission window into timeslots. A pictorial representation of OFDMA shown below. 
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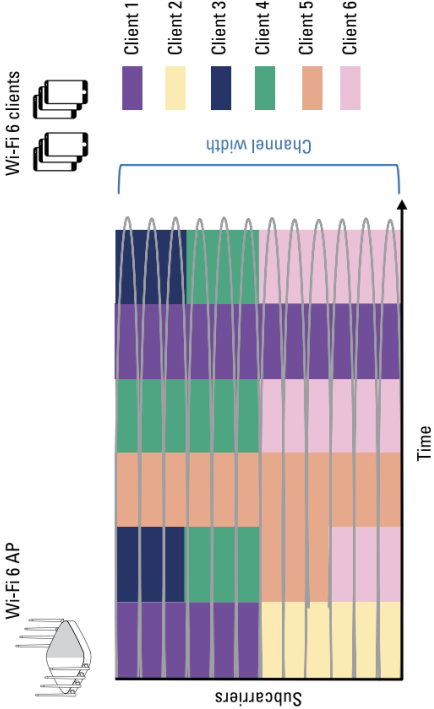
	Determining when each device receives data and on which subcarrier is determined by the network device, as shown below:  The multi-user request to send (MU-RTS) frame informs the devices as to which sub-carrier and at what timeslot they will receive data.
a portable client device configured to wirelessly receive the synchronization information, the received synchronization information comprising assigning a specific time slot during	Portable client devices, like cell phones, tablets, and/or laptop computers with Intel wireless adapters utilizing Wi-Fi 6 and/or 6E including, but not limited to, the AX101, AX200, AX201, AX210, AX211, AX411 adapters, and Intel wireless adapters utilizing Wi-Fi 7 including, but not limited to, the BE200 and BE202 adapters (collectively, Intel's Accused Adapter Products), and Intel's 10th to current generation processors with integrated Wi-Fi 6 and above, as well as the Intel® Home Wi-Fi Chipset WAV600 Series, including the WAV654, (Intel's Accused Gateway Products) which are included in Intel-based Wi-Fi 6 routers and gateways, are configured by Intel to wirelessly receive the synchronization information by virtue of being Wi-Fi 6 (and above) compliant. A portable client device with an Intel wireless adapter receives synchronization information, as noted above, and the client device is assigned a specific time slot when it will receive data. The time slot will be determined by the quality of service (QoS) category of the data, such that highest priority data is delivered first. The class of QoS data a device needs to receive will be associated with both the device and the user. Data to be received by a device will be associated with the device, specifically applications the device is

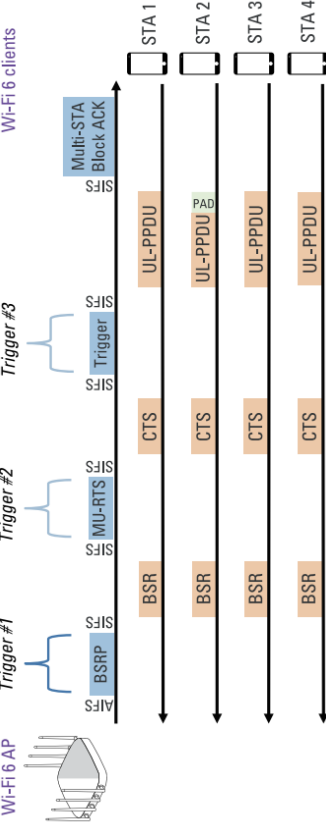
	which the client device can receive data from the network device, the time slot being determined according to a priority level data associated with a class, the class associated with the one or more of the portable client device and the user of the portable client device.	running. The data is also associated with the user in that the user is interacting with the application to request the data. <i>See e.g.</i> 802.11ax Standard at 26.5.5 – Buffer status report operation. The 802.11ax Standard, which are utilized by Intel's devices, describes the format and usage of the Trigger Frame, which comprises synchronization information necessarily for uplink transmission. It details how the frame contains the resource allocation and timing information for client devices. <i>See</i> Section 9.3.1.22; <i>see also</i> Sections 27.3.4.
18	A method of facilitating data exchange, comprising:	Intel wireless adapters utilizing Wi-Fi 6 and/or 6E including, but not limited to, the AX101, AX200, AX201, AX210, AX211, AX411 adapters, and Intel wireless adapters utilizing Wi-Fi 7 including, but not limited to, the BE200 and BE202 adapters, (collectively, Intel's Accused Adapter Products), and Intel's 10th to current generation processors with integrated Wi-Fi 6 and above, as well as the Intel® Home Wi-Fi Chipset WAV600 Series, including the WAV654, (Intel's Accused Gateway Products) which are included in Intel-based Wi-Fi 6 routers and gateways, , employ a method of facilitating data exchange by virtue of orthogonal frequency division multiple access (OFDMA).

wirelessly broadcasting synchronization information on a portable client device, the synchronization information comprising information assigning a time slot during which the client device can receive data, the time slot being determined according to priority level data associated with a class, the class associated with one or more of the portable client device	Intel wireless adapters utilizing Wi-Fi 6 and/or 6E including, but not limited to, the AX101, AX200, AX201, AX210, AX211, AX411 adapters, and Intel wireless adapters utilizing Wi-Fi 7 including, but not limited to, the BE200 and BE202 adapters, (collectively, Intel's Accused Adapter Products), and Intel's 10th to current generation processors with integrated Wi-Fi 6 and above, as well as the Intel® Home Wi-Fi Chipset WAV600 Series, including the WAV654, (Intel's Accused Gateway Products) which are included in Intel-based Wi-Fi 6 routers and gateways, when configured in access point or router mode, capable of wirelessly broadcasting synchronization information to a portable client Specifically, orthogonal frequency division multiple access (OFDMA), which divides the available band into sub-carriers and the transmission window into timeslots. See e.g. What is Wi-Fi 6, Intel, available at https://www.intel.com/content/www/us/en/gaming/resources/wifi-6.html ("Wi-Fi 6 can be faster due to technologies like ... OFDMA...") See <i>also</i> 802.11ax Standard, Section 27.3.1.2 on OFDMA. OFDMA is an OFDM-based multiple access scheme where different subsets of subcarriers are allocated to different users, and this scheme allows simultaneous data transmission to or from one or more users. In OFDMA, users are allocated different subsets of subcarriers that can change from one PPDU to the next. Similar to OFDM, OFDMA employs multiple subcarriers, but the subcarriers are divided into several groups where each group is referred to as an RU. With OFDMA, different transmit powers may be applied to different RUs. See <i>also id.</i> Section 27.3.2 on Subcarrier and resource allocation. Pictorial representations of OFDMA are shown below:
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and the user
of the
portable
client device;
and



	 https://www.hitchhikersguidetolearning.com/2023/03/30/resource-units-in-802-11ax/ (citing WiFi 6 for Dummies). A key feature of Wi-Fi 6 is the introduction and use of Block-ACK messages, which divides the available band into sub-carriers and the transmission window into timeslots. Intel describes that “OFDMA works by subdividing channels into subcarriers and allowing for transmission to multiple endpoints (devices) at the same time.” https://www.intel.com/content/www/us/en/gaming/resources/wifi-6.html. “This results in a single transmission from the [access point] being able to communicate with multiple devices, instead of each device having to wait its turn as the [access point] serves up the data across the network.” Wi-Fi 6 (and later) compliant client devices, which utilize Intel’s Wi-Fi 6 (or later) compatible chips/adapters (i.e., the accused products), each represented by a different color in the second figure, receive data from, for example, a Wi-Fi 6 access point with an Intel wireless adapter or chip, or Intel-based Wi-Fi 6 routers and gateways, during one of six timeslots and using one of twelve different sub-carriers. Determining when each device receives data and on which subcarrier is determined by the router. The figure below shows the procedure by which the devices broadcast and the subcarrier is determined:	

	 See https://cradtech.com/2018/10/25/802-11ax-ofdma-overview/. The multi-user request to send (MU-RTS) frame informs the devices of which sub-carrier and at what timeslot they will receive data. The time slot will be determined by the quality of service (QoS) category of the data, such that highest priority data is delivered first. See e.g. 802.11ax Standard at 26.5.5 – Buffer status report operation. The 802.11ax Standard, which are utilized by Intel’s devices, describes the format and usage of the Trigger Frame, which comprises synchronization information necessarily for uplink transmission. It details how the frame contains the resource allocation and timing information for client devices. See Section 9.3.1.22; see also Sections 27.3.4. The class of QoS data a device needs to receive will be associated with both the device and the user. Data to be received by a device will be associated with the device, specifically applications the device is running. The data is also associated with the user in that the user is interacting with the application to request the data.	
wirelessly broadcasting data for reception by the client	As shown in the below figure, after the access point has transmitted received clear to send (CTS) for each device, it sends the data to the client devices.	

