

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

INTEL CORPORATION,
Petitioner

v.

PROXENSE, LLC
Patent Owner.

IPR2025-00327
U.S. Patent 9,265,043

**PETITION FOR *INTER PARTES* REVIEW
OF U.S. PATENT 9,265,043**

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1001	U.S. Patent 9,265,043 to Brown
1002	File History for U.S. Patent 9,265,043
1003	Declaration of Dr. James Lansford in Support of Petition
1004	Curriculum Vitae of Dr. James Lansford
1005	“Wireless Multimedia ... A Guide to the IEEE 802.15.3 Standard” by Gilb (“Gilb”)
1006	Part 15.3: Wireless Medium Access Control (MAC) and Physical Layer (PHY) Specifications for High Rate Wireless Personal Area Networks (WPANs)” (“802.15.3”)
1007	WO 02/067009 to Ward, et al. (“Ward”)
1008	File History for U.S. Patent 8,219,129
1009	U.S. Patent Publication 2007/0016637A1 to Brawn, et al. (“Brawn”)
1010	Declaration of June Ann Munford
1011	Declaration of David Ringle
1012	Patent Owner’s List of Proposed Claim Constructions from <i>Proxense, LLC v. Intel Corp.</i> , No. 6-24-cv-00283 (WDTX)
1013	Intel’s List of Proposed Claim Constructions from <i>Proxense, LLC v. Intel Corp.</i> , No. 6-24-cv-00283 (WDTX)
1014	U.S. Patent No. 7,209,955 to Major (“Major”)
1015	Patent Owner’s Infringement Contentions for ’043 patent from <i>Proxense, LLC v. Intel Corp.</i> , No. 6-24-cv-00283 (WDTX)
1016	U.S. Patent Publication 2006/0002349 to Demirhan (“Demirhan”)
1017	U.S. Patent Publication 2003/0152059 to Odman (“Odman”)
1018	“A Novel Scheduling Scheme and MAC Enhancements for IEEE 802.15.3 High-Rate WPAN” to Zeng, et al.

Exhibit	Reference
1019	Draft Running Comment Resolution, IEEE P802.15 Wireless Personal Area Networks by James P. K. Gilb, July 2004 (“Multicast Group Submission”)
1020	Wireless Communication Standards, A Study of IEEE 802.11 TM , 802.15 TM , and 802.16 TM , by Todor Cooklev (“Cooklev”)
1021	“Welcome to Standards Information Network,” IEEE (2004) https://web.archive.org/web/20040603154924/http://www.standards.ieee.org/StandardsPress/
1022	“Get IEEE 802,” IEEE (2003), https://web.archive.org/web/20031008112815/http://www.standards.ieee.org/getieee802/
1023	“Get IEEE 802.15 Wireless Lans,” IEEE (2004), https://web.archive.org/web/20040414112100/http://standards.ieee.org/getieee802/802.15.html
1024	“IEEE-SA Template,” IEEE (2005), https://web.archive.org/web/20050529084555/http://standards.ieee.org/getieee802/download/802.15.3-2003.pdf
1025	“Get IEEE 802 Update,” IEEE Standards Association (2018), https://mentor.ieee.org/802-ec/dcn/18/ec-18-0210-00-00SA-ieee-802-november2018-standardsdownloadreport.pdf
1026	U.S. Patent Publication 2004/0025179 to Russ
1027	U.S. Patent Publication 2005/0113102 to Kwon
1028	U.S. Patent Publication 2005/0265371 to Sharma
1029	“Comparison of IEEE 802.11e and IEEE 802.15.3 MAC” by Wang, et al., Proceedings of the IEEE 6 th Circuits and Systems Symposium on Emerging Technologies: Frontiers of Mobile and Wireless Communication (2004)
1030	“Intra-superframe power management for IEEE 802.15.3 WPAN,” by Guo et al., IEEE Communications Letters, Volume 9, Issue 3 (March 2005)
1031	U.S. Patent Publication 2006/0205408 to Nakagawa (“Nakagawa”)

Exhibit	Reference
1032	United States District Courts National Judicial Caseload Profile, September 30, 2024, https://www.uscourts.gov/sites/default/files/2024-12/fcms_na_distprofile0930.2024.pdf
1033	Amendment to Part 15.3: Wireless Medium Access Control (MAC) and Physical Layer (PHY) Specifications for High Rate Wireless Personal Area Networks (WPANs), Amendment 1: MAC Sublayer

I. Introduction

Intel Corporation petitions for *inter partes* review of U.S. Patent 9,265,043 (INTEL-1001) claims 1-5, 8-11.

II. Grounds for Standing

Petitioner certifies the '043 patent is available for IPR and Petitioner is not barred or estopped.

III. Identification of Challenge

A. Prior Art

The '043 patent, filed May 2, 2013, is a continuation of U.S. Patent 8,457,672, which is a continuation of U.S. Patent 8,219,129, which claims benefit to U.S. Provisional 60/760,362, filed January 6, 2006. Petitioner reserves the right to challenge priority. Regardless, each applied reference was filed or published before January 6, 2006.

1. **“Wireless Multimedia ... A Guide to the IEEE 802.15.3 Standard”** by Gilb (“Gilb”; INTEL-1005), published March 1, 2004, is prior art under 35 U.S.C. §102(b). (INTEL-1010, ¶¶21-29; INTEL-1003, ¶82.)

2. **“Part 15.3: Wireless Medium Access Control (MAC) and Physical Layer (PHY) Specifications for High Rate Wireless Personal Area Networks (WPANs)”** (“802.15.3”; INTEL-1006), published September 2003, is prior art under 35 U.S.C. §102(b). (INTEL-1003, ¶¶85-94; INTEL-1010, ¶¶6-20; INTEL-1011, ¶¶9-10, 12.)

3. **WO 02/067009 to Ward**, et al. (“Ward”; INTEL-1007), published August 29, 2002, is prior art under 35 U.S.C. §102(b).

4. **U.S. Patent Publication 2007/0016637A1 to Brawn**, et al. (“Brawn”; INTEL-1009), filed July 18, 2005, is prior art under 35 U.S.C. § 102(e).

B. Grounds For Challenge

Ground		Claims	
1	103	1-5, 8-11	Gilb, 802.15.3
2	103	1-5, 8-11	Gilb, 802.15.3, Ward
3	103	1-5, 8-11	Gilb, 802.15.3, Ward, Brawn

IV. Level of Ordinary Skill

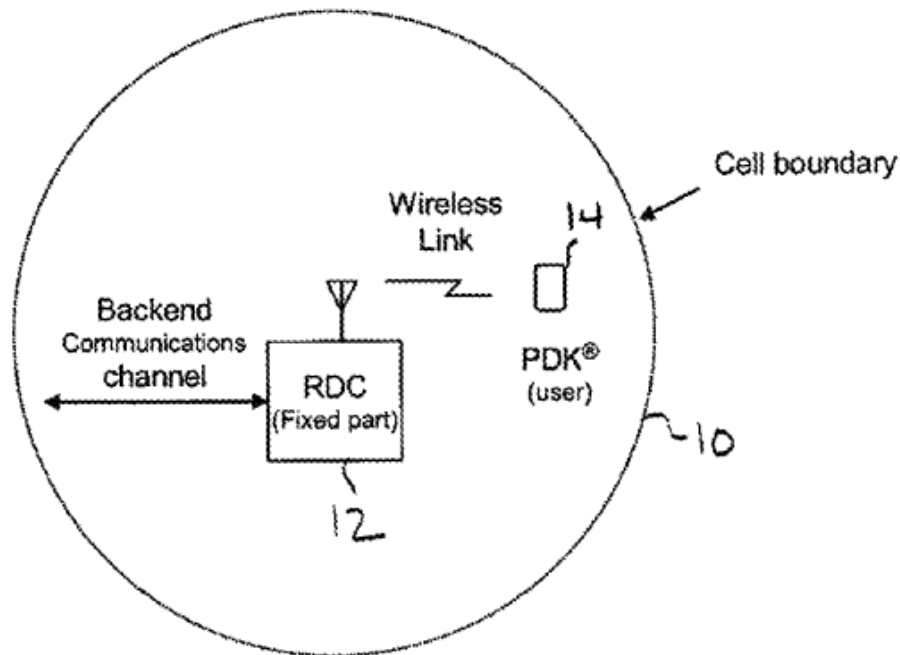
A person of ordinary skill in the art (“POSITA”) would have had at least a master’s degree in electrical engineering or similar discipline or at least two years’ experience working or conducting research in the field of wireless communication protocols, or an equivalent combination of education and experience. (INTEL-1003, ¶65.)

V. Background

A. ’043 Patent Overview

The ’043 patent describes a wireless communication system that may be based on the prior art IEEE 802.15.4 protocol. (INTEL-1001, 7:26-28.) More specifically, it relates “to a technique for wirelessly communicating with a plurality of client devices without data collision,” where “individual client devices are

assigned time slots” to communicate. (INTEL-1001, 4:28-33.) The ’043 patent describes an exemplary system including a gatekeeper device, called a Reader Decoder Circuit (RDC), and a user device, called a Personal Digital Key (PDK). (INTEL-1001, 4:34-36, 4:55-57, 5:24-25, 7:6-7, Figure 1 (below).) The RDC “generates and wirelessly broadcasts synchronization information to the client devices” containing “individual masks to be applied to bit fields of individual client devices” where time slots “are determined in accordance with the masked bit fields.” (INTEL-1001, Abstract.)



'043 Patent, Figure 1

B. Claim Construction

Petitioner proposes three claim constructions.

1. “synchronization information” (all challenged claims)

All challenged claims recite “*synchronization information*” used to determine or assign time slots. “*Synchronization information*” should be construed consistent with the intrinsic record as “information that contains individual bit masks to be applied to bit fields of individual client devices.”

First, the Abstract defines “*synchronization information*”: “the system generates and wirelessly broadcasts synchronization information to the client devices, **where the synchronization information contains individual masks to be applied to bit fields of individual client devices.**” (INTEL-1001, Abstract.) “*Synchronization information*” should be construed accordingly. *Hill-Rom Co. v. Kinetic Concepts, Inc.*, 209 F.3d 1337, 1341 n.1 (Fed. Cir. 2000).

Second, the claims and specification confirm that definition. The claims state “*synchronization information*” is used to “determine[]” or “assign[]” “time slots.” (INTEL-1001, cl. 1.) The **only method** the specification discloses for determining or assigning time slots is using masks. (*Id.*, 15:48-55 (“by reserving time slots for both client device transmission and reception (based on masks established by the network), client transmission and reception time slots may be efficiently coordinated”), 15:8-11, 15:32-44, 15:45-48, 16:2-27, 19:25-32, 19:33-50, 19:65-20:5.) *Techtronic Indus. Co. v. Int’l Trade Comm’n*, 944 F.3d 901, 907-

10 (Fed. Cir. 2019) (where specification discloses one configuration, construction consistent with specification is proper).

Third, the prosecution history of the parent '129 patent further confirms Petitioner's construction. The Examiner rejected PO's claims under §112, finding no support showing how a time slot is determined according to class. (INTEL-1008, 356.) To overcome the rejection, PO represented that "[a] mask is set according to the class" and "**the mask sets the times or time slot.**" (*Id.*, 391.) *Iridescent Networks, Inc. v. AT&T Mobility, LLC*, 933 F.3d 1345, 1353 (Fed. Cir. 2019) ("statements made to overcome the examiner's enablement rejection inform the claim construction analysis").

In the co-pending litigation, PO interprets "*synchronization information*" to cover information used to determine time slots—even without masks—contrary to the intrinsic record. (INTEL-1012, 1.) But as explained below, the challenged claims are invalid even under PO's overbroad interpretation.

2. "class is associated with one or more of the [] client device and a user of the [] client device" (all challenged claims)

All challenged claims require time slots set according to "*priority level data*" associated with a "class" that is "*associated with one or more of the [] client device and [a/the] user of the client device.*" Because of PO's prosecution disclaimers, "*class associated with one or more of the [] client device and [a/the] user of the [] client device*" (hereinafter, "*class associated with [device/user]*")

should be construed as “plain and ordinary meaning in which the class is associated with the client device or user of the client device, **not data items or network characteristics.**”

The Examiner of the '129 patent rejected all pending claims over Nakagawa (INTEL-1031). (INTEL-1008, 267-79.) PO represented that Nakagawa does not disclose the claimed “class” because “time slots in Nakagawa ... **are allocated based on network characteristics.**” (INTEL-1008 302, 303 (arguing Nakagawa “determines time slots based on characteristics of a mobile communications network.”).) The Examiner accepted PO’s representation. (INTEL-1008, 360.)

The Examiner subsequently rejected all pending claims on the grounds that Major (US 7,209,955) (INTEL-1014) disclosed the claimed class. (INTEL-1008 [INTEL-1008, 358-73.]) PO again distinguished its claimed class, asserting: “**In Major, class is associated with data items;** in the Applicants’ specification, class is associated with one or more of the client device and the user of the client device.” (*Id.*, 367-68.) The Examiner then allowed the claims. (*Id.*, 411-22, 457.)

PO thus disclaimed class associated with “data items” and “network characteristics.”¹ *Seachange Int’l, Inc. v. C-COR, Inc.*, 413 F.3d 1361, 1372–73 (Fed. Cir. 2005). In the co-pending litigation, however, PO proposes “plain and ordinary meaning” (INTEL-1012, 1), but interprets the claimed class to cover data items and network characteristics—contrary to the intrinsic record. (INTEL-1015, 4-6.) As explained below, the challenged claims are invalid even under PO’s overbroad interpretation.

3. “*time slot*” (all challenged claims)

All claims recite a “*time slot*” during which a client device communicates with a reader or network device. The specification states that “a ‘**timeslot**’ is **defined as a period of time that information is communicated between two devices.**” (INTEL-1001, 11:14-15.) “*Time slot*” should be construed according to that definition. *Martek Biosciences Corp. v. Nutrinova, Inc.*, 579 F.3d 1363, 1380 (Fed. Cir. 2009). In the co-pending litigation, PO seeks an alternative construction: “a set period of time for communicating – i.e., sending and/or receiving data.”

¹ PO’s disclaimer is consistent with the specification, which exclusively describes the claimed class as associated with a user or device, never with data items or network characteristics. (INTEL-1001, 15:48-16:31.)

(INTEL-1012, 2.) The Board need not resolve the parties' dispute, as the prior art discloses this limitation under any reasonable construction.

VI. GROUND 1: Gilb-802.15.3 Combination Renders Claims 1-5, 8-11 obvious.

The combination of Gilb and 802.15.3 ("Gilb-802.15.3 combination") renders the challenged claims obvious under PO's interpretation of "*class*" and "*synchronization information*." (See §V.B.1-2.)

A. Combination Overview

1. Gilb

Gilb, an IEEE publication, is "intended for people who want to learn more about wireless multimedia solutions based on IEEE Std 802.15.3" which was "designed to specifically address the needs of high-speed, low-cost portable multimedia devices." (INTEL-1005, xv.) Gilb provides an "introduction and explanation of the IEEE 802.15.3" standard but does not provide all protocol details. (See *id.*, 1.) These are provided by the standard, IEEE 802.15.3-2003. (See, *e.g., id.* 297.)

2. IEEE 802.15.3 Standard (2003)

The IEEE 802.15.3 standard (“802.15.3²”) defines the “PHY and MAC specifications for high data rate wireless connectivity with fixed, portable and moving devices within or entering a personal operating space.” (INTEL-1006, 1.)

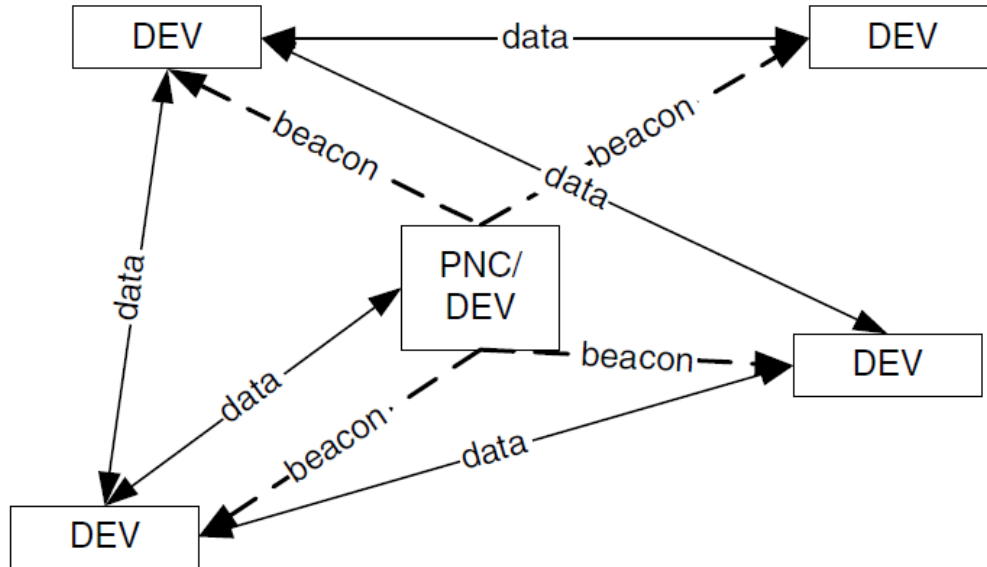
* * *

An overview of the IEEE 802.15.3 described by Gilb and 802.15.3 follows.

3. IEEE 802.15.3 Protocol

The 802.15.3 protocol is designed for wireless personal area networks (WPANs), called “piconets.” (INTEL-1005, 1, 23-25; INTEL-1006, 1, 8.) The key elements of the IEEE 802.15.3 piconet are “the piconet coordinator (PNC) and the device (DEV).” (INTEL-1005, Figure 3-1 (below), 25; INTEL-1006, 8.)

² Herein, “IEEE 802.15.3” refers to the protocol and “802.15.3” refers to the standard document.



Gilb, Figure 3-1

“The PNC is the center of the piconet, and the extent of the piconet is determined by the ability of DEVs to hear the beacon transmitted by the PNC.” (INTEL-1005, 25; INTEL-1006, 8-9, 150-51.) “Every 802.15.3-compliant implementation is a DEV,” including the PNC. (INTEL-1005, 25, 300; INTEL-1006, 168 (referring to “DEV personality of the PNC”).)

a) Frame/Superframe

The basic data structure in IEEE 802.15.3 “is called a frame.” (INTEL-1005, 47.) Frames are grouped into a repeating structure called a superframe, illustrated in 802.15.3 Figure 2 below. (INTEL-1006, 12.) A superframe consists of a beacon, contention access period (CAP), and channel time allocation period (CTAP). (INTEL-1005, 32; INTEL-1006, 11-12.)

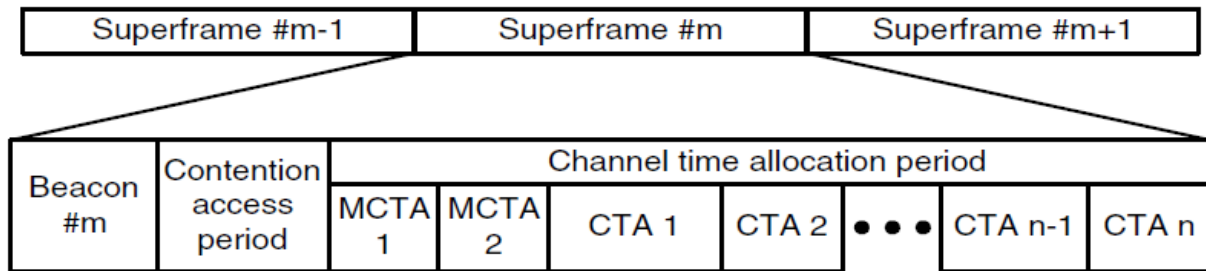


Figure 2—802.15.3 piconet superframe

The beacon “is used to set the timing allocations and to communicate management information for the piconet.” (INTEL-1006, 11.) The CAP “is used to transfer commands and data either between the PNC and a DEV or between the DEVs in the piconet.” (INTEL-1005, 33.) The CTAP “is composed of one or more” channel time allocations (CTAs) “allocated by the PNC to a pair of DEV identifiers (DEVIDs).” (INTEL-1005, 33.) “Only the DEV that is listed as the source is allowed to transmit in a CTA.” (INTEL-1005, 33; INTEL-1006, 172.)

b) CTA Allocation

A DEV requests “channel time from the PNC to send frames to other DEVs” in a channel time request (CTRq). (INTEL-1005, 35; INTEL-1006, 139-140.) IEEE 802.15.3 supports two types of CTRqs. The first, an “isochronous CTRq”, “is a request for channel time on a periodic basis that does not expire.” (INTEL-1005, 35; INTEL-1006, 139-140.) The second, an “asynchronous CTRq”, “is a request for a total amount of channel time that will be allocated whenever the PNC is able to fit it into the superframe.” (INTEL-1005, 36; INTEL-1006, 139.)

The PNC considers received CTRqs and allocates CTAs in the CTAP of each superframe. (*See, e.g.*, INTEL-1005, 33, 56, 88-89, 93; INTEL-1006, 169-70, 180, 188-89.) CTA allocations “are communicated to the DEVs in the piconet via the CTA IE in each beacon” which “contains one or more CTA blocks, each of which has the source, destination, stream index, start time, and duration of the CTA.” (INTEL-1005, 56-57; INTEL-1006, 117, Figures 25-26.)

4. Motivation to Combine

A POSITA would have been motivated to combine Gilb with 802.15.3. (INTEL-1003, ¶¶95-99.) Gilb and 802.15.3 are analogous art as they are in the same field as the challenged claims (network, encompassing wireless, communications) and are reasonably pertinent to the problem addressed by the ’043 patent (structuring communications between network and client devices). (INTEL-1005, 25-28; INTEL-1006, 8; INTEL-1001, Abstract.)

First, Gilb explicitly motivates a POSITA to look to 802.15.3. Gilb is “A Guide to the IEEE 802.15.3 Standard.” (INTEL-1005, Title, 3 (“IEEE Std 802.15.3, which is the subject of this book”); INTEL-1003, ¶96.) Gilb also cites to the standard, including as reference [B16]. (*See, e.g.*, INTEL-1005, 260 (“[T]o create an interoperable, 802.15.3-compliant DEV, the implementer only needs to refer to Clause 7, Clause 8, Clause 9 ..., and Clause 11”), 297.)

Second, a POSITA reading Gilb would have looked to the standard for further detail and clarification on implementing IEEE 802.15.3 applications. (INTEL-1003, ¶97.) Gilb “provides an **introduction** and **explanation** of the IEEE 802.15.3™ wireless personal area networks (WPANs) standard” and is purposed to “[c]larify IEEE Std 802.15.3 for individuals who are implementing compliant devices” and “[s]how how IEEE Std 802.15.3 can be used to develop wireless multimedia applications.” (INTEL-1005, 1.) Gilb recognizes, however, that portions “provide[] a **high-level overview** of the standard.” (*Id.*, xv.) Gilb thus explicitly motivates a POSITA to combine further details from 802.15.3 with the introductory, explanatory, and high-level overview teachings of Gilb. For example, 802.15.3 provides the specific formats of IEEE 802.15.3 messages disclosed in Gilb, such as the beacon and CTA IE formats. (*See, e.g.*, §VI.B.2.c.)

Third, the Gilb-802.15.3 combination applies a known technique (802.15.3’s wireless protocol) to provide details of Gilb’s 802.15.3-compliant system. As discussed above, Gilb “[s]how[s] how IEEE Std 802.15.3 can be used to develop wireless multimedia applications.” (INTEL-1005, 1.) Gilb therefore describes systems that are not just similar to 802.15.3, but rather, *are* 802.15.3 systems. Thus, a POSITA would apply the known techniques in 802.15.3 to add further detail and clarification, to improve the 802.15.3 systems that Gilb describes. (INTEL-1003, ¶98.)

A POSITA would have had a reasonable expectation of success in the combination, and the results would have been predictable because, as discussed above, Gilb is a companion to 802.15.3. (INTEL-1003, ¶¶99.)

B. Claim 1

1. Preamble [1P]³

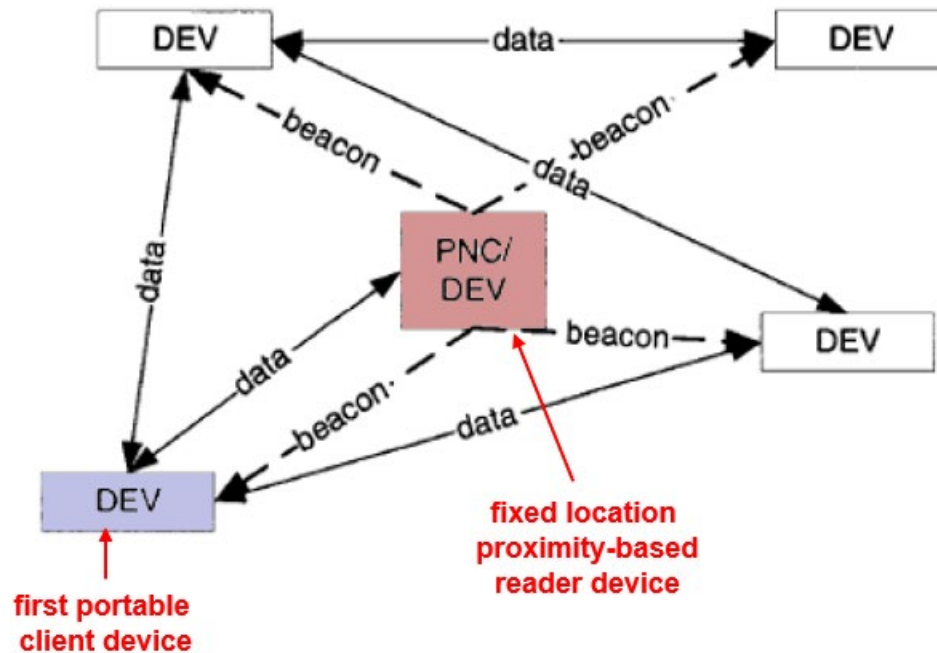
The Gilb-802.15.3 combination discloses a “*method of facilitating wireless data exchange between a first portable client device and a fixed location proximity[-based] reader [device]*”⁴ [1P]. (INTEL-1003, ¶¶101-113.)

The IEEE 802.15.3 “piconet is a wireless ad hoc data communications system which allows ... devices (DEVs) to communicate with each other.” (INTEL-1006, 8; *see also* INTEL-1005, Figure 3-1 (below), 25.) Thus, the Gilb-802.15.3 combination discloses a “*method of facilitating data exchange*” [1P]

³ Petitioner does not acquiesce the preamble is limiting.

⁴ Petitioner applies the plain and ordinary meaning to “*fixed location proximity reader*,” but in co-pending litigation, PO seeks an alternative construction: “a fixed access point that can wirelessly interact with a client device to link the user with various applications, assets, and/or services.” (INTEL-1012, 1.) The Board need not construe this term because the prior art teaches the limitation under either construction.

between two piconet devices. (INTEL-1003, ¶¶102-104; INTEL-1006, 8-9 (802.15.3 facilitates “efficient data transfer”).)



Gilb, Annotated Figure 3-1

Should the Board determine “data exchange” requires bi-directional communication, Gilb’s Figure 3-1 above demonstrates data is exchanged between DEVs and between a PNC/DEV and DEV, as demonstrated with bidirectional arrows for data. (INTEL-1005, 29; INTEL-1003, ¶¶102-104.)

IEEE 802.15.3 is a wireless protocol “designed specifically to address the needs of high-speed, low-cost **portable** multimedia devices,” (DEVs) (INTEL-1005, xv, 13 (“only 802.15.3 is able to address all of the requirements for **portable, wireless multimedia devices**”), Figure 3-1 (below), 25; *see also*, INTEL-

1006, 1.) Gilb provides examples of portable devices including digital cameras, headphones, wireless microphones, and wireless game controllers. (INTEL-1005, 14-19.) IEEE 802.15.3 therefore supports “portable” piconet devices. (INTEL-1005, 25; INTEL-1006, 8; INTEL-1003, ¶¶105-106.)

Although neither Gilb nor 802.15.3 refers to piconet DEVs as “*client devices*”, a POSITA would have understood the DEVs not acting as the piconet PNC to be “*clients*”, consistent with the ’043 patent’s reference to devices not acting as a network coordinator as “*client*” devices. (See, e.g., INTEL-1001, 15:45-48 (referring to PDKs as “client devices” within “RDC’s wireless coverage area”); see also, INTEL-1017, ¶¶9 and 22 (referring to 802.15.3 devices not acting as the PNC as clients).) The Gilb-802.15.3 combination therefore discloses “*a first portable client device.*” (INTEL-1003, ¶107.)

IEEE 802.15.3 supports devices that have a “*fixed location.*” (See INTEL-1006, 123, 1 (“This standard defines the PHY and MAC specifications for high data rate wireless connectivity with **fixed**, portable and moving devices ...”).) Gilb provides examples of IEEE 802.15.3 applications using devices which a POSITA would have understood to be “*fixed*” such as a photo kiosk that enables digital cameras to wirelessly transfer pictures. (INTEL-1005, 14, 18-22.) In that example, a POSITA would understand the kiosk acts as the PNC/DEV, which meets PO’s construction of a “*fixed location proximity[-based] reader [device]*” that wirelessly

interacts with a client device (camera) and links the user to the application/service (e.g., photo printing). (INTEL-1003, ¶¶108-109, 112; *see* INTEL-1005, 25, 67 (factors in determining which DEV acts as PNC); INTEL-1006, 4, 152-155.)

Gilb explains “the extent of the piconet is determined by the ability of DEVs to hear the beacon transmitted by the PNC.” (INTEL-1005, 25.) 802.15.3 similarly provides that “piconet ... communications are normally confined to a small area around person or object that typically covers at least 10 m in all directions” (INTEL-1006, 8) The PNC/DEV is a “*proximity[-based]*” device because its ability to communicate with other devices depends on its geographic proximity to the receiving device. (INTEL-1005, 80, 131, 155; INTEL-1003, ¶110.)

The PNC/DEV controls access to the piconet by accepting or rejecting association requests received (read) from DEVs within its proximity, so it is a “*reader*” device consistent with the disclosure of the ’043 patent. (*See, e.g.*, INTEL-1001, 5:27-31, 7:6-7 (“an RDC is a device that acts as a gatekeeper controlling access of a PDK to a particular system”); INTEL-1005, 66 (PNC “responsible for starting and stopping the piconet, admitting DEVs into the piconet, allocating channel time”), 74-76; INTEL-1006, 11.) For example, Gilb teaches the PNC/DEV “controls membership in the piconet using association, disassociation, and secure membership.” (INTEL-1005, 302.) If security is enabled in the piconet, the PNC/DEV performs an “authentication method” as part of the

“secure membership process” for DEVs requesting association. (See INTEL-1005, 75-76.) Thus, the PNC is a “*fixed location proximity[-based] reader [device].*” (INTEL-1003, ¶111.)

The Gilb-802.15.3 combination discloses a DEV (“*first portable client device*”) that wirelessly exchanges data with PNC/DEV (“*fixed location proximity reader*”). Gilb explains a piconet’s “PNC also acts as a DEV in the piconet and is able to communicate with any other DEV in the piconet.” (INTEL-1005, 25, 47-48; INTEL-1006, 8.) Therefore, the PNC has both a PNC personality (with associated PNCID) and DEV personality (with associated DEVID). (See, e.g., INTEL-1005, 57; see also INTEL-1006, Figure 1 (showing “PNC/DEV”).) This is reflected in Gilb Figure 3-1 (above), indicating the PNC as “PNC/DEV” (red) and showing PNC/DEV communicating with non-PNC DEV (blue). (INTEL-1003, ¶113.)

2. Limitation [1A.1]/[1A.2]/[1B]/[1C]

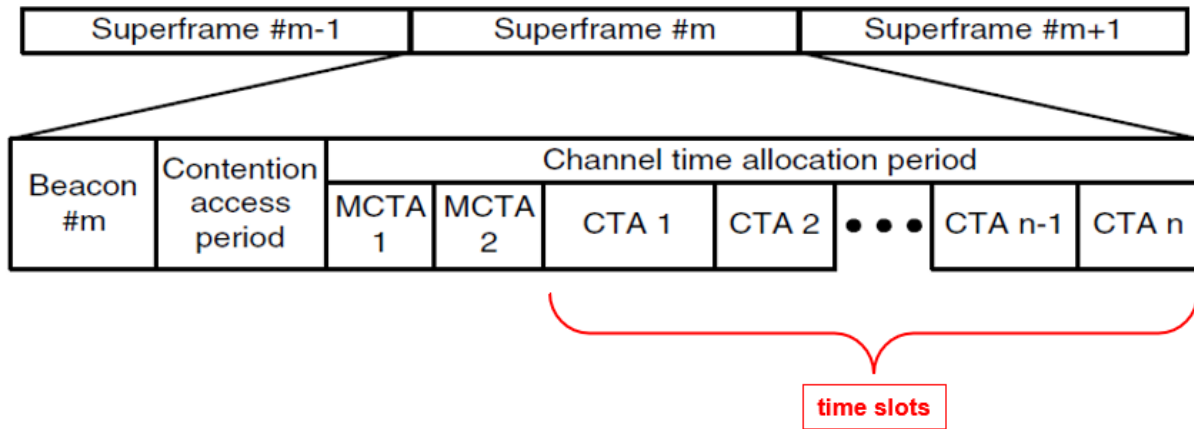
The Gilb-IEEE 802.15.3 combination discloses “*determining a first specified time slot based on [1A.1] synchronization information wirelessly received by the first portable client device and [1A.2] priority level data associated with a first class*”, “*wherein the first class is associated with one or more of the first portable client device and a user of the first portable client device*” [1B], and “*assigning the first specific time slot for the first portable client device to*

wirelessly communicate with a fixed location proximity-based reader device” [1C], under PO’s interpretation of “*synchronization information*” and “*class associated with [device/user]*.” Petitioner addresses limitation [1C] first followed by limitations [1A.2], [1B], and [1A.1].

a) Limitation [1C]

The Gilb-802.15.3 combination discloses “*assigning [a] first specific time slot for [a] first portable client device to wirelessly communicate with a fixed location proximity-based reader device*” [1C]. (INTEL-1003, ¶¶115-122.)

The CTAP portion of an IEEE 802.15.3 superframe “is composed of channel time allocations (CTAs).” (INTEL-1006, 11-12, Figure 2 (below).) The PNC/DEV “controls the channel access” during the CTAP “by **assigning CTAs** to an individual DEV or to a group DEVs with each **CTA having a fixed start time and duration.**” (INTEL-1006, 169-170.) Each CTA is a “*time slot*” under any reasonable interpretation. (§V.B.3; INTEL-1005, 33, 158, 299-300; *see also*, INTEL-1017, ¶11 (referring to CTAs as “time slots”).)

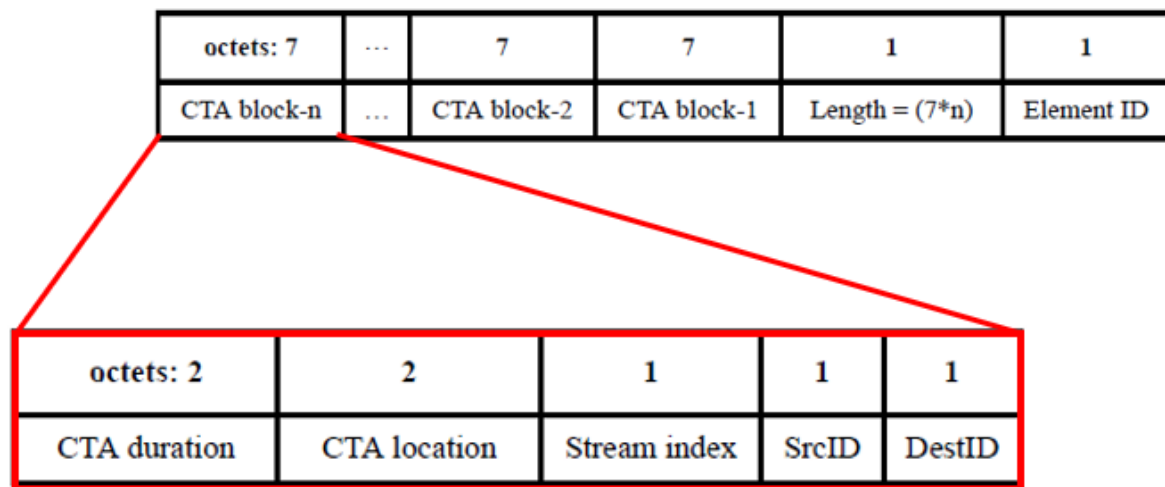


802.15.3, Annotated Figure 2

The PNC/DEV assigns a “*specific time slot*” to a source/destination DEV pair. (INTEL-1003, ¶117.) The beacon includes “information elements (IEs)”. (INTEL-1005, 53; INTEL-1006, 108.) One such IE is the channel time allocation IE (“CTA IE”), providing the CTA allocations in the superframe’s CTAP portion. (See INTEL-1005, 53 (“The PNC **will always send the CTA IE**, the BSID IE, and the Parent Piconet IE, if present, in the beacon frame”), 56, 103-104; *see also* INTEL-1006, 116, 191, Table 48.) The CTA IE, illustrated below, includes CTA blocks, “each of which has the **source**, **destination**, stream index, **start time**, and **duration** of the CTA.” (INTEL-1005, 56-57; INTEL-1006, 117, Figure 25⁵ (CTA IE format), Figure 26 (CTA block format).) The destination “indicates the DEV to

⁵ Gilb does not provide the CTA IE or CTA block formats; this information is provided by 802.15.3.

which the source DEV may send” frames. (INTEL-1006, 117.) The CTA location field “indicates the start time of the allocation” and the duration “specifies the duration of the CTA.” (INTEL-1006, 117.) The CTA location and duration define the “*specific time slot*” assigned to the source/destination pair of devices. (*See also*, INTEL-1005, 32-33.)

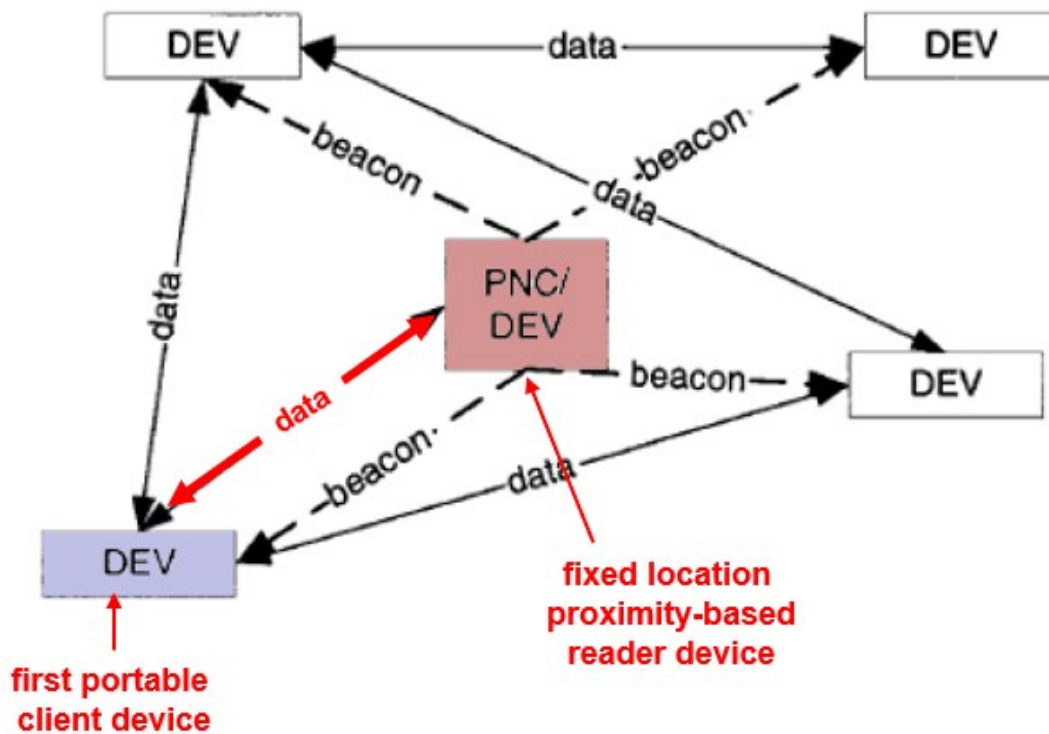


802.15.3, Figure 25 (top), Figure 26 (bottom)

The Gilb-802.15.3 combination discloses a DEV (“*first portable client device*”) “*wirelessly communicate[s] with*” the PNC/DEV (“*fixed location proximity-based reader device*”) during an assigned CTA. (INTEL-1003, ¶118.)

Gilb explains the “PNC also acts as a DEV in the piconet and is able to communicate with any other DEV in the piconet.” (INTEL-1005, 25, 47-48, 57; INTEL-1006, 8, Figure 1 (showing “PNC/DEV”).) This is reflected in Gilb Figure 3-1 (below) showing the “PNC/DEV” (red) communicating data with non-

PNC/DEV (blue). IEEE 802.15.3 contemplates circumstances where the PNC/DEV is the “source” assigned to a CTA⁶ using its DEVID. Thus, an IEEE 802.15.3 piconet supports assigning a CTA (“*first specific time slot*”) during which the PNC/DEV (“*fixed location proximity-based reader device*”) acting in its DEV personality transmits data to a DEV (“*portable client device*”). (INTEL-1006, 117; INTEL-1003, ¶118.)



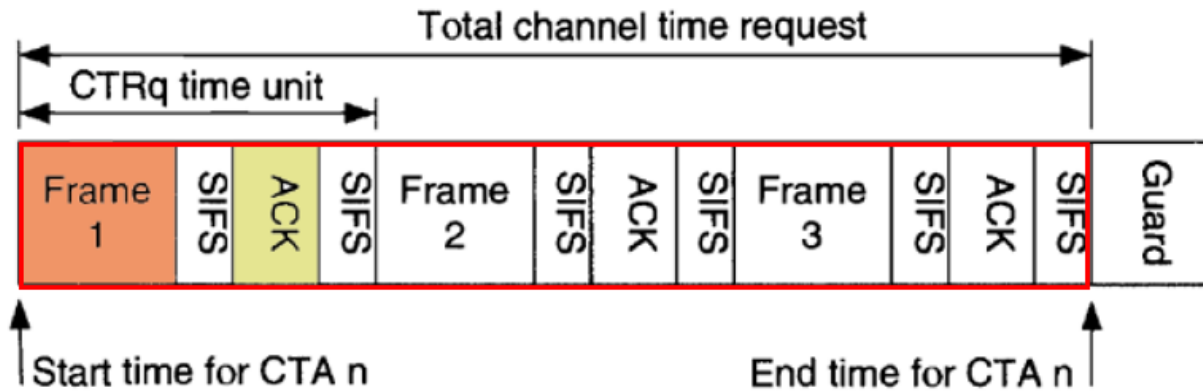
Gilb, Annotated Figure 3-1

⁶ IEEE 802.15.3 also supports management CTAs (“MCTAs”) during which a PNC is either the source/destination of data. (See INTEL-1005, 33-34.)

Gilb describes applications involving data transmission from a PNC/DEV to a DEV. For example, Gilb describes a game console/router “act[ing] as the wireless router for the house, distributing information to wireless portable devices” and being “used to play music that is sent wirelessly to speakers or headphones.” (INTEL-1005, 18.) A POSITA would understand the game console/router is the PNC because it is in center of the house or has higher transmitter power (INTEL-1005, 67) and is a source DEV communicating data to headphones (portable client DEVs) in an assigned CTA (“*time slot*”). (INTEL-1003, ¶119.)

The “*first portable client*” DEV further communicates with the PNC/DEV by transmitting an acknowledgement after receiving data. (INTEL-1005, 25, Figure 3-1 (reproduced above with first/second DEVs annotated), 82, 95; INTEL-1003, ¶120; *see also*, §VI.B.1 (bi-directional communication).) IEEE 802.15.3 provides for an “[i]mmediate acknowledgment (Imm-ACK)” sent by a DEV within an assigned CTA “to confirm” receipt of a frame. (INTEL-1005, 81-82; *see also*, INTEL-1005, 94-95, Figure 4-17⁷, 57 (“destination is only allowed to transmit the requested ACK frames ... during the CTA”), 177.)

⁷ “Total channel time request” reflects the assigned CTA (red box) is equal to the channel time requested; the Imm-ACK (yellow) is shown within the assigned CTA. (INTEL-1005, 94-95.)



Gilb, Annotated Figure 4-17

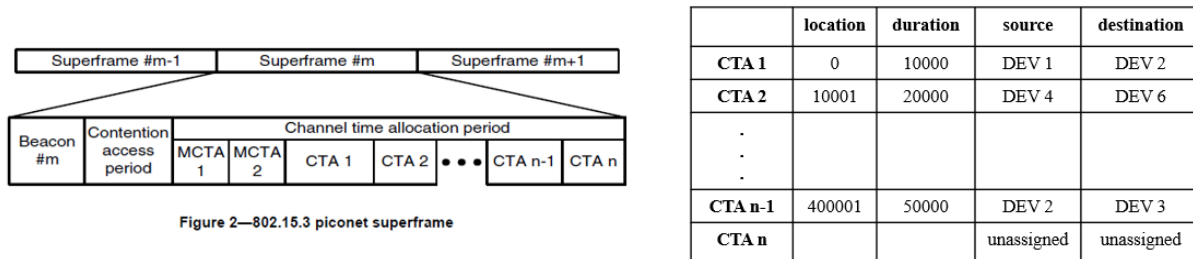
A DEV also communicates with the PNC/DEV acting in its DEV capacity by transmitting data to the PNC/DEV. (INTEL-1005, 25, 47-48, 57, 300.) Thus, as demonstrated by annotated Gilb Figure 3-1 above, the “*first portable client device* [DEV]” is the source and the “*fixed location proximity-based reader device* [PNC/DEV]” is the destination of the CTA assigned for the communication. (See, e.g., INTEL-1005, 25, Figure 3-1, 56-57, INTEL-1003, ¶121.)

Because IEEE 802.15.3 is a wireless protocol, the Gilb-802.15.3 combination discloses a “*first portable client device to **wirelessly** communicate with a fixed location proximity-based reader device.*” (See INTEL-1005, 25; INTEL-1006, 8.)

b) Limitations [1A.2] and [1B]

In IEEE 802.15.3, the PNC “allocat[es] channel time” according to an allocation (scheduling) algorithm. (INTEL-1005, 66, 26; *see also*, INTEL-1005, 44, 167, 258; INTEL-1006, 173.) The PNC determines and assigns the CTAs in

response to CTRqs received from DEVs. (See, e.g., INTEL-1005, 35-36; INTEL-1006, 172.) The CTA allocations, CTA1-CTAn (where n is the maximum number of CTAs in the CTAP) can be considered a queue. (INTEL-1006, 11-12, Figure 2 (below); INTEL-1018, 2480 (referring to allocated CTAs as “queue”).) Lansford Figure A (below right) illustrates conceptually the CTA allocations in “Superframe #m” of 802.15.3 Figure 2 (below left). (INTEL-1003, ¶¶124-125; INTEL-1006, 117.)



802.15.3 Figure 2 (left), Lansford, Figure A (right)

The Gilb-802.15.3 combination discloses or suggests two allocation/scheduling techniques which each independently meets limitations [1A.2.] and [1B] under PO’s interpretation of the “*class associated with [device/user]*” term. First, IEEE 802.15.3 assigns a CTA based on the DEV’s power management (“PM”) status (“PM Status Allocation”). Second, IEEE 802.15.3 suggests allocation of CTAs based on QoS category (“QoS Allocation”).

(1) PM Status Allocations

(a) IEEE 802.15.3 PM Overview

IEEE 802.15.3 has “four power management modes”—ACTIVE, asynchronous power save (APS), device synchronized power save (DSPS), and piconet synchronized power save (PSPS). (INTEL-1005, 40; INTEL-1006, 14-15.) A DEV in ACTIVE mode “listen[s] to every beacon.” (INTEL-1005, 40.) In APS, the DEV “stops listening to beacons” and therefore “offers the best power saving.” (*Id.*, 41.) Synchronized power save (SPS) is a “power-save mode in which devices (DEVs) wake up regularly for the same beacon, called wake beacons, which occur at regular intervals.” (*Id.*, 303.) IEEE 802.15.3 defines two types of SPS modes: DSPS and PSPS. (*Id.*, 303.)

A DEV, when changing its PM status, informs the PNC of its PM mode through the PM Mode Change command. (INTEL-1005, 110-111.) Gilb does not include the format of the PM mode change command; 802.15.3 provides this disclosure. (INTEL-1006, 148, Figure 88 (below).) In this way, the PNC knows the current PM mode of each DEV when allocating/scheduling CTAs for a current or future superframe. (INTEL-1003, ¶127.)

octets: 1	2	2
PM mode	Length (=1)	Command type

Figure 88—PM mode change command format

(b) PM Status Allocations

802.15.3 specifies the “PNC should attempt to **allocate the CTAs of all SPS** [synchronized power save] DEVs **first in the superframe.**” (INTEL-1006, 172 (describing exceptions “to placing these allocations first”).) A POSITA would have understood this disclosure indicates the location of CTAs for SPS mode DEVs is the earliest available allocation in the CTAP (e.g., SPS DEVs are assigned to CTAs at the front of the CTA “queue”). (INTEL-1003, ¶129.)

Gilb explains the “goal in any power management strategy” is for “the DEV to turn off as many of its operations as possible for the longest period of time.” (INTEL-1005, 40.) Accordingly, a POSITA would have understood SPS mode CTAs are assigned to the earliest available slots in the CTAP so SPS mode devices can maximize the amount of time they are in a continuous SLEEP state during a superframe. SPS DEVs therefore have “*priority*” (i.e. have “a right to take precedence or proceed before” (*supra* §III.E.2; INTEL-1002, 441) over non-SPS devices based on their “*class*” (PM Mode). (INTEL-1003, ¶¶130-131.)

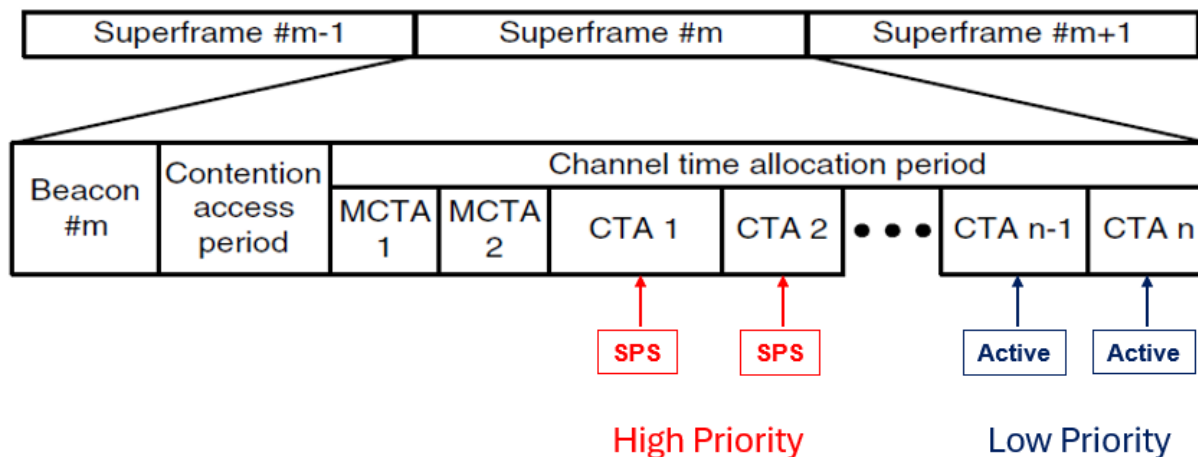
A POSITA would have understood for the PNC to assign CTAs to SPS DEVs “first in the superframe,” the PNC must access data identifying PM status (e.g., an indication of which DEVs are operating in SPS mode and which are not) and apply logic in the algorithm (a “rule”) that prioritizes identified SPS mode DEVs over non-SPS mode DEVs; thus, Gilb-802.15.3 provides “*priority level*

data.” (INTEL-1003, ¶132.) Indeed, Gilb-802.15.3 describes a message informing the PNC of any change in DEV PM status and also provides a DEV’s SPS set membership in the CTRq. (*See, e.g.*, INTEL-1005, 119; INTEL-1006, 139.) Gilb-802.15.3’s teachings and suggestions are consistent with the ’043 patent, which merely observes “priority level data” may be used to facilitate differentiation of class tiers, without prescribing any data form. (INTEL-1001, 16:10-27.)

Under PO’s interpretation, the “*class*” is the PM mode (SPS or non-SPS) of the CTA source and/or destination. (*See* §V.B.2.) The PM mode reflects the power management mode of the DEV and is therefore “*associated with [] the client device.*” (INTEL-1003, ¶134.) One or both of the source and destination DEVs identified in a CTA request may be operating in SPS mode. (*Id.*) Because an SPS mode device is in an AWAKE state only for the superframe when its designated wake beacon occurs (INTEL-1005, 41), a POSITA would have understood the PNC’s allocation/scheduling algorithm considers the PM mode of both the source and destination when allocating CTAs. (INTEL-1003, ¶134; INTEL-1005, 41 (“Because an 802.15.3 communications link is peer-to-peer, ... both the source and destination are awake at the same time so that they can exchange frames”); INTEL-1006, 145.)

The following annotations of 802.15.3 Figure 2 illustrate the allocation of CTAs between SPS and ACTIVE mode devices, with SPS mode devices receiving

CTA assignments earlier in the superframe than ACTIVE mode devices. (INTEL-1006, 12 (Figure 2); INTEL-1003, ¶135.)



802.15.3, Annotated Figure 2

Should the Board determine Gilb-802.15.3 does not explicitly disclose CTA allocation/scheduling based on an assigned DEV's PM status, a POSITA would have had a reasonable expectation of success in modifying Gilb-802.15.3's PNC to use such an allocation/scheduling algorithm, which was well within a POSITA's skill to program, and because time slot scheduling algorithms were known, as Gilb observes. (INTEL-1005, 93, 258; INTEL-1003, ¶136.)

Thus, "*first specified time slot*" (CTA-1) is assigned to a source/destination by the PNC, i.e., "*determine[ed] ... based on ... priority level data associated with a first class* (e.g., PM mode)" and, under PO's interpretation, the "*first class*" (SPS mode) is associated with the "*first portable client device*" (source and/or

destination DEV for CTA-1) [1A.2]-[1B] under PO’s interpretation. (INTEL-1003, ¶137.)

(2) QoS Allocation

Other than specifying that devices operating in SPS mode have higher priority CTA allocation, IEEE 802.15.3 leaves the CTA allocation algorithm details unspecified. (*See, e.g.*, INTEL-1005, 93, 258 (CTA allocation algorithm left as implementation function); INTEL-1006, 173.) Gilb, however, suggests a CTA allocation/scheduling algorithm based on QoS. (INTEL-1003, ¶138.)

IEEE 802.15.3 uses a hierarchical QoS “priority scheme”, defined by IEEE 802.1D and reproduced in Gilb Table 8-5⁸ below, for scheduling data transmission between peer devices. (*See* INTEL-1006, 277-280 (describing use of the 802.1D QoS scheme to classify data for transmission); INTEL-1005, 270.) This priority scheme “defines eight possible priority levels”, called “user priority” levels, associated “with seven defined traffic types” (the “QoS category”). (INTEL-1005, 270.) For example, voice telephony applications are given the highest priority⁹

⁸ Gilb’s Table 8-5 reproduces Table A.1 for 802.15.3. (INTEL-1006, 280.)

⁹ Priority 7 is designated for network control traffic which is not applicable to data transmissions between peer DEVs. (*See* INTEL-1006, 280; INTEL-1003, ¶141.)

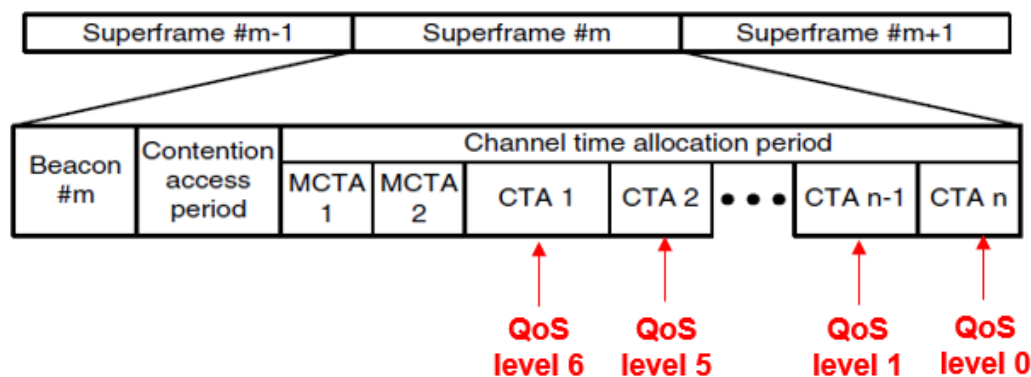
(priority 6). (See INTEL-1005, 16-17 (describing high priority audio applications).) Streaming multimedia applications are given lower priority (e.g., priority 3 or 5) because they have “often have more relaxed latency requirements.” (See INTEL-1005, 19-20.)

Table 8–5: IEEE Std 802.1D traffic types

User priority	Traffic type	Used for	Comments
0 (default)	Best effort (BE)	Asynchronous	Default level
1	Background (BK)	Asynchronous	–
2	–	Spare	Currently not assigned
3	Excellent effort (EE)	Isochronous	For valued customers
4	Controlled load (CL)	Isochronous	Traffic will have to conform to some higher protocol layer admission control
5	Video (VI)	Isochronous	< 100 ms delay and jitter
6	Voice (VO)	Isochronous	< 10 ms delay and jitter
7	Network control (NC)	–	–

Gilb notes that “[o]ne of the key issues in creating connections that support QoS is to map the requested bandwidth and latency into channel time and its repetition, i.e., the latency between allocations.” (INTEL-1005, 92.) Gilb stresses a “PNC with a good **CTA algorithm** will be able to better maintain **the QoS** in [the] piconet and to provide greater overall throughput.” (INTEL-1005, 258.) Based on this suggestion, a POSITA would have been motivated to integrate a CTA allocation/scheduling algorithm based on the QoS of data to be transmitted.

(INTEL-1003, ¶143.) Similar to how a DEV uses QoS to determine transmission priority, a POSITA would have been motivated to sort CTAs to be allocated by QoS priority, with highest QoS (level 6: isochronous voice) at the top/front, and continuing allocations down the CTA queue in order of descending QoS level (6 to 0)¹⁰, to ensure data requiring a higher QoS receives a “*time slot*” allocation. (*Id.*) The queue of CTA allocations determined by the PNC is mapped to the available positions in the CTAP, as illustrated below. (*Id.*)



802.15.3, Annotated Figure 2

A POSITA would have had a reasonable expectation of success modifying Gilb-802.15.3 to include a CTA allocation/scheduling algorithm that prioritizes

¹⁰ A POSITA would have also recognized the potential need to order CTAs in the same QoS level and would have understood techniques such as ordering by duration or time request was received would be applicable. (INTEL-1003, ¶143; *see* INTEL-1005, 258 (recognizing design considerations).)

based on QoS category, and the results would have been predictable. (INTEL-1003, ¶144.) Such a modification would have been compatible with the existing data structures of Gilb-802.15.3, whereby a DEV provides the QoS category of the data it needs to send in its CTRq. (See INTEL-1006, 139-140 (“Priority field” in the CTRq control field is defined by “Table A.1”).) Further, allocation/scheduling based on QoS level was known for the data transmission context. (INTEL-1003, ¶144.) Moreover, Zeng, a prior art paper, evidences QoS-based CTA allocation was a known technique already applied to IEEE 802.15.3 successfully. (See, e.g., INTEL-1018, 2480-81); *Novartis AG v. Torrent Pharms. Ltd.*, 853 F.3d 1316, 1327-28 (Fed. Cir. 2017). Zeng further builds on the basic notion of prioritizing CTA assignments by QoS category with a more complex algorithm that also reduces allocation wait time by reducing the CTA duration of low priority QoS traffic. (INTEL-1018, 2480-81; INTEL-1003, ¶144.)

In QoS allocation, under PO’s interpretation, the “*class*” is the QoS category (e.g., “voice”, “video”, “best effort”) and is associated with both the source and destination DEV endpoints for the data. (See §V.B.2; see also, e.g., INTEL-1006, 279 (data classified according to destination, source, and priority QoS scheme).) Indeed, PO has alleged a QoS category as a “*class*.” (INTEL-1015, 4.) Under PO’s interpretation, the “*class*” in the Gilb-802.15.3 combination is also associated with the user interacting with the application. (See §V.B.2.) Thus, under PO’s

interpretation, in the QoS allocation suggested by the combination of Gilb-802.15.3, “*the first class is associated with [device/user of the first portable client device]*” [1B]. (INTEL-1003, ¶¶145-146.)

The QoS category (a “*class*” under PO’s interpretation) is associated with a QoS priority level (the “*priority level data*”)—e.g., QoS level 6 is highest priority and QoS level 0 (“best effort”) is associated with the lowest priority. That is, the QoS allocation algorithm associates a “*class*” with “*priority level data*” under PO’s interpretation. As described above, the PNC arranges the CTA queue according to QoS priority level. Thus, under PO’s interpretation, “*first specified time slot*” (CTA1) is assigned to a source/destination by the PNC, i.e., “*determine[ed] ... based on ... priority level data associated with a first class (e.g., QoS level 6)*” and the *first class* is associated with the *first portable client device* (source or destination DEV for CTA-1) [1A.2]-[1B] under PO’s interpretation. (INTEL-1003, ¶147.)

3. Limitation [1A.1]

The Gilb-802.15.3 combination discloses “*determining a first specified time slot based on synchronization information wirelessly received by the first client device ...*” [1A.1] under PO’s interpretation of “*synchronization information.*” (INTEL-1003, ¶¶148-156.)

The PNC/DEV “operates as the arbitrator in assigning channel time” and “provides the timing reference for the piconet.” (INTEL-1005, 26.) It partially fulfills these roles through the IEEE 802.15.3 superframe’s “beacon”, illustrated below. (INTEL-1005, 26, 32, 33, Figure 3-5; *see also* INTEL-1006, 11, Figure 2 (below-top, IEEE 802.15.3 superframe), 108, Figure 11 (below-bottom, beacon frame); §VI.A.3.a.) All piconet DEVs “acquire synchronization through beacons from the PNC.” (INTEL-1006, 193.)

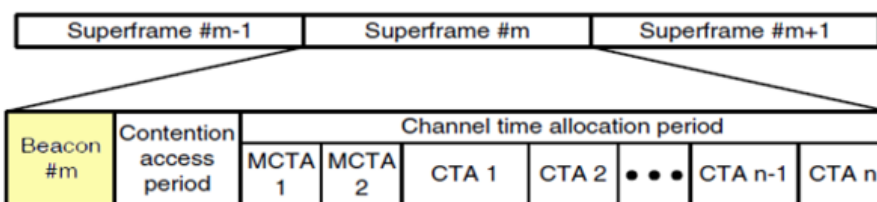


Figure 2—802.15.3 piconet superframe

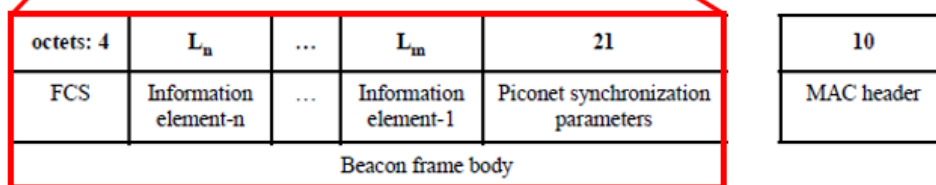


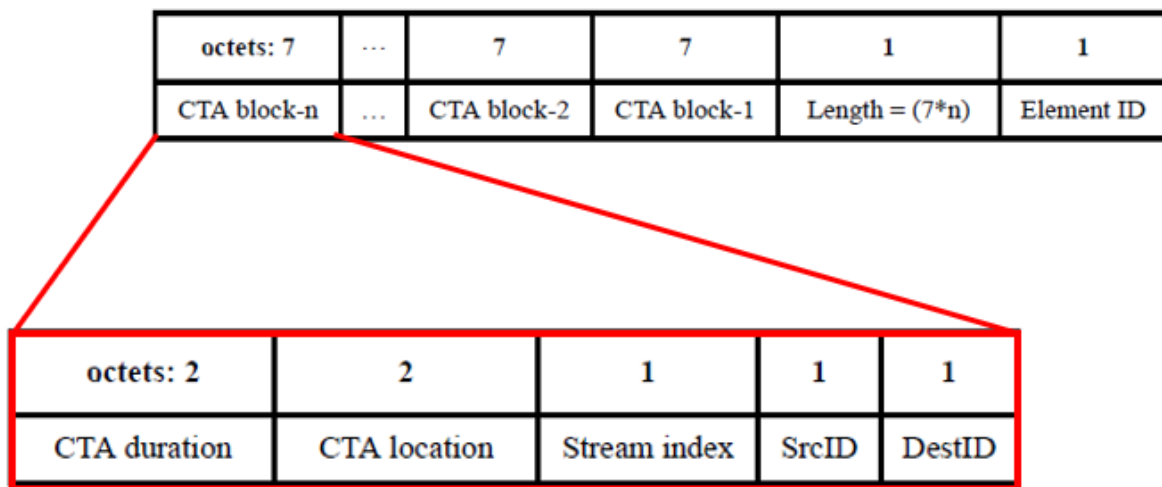
Figure 11—Non-secure beacon frame format

Gilb describes use of an IEEE 802.15.3 beacon, but does not provide details of its format; 802.15.3 does, specifying the beacon’s piconet synchronization parameters field “contains the information necessary to time-synchronize the DEVs in the piconet.” (INTEL-1006, 191, Figure 12 (below), 108.)

octets: 8	1	1	1	2	2	6
PNC address	PNC response	Piconet mode	Max TX power Level	CAP end time	Superframe duration	Time token

Figure 12—Piconet synchronization parameters field format

The beacon also includes a CTA IE having CTA block[s], “each of which has the **source**, **destination**, stream index, **start time**, and **duration** of the CTA.” (INTEL-1005, 53, 56-57, 103-104; INTEL-1006, 108, Figure 11 (above), 116-117, 191, Table 48, Figure 25¹¹ (CTA IE format), Figure 26 (CTA block format).)



802.15.3, Figure 25 (top), Figure 26 (bottom)

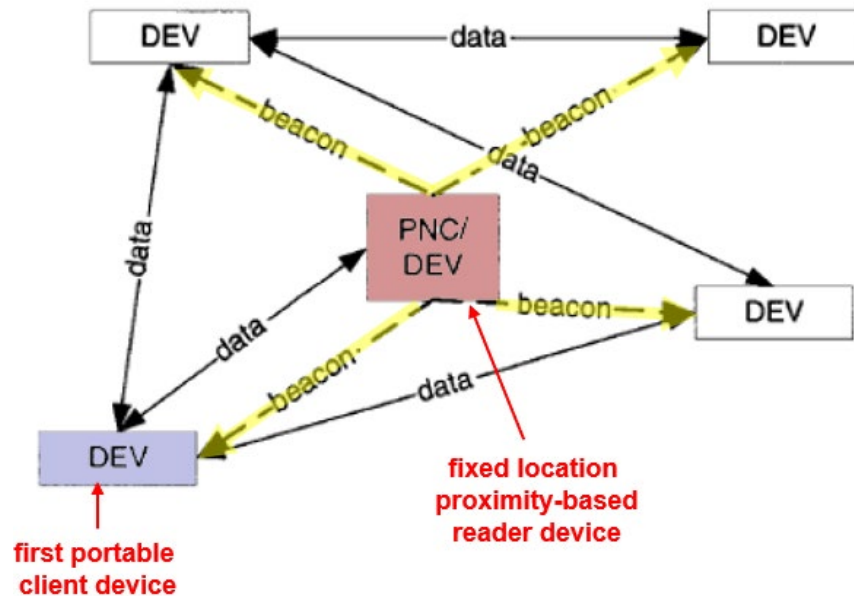
The CTA IE is used by piconet DEVs to determine when to transmit (for a source) or listen for transmissions (for a destination). (See INTEL-1005, 40 (“[i]f

¹¹ Gilb does not provide the CTA IE or CTA block formats; this information is provided by 802.15.3.

the DEV sees that it is not the source or destination of a particular CTA, it is not required to have its receiver active for that duration”), 59, 101; INTEL-1006, 178, 192 (“All of the DEVs ... shall use the beacon start time, CAP end time and the CTA IEs contained in the beacon to start their transmissions”).)

The 802.15.3 beacon therefore provides CTA (*“time slot”*) allocations for source and destination DEVs and provides information about frame structure and timing for all piconet DEVs. The beacon therefore is or includes *“synchronization information”* under PO’s interpretation of the term—“information assigning a time slot.” (See INTEL-1005, 26; §V.B.1; INTEL-1003, ¶154.)

As shown in Gilb’s Figure 3-1 below, DEVs in the piconet receive the beacon from the PNC. (INTEL-1005, 25, 56 (“The CTAs are communicated to the DEVs in the piconet via the CTA IE in the beacon.”); INTEL-1006, 192 (“Beacon reception”).) Because 802.15.3 is a wireless protocol, *“synchronization information [is] wirelessly received by”* the piconet DEVs, including the *“first portable client device”* [1A.1], in the beacon under PO’s interpretation of *“synchronization information.”* (INTEL-1006, 1, 3, 8; INTEL-1003, ¶155.)



Gilb, Annotated Figure 3-1

When a DEV has been assigned a CTA as a source, the DEV “shall use the beacon start time, CAP end time and the CTA IEs contained in the beacon to start their transmissions.” (INTEL-1006, 192.) Similarly, when a DEV has been assigned a CTA as a destination, the DEV uses the beacon start time, CAP end time, and CTA IEs contained in the beacon to turn on its receiver. (INTEL-1005, 40, 56, 101, 103-104); INTEL-1006, 192.) Thus, each DEV (*“portable client device”*) uses information in the beacon (*“synchronization information”*) to determine the specific CTA (*“time slot”*) assigned to it for transmission or reception, under the PO’s interpretation of *“synchronization information.”* (INTEL-1003, ¶156.) The Gilb-802.15.3 combination therefore discloses the *“first specified time slot”* is determined *“based on synchronization information*

wirelessly received by the first portable client device ...” [1A.1] under PO’s interpretation. (*Id.*)

4. Limitations [1D]/[1E]

The Gilb-802.15.3 combination discloses “*determining a change in network traffic*” [1D] and “*unassigning, responsive to the change in the network traffic, the first specific time slot to which the first portable client device is assigned to wirelessly communicate with a fixed location proximity reader based on the priority level data associated with the first class associated with one or more of the first portable client device and the user of the first portable client device*” [1E] under PO’s interpretation. (INTEL-1003, ¶¶157-166.)

As explained in §§VI.B.2.a-b, the Gilb-802.15.3 combination discloses “*the first portable client device*” is “*assign[ed]*” to “*the first specific time slot*” which is “*based on the priority level data associated with the first class ...*” in order “*to wirelessly communicate with a fixed location proximity-based reader device.*” (INTEL-1003, ¶158.)

A CTA (“*first specific time slot*”) allocated to a “*first portable client device*” is “*unassigned*” when the CTA allocation is terminated. A CTA allocation can be terminated when a DEV disassociates from the piconet or when the CTA is deallocated by either the source DEV or the PNC. (INTEL-1003, ¶¶159-166.)

a) Disassociation

The PNC disassociates a device from the piconet if it does not receive traffic from that device (i.e., if it does not successfully send a frame to the PNC) during a predetermined period (the “association timeout period (ATP)). (INTEL-1005, 35; INTEL-1006, 168.) That is, the PNC determines it has not received traffic from a DEV within a predetermined time period—i.e., “*determine[es] a change in network traffic*” [1D]. (INTEL-1003, ¶¶160-161.)

An existing CTA allocation is terminated when a DEV disassociates. (*See, e.g.,* INTEL-1006, 168 (PNC “shall perform the stream termination procedures for each of the assigned CTAs with the disassociated DEV as the SrcID or DestID”), 186-187 (terminating CTA allocations for isochronous stream); INTEL-1005, 36 (terminating isochronous allocation), 91 (terminating asynchronous allocations.) Therefore, the CTA assigned to a disassociated device (“*first specific time slot*”) is “*unassign[ed], responsive to the change in the network traffic*” [1E]. (INTEL-1003, ¶162.)

b) Deallocation

(1) DEV Requested

IEEE 802.15.3 supports both asynchronous and isochronous traffic. (*See, e.g.,* INTEL-1005, 35-36, 270.) Gilb describes an asynchronous CTRq made for “channel time that will be allocated whenever the PNC is able to fit it into the superframe.” (INTEL-1005, 36.) When a DEV “needs channel time on a regular

basis”, e.g., for voice or video traffic, “it makes a request from the PNC for isochronous channel time.” (INTEL-1006, 12; INTEL-1005, 92, 270 (Table 8-5 (listing isochronous traffic types), 16-22 (describing applications having isochronous traffic).)

A “source, destination, or PNC may terminate” an “existing isochronous allocation” and the source or PNC “may terminate an asynchronous allocation.” (INTEL-1005, 36, 88; INTEL-1006, 12, 186-188.) Although not explicit, a POSITA would have understood that a source terminates a CTA allocation when it determines it no longer has traffic to send. (INTEL-1003, ¶164; *see also* INTEL-1006, 12.) That is, the source “*determin[es] a change in network traffic*” [1D] (e.g., it no longer has traffic to send). As discussed in §VI.B.2.a, the PNC may be the source or destination DEV. In the latter scenario, the PNC also “*determin[es] a change in network traffic*” from “receiving a Channel Time Request command from [the source] DEV requesting stream termination.” (INTEL-1006, 186; INTEL-1003, ¶¶163-164.)

The “PNC always grants the termination request” if the “allocation exists”, the requesting DEV “is a valid member of the piconet” and “the requesting DEV is either the source or destination of the allocation.” (INTEL-1005, 36.) Therefore, the CTAs are “*unassign[ed], responsive to the change in the network traffic.*” (INTEL-1003, ¶165.)

(2) PNC Handover

Gilb explains that during operation of the piconet, a PNC may determine that it “should hand over control of the piconet” to a new DEV. (INTEL-1005, 66-67.) If the new PNC cannot support all the CTRqs handed over by the old PNC, “it will terminate the streams of the allocations that it is unable to serve.” (INTEL-1005, 67.) That is, the new PNC determines the new, reduced level of network traffic—i.e., “*determine[es] a change in network traffic*” [1D]. As a result of this determination of the change in network traffic, the PNC “*unassign[s]*” the CTA (“*first specific time slot*”) allocated to the “*first portable client device*.” (INTEL-1003, ¶166.)

C. Dependent Claims

1. Claim 2

The Gilb-802.15.3 combination discloses “*assigning a second specific time slot to the first portable client device, the second specific time slot set according to the first class*” under PO’s interpretation of “*class*.” (INTEL-1003, ¶¶167-170.)

Gilb teaches that IEEE 802.15.3 “allows a DEV to request allocations that control the latency of its data transmissions,” such as a CTRq requesting an allocation “multiple times in a superframe” (i.e., a “super-rate allocation”). (INTEL-1005, 292, 35, 62.) Gilb suggests applications requiring super-rate allocations for isochronous traffic such as the game console/router application, stating “[i]nsufficient bandwidth or too much latency can make or break a

product.” (INTEL-1005, 35-36; *see also* 16-17 (“If the DEV wanted to have lower latency, it could request ... a super-rate allocation.”) Thus, the PNC “*assigns*” both “*the first specific time slot*” to the “*first portable client device*” and “*a second specific time slot*” to the “*first portable client device*.” (INTEL-1003, ¶168.)

Additionally, Gilb-802.15.3 suggests a “*first portable client device*” that remains associated with the piconet (e.g., after its “*first specific time slot*” assignment was terminated upon its request, *see* §§VI.B.1, 3) could be assigned a “*second specific time slot*” in a future superframe. (INTEL-1006, Figure 2, 12; INTEL-1003, ¶169.)

For the reasons discussed in §VI.B.2.b, Gilb-802.15.3 discloses “*the second specific time slot [is] set according to the first class*” under PO’s interpretation. (INTEL-1003, ¶170.)

2. Claim 3

The Gilb-IEEE 802.15.3 combination discloses “*the first specified time slot and the second specified time slot are on different wireless channels*.” (INTEL-1003, ¶¶171-176.)

As discussed in §VI.B.1, the IEEE 802.15.3 “piconet is a **wireless** ad hoc data communications system.” (INTEL-1006, 8.) To start a piconet, a PNC-capable DEV scans the available channels, and if it finds a clear channel, starts the piconet by broadcasting its beacon. (INTEL-1005, 31, 66; INTEL, 1006, 9.) The frequency

“*channels*” used by the piconet are “*wireless channels*.” (INTEL-1003, ¶173.) A POSITA would further understand that different frequency channels are different “*wireless channels*.” (INTEL-1005, 132 (“the current PHY uses frequency-based channelization”); INTEL-1006, 243, Table 70 (“2.4 GHz PHY channel plan”).)

Both Gilb and 802.15.3 describe a PNC can change the channel of a piconet “[t]o overcome the problems due to overlapping piconets and interference in a given channel.” (INTEL-1006, 149; INTEL-1005, 40.) For example, “[i]f the PNC determines that the channel is getting too much interference, it searches the other channels to find one that has a lower level of interference” and “[i]f the PNC finds a channel with less interference, then the PNC moves the piconet to a quieter channel.” (INTEL-1005, 273; *see also*, INTEL-1006, 205.)

When “the PNC has decided to change the piconet’s PHY channel, it places the Piconet Parameter Change IE in the beacon with the new channel number and beacon number of the first beacon that will be sent on the new PHY channel.” (INTEL-1005, 133; INTEL-1006, 202-203, 205.) A “*first specified time slot*” assigned before the channel switch is on a first “*wireless channel*.” (INTEL-1003, ¶175.) When the PNC changes channels, subsequent CTA assignments (“*second specified time slot*”) are placed on the new, second “*wireless channel*.” (*Id.*, INTEL-1005, 132-133; INTEL-1006, 205-206.)

3. Claim 4

The Gilb-IEEE 802.15.3 combination discloses “*determining a second change in the network traffic, and assigning, responsive to the second change in network traffic, a second specific time slot to the first portable client device according to the first class*” in two ways. (INTEL-1003, ¶¶177-180.)

First, when the “*first portable client device*” has data to send, “it makes a request from the PNC” for channel time (INTEL-1005, 35-36, 92, 270 (Table 8-5 (listing traffic types), 16-22 (describing applications and their traffic types).) A POSITA would have therefore understood that the “*first portable client device*” needs channel time when it has traffic, e.g., isochronous or asynchronous, to transmit. (INTEL-1003, ¶178.) That is, the “*first portable client device*” “*determin[es] a second change in the network traffic*” (i.e., DEV has new network traffic to transmit). Under PO’s interpretation, a new CTA (e.g., “*a second specific time slot*”) is assigned “*to the first portable client device according to the first class*” for exchange of the new traffic. (See §§VI.B.2.a-b.)¹²

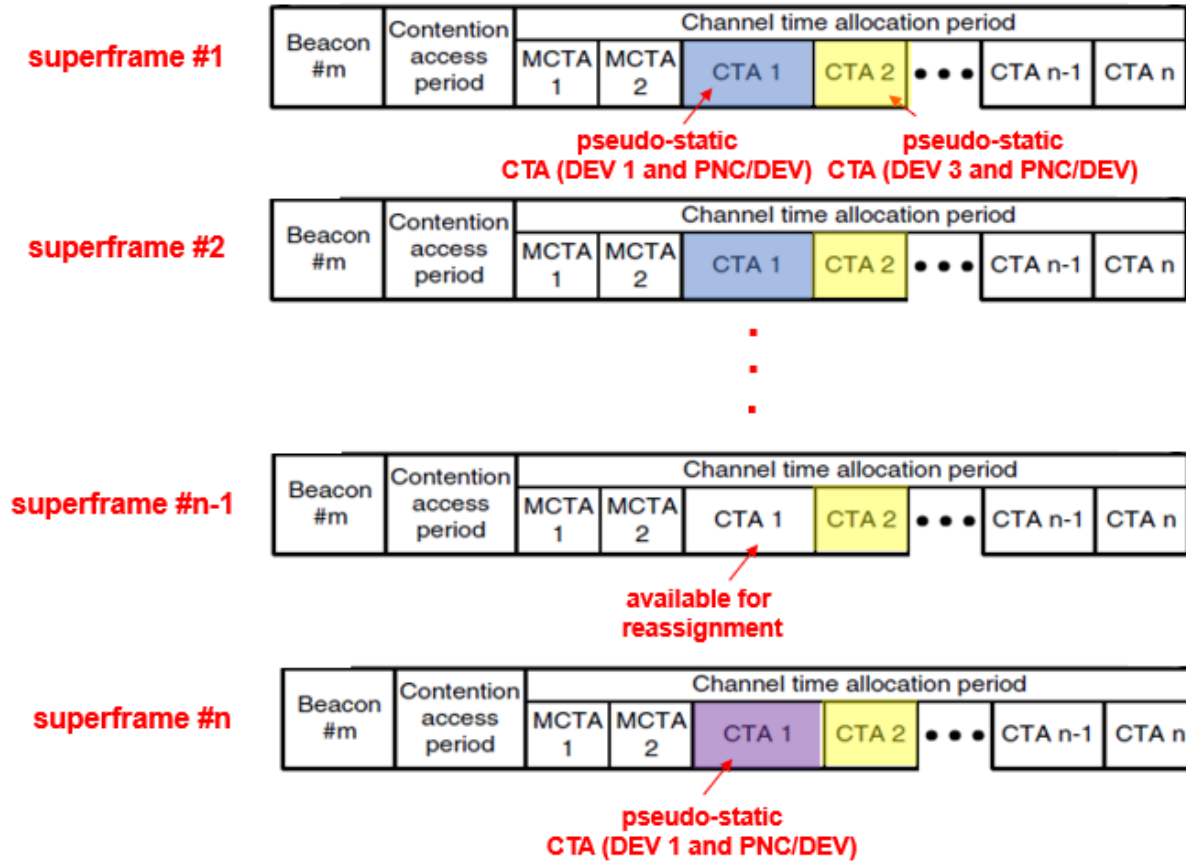
¹² A previously disassociated DEV can rejoin the piconet through the association process. (INTEL-1005, 70 (DEV re-authorized once “it rejoins the piconet”); INTEL-1006, 164-66).)

Second, 802.15.3 explains a PNC assigns time slots “based on the current pending requests from all the DEVs and the currently available channel time” (i.e., available time slots). (INTEL-1006, 173.) As discussed in §VI.B.4.b.ii, because the new PNC was oversubscribed, the new PNC unassigned the “*first specific time slot*” previously allocated “*to the first portable client device.*” (INTEL-1005, 67, 71-72, 89.) When a time slot opens up (“*a second change in the network traffic*”), the PNC assigns an available CTA (e.g., “*second specific time slot*”) “*to the first client device.*” (INTEL-1006, 173 (PNC assigns time slots “based on the current pending requests from all the DEVs and the currently available channel time”); INTEL-1005, 89; INTEL-1003, ¶180.) A new CTA (e.g., “*a second specific time slot*”) is therefore assigned “*to the first portable client device according to the first class*” for exchange of new traffic, under PO’s interpretation. (See, §§VI.B.2.a-b.)

4. Claim 5

Claim 5, depends from claim 4, and recites “*determining a third change in the network traffic; and reassigning the first specific time slot to the first client device responsive to the third change in the network traffic.*” The Gilb-802.15.3 combination discloses this in two ways. (INTEL-1003, ¶¶181-186.)

First, as discussed in §VI.B.4, the “*first specific time slot*” is “*unassigned*” when a termination request is received from the source DEV. The “*first specific time slot*” is then available for reallocation, as shown in Lansford Figure B.



Lansford, Figure B

As discussed in §VI.C.3, when a source DEV has data to transmit, “it makes a request from the PNC” for channel time (INTEL-1006, 12; INTEL-1005, 92, 270, 16-22); the source DEV and/or PNC thereby “*determin[e] a third change in the network traffic*” (the DEV has traffic to send).

In 802.15.3, when allocating CTAs (e.g., for isochronous CTRqs), “[i]f the Available Number of” time units (‘TUs’) assigned to the ‘requested isochronous stream’ is greater than or equal to the Minimum Number of TUs requested and less than or equal to the Desired Number of TUs requested”, the CTA is assigned to the

request (i.e., the requested “*time slot*” fits within the available CTA). (See INTEL-1006, 141.) However, if the “Available Number of TUs” is “less than Minimum Number of TUs requested”, the requesting DEV is informed the “PNC is unable to fulfill the DEV’s request.” (*Id.*) Here, “the Available Number of TUs will be set by the PNC to the number of TUs that the PNC would have been able to allocate for this request.” (*Id.*) The requesting DEV can then “modify its original request parameters” (i.e., make a request that “fits within” the available CTA). (INTEL-1006, 181; INTEL-1003, ¶184.)

These disclosures teach or suggest to a POSITA that a CTA (“*first specific time slot*”) originally assigned to the “*first portable client device*,” which is deallocated is “*reassigned*” to the “*first portable client device*”, as illustrated in Lansford Figure B above, when it requests a CTA matching the duration of the *first specific time slot* that it had been assigned. (INTEL-1003, ¶185.) A POSITA would have understood that a DEV would periodically have isochronous voice or video traffic to transmit in video streaming applications, two-way voice applications (e.g., chat during game), audio streaming or have asynchronous data to transmit, e.g., in gaming applications between a controller and game console/router. (See INTEL-1005, 18-22.)

Second, a new PNC may subsequently hand back control of the piconet to the original PNC/DEV. (See INTEL-1005, 66-67.) As discussed in §VI.B.4.b.ii,

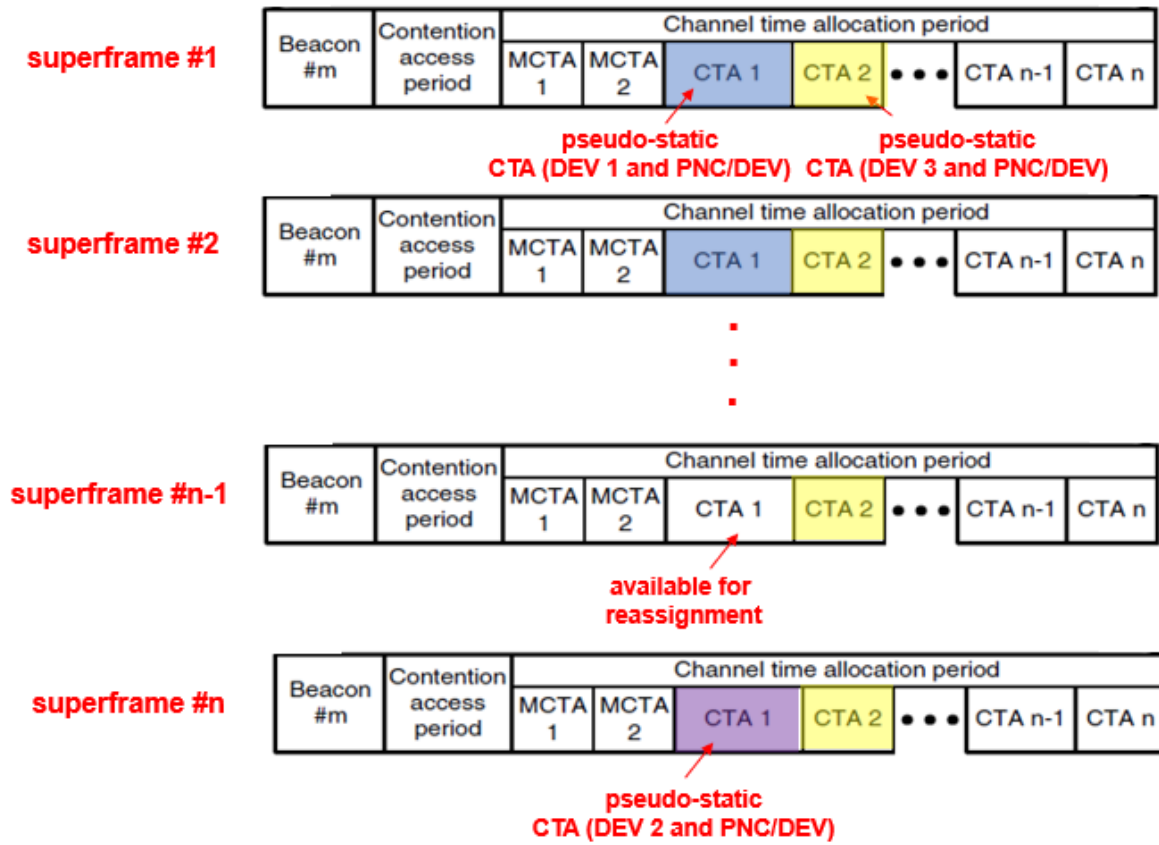
the new PNC cannot support all the CTRqs handed over by the old PNC. (INTEL-1005, 67, 71-72.) That is, the original PNC could handle more network traffic than the new PNC. (INTEL-1003, ¶186.) Thus, because the original PNC/DEV can handle more streams, the original PNC can “*reassign*” its CTAs, including the “*first specific time slot to the first client device.*” (INTEL-1003, ¶186.)

5. Claim 8

The Gilb-802.15.3 combination provides “*reassigning the first specific time slot to a second client device in response to a detection that the first client device is unavailable.*” (INTEL-1003, ¶¶187-191.)

Gilb discloses a DEV “ceases to be a member of the piconet because it requests to leave, the PNC tells it to leave, or through inactivity in the piconet;” termination of the DEV’s piconet membership is accomplished through disassociation. (INTEL-1005, 35, 41, 79-80; *see also* INTEL-1006, 168.) Gilb elaborates a DEV “leaving the piconet,” such as when out of range of the PNC, triggers disassociation. (INTEL-1005, 79-80; *accord* INTEL-1001, 15:60-63 (“once a specific client exits the network, previously reserved time slots of that client may be reassigned to one or more other client devices”).) When a DEV leaves (exits) the piconet, it is “*unavailable*” for receiving/transmitting data within the piconet. (INTEL-1003, ¶188; INTEL-1006, 11 (only associated DEVs can participate in piconet).)

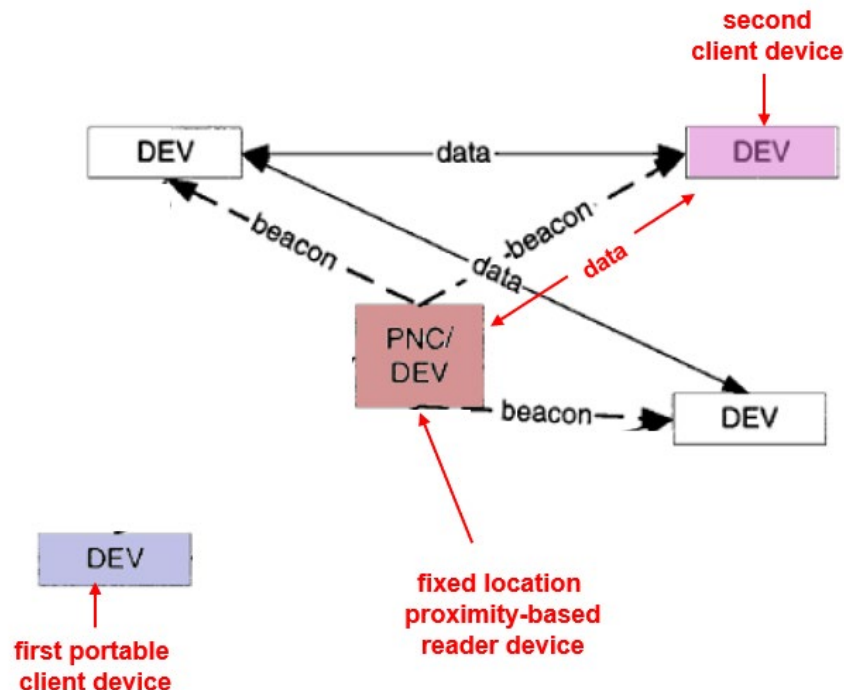
As discussed in §VI.B.4, an existing CTA allocation is terminated in IEEE 802.15.3 when a DEV disassociates. (See, e.g., INTEL-1006, 168, 186-187; INTEL-1005, 36, 91.) A POSITA would have understood when a CTA allocation (“*first specific time slot*”) to the “*first client device*,” such as a pseudo-static CTA for isochronous data, is terminated, the “*first specific time slot*” associated with that CTA is available for reallocation to a different source/destination DEV pair. (INTEL-1003, ¶189; INTEL-1006, 172 (“the PNC may reuse the old [pseudo-static] allocation for another pair of DEVs”); see §VI.A.4).) This is illustrated in Lansford, Figure C showing the pseudo-static allocation of CTA-1 terminated and becoming available in superframe #n-1. (INTEL-1003, ¶189.)



Lansford, Figure C

As discussed in §VI.B.4, the PNC assigns CTAs “based on the current pending requests from all the DEVs and the currently available channel time within the CTAP.” (INTEL-1006, 173.) Another device (“*second client device*”) having data to receive or send, such as in annotated Gilb, Figure 3-1 below (INTEL-1005, 25), requires a CTA assignment. As explained by 802.15.3, when allocating CTAs for isochronous CTRqs, “[i]f the Available Number of” time units (‘TUs’) assigned to the ‘requested isochronous stream’ is greater than or equal to the Minimum Number of TUs requested and less than or equal to the Desired

Number of TUs requested”, the CTA is assigned to the request (i.e., the requested “time slot” fits within the available CTA). (See INTEL-1006, 141.) However, if the “Available Number of TUs” is “less than Minimum Number of TUs requested”, the requesting DEV is informed the “PNC is unable to fulfill the DEV’s request.” (*Id.*) There, “the Available Number of TUs will be set by the PNC to the number of TUs that the PNC would have been able to allocate for this request.” (*Id.*) The requesting DEV can then “modify its original request parameters” (i.e., make a request that “fits within” the available CTA). (INTEL-1006, 181.) That is, the “second client device” has a CTA request that matches the duration of unassigned CTA-1. (INTEL-1003, ¶190.)



Gilb, Annotated Figure 3-1

These disclosures teach or suggest to a POSITA a CTA (*“first specific time slot”*) originally assigned to the *“first client device,”* which is deallocated is *“reassigned”* (i.e., reallocated) to a new source/destination pair (i.e., pair including a *“second client device”*), as illustrated in Lansford Figure C above, when the PNC has a request for a CTA matching the duration of the *first specific time slot* that had been assigned to the now disassociated, unavailable *first client device*. (INTEL-1003, ¶191.)

6. Claim 9

The Gilb-802.15.3 combination discloses *“determining that the first client device should switch to a different channel; and sending a message to the first client device and the first client device, responsive to receiving the message, switching the channel upon which the first client device wirelessly communicates with a fixed location proximity-based reader device.”* (INTEL-1003, ¶¶192-195.)

As discussed in §VI.C.2, the PNC determines whether to change the piconet’s channel, and therefore *“determin[es] that the first client device should switch to a different channel.”* (INTEL-1003, ¶193.)

The PNC communicates the change of channel in the “Piconet Parameter Change IE,” included in the beacon. (INTEL-1005, 132; INTEL-1006, 202-203, 116, 108.) The beacon frame including the CTA IE and Piconet Parameter Change

IE therefore includes “*a message*”¹³ sent “*to the first client device.*” (See INTEL-1005, 128 (“Whenever the PNC changes one of these key characteristics of the piconet, it uses the Piconet Parameter Change IE to communicate the upcoming change to the members of the piconet.”).) Specifically, “[o]nce the PNC has decided to change the piconet’s PHY channel, it places the Piconet Parameter Change with the **new channel number** and the beacon number of the first beacon that will be sent on the new PHY channel.” (INTEL-1005, 133.) Gilb does not provide the format of Piconet Parameter Change IE. This information is provided by 802.15.3, Figure 33:

octets: 6–32	2	2	1	2	1	1	1
BSID	PNID	Superframe timing	New channel index	Change beacon number	Change type	Length (=14-40)	Element ID

Figure 33—Piconet parameter change information element format

(INTEL-1006, 119.) The “Change type” field “indicates the parameter of the piconet that is changing and, therefore, the field that shall be interpreted by the DEV.” (INTEL-1006, 119.) A change type field value of “4” indicates the “New

¹³ The beacon includes synchronization information, under PO’s interpretation, as discussed in §VI.B.2.c. When the Piconet Parameter Change IE is included in the beacon, it also includes a message that commands the DEVs in the piconet to change the channel. (INTEL-1003, ¶194.)

channel index” as the “field that shall be interpreted by the DEV.” (INTEL-1006, 119.) The “New channel index” indicates the PHY channel to be used by the piconet, and in turn, by the “*first client device.*” (INTEL-1006, 120.)

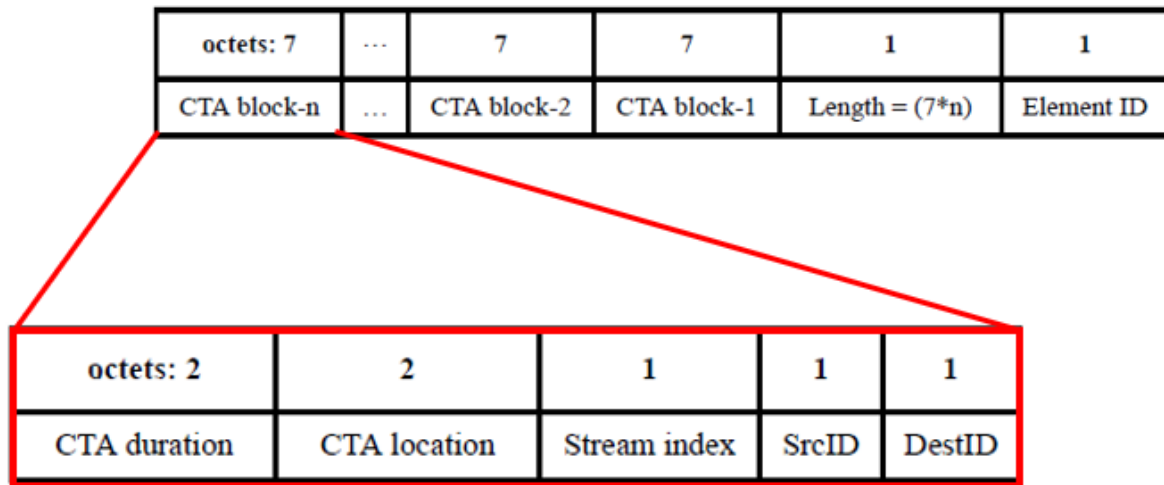
The Gilb-802.15.3 combination discloses “*the first client device, responsive to receiving the message, switching the channel upon which the first client device wirelessly communicates with a fixed location proximity-based reader device*” (See INTEL-1005, 132-133 (describing need to ensure DEVs and PNC “have enough time to switch channels”).) The channel is then used by members of the piconet to communicate with the PNC/DEV and other DEVs as discussed in §§VI.B.1-2.

7. Claim 10

The Gilb-802.15.3 combination discloses “*the message includes information identifying the first client device, information identifying the fixed location proximity-based reader device, a designation of a channel and a command to switch to the designated channel.*” (INTEL-1003, ¶¶196-199.)

As discussed in §VI.C.6, the beacon frame which includes a CTA IE and a Piconet Parameter Change IE includes the “*message*”. (See INTEL-1006, 108, Table 48.) Because the client device communicates with the reader (PNC/DEV) as discussed in §VI.B.2.a, the beacon contains a CTA IE identifying the PNC/DEV and the DEV as the endpoints for the CTA and therefore the CTA IE includes “*information identifying the first client device*” and “*information identifying the*

fixed proximity-based reader device.” (INTEL-1005, 56-57; INTEL-1006, 117, Figure 25 (CTA IE format), Figure 26 (CTA block format).) Figures 25-26, below, show the CTA IE and CTA block formats:



802.15.3, Figure 25 (top), Figure 26 (bottom)

The Piconet Parameter Change IE, described in §VI.C.6, contains a “*designation of a channel*” and a “*command to switch to the designated channel.*” The “change type” field indicates a change to the channel when the value is set to “4,” and the “New channel index” contains the “channel index of the PHY channel that the piconet will begin using,” i.e, a “*designation of a channel.* (802.15.3, 120; *see also* §VI.C.6.) The “Change beacon number” field provides “the beacon number of the superframe when the change will take effect,” which indicates “a *command to switch to the designated channel.*” (INTEL-1005, 132; INTEL-1006, 119, 205; *see also* §VI.C.6.)

8. Claim 11

The Gilb-802.15.3 combination discloses “*the determination to switch to the different channel is dependent on at least one of a user associated with the first client device, a class of a user associated with the first client device, a class of the first client device, and a network traffic load in the system.*” (INTEL-1003, ¶¶200-201.)

The PNC periodically listens to the current channel to detect the “presence of other 802.15.3 piconets.” (INTEL-1006, 204.) If the PNC detects another piconet operating on the channel, the “PNC may change channels to one that is unoccupied.” (INTEL-1006, 205; INTEL-1005, 40.) That is, the presence of another 802.15.3 piconet operating on the same channel is an indication of “*network traffic load in the system.*”

VII. Ground 2: Gilb-802.15.3-Ward Combination Renders Claims 1-5, 8-11 obvious.

The Gilb-802.15.3-Ward combination renders the challenged claims obvious under the correct construction of “*class associated with [device/user]*” and under PO’s interpretation of “*synchronization information.*”

A. Combination Overview

1. Ward

Ward, like Gilb and 802.15.3, is directed to techniques for providing time slot assignments. (INTEL-1007, 4-5 (providing “a time-division multiplex

communication system comprising a scheduler for scheduling a plurality of messages for transmission.”)) Ward describes various applications for these time slots, including location tracking systems (where users receive time slots to provide location updates) and stock price update systems (where users receive stock price updates in assigned time slots). (INTEL-1007, 4-5, 12-13.) In particular, Ward describes prioritizing time slot assignments for certain users over others based on (1) users paying more to receive more frequent or immediate stock updates and/or (2) priority request messages sent from a user to the coordinator (scheduler). (INTEL-1007, Abstract, 12-13.)

In one example of Ward’s stock price update application, users can pay more to be placed in a higher “level of subscription.” (*Id.*, 12.) Users are prioritized by receiving time slot assignments **more often** than users in a lower subscription level—e.g., higher priority users receive stock price updates every few seconds, whereas lower priority users receive updates every few minutes. (*Id.*; INTEL-1003, ¶206.) In another example, users can pay more for a premium service where they receive **immediate** notifications when certain events occur, such as when one of their stocks falls below a threshold price. (INTEL-1007, 12-13.)

2. Motivation to Combine

As discussed in §VI.B.2.b, Gilb-802.15.3 teaches prioritizing time slot assignments according to PM mode (and suggests QoS-based allocation), but

expressly contemplates the use of alternative, and more complex, techniques. (INTEL-1005, 93 (noting “there are undoubtedly many good algorithms” but no one was sufficiently acceptable to warrant adoption in the standard), 258 (standard setting “[g]roup wanted to keep the CTA algorithm as an implementation dependent function” because “[t]he ‘correct’ algorithm depends on the type of traffic that the PNC expects to support, the level of complexity that can be supported by the price of the implementation, and so on.”); INTEL-1006, 173.) A POSITA would be motivated to use the teachings of Ward to prioritize users who pay more to receive more/better services. (INTEL-1003, ¶¶207-219.) Prioritizing based on device PM mode or type of data (QoS) does not allow users to pay more to get faster or more service—time slots depend on the device PM mode or data the user is sending, rather than who the user is. Ward’s subscription/premium service options, allow users to pay more to get better or more service. By incorporating Ward’s teachings, a POSITA assigning time slots using Gilb-802.15.3 could offer higher-level/premium subscribers **more** and/or **immediate** time slots for higher subscription/premium fees.¹⁴ For example, users could pay more to receive

¹⁴ It would have been well within a POSITA’s skill to implement an allocation algorithm based on several criteria, such as applying Ward’s prioritization to order CTAs associated with the same PM mode or QoS level.

immediate notification when a significant stock price drop occurs. (INTEL-1007, 12-13.) Gilb-802.15.3-Ward would have been obvious for the reasons below.

Ward—like Gilb-802.15.3—is analogous art to the challenged claims, as it is in the same field as the challenged claims (network, encompassing wireless, communication) and is directed to solving the same purported problems addressed in the '043 patent (structuring communications between devices in a network). (INTEL-1007, 1, 4-5 (describing wireless TDMA systems), 12-13 (allocating time slots based on user subscription-based levels and premium services).) A POSITA would have been motivated to make this combination for multiple reasons.

First, combining Ward with Gilb-802.15.3 allows for increased revenues by offering faster or more service to specific users or tiers of users in exchange for higher fees. As discussed above and in §VI.B.2.b, aside from prioritizing time slots for SPS mode devices and suggesting prioritization schemes based on type of data (QoS), Gilb-802.15.3 otherwise leaves the selection of an appropriate time slot assignment algorithm to the implementer. Allocating time slots based on PM mode or type of data does not allow a provider to charge different fees to users who want more or less service. Ward, however, allows the implementer to charge more or

(INTEL-1003, ¶207; *see* INTEL-1005, 258 (recognizing differing levels of complexity possible in allocation algorithms).)

less depending on the user's service selection. This allows the provider of the Gilb-802.15.3 system to charge more to users who want more time slots and/or immediate service. (*Id.*; INTEL-1003, ¶209.) Conversely, users who do not want more time slots or immediate service can pay less. (*Id.*; INTEL-1007, 12-13.) A POSITA would thus recognize that using Ward's teachings would allow more revenue generating opportunities. (INTEL-1003, ¶209.)

Second, the references themselves provide a motivation to combine. Gilb specifically refers to the use of IEEE 802.15.3 networks for revenue generation, such as for a photo kiosk, set-top box video distribution, and other applications. (INTEL-1005, 14, 18-24, 156.) Ward expressly states its subscription levels and/or premium options allow greater revenue generation, for example in applications relating to stock price updates. (INTEL-1007, 12-13; INTEL-1003, ¶210.) Moreover, as discussed above, Gilb-802.15.3 expresses the need for other application-dependent time slot allocation techniques, and Ward provides a suitable technique for systems like stock price update services that "may be employed in any time division multiplex system." (INTEL-1005, 93, 258; INTEL-1006, 173; INTEL-1007, 11; INTEL-1003, ¶210.)

Third, Gilb suggests motivation to use an additional allocation/scheduling algorithm when the PNC has allocated all time slots (i.e., an overflow scenario). In that case, Gilb explains the PNC stores pending requests without allocating time

slots, and then allocates time slots from that list of pending requests when time slots become available. (INTEL-1005, 36, 89, 91-92; INTEL-1006, 189.) In these circumstances, a POSITA would have been motivated to use Ward's teaching to prioritize messages for certain subscription level or premium service users over others as a way to determine which messages should be transmitted first. (INTEL-1003, ¶211.)

Fourth, the Gilb-802.15.3-Ward combination applies a known technique (Ward's user-based prioritization) to improve similar systems (the Gilb-802.15.3 piconet) in the same way (by supplying an additional criteria for assigning time slots). (INTEL-1003, ¶212.)

Fifth, a POSITA would have had a reasonable expectation of success combining the teachings of Ward with Gilb-802.15.3 and the results of the combination would have been predictable. A POSITA would have recognized Ward's allocation algorithm is compatible with the data structures of IEEE 802.15.3. For example, Ward's prioritized time slots could be assigned using the existing CTA block fields of Gilb-802.15.3, including the appropriate source and destination identifiers. Moreover, a PNC could be provided with Ward's user information (e.g., subscription level) through initial setup procedures or by using

existing techniques in Gilb-802.15.3.¹⁵ For example, the Gilb-802.15.3 combination discloses a process for a DEV to inform a PNC of its capabilities when it joins the network, including a field reserved for the piconet implementer to provide additional relevant information not already specified. (INTEL-1005, 74-75; INTEL-1006, 122, Figures 39, 49.) A POSITA would have therefore known to include information such as a DEV's subscription level and/or premium service subscription status in that reserved field. (INTEL-1003, ¶¶213-215.)

A POSITA would have also expected success because Gilb provides example applications for the 802.15.3 piconet similar to Ward's stock price update service. Gilb discloses similar content delivery systems, including set top boxes and game consoles. (INTEL-1005, 18-22; INTEL-1003, ¶¶216-219.)

A POSITA would have further understood the PNC would need to refer to data used to implement prioritized time slot assignments. For example, a PNC would refer to data such as a rule or criteria determining which users would be prioritized over others (e.g., a higher subscription level should receive more time

¹⁵ Neither the '043 Patent nor Ward disclose how the relevant coordinator node learns of information relevant to prioritization of devices, confirming determining how to provide such information would have been well within the level of ordinary skill. (INTEL-1003, ¶213.)

slots than a lower one, and/or that premium service investors should receive stock crash updates in the next available time slot). Likewise, a POSITA would have known the PNC would refer to data associating each user/DEV with their associated subscription level (e.g., higher or lower) and/or whether each user/DEV is subscribed to the premium service, such as a list associating DEVs with user subscription level and/or premium subscription status. (INTEL-1003, ¶218.) These changes would have been well within the level of ordinary skill in the art,¹⁶ would not impose a significant burden on the PNC, and the costs of any such changes would be offset by the opportunity for revenue generation. (INTEL-1003, ¶219.)

B. Claim 1

1. Preamble [1P]/[1A.1]/[1C]/[1D]

For the reasons discussed in §§VI.B.1, VI.B.2.a, VI.B.3-4, the Gilb-802.15.3-Ward combination discloses [1P] and limitations [1A.1], [1C], and [1D].

2. “Class” Limitations [1A.2]/[1B]/[1E]

Under the correct construction of the “*class associated with [user/device]*”—“plain and ordinary meaning in which the class is associated with the client device or user of the client device, **not data items or network**

¹⁶ Neither the ’043 Patent nor Ward describes what data the relevant coordinator node uses to implement prioritization, confirming incorporating such data would have been well within the level of ordinary skill. (INTEL-1003, ¶219.)

characteristics”—the Gilb-802.15.3-Ward combination renders obvious limitations [1A.2], [1B] and [1E]. (See §V.B.2.)

The Gilb-802.15.3-Ward combination applies Ward’s teaching of assigning time slots based on user subscription level and/or premium service subscription in a time slot allocation algorithm of the Gilb-802.15.3 PNC. (INTEL-1007, 12-13.) This combination meets limitations [1A.2], [1B] and [1E] including the “*class*” term. (INTEL-1003, ¶¶222-

The users associated with Ward’s subscription levels and/or premium service subscriptions constitute the “*class*” or “*first class*” [1A.2]. (INTEL-1007, 12-13.) For example, a “*first class*” includes the users with a higher subscription level and/or premium service subscription.

Ward teaches that the classes are “*associated with*” the “*user[s] of [] client device[s]*” [1B]—individual users paying for the particular subscription level class and/or premium service class who receive stock price updates on their devices. For example, investors (*i.e.*, “*users*”) that pay for a subscription level with more frequent time slots would be associated with a “*first class*.” (INTEL-1007, 12.) Investors who pay for the premium service alerts about stock price drops would be associated with a “*first class*.” (INTEL-1007, 12-13.) Neither class is associated with data items or network characteristics; both are associated with “*users*” that paid for the services.

Ward teaches “*specific*” time slots are “*determine[ed]*” based on the classes. For example, Ward discloses users in the higher priority level (“*first class*”) receive more time slots than users in the lower priority level. (INTEL-1007, 12.) That is, the respective “*specific time slots*” users in each class are assigned to are “*determine[ed]*” based on an algorithm that depends on the users’ higher or lower subscription levels (i.e., “*class*”). Likewise, “the next available time slot” (“*first specified time slot*”) received by a user when a stock price alert is issued is “*determine[ed]*” based on the “*class*” of a premium service subscriber. (INTEL-1007, 12-13.)

Ward’s classes are associated with “*priority level data*” as recited in [1A.2] and [1E] upon which the time slots are determined. Ward teaches that higher subscription level users receive more time slots, and subscribers who pay for a premium service receive stock-crash alerts in the next available time slot. (INTEL-1007, 12-13.) As discussed above, in the combination, Gilb-802.15.3’s PNC would receive and store rules/algorithms to implement Ward’s prioritization technique. In the combination, the “*priority level data*” would include this information, such as a rule that equates higher subscription level and/or premium service investors with a higher priority for time slot allocation, the listing that associates DEVs in the piconet with their user’s class, and/or the data included in the reserved field of the

message sent from the DEV to the PNC during association discussed above in §VII.A.2.

As discussed in §VI.B.4, Gilb-802.15.3 discloses “*unassigning, responsive to the change in the network traffic*” the CTA (“*first specific time slot*”) to which the DEV (“*first portable client device*”) “*is assigned*” (e.g., CTA-1). The “*unassigning*” of the CTA to receive a stock update in Gilb-802.15.3-Ward may be a result of the “*first portable client device*” disassociating (as discussed in §VI.B.4.a) or the CTA being deallocated at the request of the DEV or PNC or due to a PNC handover. (§VI.B.4.b.)

C. Dependent Claims

For the reasons discussed in §§VI.C.2, 4-8, the Gilb-802.15.3-Ward combination renders obvious dependent claims 3, and 8-11. As discussed above in §VI.B.2.b, the “*first specific time slot*” assigned the “*first client device*” is set according “*first class.*”

For the same reasons as discussed in §VI.C.1, “*a second specific time slot*” assigned “*to the first portable client device*” is set “*according to the first class*” as recited in claim 2. (INTEL-1003, ¶228) Indeed, Ward teaches providing more frequent updates to higher-level/premium subscribers (i.e., assigning more or earlier time slots to such subscribers). (See INTEL-1007, Abstract, 12-13.) And for

the same reasons as discussed in §VI.C.3, Gilb-802.15.3-Ward renders claim 4 obvious.

For the same reasons discussed in §VI.C.4, Gilb-802.15.3-Ward discloses “*determining a third change in network traffic.*” When a CTA assigned for a client DEV in the system of Gilb-802.15.3-Ward (“*first specific time slot*”) to receive a stock update is terminated (e.g., when the CTA is deallocated), the CTA becomes available for reassignment. (INTEL-1003, ¶229.) A POSITA would have understood that in Gilb-802.15.3-Ward, when the premium subscriber receives an immediate notification of a stock update, the “*first specific time slot*” is “*reassign[ed]*” to the “*first client device.*” A POSITA would understand the “next available time slot” would be reassigned to the open time slot because the duration of the asynchronous CTA transmitting stock data would be the same. (INTEL-1003, ¶229; INTEL-1007, 12-13.)

VIII. Ground 3: Gilb-802.15.3-Ward-Brawn Combination Renders Claims 1-5, 8-11 obvious.

The Gilb-802.15.3-Ward-Brawn combination renders the challenged claims obvious under the correct construction of “*synchronization information*” and the “*class associated with [device/user].*”

A. Combination Overview

1. IEEE 802.15.3-Group Allocations

In IEEE 802.15.3, when a source DEV needs to send data to multiple destination DEVs, it can request a **group allocation**. (INTEL-1005, 88-89; INTEL-1006, 188-190.) For group allocations, the PNC provides multiple CTA blocks in the same beacon; each such block contains the same source (“SrcID”) and timing information, but has a different destination information (“DestIDs”). (INTEL-1005, 89; INTEL-1006, 189.) For example, a group allocation to 10 destinations requires 10 CTA blocks (one per destination). (INTEL-1003, ¶¶232-235.)

IEEE 802.15.3 specifies the fields of a CTA block using “octets” (groups of eight bits):

octets: 2	2	1	1	1
CTA duration	CTA location	Stream index	SrcID	DestID

Figure 26—Channel time allocation block

802.15.3 Figure 26

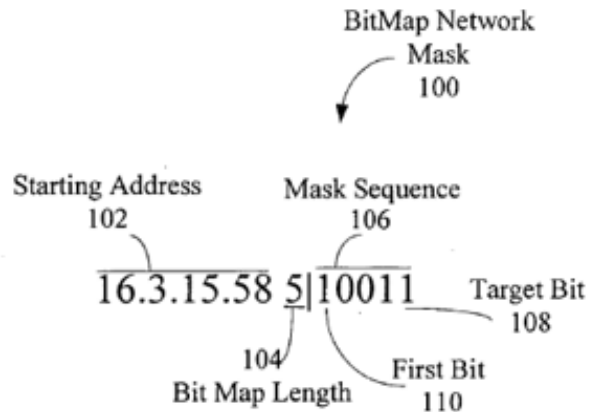
With group allocations, each device receives multiple CTA blocks with the same source (1 octet), duration (2 octets), and location (2 octets). Each device has to read all this repetitive information until it reaches a CTA block with its identifier in the destination field. (INTEL-1003, ¶234.)

2. Brawn

Brawn is directed to encoding information in networked, including wireless networks. (INTEL-1009, ¶¶2-3, 55.) Brawn discloses a masking scheme that “efficiently describe[s]” multiple “network parameters,” such as “network address[es].” (INTEL-1009, ¶3, ¶27.) Because network addresses (or identifiers) can be long, transmitting/storing many of these IDs requires significant space (i.e., bits). Rather than each full address, Brawn discloses including only the first address (e.g., 16.3.15.58) and using shorter numbers (i.e., single bits) to represent other addresses. (INTEL-1009, ¶28.)

Brawn does this using a mask sequence indicating which addresses after the initial address are included or not. (INTEL-1009, ¶28.) Brawn’s “bit map length” indicates the number of addresses in the mask sequence. (*Id.*) If the bit map length is 3, the sequence includes the initial address and two subsequent addresses. The mask sequence consists of a series of 1s (indicating the address in the corresponding sequence position is unmasked) and 0s (indicating that the corresponding address is masked). (*Id.*)

In Brawn’s exemplary Figure 1A (below), the “bitmap length 104” is “5,” indicating five total network addresses: initial address (16.3.15.58) and the four that follow: 16.3.15.59, 16.3.15.60, 16.3.15.61, 16.3.15.62. (INTEL-1009, ¶28.)



Brawn, Figure 1A

The first “1” of mask sequence 106 turns on (unmasks) the first address: 16.3.15.38. The next two “0s” turn off (mask) 16.3.15.59/16.3.15.60 and the final “1s” turn on (unmask) 16.3.15.61/16.3.15.62. (INTEL-1009, ¶28.)

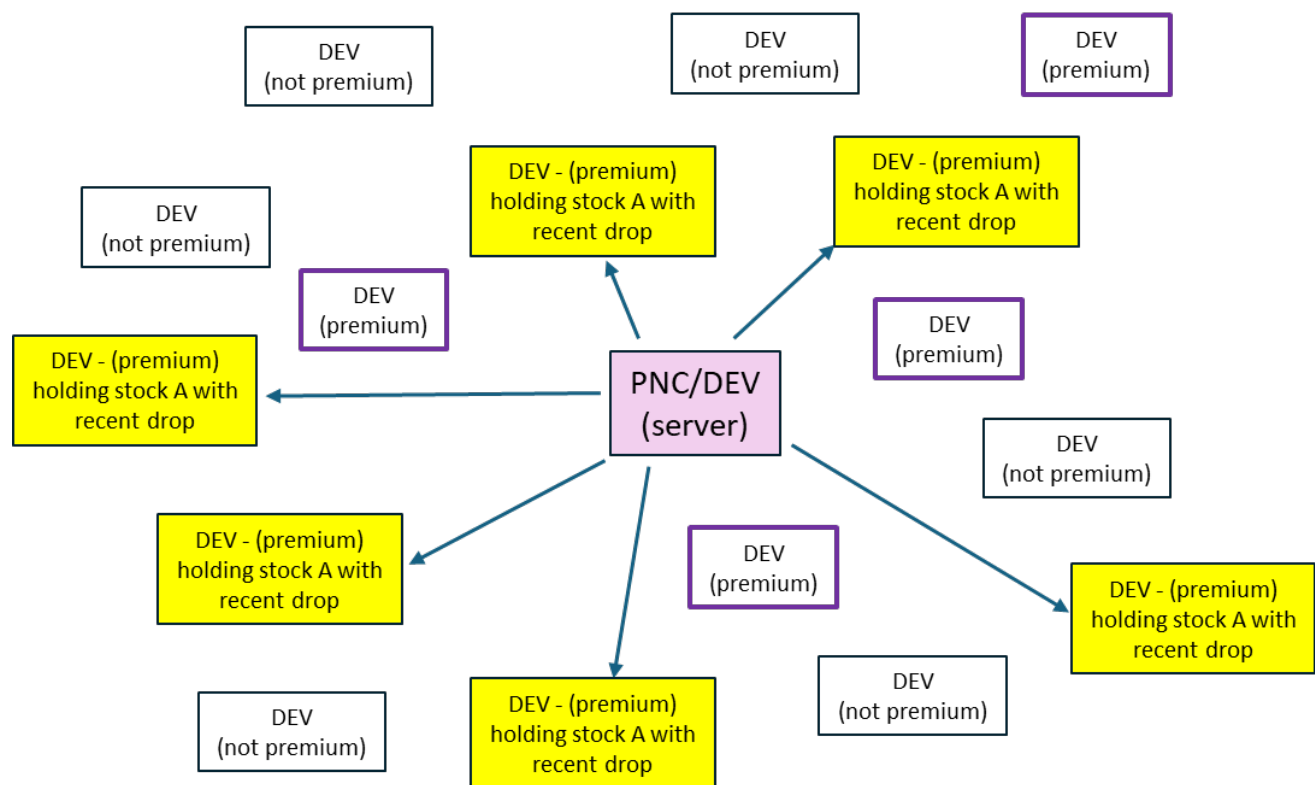
3. Motivation to Combine

A POSITA would have been motivated to use Brawn’s bit mask with Gilb-802.15.3’s group allocations. (INTEL-1003, ¶¶241-254.) Brawn—like Gilb-802.15.3-Ward—is analogous art, as it is in the same field as the challenged claims (network, encompassing wireless, communications) and relates to solving the same purported problems addressed in the ’043 patent (how to structure communications between network devices). (INTEL-1009, ¶¶ 2-3, ¶¶27-28, ¶51 (applicability to wireless networks).) A POSITA would have been motivated to make this combination for multiple reasons. (INTEL-1003, ¶¶243-254.)

First, a POSITA would have been motivated to use Gilb-802.15.3’s group allocations with Ward to send a stock update in a single time slot to multiple users

in the same subscription/service level that have the same stock, thereby conserving network resources. In the Gilb-802.15.3-Ward combination, the same stock update (blue arrow) would be provided from the PNC to all users with the same subscription/service level in the same time slot (yellow):

Trading Floor



Lansford Figure D

A POSITA would have had a reasonable expectation of success combining Gilb-802.15.3's group allocations with Ward, as it would use Gilb-802.15.3's group allocations for the exact disclosed purpose—providing the same information

from one source to multiple destinations. (INTEL-1005, 88-89; INTEL-1006, 188-190; INTEL-1003, ¶245.)

Second, a POSITA would have been motivated to use Brawn's bit mask to assign a group allocation in Gilb-802.15.3-Ward to reduce beacon length. Gilb-802.15.3-Ward uses a single time slot to transmit a stock price to multiple devices of the same class using a beacon with separate CTA blocks for each destination device. (INTEL-1005, 88-89; INTEL-1006, 188-190.) Gilb teaches the benefit of reducing the beacon size: "[a]s the number of octets in the beacon increases, the probability that it will be correctly received decreases." (INTEL-1005, 52-53.) A POSITA would therefore have recognized that using Brawn's masking with the Gilb-802.15.3-Ward combination would reduce the number of unnecessary bits transmitted in the beacon. (INTEL-1003, ¶246.)

For example, without Brawn's teachings, a group allocation requires sending and receiving a CTA block with 16 bits (2 octets) for the timing information, 24 bits (3 octets) for additional information (CTA location and Streaming index), and 16 bits (2 octets) to identify the source and destination IDs for a total of 7 octets (56 bits) **for each** destination device. (INTEL-1006, Figure 26; INTEL-1003, ¶247.) In contrast, a POSITA would have accomplished a more efficient group allocation by simply modifying the last field in one CTA block to include Brawn's masks while leaving the rest unchanged. The fields of Gilb-802.15.3's CTA block

are illustrated in 802.15.3's Figure 26, along with information regarding the size of each field (in octets). Using Brawn's mask as discussed above, a POSITA would have been motivated to replace the DestID of the CTA block field (outlined in blue in original Figure 26 of 802.15.3) with Brawn's starting ID, length and mask sequence as illustrated in red in the modified Figure 26 below. In this combination, instead of sending each device multiple CTA blocks, **only one single modified CTA block** would be sent to allocate a timeslot to *all* group destination devices:

Without Brawn: Separate CTA Block Sent for Each Destination Device

octets: 2	2	1	1	1
CTA duration	CTA location	Stream index	SrcID	DestID

Figure 26—Channel time allocation block

Ex-1006-802.15.3, Figure 26

With Brawn: Single CTA Block For Entire Group

octets: 2	2	1	1	1 octet	1 octet	1-32 octets
CTA duration	CTA location	Stream index	SrcID	starting ID	length	map sequence

Figure 26—Channel time allocation block

802.15.3, Figure 26 (Modified to include Teachings of Brawn)

Because Brawn's mask sequence can use as little as one bit for each additional address (or ID) receiving the assignment (INTEL-1009, ¶28), it would

reduce the size of Gilb/802.15.3's beacon for group allocations.¹⁷ (INTEL-1003, ¶249.)

A POSITA would have had a reasonable expectation of success and the results of the combination would have been predictable, at least because it would have merely involved replacing the known destination device identification technique in Gilb-802.15.3-Ward with a known bit mask disclosed by Brawn. Brawn itself suggests that its technique “can be applied to many common network functions.” (INTEL-1009, ¶3.) Further, a similar mask-based technique was already adopted for 802.15.3 for specifying multiple device IDs to be included a “multicast group”—a set of devices that can be assigned time slots to receive information simultaneously using the multicast group's “Group ID,” demonstrating that POSITAs would have been motivated to use a mask with Gilb-802.15.3's resource allocation scheme. (*See* INTEL-1019, 4 (proposal); INTEL-1033, 39 (adopted standard); INTEL-1003, ¶¶2500-51.)¹⁸

¹⁷ An IEEE 802.15.3 piconet can have up to 256 devices. (INTEL-1005, 161-162.) Because Brawn's mask can be up to the length of the entire list of devices, the mask can be up to 32 octets long. (INTEL-1003, ¶249.)

¹⁸ Because Brawn's fields are unnecessary for individual allocations, a POSITA would have been further motivated to include an indicator to differentiate

Further, the Gilb-802.15.3-Ward-Brawn combination constitutes the use of a known technique (Brawn’s bit mask) to improve similar devices (Gilb-802.15.3 and Ward’s wireless network devices (*see* INTEL-1009, FIG. 10, ¶51) (noting application to wireless devices)) in the same way (by representing multiple device IDs using fewer bits). (INTEL-1003, ¶253.)

B. Claim 1

1. Preamble [1P]/[1A.2]/[1B]/[1C]/[1D]

For the reasons discussed in §§IV.B.1, 2.a-b, 3 and §§V.B.1-2, the Gilb-802.15.3-Ward-Brawn combination discloses [1P] and limitations [1A.2]/[1B]/[1C]/[1D].

2. Limitation [1A.1]

Under the correct construction of “*synchronization information*,” limitation [1A.1] is obvious over Gilb-802.15.3-Ward-Brawn combination. (§V.B.1.)

The combination discloses “*synchronization information*”: bit masks applied to bit fields of individual client devices. As explained in §VIII.A.3, Gilb-802.15.3-

individual and group allocations, which could be integrated into an existing field in the CTA block, such as the stream index field, without increasing the size of individual allocations. (INTEL-1006-802.15.3, 117, Figure 26; §VI.A.3.b.; INTEL-1003, ¶254.)

Ward-Brawn uses a “*mask*” reducing the amount of information needed for group allocations in Gilb-802.15.3-Ward. The mask sequence of Brawn is made up of individual masks that are one bit in length (i.e., bit masks). (INTEL-1009, ¶¶27-29.) When Brawn’s masks are used with the combination of Gilb-802.15.3-Ward for a group allocation to all devices of the same priority receiving the same stock price information, Brawn’s mask is transmitted in Gilb-802.15.3’s beacon to each device, and each individual device reads that information to identify whether its individual bit field is masked or unmasked. That is, each individual device applies the mask to its own individual bitfield in the mask sequence. (INTEL-1003, ¶¶257-258.)

In the combination, time slots are determined based on this synchronization information. As discussed in §VI.B.2, Gilb-802.15.3’s CTA block includes a CTA duration and location which specify a “*specific time slot*.” As discussed in §VIII.A.3, the Gilb-802.15.3-Ward-Brawn combination incorporates Brawn’s mask into Gilb-802.15.3’s CTA allocation to identify all destination DEVs for group allocations (i.e., the mask determines the “*specific time slot*” because it is used in the CTA block for the “*specific time slot*” indicating which destination device(s) are assigned to the time slot). (INTEL-1003, ¶259.) Thus, in applications where data is transmitted to a group of destinations, such as all users with the same priority level/premium subscription holding the same stock in Ward (INTEL-1007,

12-13), the “*specific time slot*” of Gilb-802.15.3-Ward is assigned to each DEV identified by (or determined based on) Brawn’s mask. (*Id.*)

3. Limitation [1E]

As discussed in §VI.B.4, Gilb-802.15.3 discloses “*unassigning, responsive to the change in the network traffic*” the CTA (“*first specific time slot*”) to which the DEV (“*first portable client device*”) “*is assigned*” (e.g., CTA-1). In the Gilb-802.15.3-Ward-Brawn combination, the PNC/DEV may terminate the group stock update (“*first specific time slot*”) for the higher-level/premium subscribers, e.g., after an event has been reported (e.g., notification of stock dropping below or moving above a pre-set value). (INTEL-1003, ¶260.)

C. Dependent Claims

For the reasons discussed in §§VI.C.2, 5-8 and V.C, the Gilb-802.15.3-Ward combination renders obvious dependent claims 3, and 8-11. As discussed above in §VII.B.2.b, the “*first specific time slot*” assigned the “*first client device*” is set according to a “*first class*.”

For the same reasons as discussed in §VI.C.1, “*a second specific time slot*” assigned “*to the first portable client device*” is set “*according to the first class*” as recited in claim 2. The claim does not preclude an individual allocation for the “*second specific time slot*.” And for the reasons discussed in §§VI.C.3 and VII.C, the combination renders claim 4 obvious.

For the reasons discussed in §§VI.C.4 and VII.C, Gilb-802.15.3-Ward discloses “*determining a third change in network traffic.*” When a CTA assigned for a client DEV (“*first specific time slot*”) to receive a group stock update is terminated (e.g., when the CTA is deallocated), the CTA becomes available for reassignment. (INTEL-1003, ¶263.) A POSITA would have understood, premium subscriber receives a group notification of a new stock event, the “*first specific time slot*” is “*reassign[ed]*” to the “*first client device.*” A POSITA would understand the “next available time slot” would be reassigned to the open time slot because the duration of the asynchronous CTA transmitting stock data would be the same. (*Id.*; INTEL-1007, 12-13.)

Gilb-802.15.3-Ward-Brawn renders claim 5 obvious.

IX. Discretionary Denial Is Not Appropriate

A. 35 U.S.C. §314(a)

The Board should reach the merits because the Petition presents a compelling unpatentability challenge. (*See Interim Procedure for Discretionary Denials*, 4-5.) The evidence presented in this Petition, “if unrebutted in trial, would plainly lead to a conclusion that one or more claims are unpatentable by a preponderance of the evidence.” (*Interim Procedure*, 4.)

The *Fintiv* factors also weigh against discretionary denial. Because the median time to trial in the Western District of Texas for the twelve month period

ending September 30, 2024 is 33.1 months, trial is expected to occur in early 2027, months after the Final Written Decision would be due. (*See* INTEL-1032, 37.)

Thus, Fintiv factors 2 and 3 favor institution.

B. 35 U.S.C. §325(d)

Advanced Bionics Part 1 is not satisfied because none of the asserted references were cited or applied during prosecution and no asserted reference is substantially the same as any art previously presented. Thus, the Board need not reach Part 2.

X. Mandatory Notices

A. Real Party In Interest

The real parties in interest include Petitioner.

B. Related Matters

To the best of Petitioner's knowledge, the '043 patent is involved in the following ongoing litigation:

- *Proxense, LLC v. Intel Corp.*, No. 6-24-cv-00283 (WDTX)

C. Notice Of Counsel and Service Information

Pursuant to 37 C.F.R. §§42.8(b)(3), 42.8(b)(4) and 42.10(a), Intel appoints the following lead and backup counsel:

Lead Counsel	Back Up Counsel
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Intel consents to electronic service by email at the email addresses: gordon-ptab@goodwinlaw.com, clarochelle@goodwinlaw.com.

XI. Conclusion

Inter partes review is respectfully requested.

Respectfully submitted,

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CERTIFICATE OF WORD COUNT

Pursuant to 37 C.F.R. § 42.24(d), the undersigned certifies that this Petition for *Inter Partes* Review complies with the type-volume limits of 37 C.F.R.

§ 42.24(a)(1)(i) because it contains 13,985 words according to the word-processing system used to prepare this Petition, excluding the words in the Table of Contents, Table of Authorities, List of Exhibits, Mandatory Notices, Certification Under §42.24(d), and Certificate of Service, and any claims listing as set forth in 37 C.F.R. § 42.24(a)(1). This word count was prepared using Microsoft Word.

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CERTIFICATE OF SERVICE

The undersigned certifies that a true and correct copy of the Petition together with all exhibits identified in the above Table of Exhibits and Petitioners' Power of Attorney, have been served on the Patent Owner via Federal Express Next Business Day Delivery on the below date, at the following address:

89194 – Patent Law Works/Proxense
Greg Sueoka
4516 South 700 East, Suite 290
Salt Lake City, UT 84107

Courtesy copies of the foregoing documents were served by e-mail on the following lead counsel of record for Patent Owner in the Underlying Litigation:

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Respectfully submitted,
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Challenged Claim Appendix

[1P] A method of facilitating wireless data exchange between a first portable client device and a fixed location proximity reader, comprising:

determining a first specified time slot based on [1A.1] synchronization information wirelessly received by the first portable client device and [1A.2] priority level data associated with a first class,

[1B] wherein the first class is associated with one or more of the first portable client device and a user of the first portable client device;

[1C] assigning the first specific time slot for the first portable client device to wirelessly communicate with a fixed location proximity-based reader device;

[1D] determining a change in network traffic;

[1E] unassigning, responsive to the change in the network traffic, the first specific time slot to which the first portable client device is assigned to wirelessly communicate with a fixed location proximity reader based on the priority level data associated with the first class associated with one or more of the first portable client device and the user of the first portable client device.

[2] The method of claim 1, comprising:

determining a second change in the network traffic, and

assigning, responsive to the second change in network traffic, a second specific time slot to the first portable client device according to the first class.

[3] The method of claim 2, wherein the first specified time slot and the second specified time slot are on different wireless channels.

[4] The method of claim 1, comprising:
determining a second change in the network traffic, and
assigning, responsive to the second change in network traffic, a second specific time slot to the first portable client device according to the first class.

[5] The method of claim 4, comprising:
determining a third change in the network traffic, and
reassigning the first specific time slot to the first client device responsive to the third change in the network traffic.

[8] The method of claim 1, further comprising:
reassigning the first specific time slot to a second client device in response to a detection that the first client device is unavailable.

[9] The method of claim 1, further comprising:
determining that the first client device should switch to a different channel;
and
sending a message to the first client device and the first client device,
responsive to receiving the message, switching the channel upon which the first client device wirelessly communicates with a fixed location proximity-based reader device.

[10] The method of claim 9, wherein the message includes information identifying the first client device, information identifying the fixed location proximity-based reader device, a designation of a channel and a command to switch to the designated channel.

[11] The method of claim 9, wherein the determination to switch to the different channel is dependent on at least one of a user associated with the first client device, a class of a user associated with the first client device, a class of the first client device, and a network traffic load in the system.