

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

INTEL CORPORATION,

Petitioner

v.

PROXENSE, LLC

Patent Owner.

IPR2025-00328

U.S. Patent 8,219,129

**PETITION FOR *INTER PARTES* REVIEW
OF U.S. PATENT 8,219,129**

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EXHIBIT LIST

Exhibit	Reference
1001	U.S. Patent 8,219,129 to Brown
1002	File History for U.S. Patent 8,219,129
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) (“IEEE 802.15.3”)
1007	WO 02/067009 to Ward, et al. (“Ward”)
1008	“A Novel Design of IEEE 802.15.3 MAC over UWB” by Cai et al. (“Cai”)
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 Revised Infringement Contentions for ’129 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”)

Exhibit	Reference
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.
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™, 802.15™, and 802.16™, 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

Exhibit	Reference
	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”)
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 8,219,129 (INTEL-1001) claims 1-2, 5-7, 12-13, 15-16 and 18.

II. Grounds for Standing

Petitioner certifies the '129 patent is available for IPR and Petitioner is not barred or estopped.

III. Identification of Challenge

A. Prior Art

The '129 patent 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. **“A Novel Design of IEEE 802.15.3 MAC over UWB” by Cai et al.** (“Cai”; INTEL-1008), published March 7, 2005, is prior art under 35 U.S.C. §102(a). (INTEL-1010, ¶¶30-32.)

5. **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	References
1	103	1-2, 5-7, 16, 18	Gilb, 802.15.3
2	103	12-13, 15	Gilb, 802.15.3, Cai
3	103	1-2, 5-7, 16, 18	Gilb, 802.15.3, Ward
4	103	1-2, 5-7, 16, 18	Gilb, 802.15.3, Ward, Brawn
5	103	12-13, 15	Gilb, 802.15.3, Ward, Cai
6	103	12-13, 15	Gilb, 802.15.3, Ward, Brawn, Cai

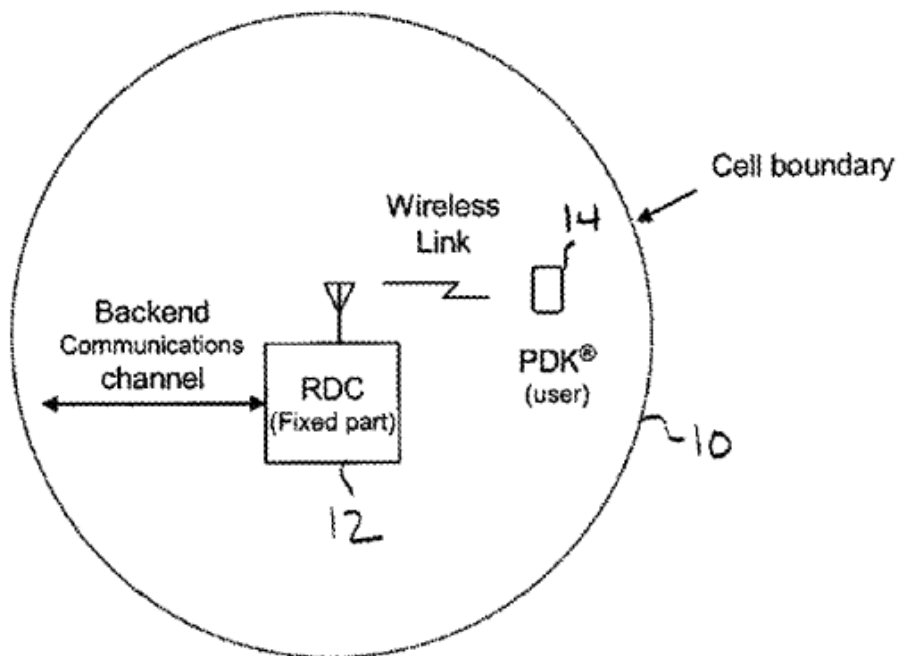
IV. Level of Ordinary Skill

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 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. '129 Patent Overview

The '129 patent describes a wireless communication system that may be based on the prior art IEEE 802.15.4 protocol. (INTEL-1001, 11:5-7.) 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. (*Id.*, 4:25-30.) The '129 patent describes an exemplary system including a gatekeeper, called a Reader Decoder Circuit (RDC), and a user device, called a Personal Digital Key (PDK). (*Id.*, 4:31-33, 4:52-55, 5:21-22, 7:2-3, Figure 1 (below).)



'129 Patent, Figure 1

B. Claim Construction

Petitioner proposes three claim constructions.

1. “*synchronization information*”

All 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, cls. 1, 8, 12, 16, 18.) The **only method** the specification discloses for determining or assigning time slots is using masks. (*Id.*, 15:52-16:3 (“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, 15:33-38, 15:39-51, 16:4-20, 16:17-20,

19:26-32, 19:33-44, 20:1-5.) *Techtronic Indus. Co. v. Int’l Trade Comm’n*, 944 F.3d 901, 907-10 (Fed. Cir. 2019) (where specification discloses one configuration, consistent construction is proper).

Third, the prosecution history 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-1002, 356.) To overcome the rejection, PO represented “[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 ... enablement rejection inform the claim construction analysis”).

In the co-pending litigation, PO seeks to construe “*synchronization information*” as any “information assigning a time slot”—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 associated with one or more of the [] client device and [a/the] user of the [] client device*”

All 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 rejected all pending claims over Nakagawa (INTEL-1031). (INTEL-1002, 267-79.) PO represented that Nakagawa does not disclose the claimed “class” because “time slots in Nakagawa ... **are allocated based on network characteristics.**” (*Id.*, 302, 303 (arguing Nakagawa “determines time slots based on characteristics of a mobile communications network.”).) The Examiner accepted PO’s representation. (*Id.*, 360.)

The Examiner subsequently rejected all claims arguing Major (INTEL-1014) disclosed the claimed class. (INTEL-1002, 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 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, 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, 7, 10-14.) As explained below, the challenged claims are invalid even under PO’s overbroad interpretation.

3. “*time slot*”

All claims recite a “*time slot*” during which a client device communicates with a reader/network device. The specification states “a ‘**timeslot**’ is defined as a **period of time that information is communicated between two devices.**” (INTEL-1001, 11:7-9.) “*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.” (INTEL-

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, 15:58-16:3, 16:15-20.)

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 1-2, 5-7, 16, 18 obvious.

The combination of Gilb and 802.15.3 (“Gilb-802.15.3 combination”) renders claims 1-2, 5-7, 16, 18 obvious under PO’s interpretation of “*class*” and “*synchronization information*.” (See §V.B.1.)

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,” “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

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.)

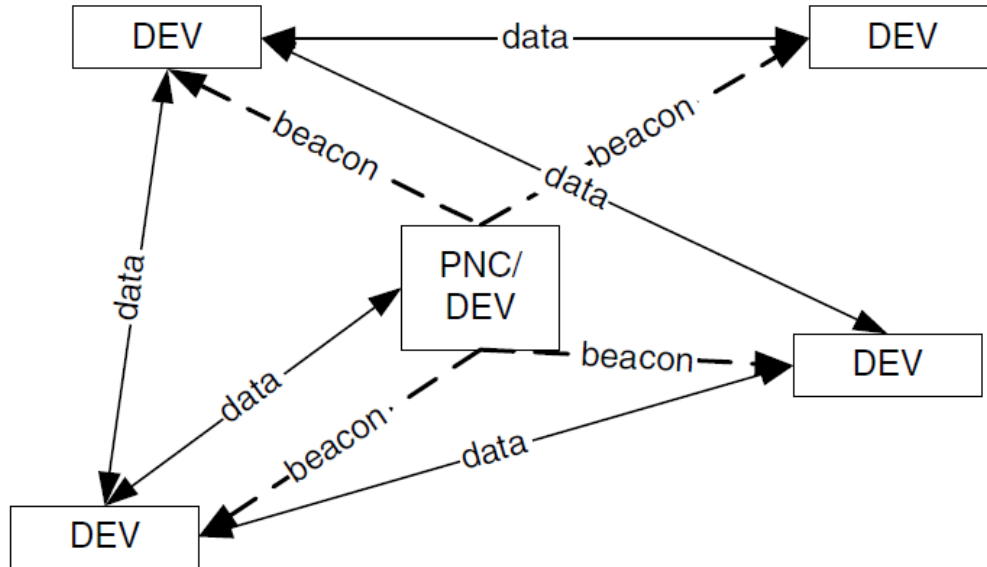
* * *

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

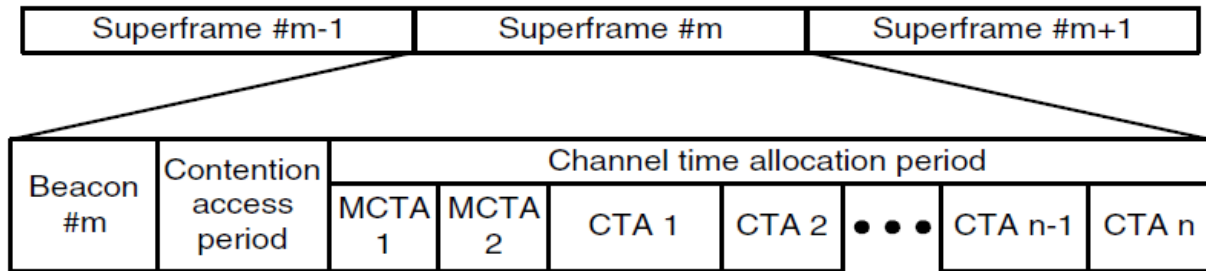


Figure 2—802.15.3 piconet superframe

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).” (*Id.*, 33.)

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 at 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 superframe's CTAP. (*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 CTA block[s], “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; INTEL-1003, ¶¶48-52.)

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 in the same field as the challenged claims (network, encompassing wireless, communications) and are reasonably pertinent to the problem addressed by the '129 patent (how to structure communications between network and client devices). (INTEL-1005, 25-28; INTEL-1006, 8; INTEL-1001, Abstract.)

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; INTEL-1003, ¶96.) Gilb also cites to the standard, including as reference [B16]. (*See, e.g.*, INTEL-1005, 260 (“In order to 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.)

A POSITA reading Gilb would have looked to the standard for further details on implementing 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, 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.*, §IV.B.1.b.)

The 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 to improve the 802.15.3 systems 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. (*Id.*, ¶99.)

B. Claims

Petitioner addresses claim 16 then claims 18 and 1.

1. Claim 16

a) Preamble [16P]

The Gilb-802.15.3 combination discloses “a system” [16P]³, the IEEE 802.15.3 piconet, “a wireless ad hoc data communications system” allowing “devices (DEVs) to communicate with each other.” (INTEL-1005, Figure 3-1 (below), 25; INTEL-1006, 8; INTEL-1003, ¶102.)

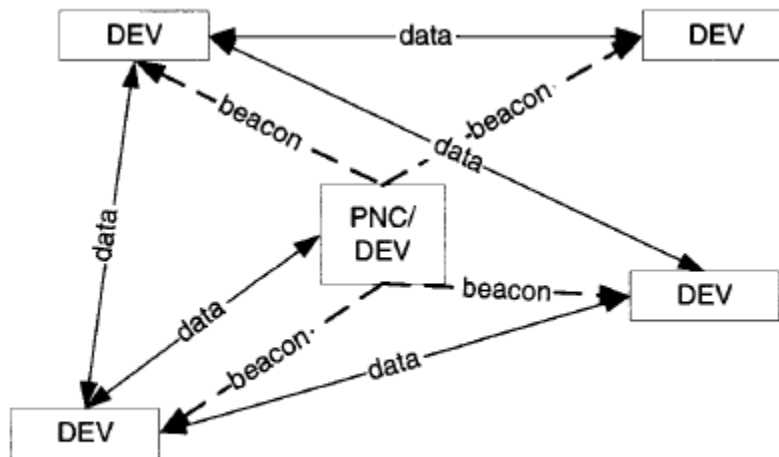


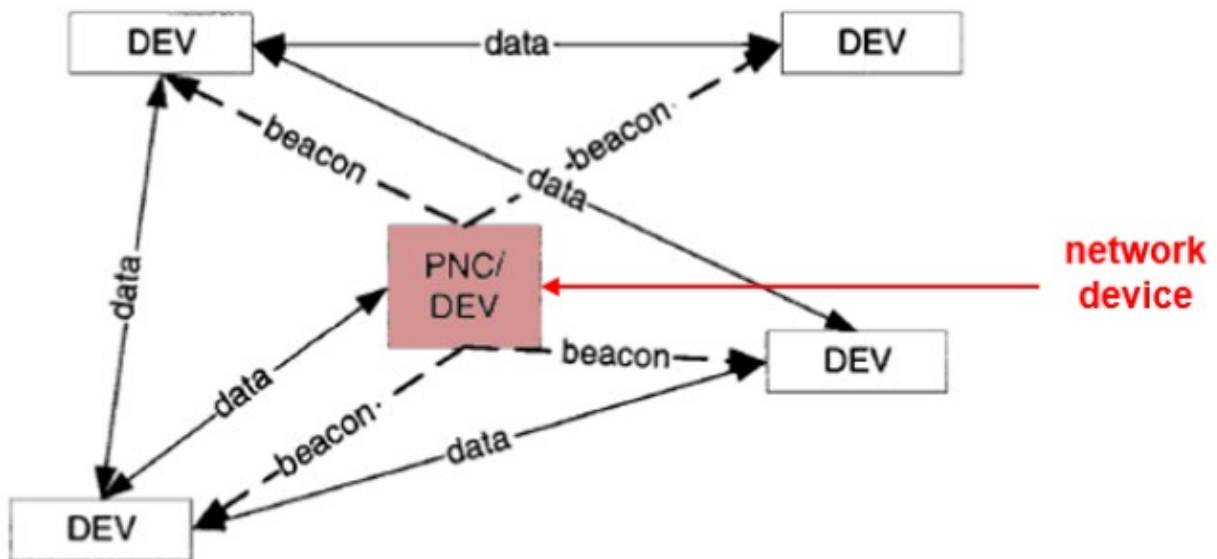
Figure 3–1: Elements of an 802.15.3 piconet

³ Petitioner does not acquiesce the preamble of any claim is limiting.

b) Limitation [16A]

The Gilb-802.15.3 combination discloses “a network device configured to wirelessly broadcast synchronization information” [16A] under PO’s interpretation of “synchronization information.” (INTEL-1003, ¶¶103-12.)

The key piconet elements are the PNC and DEV. (INTEL-1005, 25; INTEL-1006, 8 (one DEV “is required to assume the role of” PNC).) The PNC/DEV (red) is a “network device.” (INTEL-1003, ¶104; INTEL-1005, 300; INTEL-1006, 8.)



Gilb, Annotated Figure 3-1

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 superframe’s “beacon”, illustrated below. (*Id.*, 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.) All piconet DEVs “acquire synchronization through beacons.” (INTEL-1006, 193.)

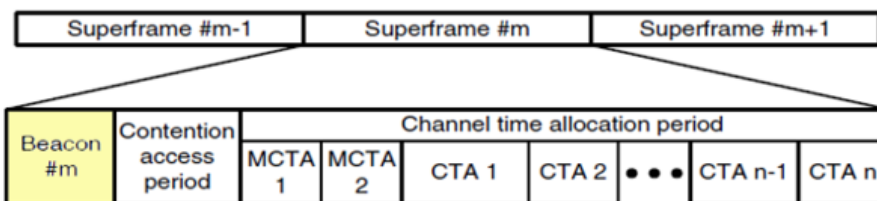


Figure 2—802.15.3 piconet superframe

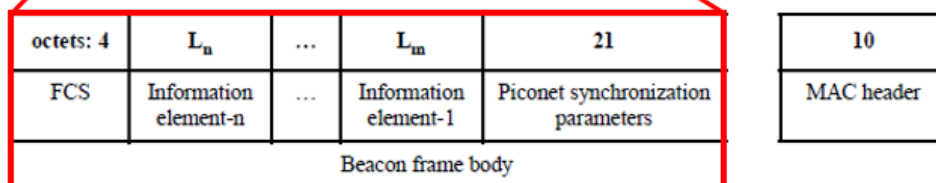


Figure 11—Non-secure beacon frame format

Gilb describes use of a 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.)

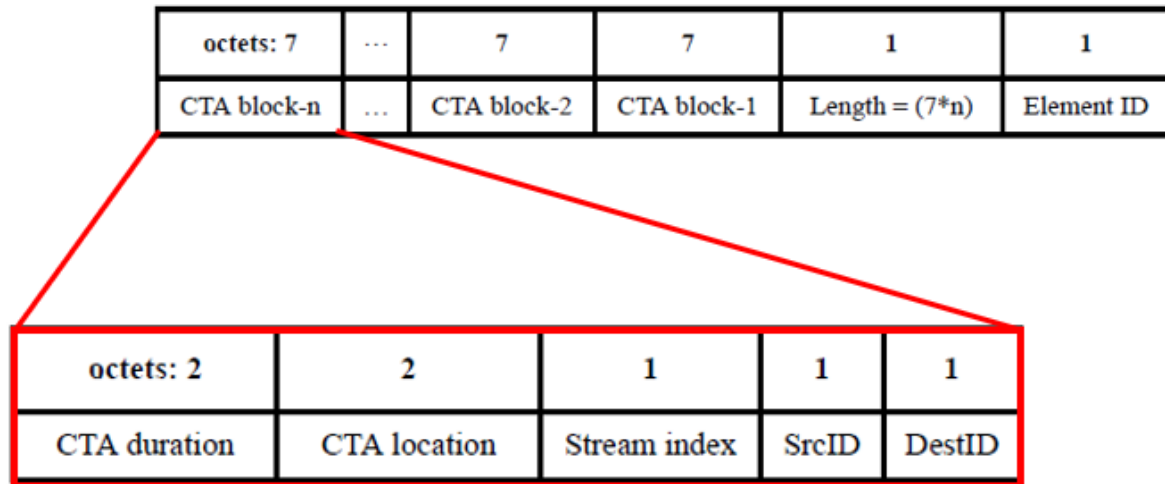
octets: 8	1	1	1	2	2	6
PNC address	PNC response	Piconet mode	Max TX power Level	CAP end time	Superframe duration	Time token

Figure 12—Piconet synchronization parameters field format

The beacon also includes “information elements (IEs)”. (INTEL-1005, 53; INTEL-1006, 108, Figure 11 (above).) One such IE is the channel time allocation

IE (“CTA IE”), providing 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 block(s), “each of which has the **source, destination**, stream index, **start time**, and **duration** of the CTA.” (INTEL-1005, 56-57; INTEL-1006, 117, Figure 25⁴ (CTA IE format), Figure 26 (CTA block format).) Each CTA is therefore a “*time slot*” under any reasonable interpretation. (§V.B.3; INTEL-1005, 33 (“the access method for CTAs is **time division**”), 158 (“Because a CTA is a **TDMA allocation** ...”), 299-300; *see also*, INTEL-1016, ¶11 (referring to CTAs as “time slots”).)

⁴ Gilb does not provide the CTA IE or CTA block formats. This information is provided by 802.15.3.



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

The CTA IE is used by DEVs to determine when to transmit (if identified as source) or listen for transmissions (if identified as destination). (See INTEL-1005, 40, 59, 101; INTEL-1006, 178, 192, INTEL-1003, ¶110.)

The 802.15.3 beacon provides CTA (“*time slot*”) allocations for source and destination DEVs and provides information about the frame structure and timing for all DEVs. (INTEL-1003, ¶111.) 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, ¶111.)

The PNC “*wirelessly broadcasts*” the beacon to all DEVs as shown in Gilb’s Figure 3-1(above). (See, e.g., INTEL-1005, 31 (PNC starts a “piconet by **broadcasting** a beacon”), 56-57; INTEL-1006, 4, 151, 171.)

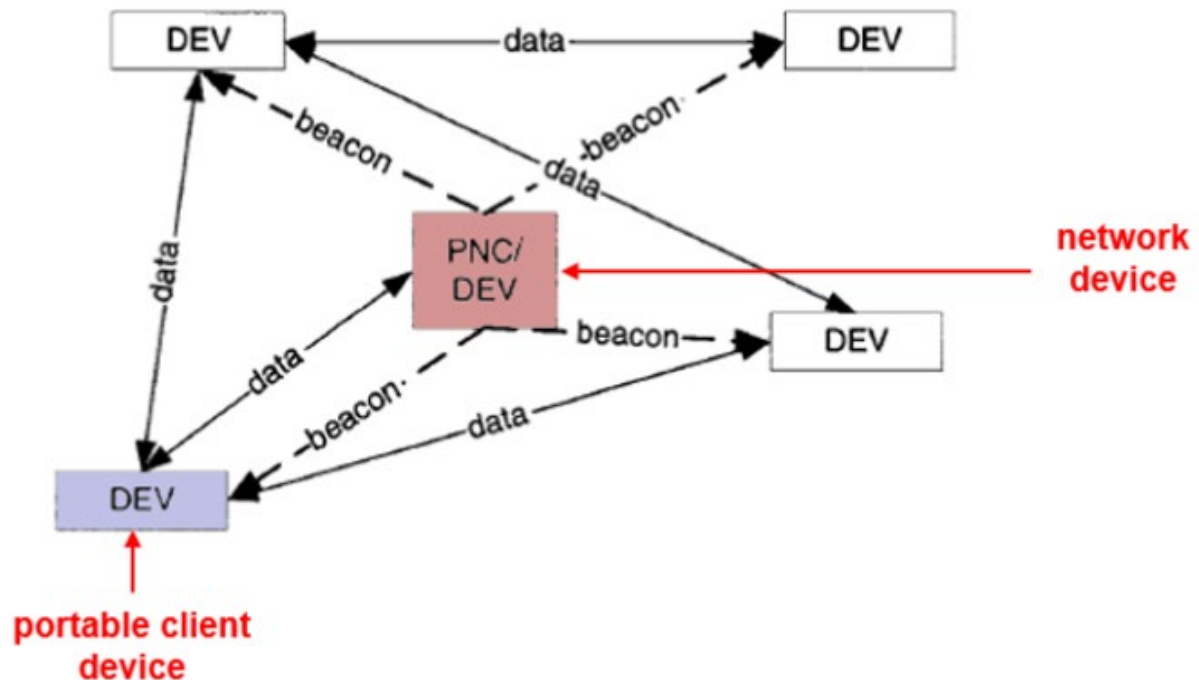
c) Limitation [16B]

The Gilb-802.15.3 combination discloses “*a portable client device configured to wirelessly receive the synchronization information*” [16B] under PO’s interpretation of “*synchronization information.*” (INTEL-1003, ¶113-18.)

IEEE 802.15.3 is a wireless protocol “designed specifically to address the needs of high-speed, low-cost **portable** multimedia devices.” (INTEL-1005, xv, 13 (“802.15.3 is able to address all of the requirements for **portable, wireless** multimedia devices”); *see also* INTEL-1006, 1 (“This standard defines ... specifications for high data rate **wireless** connectivity with fixed, **portable** and moving **devices**”).) Gilb provides exemplary portable devices including digital cameras, headphones, wireless microphones, and wireless game controllers. (INTEL-1005, 14-19; INTEL-1003, ¶115.) IEEE 802.15.3 therefore supports “*portable*” devices. (INTEL-1005, 25; INTEL-1006, 8; INTEL-1003, ¶115.)

Although neither Gilb nor 802.15.3 refers to DEVs as “*client devices*”, a POSITA would have understood DEVs not acting as the PNC to be “*clients*” consistent with the ’129 patent’s reference to non-coordinator devices as “*client*” devices. (*See, e.g.*, INTEL-1001, 15:52-55 (referring to PDKs as “client devices” within RDC’s “coverage area”); *see also* INTEL-1017, ¶¶9, 22 (referring to 802.15.3 devices not acting as the PNC as clients).) The Gilb-802.15.3 combination therefore discloses “*a portable client device.*” (INTEL-1003, ¶116.)

As discussed in §VI.A.3 and shown in Gilb’s Figure 3-1 below, DEVs receive the beacon from the PNC. (INTEL-1005, 25; INTEL-1005, 56; INTEL-1006, 192 (section titled “Beacon reception”).) Because 802.15.3 is a wireless protocol, the DEVs are “*configured to wirelessly receive the synchronization information*” [16B] in the beacon, under PO’s interpretation. (INTEL-1006, 1, 3, 8; INTEL-1003, ¶117.)



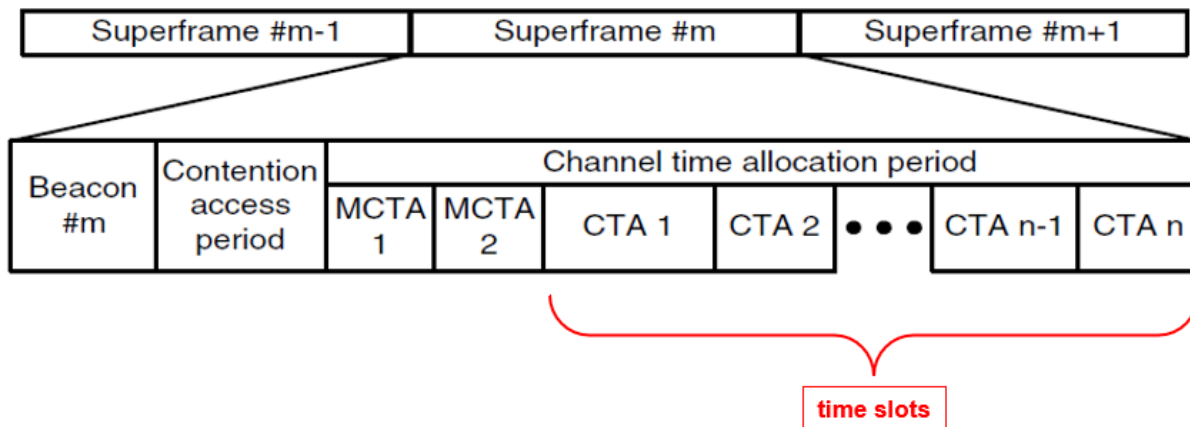
Gilb, Annotated Figure 3-1

d) Limitation [16C]

The Gilb-802.15.3 combination discloses “*the received synchronization information comprising information assigning a specific time slot during which the*

client device can receive data from the network device” under PO’s interpretation of “*synchronization information.*” (INTEL-1003, ¶¶119-23.)

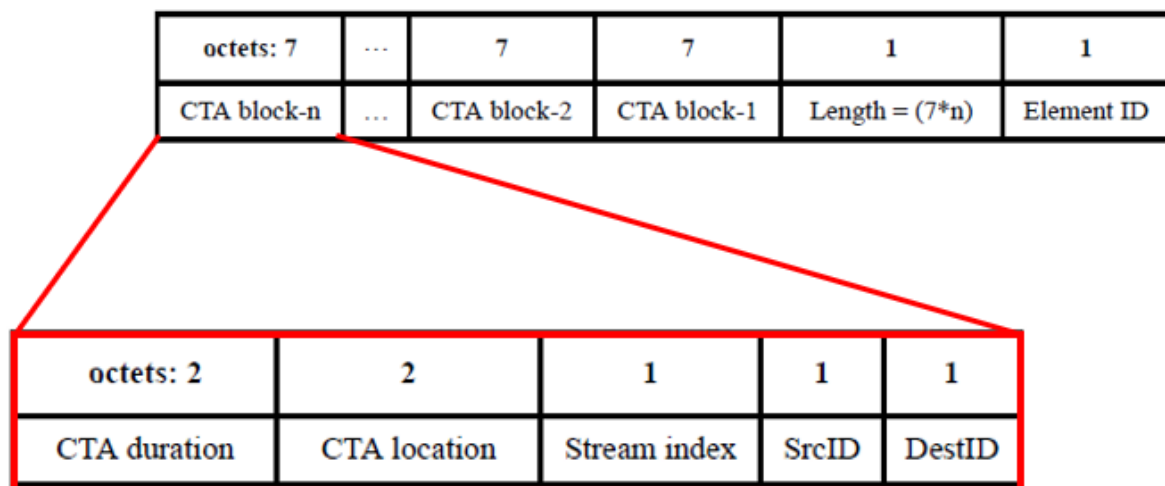
The superframe’s CTAP portion “is composed of channel time allocations (CTAs).” (INTEL-1006, 11-12, Figure 2 (below).) Each CTA is therefore a time period information is communicated between devices and a set period of time for communicating – i.e., sending/receiving data — a “*time slot.*” (See §§V.B.3, VI.B.1.b[16A]; INTEL-1003, ¶120.) The PNC “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.)



802.15.3, Annotated Figure 2

The PNC assigns a “*specific time slot*” to a source/destination DEV pair. (INTEL-1003, ¶121.) As discussed in §VI.B.1.b, the beacon’s CTA IE includes CTA block(s), “each of which has the **source, destination, stream index, start**

time, and duration of the CTA.” (INTEL-1005, 56-57; INTEL-1006, 117, Figure 25, Figure 26.) The destination “indicates the DEV to which the source DEV may send” frames. (INTEL-1006, 117.) The CTA location field “indicates the start time of the allocation” and duration “specifies the duration of the CTA.” (*Id.*) The CTA location and duration therefore define the “*specific time slot*” assigned to the source/destination devices. (INTEL-1003, ¶121; *see also* INTEL-1005, 32-33.)



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

The Gilb-802.15.3 combination discloses a “*client device can receive data from the network device*” during an assigned CTA. (INTEL-1003, ¶122.) 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; 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, 8,

Figure 1 (showing “PNC/DEV”).) This is reflected in Gilb Figure 3-1 (above) showing the “PNC/DEV” (red) communicating data with a non-PNC DEV (blue). IEEE 802.15.3 contemplates circumstances where the PNC/DEV is the “source” assigned to a CTA⁵ using its DEVID. Thus, an IEEE 802.15.3 piconet supports assigning a CTA during which the PNC/DEV (“*network device*”) acting as a DEV transmits data to another DEV (“*portable client device*”). (INTEL-1006, 117; INTEL-1003, ¶122.)

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, e.g., 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 DEV) in an assigned CTA (“*time slot*”). (INTEL-1003, ¶123.)

⁵ IEEE 802.15.3 also supports management CTAs (“MCTAs”) during which a PNC is a data source/destination. (See INTEL-1005, 33-34.)

Thus, Gilb-802.15.3 combination discloses limitation [16C] under PO's construction of "*synchronization information.*" (*Id.*, ¶119-123.)

e) Limitations [16D]-[16E]

The Gilb-802.15.3 combination discloses "*the time slot being determined according to a priority level data associated with a class*" [16D], "*the class associated with [device/user]*" [16E], under PO's interpretation of "*class associated with [device/user]*". (*Id.*, ¶124-48.)

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; INTEL-1003, ¶125.) The PNC assigns CTAs in response to CTRqs received from DEVs. (*See, e.g.*, INTEL-1005, 35-36; INTEL-1006, 172.) The CTA allocations, CTA₁-CTA_n (where n is the maximum number of CTAs in the CTAP) can be considered as a queue. (INTEL-1006, 11-12, Figure 2 (below); INTEL-1003, ¶126; 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, ¶126; INTEL-1006, 117.)

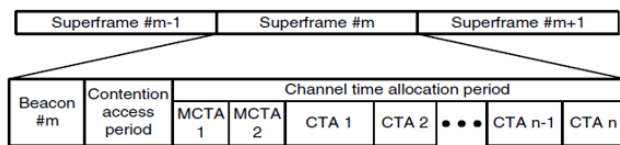


Figure 2—802.15.3 piconet superframe

	location	duration	source	destination
CTA 1	0	10000	DEV 1	DEV 2
CTA 2	10001	20000	DEV 4	DEV 6
.				
.				
.				
CTA n-1	400001	50000	DEV 2	DEV 3
CTA n			unassigned	unassigned

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

The Gilb-802.15.3 combination discloses or suggests two allocation/scheduling techniques that each independently meet limitations [16D]-[16E] under PO’s interpretation. 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”). (INTEL-1003, ¶127.)

(1) Power Management (“PM”) Status Allocation

(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 (DPS), 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.) There are two types of SPS modes defined in IEEE 802.15.3: DSPS and PSPS. (*Id.*, 303; INTEL-1003, ¶53.)

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); INTEL-1003, ¶57, 128.) In this way, the PNC knows the current PM mode of each DEV when allocating CTAs for a current or future superframe. (INTEL-1003, ¶¶57, 128.)

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.) Thus, a POSITA would have understood 802.15.3 indicates the CTA location for an SPS mode DEV is the earliest available CTA in the CTAP (e.g., SPS DEVs are assigned to CTAs at the front of the “queue”). (INTEL-1003, ¶130.)

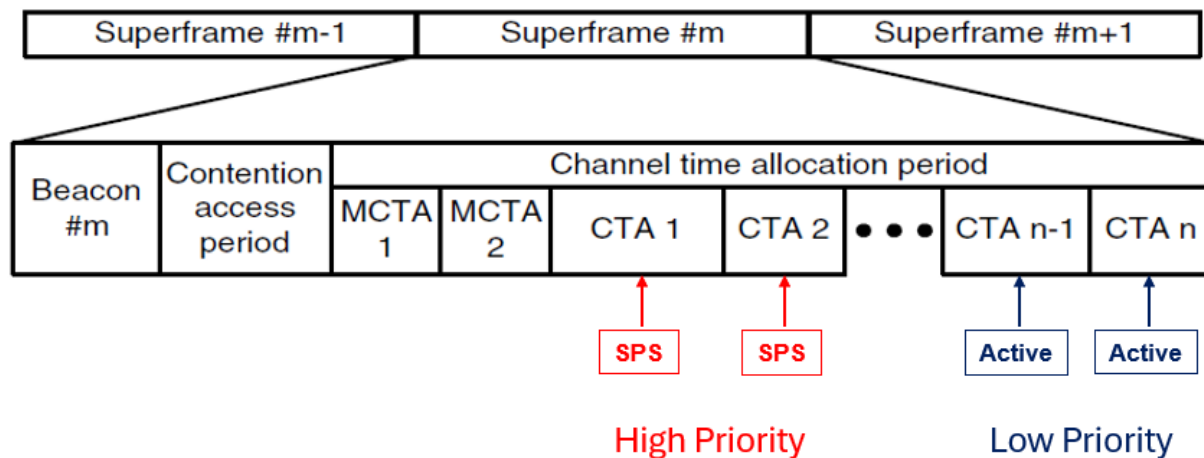
Gilb explains the “goal in any power management strategy” is for “the DEV to turn off as many of its operations as possible for the longest period of time.”

(INTEL-1005, 40.) Accordingly, based on Gilb-802.15.3, 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 continuous SLEEP state during a superframe. (INTEL-1003, ¶131.) 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) under PO’s interpretation.

A POSITA would have understood for the PNC to assign CTAs to SPS DEVS “first in the superframe,” the PNC must access data identifying the DEVS’ PM status (e.g., indication of DEVS operating in SPS mode and those that are not) and apply logic in its algorithm that prioritizes these identified SPS mode DEVS over non-SPS mode DEVS. (INTEL-1003, ¶133.) Thus, Gilb-802.15.3 provides “*priority level data.*” (*Id.*) Indeed, as discussed above, Gilb-802.15.3 describes a message informing the PNC of any change in DEV PM mode, and also provides an indication of the 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 ’129 patent, which merely observes “priority level data” may be used to facilitate differentiation of class tiers without prescribing any data form. (INTEL-1001, 16:17-20.)

The PM mode reflects the DEV PM mode and is therefore “*associated with the client device*” under PO’s interpretation. (INTEL-1003, ¶135.) One or both of the source and destination DEVs identified in a CTA request may be 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 takes into consideration the PM mode of both the source and destination when allocating CTAs. (INTEL-1003, ¶135; INTEL-1005, 41; INTEL-1006, 145.)

The following annotations of 802.15.3 Figure 2 illustrate SPS mode receiving CTA assignments earlier in the superframe than ACTIVE mode. (INTEL-1006, 12 (Figure 2); INTEL-1003, ¶136.)



802.15.3, Annotated Figure 2

Should the Board determine Gilb-802.15.3 does not explicitly disclose CTA allocation/scheduling based on 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, ¶137.)

(2) QoS Allocation

Other than specifying 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 8-5⁶ below, for scheduling data transmission between peer devices. (*See* INTEL-1006, 277-280 (describing frame convergence sublayer which uses 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” (“QoS category”). (INTEL-1006, 280) For example, voice telephony applications are

⁶ Gilb's Table 8-5 reproduces 802.15.3's Table A.1. (INTEL-1006, 280.)

given the highest priority⁷ (priority 6). (See INTEL-1005, 16-17 (describing high priority audio applications).) Streaming multimedia applications are given lower priority (e.g., priority 3) because they “often have more relaxed latency requirements.” (See *id.*, 19-20.)

Table 8–5: IEEE Std 802.1D traffic types

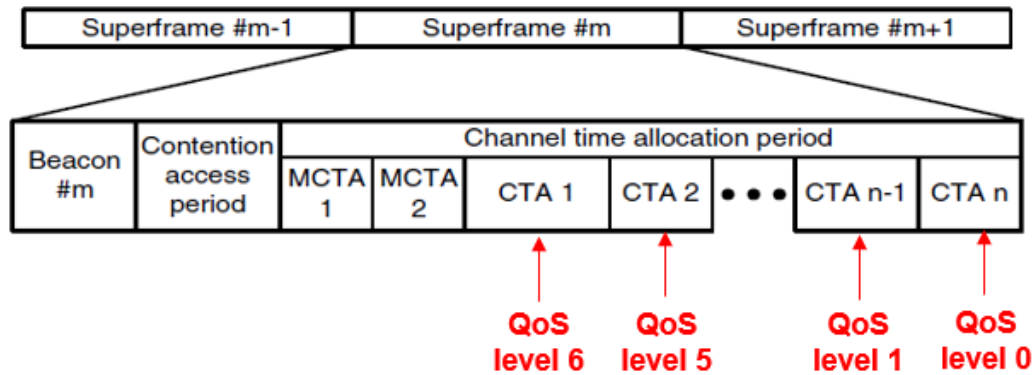
User priority	Traffic type	Used for	Comments
0 (default)	Best effort (BE)	Asynchronous	Default level
1	Background (BK)	Asynchronous	–
2	–	Spare	Currently not assigned
3	Excellent effort (EE)	Isochronous	For valued customers
4	Controlled load (CL)	Isochronous	Traffic will have to conform to some higher 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 “[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.” (*Id.*, 92.) Gilb stresses a “PNC with a good

⁷ Priority 7 is designated for network control traffic which is not applicable to peer DEV communication. (See INTEL-1006, 280; INTEL-1003, ¶141.)

CTA algorithm will be able to better maintain **the QoS** in [the] piconet and to provide greater overall throughput.” (*Id.*, 258.) Based on this suggestion, a POSITA would have been motivated to integrate a CTA allocation/scheduling algorithm based on the QoS of the data to be transmitted. (INTEL-1003, ¶143.) Similar to how a DEV uses QoS to determine transmission priority as discussed above, a POSITA would have been motivated to sort CTAs to be allocated by QoS priority with highest QoS (6: voice) at the top/front, and continuing allocations down the CTA queue in order of descending QoS level (6 to 0)⁸, 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.*)

⁸ A POSITA would have also recognized the potential need to order CTAs in the same QoS level and understood techniques such as ordering by duration or time received would be applicable. (INTEL-1003, ¶143; *see* INTEL-1005, 258.)



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 based on QoS category, and the results would have been predictable. (*Id.*, ¶144.) Such 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 for transmission 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, as noted above, for the data transmission context. Zeng, a prior art paper, evidences QoS-based CTA allocation was also a known technique successfully applied to IEEE 802.15.3. (See, e.g., INTEL-1018, 2480-81); *Novartis AG v. Torrent Pharms. Ltd.*, 853 F.3d 1316, 1327-28 (Fed. Cir. 2017). Indeed, Zeng builds on the basic notion of prioritizing CTA assignments by QoS category with a more complex algorithm that reduces allocation wait time by reducing CTA duration of low priority QoS traffic. (INTEL-1018, 2480-81; INTEL-1003, ¶144.)

In QoS allocation, the “*class*” is the QoS category under PO’s interpretation (e.g., “voice”, “video”, “best effort”) and is associated with the endpoints for the data to be transmitted (source-destination DEVs). (See §V.B.2; *see also, e.g.*, INTEL-1006, 279 (data classified according to destination, source, and QoS scheme).) Indeed, PO has alleged QoS category is a “*class*.” (INTEL-1015, 5.) Under PO’s interpretation, “*class*” in the Gilb-802.15.3 combination is also associated with the user interacting with the application. (See §V.B.2; INTEL-1018, 8.) Thus, under PO’s interpretation, in the QoS allocation suggested by the Gilb-802.15.3 combination, “*the class [is] associated with [device/user]*” [16E]. (INTEL-1003, ¶145.)

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”) the lowest priority. (*Id.*) As described above, the PNC arranges the CTA queue according to QoS priority level. Thus, under PO’s interpretation, “*the time slot*” assigned to a source/destination “[is] *determined according to a priority level associated with a class*” [16D]. (*Id.*, ¶146.)

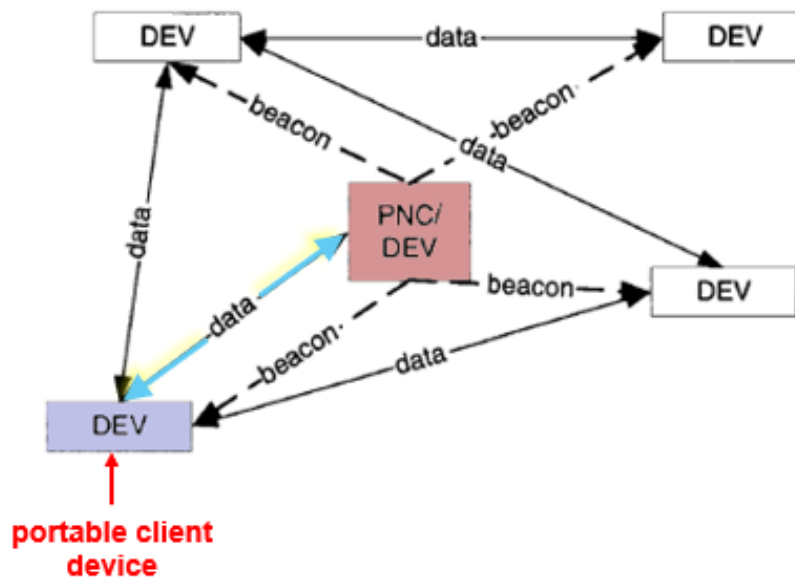
2. Claim 18

Claim 18 recites substantially similar limitations as claim 16 with the primary differences being: claim 18 recites “*a method*” whereas claim 16 recites “*a system*” and claim 16 requires the client be configured to wirelessly receive

synchronization information, whereas claim 18 requires wirelessly broadcasting synchronization information to a client. For the second difference, claim 16 is narrower than claim 18 and therefore the Gilb-802.15.3 combination meets claim 18 for the same reasons. Thus, for the reasons discussed in §§VI.B.1, the Gilb-802.15.3 combination provides limitations [18A]-[18D]. (INTEL-1003, ¶¶155-58.) Petitioner addresses the preamble [18P] and limitation [18E] below. (*Id.*, ¶¶148-63.)

a) Preamble [18P]

The IEEE 802.15.3 “piconet is a wireless ad hoc data communications system which allows a number of independent data devices (DEVs) to communicate with each other.” (INTEL-1006, 8, Figure 1 (below); *see also* INTEL-1005, 25.) As discussed in §VI.B.1.d), the CTA block in the CTA IE specifies a source DEV “to which the channel time is being allocated” and a destination DEV “to which the source DEV may send the frame.” (INTEL-1006, 117.) Thus, the Gilb-802.15.3 combination discloses a “*method of facilitating data exchange*” between two piconet devices. (INTEL-1003, ¶152; INTEL-1006, 8-9.)



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 double-direction arrows for data. (INTEL-1005, 29; INTEL-1003, ¶153.)

b) Limitation [18E]

The Gilb-802.15.3 combination discloses “*wirelessly broadcasting data for reception by the client device during the time slot.*” (INTEL-1003, ¶¶159-63.)

A CTA is “[a] contiguous period of time in the superframe allocated by the piconet coordinator **for communication between specified source and destination.**” (INTEL-1006, 3.) As discussed in §VI.B.1.b)-d), the PNC assigns a CTA (“*time slot*”) to a source-destination and communicates the assignment “to the

DEVs in the piconet via the CTA IE in the beacon.” (INTEL-1005, 35, 56-57.) As discussed in §VI.B.1.d), the assigned “*time slot*” is for the “*client device* [to] *receive data*.” Thus, “*data*” is transmitted “*for reception by the client device during the time slot*.” (INTEL-1003, ¶160; *see also* INTEL-1005, 48.)

The Gilb-802.15.3 combination discloses “*wireless broadcasting*” as used in the challenged claims in multiple ways. First, Gilb describes that a piconet supports use of a broadcast ID (BcstID) as the CTA destination ID. (*See* INTEL-1005, 102-103, 80-81.) When allocating a CTA to a BcstID as destination, the PNC considers the class of all piconet DEVs. (INTEL-1003, ¶161.) For example, if a DEV (e.g., the “*client device*”) is in SPS mode, the PNC allocates the broadcast CTA in a wake superframe for the SPS device. (*Id.*; *see, e.g.*, INTEL-1005, 42-43, 103; INTEL-1006, 62-63.) When the source broadcasts data to the BcstID during the allocated CTA, all DEVs in an AWAKE state receive the transmitted data. (INTEL-1003, ¶161; *see* INTEL-1005, 103-104, Table 4-4.)

Moreover, to the extent “*wireless broadcasting*” in claim 18 encompasses a directed wireless transmission to the “*client device*,” as discussed above in §VI.B.1.d), Gilb-802.15.3 describes such directed wireless transmission. (*See* INTEL-1005, 25, 31, 32, 56-57; *see also*, INTEL-1006, 1, 8, 151, 171.)

Finally, IEEE 802.15.3 defines an operating mode 0 in which “no security is provided and the piconet is wide open.” (INTEL-1005, 190; INTEL-1006, 221.) In

such a wireless system, any device that is AWAKE receives the data. (INTEL-1005, 190-91; INTEL-1003, ¶163.) The receiving DEV may ignore the received data if it is not the intended recipient. In this circumstance, the combination discloses “*wirelessly broadcasting data for reception by the client device during the time slot.*” (INTEL-1003, ¶163.)

3. Claim 1

a) Preamble [1P]

Preamble [1P] is the same as [18P]. For the reasons discussed in §VI.B.2.a), the Gilb-802.15.3 combination discloses [1P]. (INTEL-1003, ¶166.)

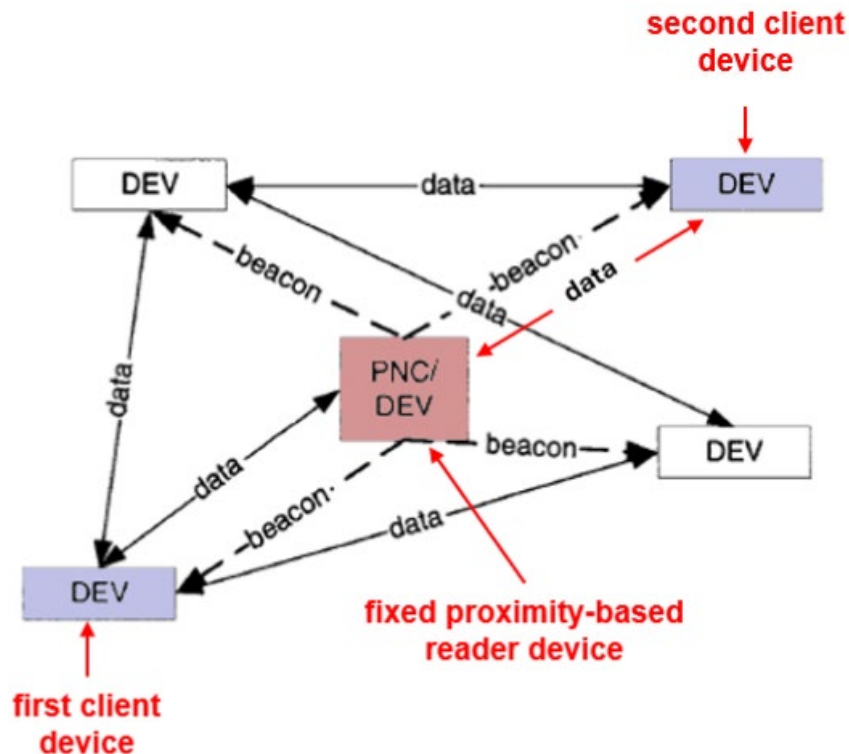
b) Limitations [1A.1]/[1B.1]

The Gilb-802.15.3 combination discloses “*assigning a first specific time slot for a first client device to wirelessly communicate with a fixed proximity-based reader device*” [1A.1] and “*assigning a second specific time slot for a second client device to wirelessly communicate with the fixed proximity-based reader device*” [1B.1]. (*Id.*, ¶¶167-78.)

(1) “*first/second client device*” and “*fixed proximity-based reader device*”⁹

As discussed in §VI.B.1.c), an 802.15.3 piconet includes a PNC/DEV and one or more DEVs, which are each a “*client device*.” (See INTEL-1005, 25, Figure 3-1(below); INTEL-1006, 8.) Thus, Gilb-802.15.3 discloses a “*first/second client device*”. (INTEL-1003, ¶168.)

⁹ Petitioner applies the plain and ordinary meaning to “*fixed proximity-based reader device*”. In the co-pending litigation, PO seeks an alternative construction: “fixed access point that can wirelessly interact with a client device to link the user with various applications, assets, and/or services.” (INTEL-1012, 2.) The Board need not construe this term because the prior art teaches the limitation under either construction.



Gilb, Annotated Figure 3-1

IEEE 802.15.3 supports devices that are “*fixed*.” (See INTEL-1006, 1 (“This standard defines the PHY and MAC specifications for high data rate wireless connectivity with **fixed**, portable and moving devices ...”).) Gilb provides exemplary IEEE 802.15.3 applications using devices a POSITA would have understood to be “*fixed*,” such as a photo kiosk enabling 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 proximity-based reader device*” that wirelessly interacts with a client device (camera) and provides access to and links the user to the application or

service (e.g., photo printing). (INTEL-1003, ¶170; *see* INTEL-1005, 25, 67; INTEL-1006, 4, 152-155.)

The extent of a “piconet is determined by the ability of DEVs to hear the beacon transmitted by the PNC.” (INTEL-1005, 25.) 802.15.3 similarly provides “piconet ... communications are normally confined to a small area around person or object that typically covers at least 10 m in all direction.” (INTEL-1006, 8.) That is, 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 (“Because it is possible or even likely that DEVs will move out of range of the PNC without the PNC being aware ...”), 131, 155; INTEL-1003, ¶171.)

The PNC/DEV controls piconet access by accepting or rejecting association requests received (read) from DEVs within its proximity. (*See, e.g.*, INTEL-1001, 5:24-28, 7:2-3; INTEL-1005, 66, 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, the PNC/DEV performs an “authentication method” as part of the “secure membership process” for DEVs requesting association with the piconet. (*See Id.*, 75-76.) And as explained in §§VI.B.1.d), VI.B.2.b), DEVs “*wirelessly communicate with*” (interact with) the PNC/DEV. (INTEL-1003, ¶172.)

Thus, Gilb-802.15.3 discloses a “*fixed proximity-based reader device*” under the plain and ordinary meaning and PO’s interpretation. (*Id.*, ¶173.)

(2) “*assigning a first/second specific time slot ...*”

The PNC “operates as the arbitrator in assigning channel time” by performing a “CTA algorithm” to determine how to allocate (assign) available CTAs based on the CTRqs received. (*See, e.g.*, INTEL-1005, 26, 258; §VI.A.3.b).) As discussed in §VI.B.1.d), each CTA assignment made by the PNC/DEV specifies the CTA duration and location, which collectively identify a “*specific time slot*” for communication between the identified source and destination DEVs. Because the superframe contains multiple CTAs that are separately assigned to each source/destination DEV pair, the Gilb-802.15.3 combination provides “*assigning a [first]/[second] specific time slot*” (e.g., CTA 1 and CTA n), and for the reasons in §§VI.B.1.d), VI.B.2.b), CTAs (“*time slots*”) are assigned “*for a [first]/[second] client device to wirelessly communicate with*” (by receiving data from) the PNC/DEV. (*See also* INTEL-1006, Figure 2 (below), 12; INTEL-1003, ¶¶175-76.)

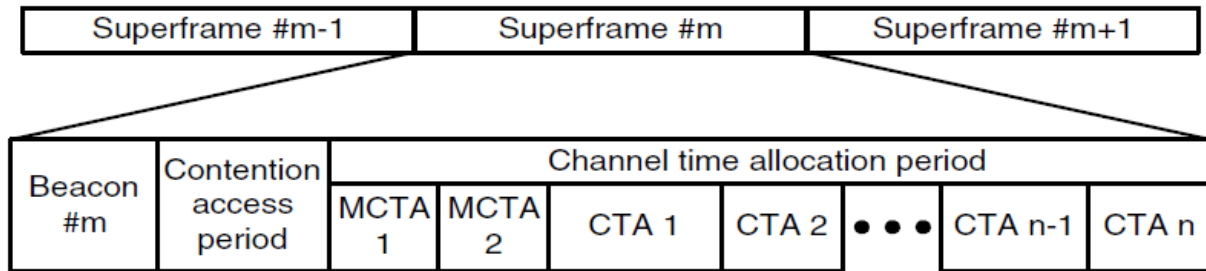
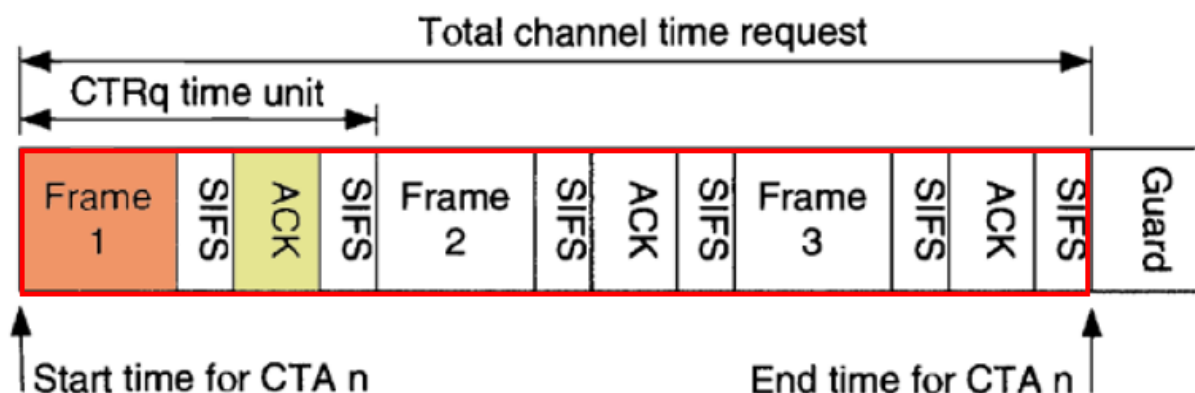


Figure 2—802.15.3 piconet superframe

In IEEE 802.15.3, a DEV also communicates with the PNC/DEV acting in its DEV capacity by transmitting data to it. (INTEL-1005, 25, 47-48, 57, 300.) That is, as demonstrated by annotated Gilb Figure 3-1 above, the “*first/second client device* [DEV]” is the source and the “*first proximity-based reader device* [PNC/DEV]” is the destination of the assigned CTA. (See, e.g., INTEL-1005, 25, Figure 3-1, 56-57, INTEL-1003, ¶177.)

The “*first/second*” DEV can also communicate with 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, ¶178; see also, §§VI.B.2.a), VI.B.2.b) (discussing bi-directional communication).) IEEE 802.15.3 provides an “[i]mmediate acknowledgment (Imm-ACK)” sent by a DEV within an assigned CTA “to confirm” frame receipt. (INTEL-1005, 81-82,

see also *id.*, 94-95, Figure 4-17¹⁰, 57 (“destination is only allowed to transmit the requested ACK frames, either Imm-ACK or Dly-ACK, during the CTA”), 177.)



Gilb, Annotated Figure 4-17

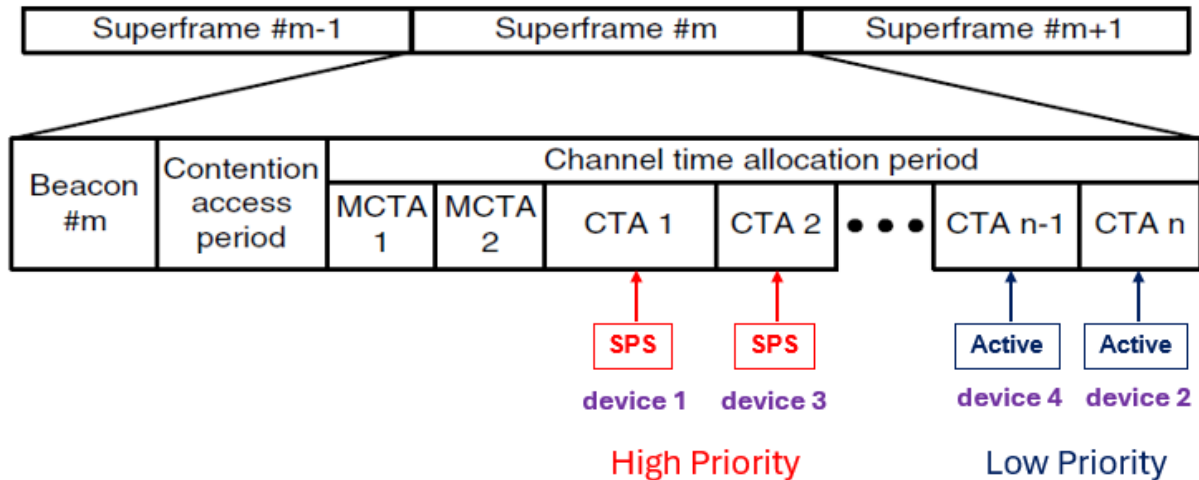
c) Limitations [1A.2]/[1B.2]/[1D]

The Gilb-802.15.3 combination discloses “*the first specific time slot set according to a first class*” [1A.2], “*the second specific time slot set according to a second class*” [1B.2], and “*the first class is associated with [second device/user], and the second class is associated with [second device/user]*” [1D] under PO’s interpretation of “*class.*” (INTEL-1003, ¶179-82.)

¹⁰ “Total channel time request” reflects that 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; INTEL-1003, ¶178.)

As discussed in §VI.B.1.e)(1), the Gilb-802.15.3 combination discloses or suggests a CTA allocation algorithm based on PM status (SPS or non-SPS). Under PO's interpretation, the PM mode is the "*class*," and because it reflects a PM mode of the DEV, it is "*associated with ... the [first]/[second] client device*" under PO's interpretation. Accordingly, for the same reasons addressed in §VI.B.1.e), under PO's interpretation, the PNC allocates (sets) the "*first time slot*" (e.g., CTA 1) according "*to a first class*" (e.g., SPS mode) associated with the "*first client device (device 1)*" and allocates (sets) the "*second time slot*" (e.g., CTA n) according "*to a second class*" (e.g., ACTIVE mode) associated with the "*second client device (device 2)*."¹¹ (*Id.*, ¶180-82.)

¹¹ The claim does not preclude the "*first class*" and "*second class*" from being the same (e.g., both SPS modes). The classes would still be distinct as recited because the "*first class*" under PO's interpretation (e.g., SPS mode) is associated with a first device/user and the "*second class*" under PO's interpretation (e.g., SPS mode) is associated with a second device/user.



802.15.3, Annotated Figure 2

As discussed in §VI.B.1.e)(2), Gilb-802.15.3 also suggests allocating CTAs according to QoS category. Under PO’s interpretation, the QoS category is the “*class*” and is associated with both the “*client device*” and the “*user of the client device*.” (INTEL-1003, ¶182.) Accordingly, for the same reasons addressed for 16[D]-[E], under PO’s interpretation, the PNC allocates (sets) the “*first time slot*” (e.g., CTA 1) according “*to a first class*” (e.g., 6: Voice) associated with the “*first client device* (device 1)” and allocates (sets) the “*second time slot*” (e.g., CTA n) according “*to a second class*” (e.g., 5: Video) associated with the “*second client device* (device 2).” (*Id.*, ¶182.)

d) Limitation [1C]

The Gilb-802.15.3 combination discloses “*the first and second specific time slots are determined based on synchronization information wirelessly received by*

the first and second client devices and priority level data associated with the first class and with the second class” under PO’s interpretation of “class associated with [device/user]” and “synchronization information.” (INTEL-1003, ¶¶183-87.)

The piconet DEVs each wirelessly receive the beacon (“*synchronization information*”) from the PNC under PO’s interpretation of “*synchronization information.*” (See §§VI.B.1.b)-c.) The beacon contains a CTA IE with multiple CTA blocks, each of which has the source, destination, start time, and duration (“*first and second specific time slots*”). (See §VI.B.1.d.) When a DEV is a CTA’s source, the DEV “shall use the beacon start time, CAP end time and the CTA IEs contained in the beacon to start [its] transmissions.” (INTEL-1006, 192.) Similarly, when a DEV is a CTA’s destination, the DEV uses the beacon’s start time, CAP end time, and CTA IEs to determine when to turn on its receiver. (INTEL-1005, 40, 56, 101, 103-104; INTEL-1006, 192; INTEL-1003, ¶184.) Thus, each DEV (“*client device*”) uses information in the beacon (“*synchronization information*”) to determine the specific CTA (“*time slot*”) assigned to it for transmission/reception, under the PO’s interpretation of “*synchronization information.*” (INTEL-1003, ¶184.) The Gilb-802.15.3 combination therefore discloses “*the first and second specific time slots are determined based on synchronization information wirelessly received by the first and second client devices*” (*Id.*)

As discussed in §VI.B.1.e)(1), in PM mode allocation, the SPS mode (“*first class*”) has a higher priority for CTA allocation than the non-SPS mode (“*second class*”), and the CTA allocations are determined according to “*priority level data*” associated with the PM modes (“*first/second class*”) under PO’s interpretation of “*class.*” (*Id.*, ¶185.)

In QoS allocation as discussed in §VI.B.1.e)(2), each QoS category is associated with a priority level (“*priority level data*”) (e.g., “*class*” of isochronous voice (VO) has priority of 6 (“*priority level data*”) which is highest priority and the “*class*” of best effort (BE) has a priority of 0). That is, the QoS allocation algorithm associates a “*first class*” and a “*second class*” with “*priority level data*” under PO’s interpretation of “*class.*” (*Id.*, ¶186.)

Thus, “*the first and second specific time slots are determined based on ... priority level data associated with the first class and with the second class*” under PO’s interpretation. (*Id.*, ¶187.)

C. Dependent Claims

1. Claim 2

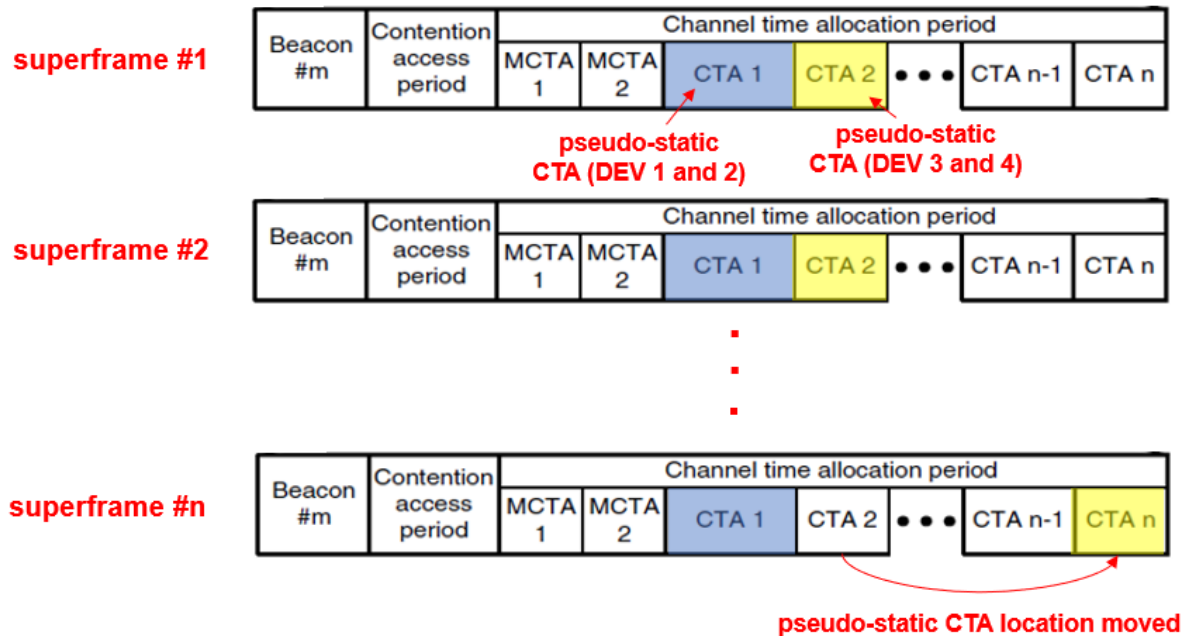
The Gilb-802.15.3 combination discloses “*dynamically adjusting at least one of the first specific time slot and the second specific time slot*” [2]. (INTEL-1003, ¶¶188-93.)

Gilb-802.15.3 “*dynamically adjusts*” CTAs (“*time slots*”) by (1) changing the location of an assigned CTA within the CTAP or (2) modifying the channel time allocated. (*Id.*, ¶189.) IEEE 802.15.3 supports two types of CTAs: dynamic CTA and pseudo-static CTA “allocated only for isochronous streams.” (INTEL-1006, 172.) Petitioner focuses on pseudo-static CTAs, but dynamic CTAs are equally applicable¹². (INTEL-1003, ¶188-93.)

An assigned pseudo-static CTA maintains the same CTA location within each superframe (e.g., DEVs 1/2 are assigned a pseudo-static CTA at CTA1 in each superframe, yellow, and DEVs 3/4 are assigned a pseudo-static CTA at CTA2, blue) as shown below. (INTEL-1005, 59; INTEL-1003, ¶191.) “The PNC is allowed to change the location of a pseudo-static CTA” with notice provided to the DEVs through the CTA IE included in multiple beacon transmissions. (*See* INTEL-1005, 59; §VI.B.1.b) (describing beacon); INTEL-1003, ¶191.) As Gilb describes, “[w]hen the source DEV sees the new allocation in the beacon, it begins using the new allocation for its transmissions”, as shown in the figure below,

¹² The PNC may “move dynamic CTAs within the superframe on a superframe by superframe basis” by “changing the CTA parameters in the beacon.” (INTEL-1006, 172.)

which adjusts the location of the pseudo-static CTA assigned to DEV 3/4 from CTA2 to CTAn. (INTEL-1005, 59; INTEL-1003, ¶191.)



Lansford, Figure B

Additionally, a DEV or PNC “may modify an established isochronous stream” by sending a CTRq requesting the modification. (See INTEL-1005, 36; INTEL-1006, 183, 139 (providing format of CTRq), Figure 73.) Modifications include adjusting the CTA duration by, e.g., increasing or decreasing number of time units. (See INTEL-1006, 183; INTEL-1005, 92-94, Figure 4-16 (showing multiple time units per CTA).)

2. Claim 5

Claim 5 recites “*the first class comprises at least one of a user associated with the first client device and a class of the first client device*” whereas claim 1 recites “*the first class is associated with*” either the user or device. As explained in §§VI.B.1.e), VI.B.3.c), the Gilb-802.15.3 combination renders obvious the “*class*” comprises “*a class of the first client device*” under PO’s interpretation in the PM status/QoS allocation because the “*class*” is the device’s PM mode/QoS category of the data it is receiving or sending. (INTEL-1003, ¶¶194-95.)

3. Claim 6

The Gilb-802.15.3 combination discloses two ways in which “*assigning the first specific time slot is dependent on a network traffic load.*” (*Id.*, ¶¶196-99.)

First, when DEVs have data to transmit, they request a CTA (“*time slot*”) by sending a CTRq to the PNC. (*See, e.g.*, INTEL-1005, 35-36; INTEL-1006, 139-40.) The time slots the PNC allocates are “*dependent on*” the received CTRqs, which are indicative of the anticipated “*traffic load*” on the network. (INTEL-1006, 173; INTEL-1003, ¶197.) For example, when relatively few or no time slots are requested—i.e., the network traffic load is low—each user would receive earlier and/or more time slots because there would be less/no competition for those time slots, whereas when more time slots are requested—i.e., the network traffic

load is high—the users would receive fewer and/or later time slots to accommodate the increase in network traffic.

Second, 802.15.3 explains the 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.) If no time slots are available, the PNC can defer assignment until one becomes available (i.e., the requested “*network traffic load*” decreases). (INTEL-1005, 89.) That is, when a time slot opens up (“*dependent on a network traffic load*”), the PNC assigns the available (“*first specific*”) “*time slot.*” (INTEL-1003, ¶198.)

In both examples, the PNC assigns the time slot(s) based on SPS/QoS (*supra*, §§VI.B.1.e), VI.B.3.c)). (INTEL-1003, ¶199.)

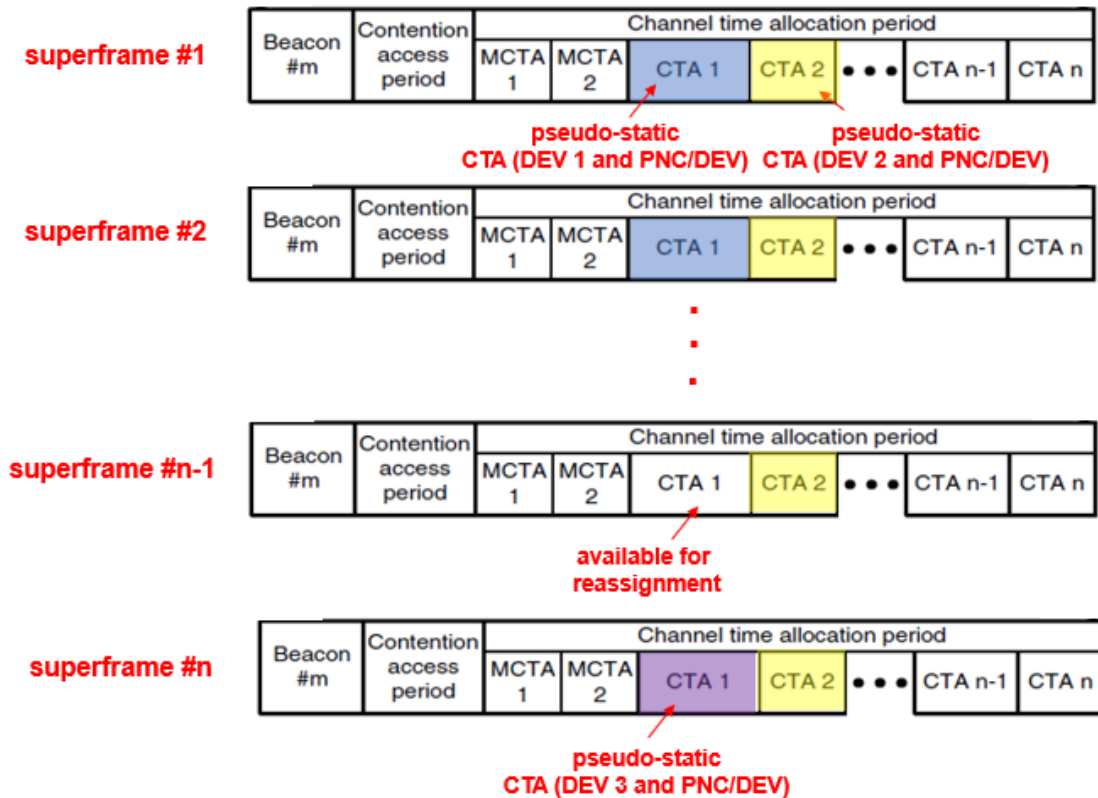
4. Claim 7

The Gilb-802.15.3 combination renders obvious “*reassigning the first specific time slot to a third client device in response to a detection that the first client device is unavailable.*” (INTEL-1003, ¶¶200-05.)

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; INTEL-1003, ¶201.) Gilb elaborates that a DEV “leaving the piconet,” such as when out of

range of the PNC, triggers disassociation. (INTEL-1005, 79-80; *accord* INTEL-1001, 15:67-16:3.) When a DEV is disassociated, it is “*unavailable*” for receiving/transmitting data within the piconet. (INTEL-1003, ¶201; INTEL-1006, 11.)

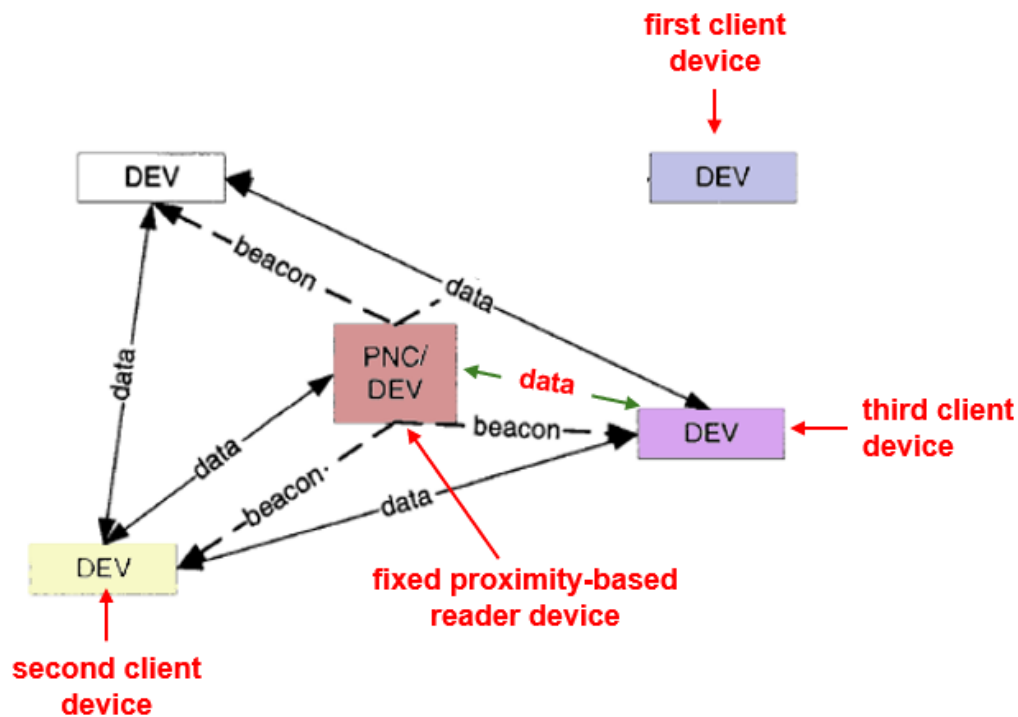
An existing CTA allocation is terminated in IEEE 802.15.3 when a DEV disassociates. (*See, e.g.*, INTEL-1006, 168 (PNC “shall perform the stream termination procedures for each of the assigned CTAs with the disassociated DEV as the SrcID or DestID”), 186-187 (describing process for terminating CTA allocations for isochronous stream); INTEL-1005, 36 (describing termination of isochronous allocation), 91 (terminating asynchronous allocations due to disassociation).) A POSITA would have understood that 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, ¶203; INTEL-1006, 172 (“the PNC may *reuse the old* [pseudo-static] *allocation* for another pair of DEVs”); *see* §VI.A.3.b.) This is illustrated in the exemplary sequence of Lansford, Figure C showing the pseudo-static allocation of CTA 1 terminated and becoming available in superframe #n-1. (INTEL-1003, ¶203.)



Lansford, Figure C

As discussed in §VI.C.3, 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 (“*third client device*”) with data to receive or send, such as depicted 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.*) In this case, “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, ¶204.)



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*,” as mapped in §§VI.B.1.d), VI.B.3.b)(2), which is deallocated and “*reassigned*” (i.e., reallocated) to a new source/destination pair (i.e., pair including a “*third 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, ¶205.) When a DEV disassociates, its data connections are unavailable for sending traffic and here, the PNC/DEV has reassigned CTA 1 to DEV 3 for exchanging data with the PNC/DEV. (*Id.*)

VII. Ground 2: Gilb-802.15.3-Cai Combination Renders Claims 12-13 and 15 obvious.

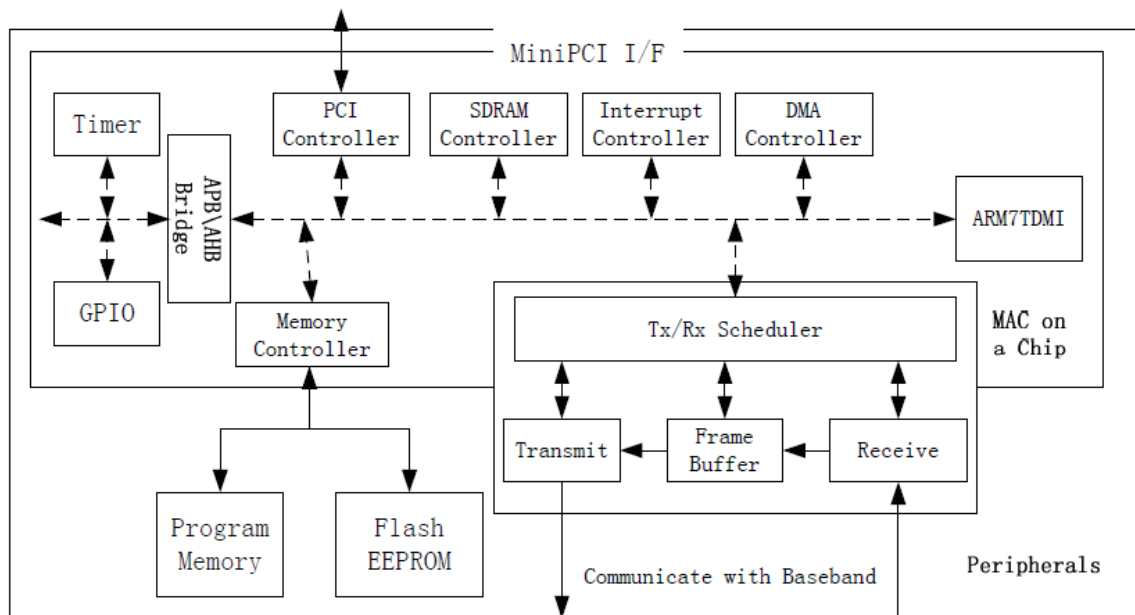
Neither Gilb nor 802.15.3 discloses “*the client device storing a bit field identifying a specific time slot*” [12C]. Cai expressly discloses this limitation.

A. Combination Overview

1. Cai

Cai’s design “split[s] the MAC into two parts”— an upper layer MAC (UMAC) “responsible for non-timing-critical functions” and lower layer MAC (LMAC) which “respond[s] to events in real time.” (INTEL-1008, 5297.) Cai’s

LMAC includes a Tx/Rx scheduler containing “status registers which may be read or set.” (*Id.*, 5300, Figure 5 (below).)



Cai, Figure 5

2. Motivation to Combine

A POSITA would have been motivated to combine Cai’s teaching regarding a two-layer MAC with Gilb-802.15.3’s DEV. (INTEL-1003, ¶¶210-13.) Cai, like Gilb and 802.15.3, is in the same field as the ’129 patent (network, encompassing wireless, communications). (*See, e.g.*, INTEL-1008, 5297.)

Gilb motivates the combination, noting the “MAC is split into hardware and software.” (INTEL-1005, 262.) Cai also expressly motivates the combination, describing its MAC layer design realizes the benefits of low cost, flexibility,

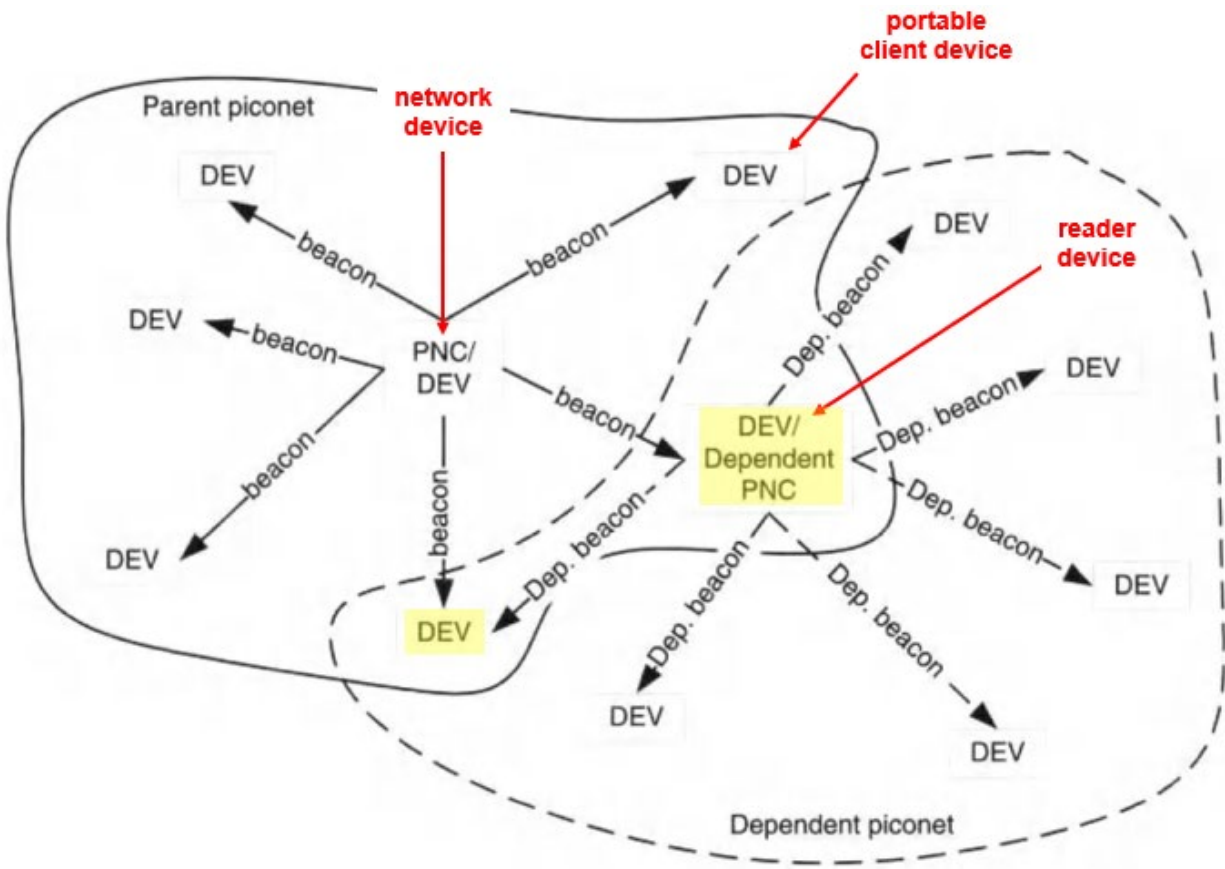
scalability, and testability. (INTEL-1008, 5297; INTEL-1003, ¶212.) Accordingly, consistent with the suggestions of Gilb and Cai, a POSITA would have been motivated to use Cai’s two-layer MAC in the DEVs of Gilb-802.15.3 to obtain a cost-effective, flexible implementation. (INTEL-1003, ¶213.) The results of the combination would have been predictable and a POSITA would have had a reasonable expectation of success because, as Gilb recognizes, it was known to implement 802.15.3 MAC functionality in hardware and software, as Cai describes. (INTEL-1005, 262; INTEL-1003, ¶213.)

B. Claim 12

1. Preamble [12P]/System Components

The Gilb-802.15.3-Cai combination discloses a “*system*” comprising a “*network device*”, “*portable client device*” and “*reader device*.” (INTEL-1003, ¶¶215-19.)

IEEE 802.15.3 supports dependent piconets such as “child piconet” which “rely on the parent piconet for their channel time and synchronization.” (INTEL-1005, 27, 36-37, Figure 3-3 (below).) The parent and dependent/child piconets are collectively a “*system*.” (INTEL-1003, ¶216.)



Gilb, Annotated Figure 3-3

As shown above, a DEV (yellow) can be a member “of both the parent and dependent piconets.” (INTEL-1005, 26.) In this arrangement, the DEV has “two separate personalities, one as a DEV in the parent piconet and the second as a DEV in the dependent piconet.” (*Id.*) One device (“DEV/Dependent PNC”) in the parent piconet “request[s] channel time from the PNC to become the PNC” of a dependent piconet. (*Id.*) That is, the parent PNC allocates a CTA during which the dependent piconet operates. (*See, e.g., Id.*, 171-172.)

As discussed in §VI.B.1.b, the PNC of the parent network is a “*network device*” within the parent piconet. (INTEL-1003, ¶218.) Any parent piconet DEV that is not currently acting as the PNC of the parent or child network is a “*portable client device*” for the reasons discussed in §VI.B.1.c.

The DEV/dependent PNC controls access to the dependent/child piconet by accepting or rejecting association requests received (read) from DEVs within its proximity, so it is a “*reader device*” for the reasons discussed in §VI.B.3.b.(1). (See, e.g., INTEL-1001, 5:24-28, 7:23; INTEL-1005, 37, 165-167; INTEL-1006, 11.)

2. Limitation [12A]

The Gilb-802.15.3-Cai combination discloses “*a network device arranged to wirelessly broadcast synchronization information in a first wireless coverage range*” [12A] under PO’s “*synchronization information*” interpretation. (INTEL-1003, ¶¶220-21.)

As discussed in §VI.B.1.b, the parent piconet PNC/DEV (“*network device*”) is “*arranged to wirelessly broadcast synchronization information*” under PO’s interpretation. The “extent of the piconet is determined by the ability of DEVs to **hear the beacon transmitted by the PNC,**” which represents the “*wireless coverage range*” of the parent PNC/DEV (“*network device*”). (INTEL-1003, ¶221; see also, INTEL-1005, 3 (defining “coverage area”), 25; INTEL-1006, 8.)

3. Limitation [12B]

The Gilb-802.15.3-Cai combination discloses “*a portable device for wirelessly communicating data with a reader device when the client device is located in communication proximity of the reader device*” [12B]. (INTEL-1003, ¶¶222-23.)

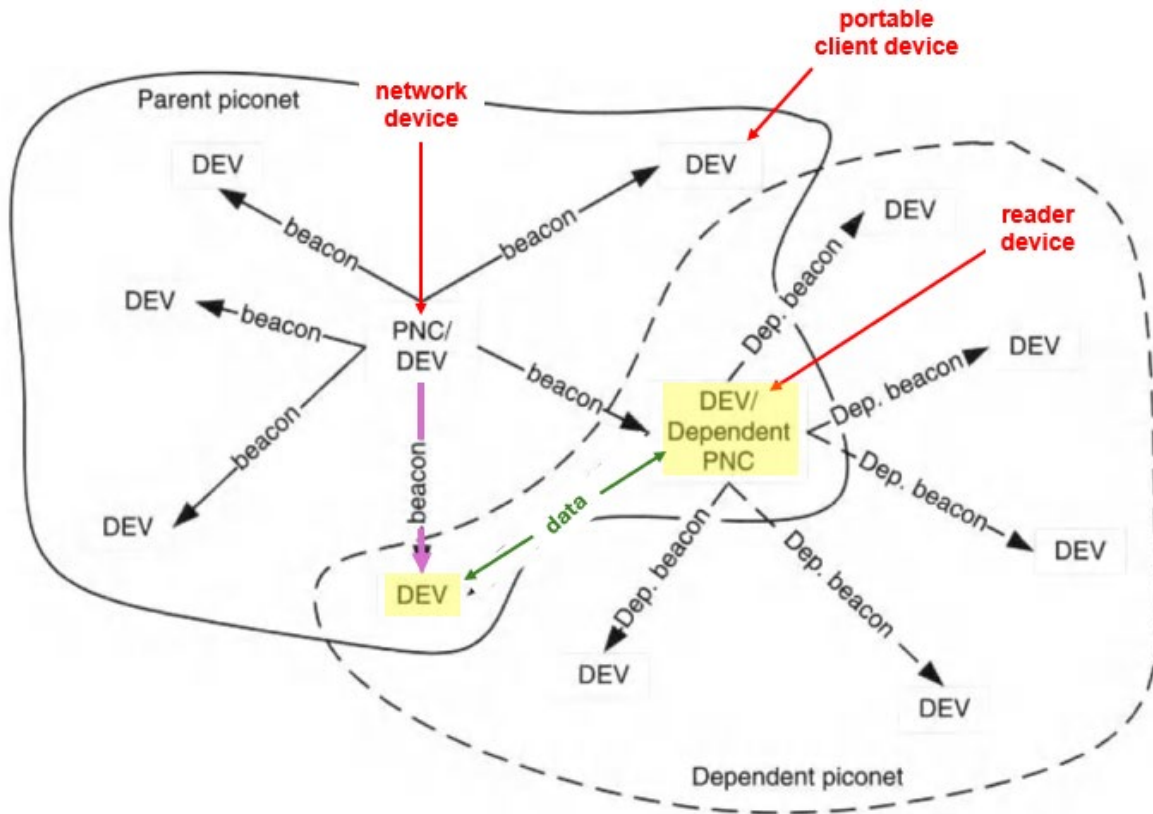
As discussed in §§VI.B.1.a and VI.B.2.a, a piconet is a wireless system allowing DEVs “to communicate with each other.” (See also, INTEL-1005, 25; INTEL-1006, 8.) Because the “*portable device*” is any non-PNC DEV in the parent piconet (§VI.B.1.c) and the DEV/dependent PNC (“*reader device*”) is also a DEV in the parent piconet (§VI.B.3.b.(1)), the “*portable device [] wirelessly communicat[es] data with the reader device.*” (INTEL-1005, 37.) And as discussed in §§VI.B.3.b.(1) and VII.B.2, IEEE 802.15.3 DEVs, e.g., the DEV and DEV/dependent PNC “*wirelessly communicat[e] data*” when in proximity to one another. (INTEL-1005, 3; INTEL-1003, ¶223.)

4. “Time Slot” Limitations [12C]-[12D]/[12F]

The Gilb-802.15.3-Cai combination discloses “*client device storing a bit field identifying a specific time slot*” [12C], “*specific time slot set according to a class associated with [device/user of the portable client device]*” [12D], and “*time slot determined based on the synchronization information and priority level data*

associated with the class” [12F] under PO’s interpretation of “*class associated with [device/user]*” and “*synchronization information.*” (INTEL-1003, ¶¶224-28.)

As discussed in §VI.B.1.d, the PNC/DEV assigns a CTA during which the client device can receive data from the network device. As discussed in §§VI.B.1.b-c, the PNC broadcasts the assigned CTA in a CTA block within the beacon (“*synchronization information*”, purple in Figure 3-3 below, as construed by PO). The CTA block identifies “*a specific time slot*” (CTA start time/duration) for communication between a source/destination DEV pair (green). (See §VI.B.1.d.) A POSITA would have understood the CTA block is specified using bits, and therefore the “*specific time slot*” is identified by “*a bit field.*” (INTEL-1006, 101 (frame consists of bits), 117 (CTA blocks consisting of octets (8 bits)), INTEL-1005, 47.)



Gilb, Annotated Figure 3-3

The Gilb-802.15.3-Cai combination uses Cai’s two-layer MAC architecture in the Gilb-802.15.3 DEV. (§VII.A.2.) Cai’s Tx/Rx scheduler “extracts **all the information in** [the received] **beacon** in real time and **reset[s] the status** of the LMAC such as CAP starting time and duration.” (INTEL-1008, 5301.) The LMAC “contains some **status registers which may be read or set** by firmware and they can trigger hardware actions to complete the frame transmission and reception.” (*Id.*, 5301.) That is, in the combination, the extracted data from Gilb-802.15.3’s beacon, which includes CTA blocks with location and duration (§VI.B.1.d)), is

set/stored in Cai's status registers and used to determine, e.g., information needed for transmission or reception. (See, e.g., INTEL-1008, 5300-5301.) Because the CTA block ("*specific time slot*") is transmitted as a "*bit field*", a POSITA would have understood, in the Gilb-802.15.3-Cai combination, the "*client device stor[es] a bit field identifying a specific time slot*" in the status registers, as taught by Cai. (INTEL-1003, ¶226.)

As discussed in §§VI.B.3.b.(2), VI.B.1.e, Gilb-802.15.3 discloses "*the specific time slot set according to a class*" which is "*associated with the one or more of the [device/user]*" [12D], and limitation [12F] as discussed in §VI.B.3.d, under PO's interpretation of "*class associated with [device/user]*" and "*synchronization information.*" (*Id.*, ¶¶227-28.)

5. Limitation [12E]

For the reasons discussed in §VI.B.1.d, the Gilb-802.15.3-Cai combination further discloses limitation [12E]. (INTEL-1003, ¶229.)

C. Dependent Claims

1. Claim 13

The Gilb-802.15.3-Cai combination discloses "*the client device is further arranged to transmit data to the network device during the time slot.*" (INTEL-1003, ¶¶230-232.) As discussed in §VI.B.3.b.(2), a DEV sends an "[i]mmediate acknowledgment (Imm-ACK)" within an assigned CTA "to confirm" receipt of a

frame. (INTEL-1005, 81-82, *see also id.*, 94-95, Figure 4-17, 57 (“destination is only allowed to transmit the requested ACK frames ... during the CTA”), 177.) Accordingly, when the “*client device*” receives a data frame from the “*network device*”, it transmits an ACK frame (“*data*”) to the “*network device during the time slot.*” (INTEL-1003, ¶230.)

2. Claim 15

The Gilb-802.15.3-Cai combination provides “*synchronization information is dependent on at least one of a user associated with the client device, a class of a user associated with the client device, a class of the client device, and a network traffic load in the system*” under PO’s interpretation of “*class associated with [device/user]*” and “*synchronization information.*” (INTEL-1003, ¶¶231-32.)

As explained in §VI.C.2, the Gilb-802.15.3 combination discloses the “*class*” comprises at least “*a class of the first client device*” in the PM status/QoS allocation under PO’s interpretation. Because the beacon (“*synchronization information*”) contains CTA allocations (assigned “*time slots*”), which are set according to a “*class*” associated with the “*client device*” (*see* §VI.B.1.c), the Gilb-802.15.3-Cai combination discloses the “*synchronization information is dependent on ... a class of the client device*” under PO’s interpretation. (*Id.*, ¶232.) Further, for the reasons described for claim 6 (*see* §VI.C.3), the “*synchronization*

information” containing the time slots is also dependent on “*a network traffic load in the system.*” (*Id.*, ¶232.)

VIII. Ground 3: Gilb-802.15.3-Ward Combination Renders Claims 1-2, 5-7, 16, 18 obvious.

The Gilb-802.15.3-Ward combination renders claims 1-2, 5-7, 16, 18 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 stock price update systems (where users receive stock price updates in assigned time slots). (*Id.*, 4-5, 12-13.) Specifically, 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). (*Id.*, Abstract, 12-13.)

In one example of Ward’s stock price update application, users pay more to be placed in a higher “level of subscription.” (*Id.*, 12.) These users are prioritized by receiving time slot assignments **more often** than users in a lower subscription level—e.g., higher priority users might receive stock price updates every few seconds, whereas lower priority users might receive updates every few minutes. (*Id.*; INTEL-1003, ¶236.) In another example, users can pay more for a premium service under which they receive **immediate** notifications when certain events occur, such as when their stock falls below a threshold price. (INTEL-1007, 12-13.)

2. Motivation to Combine

As discussed in §VI.B.1.e, Gilb-802.15.3 teaches prioritizing time slot assignments according to PM mode (and suggests QoS-based allocation) (*see* §VI.B.1.e), but expressly contemplates use of alternative, and even more complex, techniques. (INTEL-1005, 93 (noting “there are undoubtedly many good algorithms,” but no one 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 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 assigning time slots using Gilb-802.15.3 would be motivated to use the

teachings of Ward to prioritize users who pay more to receive more/better services. (INTEL-1003, ¶237.) 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, however, 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 in exchange for higher subscription/premium fees.¹³ For example, users could pay more to receive immediate notification when a significant stock price drop occurs. (INTEL-1007, 12-13; INTEL-1003, ¶237.)

Ward—like Gilb-802.15.3—is analogous art, 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 ’129 patent (how

¹³ It would have been 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. (INTEL-1003, ¶249; *see* INTEL-1005, 258 (recognizing differing levels of complexity possible).)

to structure 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); *see* §VI.A.4.) 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.1.e, 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 up 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 less depending on the user's service selection. (INTEL-1007, 12-13.) 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, ¶239.) Conversely, users who do not want more time slots or immediate service pay less. (*Id.*) A POSITA would thus recognize using Ward's teachings would allow more revenue generating opportunities. (*Id.*, ¶239.)

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.) And 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, ¶240.) 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, ¶240.)

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, the PNC stores pending requests without allocating time slots, and then allocates time slots from the pending requests list 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, ¶241.)

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). (*Id.*, ¶242.)

Fifth, a POSITA would have had a reasonable expectation of success in the combination, and the results 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 have been assigned using the existing CTA block fields of Gilb-802.15.3, including the appropriate source and destination identifiers. (*See* §VI.B.1.d.) 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-802.15.3.¹⁴ 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 in the standard. (INTEL-1005, 74-75; INTEL-1006, 122, Figures 39, 49.)

¹⁴ Neither the '129 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, ¶243.)

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, ¶243-45.)

A POSITA would have also expected success because Gilb provides example applications for the 802.15.3 piconet that are similar to Ward's stock price update service. For example, Gilb discloses content delivery systems. (INTEL-1005, 18-22; INTEL-1003, ¶246.)

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 that would be used to determine which users would be prioritized over others (e.g., a rule determining a higher subscription level should receive more time slots than a lower one, and/or 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 that associates DEVs with user subscription level and/or premium subscription status. (INTEL-1003, ¶248.) These changes would have been well within the level of ordinary skill in the art, would not impose a significant burden on the PNC, and the costs would be offset by the opportunity for revenue generation. (*Id.*, ¶249.)

B. Independent Claims

1. “*Class*” Limitations

Under the correct construction of “*class associated with [user/device]*” limitations—“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 Gilb-802.15.3-Ward combination renders obvious limitations [1A.2], [1B.2], [1C], [1D], [16D]-[16E], and [18C]-[18D]. (See §V.B.2; INTEL-1003, ¶¶250-57.)

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; INTEL-1003, ¶251.) This combination meets the “*class associated with [device/user]*” term for four reasons.

First, users associated with Ward’s subscription levels and/or premium service subscriptions constitute the “[*first/second*] class.” (INTEL-1007, 12-13.) For example, a “*first class*” includes the users with a higher subscription level and/or premium service subscription, and a “*second class*” includes the users with a lower subscription level and/or non-premium service subscription. (INTEL-1003, ¶252.)

Second, Ward teaches these classes are “*associated with*” the “*user[s] of [] client device[s]*”—namely, the 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*,” and other users who pay for a lower subscription level with less frequent time slots assignments would be associated with a “*second class*.” (INTEL-1007, 12.) Likewise, investors who pay for the premium service alerts about stock price drops would be associated with a “*first class*,” and investors who do not would be associated with a “*second class*.” (INTEL-1007, 12-13; INTEL-1003, ¶253.) None of these classes is associated with data items or network characteristics; rather they are associated with the “*users*” that paid for the services.

Third, Ward teaches “*specific*” time slots are “*set according to*” 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 (“Day traders can pay a **higher subscription** so as to be informed more often of their current share prices and a scheduling process **allocates time slots on the radio channel to investors based on the level of subscription** paid by such investors....”); INTEL-1003, ¶254.) That is, the respective “*specific time slots*” users in each class are assigned to are “*set according to*” an algorithm that depends

on the users' higher or lower subscription levels (i.e., "*class*"). Likewise, "the next available time slot" ("*first specific time slot*") received by a user when a stock price alert is issued is "*set according to*" the "*class*" of a premium service subscriber, whereas a non-premium user that receives a price update at a later time ("*second specific time slot*") has their time slot "*set according to*" their "*class*" because they received their alert at a later time as a non-premium user. (INTEL-1007, 12-13; INTEL-1003, ¶254.)

Finally, Ward's classes are associated with "*priority level data*" upon which the time slots are determined. Specifically, Ward teaches 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. 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 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 as discussed above in §VIII.A.2. (INTEL-1003, ¶255.)

Thus, the combination provides the “*time slot*” is “*set*” “*according to a [] class*” and “*determined based on ... priority level data associated with the [] class*” [1A.2]/[1B.2]/[1C]/1[D], [16D-E], [18C-D]. (INTEL-1003, ¶256.)

* * *

For the reasons above and in §§VI.B.1, VI.B.2, VI.B.3, the Gilb-802.15.3-Ward combination discloses claims 1, 16, and 18 under the proper construction of “*class associated with [device/user]*” and under PO’s interpretation of “*synchronization information.*”

C. Dependent Claims

For the reasons above and in §VI.C.1, the Gilb-802.15.3-Ward combination renders obvious dependent claim 2. As discussed above in §VIII.B.1, the “*first class*” of the Gilb-802.15.3-Ward combination comprises “*a user associated with the first client device*” and therefore the combination also renders claim 5 obvious.

In both examples of network traffic load dependency discussed for claim 6 (§VI.C.3), in the Gilb-802.15.3-Ward combination, the PNC assigns the time slot(s) based also on subscription/premium service options (§VIII.B.1), rendering claim 6 obvious. (INTEL-1003, ¶259.)

Regarding claim 7, when a client DEV in the system of Gilb-802.15.3-Ward becomes unavailable, as discussed in §VI.C.4 (e.g., by disassociation), its CTA becomes available for reassignment. (*Id.*, ¶260.) A POSITA would understand a

premium device entering the network (“*third client device*”) would be assigned to the open time slot because the duration of the asynchronous CTA transmitting stock data would be the same. (*Id.*) Thus, the Gilb-802.15.3-Ward combination renders claim 7 obvious.

IX. Ground 4: Gilb-IEEE 802.15.3-Ward-Brawn Combination Renders Claims 1-2, 5-7, 16, 18 obvious.

The Gilb-802.15.3-Ward-Brawn combination renders obvious claims 1-2, 5-7, 16 and 18 under the correct constructions of “*synchronization information*” and “*class associated with [device/user]*.”

A. Combination Overview

1. IEEE 802.15.3-Group Allocations

In Gilb-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 block containing the same source (“SrcID”) and timing information, but with 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, ¶263.)

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 CTA location (2 octets). Moreover, each device must read all this repetitive information until it reaches a CTA block listing its identifier in the destination field. (*Id.*, ¶365.)

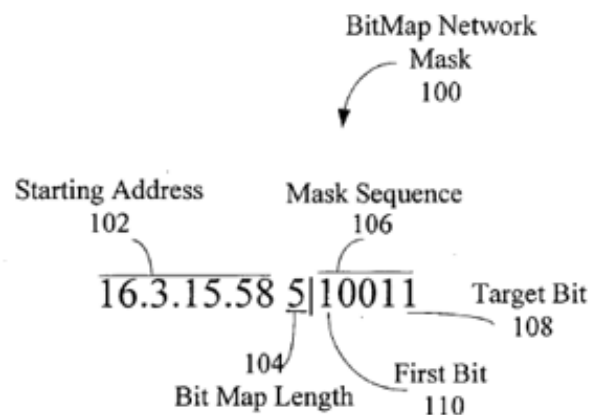
2. Brawn

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

Brawn does this using a mask sequence indicating which addresses after the initial address are included or not. (*Id.*) Brawn’s “bit map length” indicates the number of addresses in the mask sequence. (*Id.*) For example, 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 address in the corresponding sequence position is unmasked) and 0s (indicating corresponding address is masked). (*Id.*)

In Brawn’s exemplary Figure 1A (below), the “bitmap length 104” is “5,” indicating five total 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. (*Id.*, ¶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. (*Id.*, ¶28.)

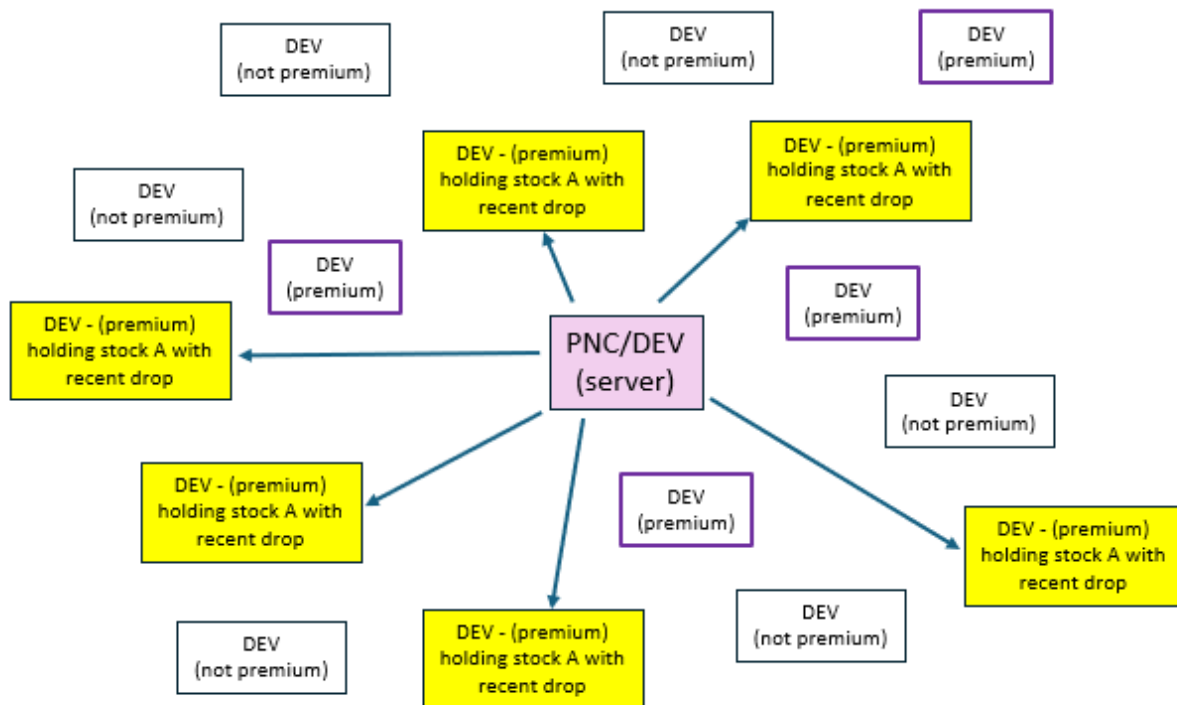
3. Motivation to Combine

A POSITA would have been motivated to use Brawn’s bitmask with Gilb-802.15.3’s group allocations. (INTEL-1003, ¶¶272-85.) Brawn—like Gilb-

802.15.3-Ward—is analogous art; 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 '129 patent (how to structure communications between network devices). (INTEL-1009, ¶¶ 2-3, ¶¶27-28, ¶51 (applicability to wireless networks); *see* §§VI.A.4, VIII.A.2.) A POSITA would be motivated to make this combination for multiple reasons. (INTEL-1003, ¶273.)

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 having the same stock, thereby conserving network resources. (*Id.*, ¶274.) In Gilb-802.15.3-Ward, 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 C

A POSITA would have had a reasonable expectation of success combining Gilb-802.15.3's group allocations with Ward, as it would have involved using 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, ¶276.)

Second, a POSITA would have been motivated to use Brawn's bitmask to assign a group allocation in Gilb-802.15.3-Ward to reduce the beacon length. Gilb-802.15.3-Ward uses a single time slot to transmit a stock price to multiple devices

of the same class, but does so using a beacon with separate CTA blocks for each destination device. (INTEL-1005, 88-89; INTEL-1006, 188-190; INTEL-1003, ¶277.) 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; INTEL-1003, ¶277.) A POSITA would have recognized that using Brawn’s masking with Gilb-802.15.3-Ward reduces the number of unnecessary bits transmitted in the beacon (*Id.*)

For example, without Brawn’s teachings, a group allocation requires sending/receiving a CTA block with 16 bits (2 octets) for timing information, 24 bits (3 octets) for 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, ¶279.) 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 in §IX.A.2, 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 multiple CTA blocks, **only one single modified CTA block** is sent to allocate the 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)

(INTEL-1003, ¶280.)

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 reduces the size of Gilb/802.15.3’s beacon for group allocations.¹⁵ (INTEL-1003, ¶281.)

¹⁵ 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. (INTEL-1003, ¶281.)

A POSITA would have had a reasonable expectation of success in the combination and the results 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 bitmask disclosed by Brawn. Brawn itself suggests 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 POSITAs would have been motivated to use a mask with Gilb-802.15.3’s resource allocation scheme. (See INTEL-1019, 4; INTEL-1033, 39 (adopted standard); INTEL-1003, ¶282.)¹⁶

¹⁶ Because Brawn’s fields are unnecessary for individual allocations, requiring only one destination ID, a POSITA would have been motivated to include an indicator to differentiate individual and group allocations, which could be integrated, e.g., into an existing field in the CTA block, such as the stream index field, without increasing the size of individual allocations. (INTEL-1006, 117, Figure 26; §VI.A.3.b); INTEL-1003, ¶282.)

Gilb-802.15.3-Ward-Brawn constitutes the use of a known technique (Brawn’s bitmask) with similar devices (Gilb-802.15.3 and Ward’s wireless network devices (*see* INTEL-1009, Figure 10, ¶51 (application to wireless devices)) in the same way (representing multiple device IDs using fewer bits). (INTEL-1003, ¶283-85.)

B. Independent Claims

1. “*Synchronization Information*” Limitations

Under the correct construction of “*synchronization information*,” limitations [1C], [16A]-[16C], and [18A]-[18B] are obvious over the Gilb-802.15.3-Ward-Brawn combination.

The combination discloses “*synchronization information*”: individual bitmasks applied to bit fields of individual client devices. (INTEL-1003, ¶287.) As explained in §IX.A, Gilb-802.15.3-Ward-Brawn uses a “*mask*” that reduces the amount of information needed for group allocations in Gilb-802.15.3-Ward. Brawn’s mask sequence is made up of individual one-bit masks (i.e., bitmasks). (INTEL-1009, ¶¶27-29.) When Brawn’s mask is used with the Gilb-802.15.3-Ward combination for a group allocation to 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 bitfield is masked or unmasked. That is, each

individual device applies the mask to its own individual bitfield in the mask sequence and, if that bitfield is equal to “1,” determines the CTA is intended for it. (INTEL-1003, ¶288.)

Time slots are determined based on this synchronization information. As discussed in §VI.B.1.d), Gilb-802.15.3’s CTA block includes a CTA duration and location which specify a “*specific time slot*”. As discussed in §IX.A.3, Gilb-802.15.3-Ward-Brawn incorporates Brawn’s in Gilb-802.15.3’s CTA allocation to identify all destination DEVs for group allocations (i.e., the mask is used to determine the “*specific time slot*” because the mask is used in the CTA block to show which destination device(s) are assigned to that time slot). (INTEL-1003, ¶290.) Thus, in applications in which data is transmitted to multiple DEVs, 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. (INTEL-1003, ¶290.) When providing a second group allocation for a stock update to a second class (e.g., lower-level/non-premium subscribers), the “*second specific time slot*” would likewise be assigned by (determined based on) Brawn’s mask.

Accordingly, for reasons above and in §VIII.A-B, the Gilb-802.15.3-Ward-Brawn combination renders obvious claims 1, 16, and 18 under Petitioner’s

construction of “*synchronization information*” and the “*class associated with [device/user]*” term. (INTEL-1003, ¶291.)

C. Dependent Claims

For the reasons in §§VI.C, VIII.C, IX.B, the Gilb-802.15.3-Ward-Brawn combination renders obvious dependent claims 2, and 5-7.

X. Grounds 5-6: Gilb-802.15.3-Ward and Gilb-802.15.3-Ward-Brawn with Cai Renders Claims 12-13 and 15 Obvious.

A. Motivation to Combine

For the reasons in §VII.A, a POSITA would be motivated to combine Cai’s MAC with the DEV of Gilb-802.15.3-Ward (Ground 5) and the DEV of Gilb-802.15.3-Ward-Brawn (Ground 6).

B. Claim 12

Claim limitations 12P-B and 12D-F are disclosed by the Gilb-802.15.3-Ward-Cai and Gilb-802.15.3-Ward-Brawn-Cai combinations for the reasons in §§VII.A-B, VIII.A-B, IX.B.1-B.

For the reasons in §VII.B.4, limitation [12C] is disclosed by the Gilb-802.15.3-Ward-Cai and Gilb-802.15.3-Ward-Brawn-Cai combinations.

C. Dependent Claims

For the reasons in §§VII, VIII, IX, the Gilb-802.15.3-Ward-Cai and Gilb-802.15.3-Ward-Brawn-Cai combinations each render claims 13 and 15 obvious. (INTEL-1003, ¶296.)

XI. 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 may be expected to occur in early 2027, months after the Final Written Decision would be due. (*See* INTEL-1032, 37; Interim Procedure, 8-9.) Thus, *Fintiv* factors 2-3 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.

XII. 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 '129 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
Lori A. Gordon (Reg. No. 50,633) Goodwin Procter LLP 1900 N. Street NW Washington, D.C. 20036 Phone: (202) 346-4000 Fax: (202) 346-4444	Christie L. Larochelle (Reg. No. 75,020) Goodwin Procter LLP 100 Northern Avenue Boston, MA 02210 Phone: (617) 570-1000 Fax: (617) 523-1231

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

XIII. Conclusion

Inter partes review is respectfully requested.

Respectfully submitted,

/Lori A. Gordon/

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Date: December 23, 2024

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 13,998 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
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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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Claim Appendix

[1P] A method of facilitating data exchange, comprising:

[1A.1] assigning a first specific time slot for a first client device to wirelessly communicate with a fixed proximity-based reader device,

[1.A.2] the first specific time slot set according to a first class; and

[1B.1] assigning a second specific time slot for a second client device to wirelessly communicate with the fixed proximity-based reader device,

[1.B.2] the second specific time slot set according to a second class,

[1C] wherein the first and second specific time slots are determined based on synchronization information wirelessly received by the first and second client devices and priority level data associated with the first class and with the second class, and

[1D] wherein the first class is associated with one or more of the first client device and a user of the first client device, and the second class is associated with one or more of the second client device and a user of the second client device.

[12P] A system, comprising:

[12A] a network device arranged to wirelessly broadcast synchronization information in a first wireless coverage range; and

[12B.1] a portable client device for wirelessly communicating data with a reader device when the client device is located in communication proximity of the reader device,

[12B.2] the client device storing a bit field identifying a specific time slot,

[12B.3] the specific time slot set according to a class associated with one or more of the portable client device and the user of the portable client device,

[12C] wherein the client device is arranged to receive data from the network device during the specific time slot, the time slot determined based on the synchronization information and priority level data associated with the class.

[16P] A system, comprising:

[16A] a network device configured to wirelessly broadcast synchronization information; and

[16B] a portable client device configured to wirelessly receive the synchronization information,

[16C] the received synchronization information comprising information assigning a specific time slot during which the client device can receive data from the network device,

[16D] the time slot being determined according to a priority level data associated with a class,

[16E] the class associated with the one or more of the portable client device and the user of the portable client device.

[18P] A method of facilitating data exchange, comprising:

[18A] wirelessly broadcasting synchronization information to a portable client device,

[18B] the synchronization information comprising information assigning a time slot during which the client device can receive data,

[18C] the time slot being determined according to priority level data associated with a class,

[18D] the class associated with one or more of the portable client device and the user of the portable client device; and

[18E] wirelessly broadcasting data for reception by the client device during the time slot.