

THE SULLIVAN GROUP OF COURT REPORTERS

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG ELECTRONICS CO.	:	CASE NOS.
LTD.,	:	
	:	IPR2025-01043
Petitioner,	:	U.S. Patent No.
	:	11,116,035
v.	:	Ref. 39843-0198IP1
	:	
	:	IPR2025-01044
WILUS INSTITUTE OF	:	U.S. Patent No.
STANDARDS AND TECHNOLOGY	:	11,516,879
INC.,	:	Ref. 39843-0199IP1
	:	
Patent Owner.	:	

REMOTE DEPOSITION OF ZYGMUNT J. HAAS, PH.D.

Friday, April 17, 2026

9:00 a.m.

Reported by: Frank R. Austin, RMR, CRR

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1 The remote deposition of ZYGMUNT J. HAAS,
2 PH.D. was taken via Zoom Video Communications, Inc.,
3 on Friday, April 17, 2026, commencing at 9:00 a.m.,
4 in the presence of counsel for the parties.

5 It was agreed that Frank R. Austin,
6 Registered Merit Reporter, Certified Realtime
7 Reporter, and Notary Public in and for the
8 Commonwealth of Virginia, would take said deposition
9 in machine shorthand and transcribe the same to
10 typewriting by means of computer-aided transcription.

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(Exhibits retained by counsel.)

1 MR. YOUNG: My name is James Young. I'm
2 from the law firm of Fish & Richardson. We
3 represent the petitioner in two of the IPRs.
4 Those are IPR 2025-01043 and IPR 2025-01044.
5 With me today is, also from the law firm of
6 Fish & Richardson, Jonathan Driesslein.

7 MS. XU: This is Linda Xu from the law
8 firm of Russ August & Kabat. I represent
9 the patent owner, Wilus Institute of
10 Technology, and I also represent the
11 witness.

12 MR. YOUNG: Okay.

13 - - -

14 ZYG MUNT J. HAAS, PH.D.
15 was duly sworn and examined as follows:

16 EXAMINATION

17 BY MR. YOUNG:

18 Q. Good morning, Dr. Haas.

19 A. Good morning, sir.

20 Q. As I said, my name is James Young. I
21 have some questions for you today. Is that okay?

22 A. Absolutely, sir.

23 Q. To begin with, could you state your
24 full name for the record.

25 A. Sure. My last name is Haas, H-A-A-S.

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1 First name is Zygmunt, Z-Y-G-M-U-N-T.

2 Q. Okay. I want to go -- I want to
3 begin by going over some ground rules for the
4 deposition, okay?

5 A. Absolutely, sir.

6 Q. You understand that you are under
7 oath today?

8 A. Yes, I do.

9 Q. You understand that means you must
10 tell the truth?

11 A. Absolutely.

12 Q. The whole truth?

13 A. Absolutely.

14 Q. And nothing but the truth?

15 A. Yes, sir.

16 Q. And you will do that today?

17 A. I'm sorry?

18 Q. You will do that today?

19 A. Yes, I will.

20 Q. You understand that you must give
21 truthful, complete and accurate testimony, and you've
22 got to do that today?

23 A. Yes, sir.

24 Q. If you ever do not understand a
25 question, please let me know.

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1 A. I will do so.

2 Q. If you answer a question, though, you
3 understood it, fair?

4 A. Sorry. If I what?

5 Q. If you answer a question, you
6 understood it, fair?

7 A. Yes.

8 Q. If you ever want to take back, change
9 or add to, modify in any way your answer, let me know
10 during the deposition today.

11 A. I will do so, sir.

12 Q. I'm planning to take breaks about
13 every hour. Is that okay?

14 A. Yes, sir, absolutely.

15 Q. But if you ever need a break sooner
16 than that, just let me know.

17 A. I will do so, sir.

18 Q. You understand that the court
19 reporter here will create a written transcript of
20 your testimony?

21 A. Yes.

22 Q. And you have the ability to read that
23 transcript and make corrections, changes to your
24 testimony?

25 A. Yes.

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1 Q. If you make the changes, though, I
2 get to tell the board that you've changed your
3 testimony.

4 A. I'm sorry. If I what?

5 Q. If you do make the changes, though, I
6 get to tell the board that you changed your
7 testimony.

8 A. Okay.

9 Q. So that's another reason why you have
10 to give truthful, complete and accurate testimony
11 today.

12 A. Yes.

13 Q. Is there any reason, medical or
14 otherwise, that prevents you from giving truthful,
15 complete and accurate testimony today?

16 A. No, there's no reason, sir.

17 Q. If that ever changes, you must tell
18 me immediately.

19 A. I will do so, sir.

20 Q. Where are you joining the call from
21 today? Sorry. Where are you joining the call today?

22 A. I am joining the call from
23 Richardson, Texas, sir.

24 Q. Is that your home?

25 A. It's my home, sir, yes.

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1 Q. Is anyone in the room with you?

2 A. No, there is nobody in this room
3 here.

4 Q. If that changes, please let me know.

5 A. Sure. I don't expect anyone to be in
6 this room. It's my room.

7 Q. Great. Do you have any
8 communications app open on your computer?

9 A. Any communication?

10 Q. Yes.

11 A. I don't have any communication. I
12 mean, it's my computer, but I don't have any
13 communication here --

14 Q. Okay. Let me --

15 A. -- except for the call right now in
16 which we are on right now.

17 Q. So you don't have any messenger or
18 instant messengers open on your computer?

19 A. No, I don't.

20 Q. If that changes, please let me know.

21 A. I will do so, sir.

22 Q. Do you have your phone or any mobile
23 device with you today?

24 A. I have a phone with me here, sir.

25 Q. If you receive a message or

1 notification, I would like to ask that you ignore it
2 until we're off the record or until we take a break;
3 is that okay?

4 A. Until we -- during -- it's okay
5 during the break to look at the messages, right?

6 Q. Of course, of course.

7 A. Yeah.

8 Q. But if you must look at the message
9 immediately, just let me know, and we'll take a
10 break.

11 A. Okay. Fair enough.

12 Q. So as I mentioned before, you are
13 being deposed in connection with IPR 2025-01043 and
14 IPR 2025-01044. Do you understand that?

15 A. I understand. I do not remember the
16 numbers, but I take your presentation of the IPRs.

17 Q. I'm going to refer to these two IPRs
18 as the IPRs of the cases; is that okay?

19 A. Fair enough.

20 Q. Okay. Both IPRs are pending at the
21 Patent Trial and Appeal Board?

22 A. That's my understanding, sir.

23 Q. I'm going to refer to the Patent
24 Trial and Appeal Board as the PTAB or the board; is
25 that okay?

1 A. Absolutely, sir.

2 Q. And these two IPRs concern the
3 invalidity of two patents, right?

4 A. That's my understanding, sir.
5 Each -- each IPR refers to one patent.

6 Q. And one of those patents is U.S.
7 patent No. 11,116,035?

8 A. So I remember it ends in '035, but I
9 don't remember the whole number. It ends in '035.
10 That's my recollection.

11 Q. Okay. So I'll refer to that patent
12 as the '035 patent, if that's okay.

13 A. Fair enough.

14 Q. And then the other patent is 11 --
15 U.S. patent No. 11,516,879. Does that sound right to
16 you?

17 A. That sounds correct. Again, I -- I
18 just remember the last three numbers, but yeah.

19 Q. I'll refer to that patent as the '879
20 patent.

21 A. Okay.

22 Q. Do you understand that Samsung filed
23 a petition in each of these IPRs?

24 A. That's my understanding, sir.

25 Q. And all three grounds are relied on,

1 three pieces of prior art references, right?

2 A. My understanding is that each one of
3 the petitions has three grounds, and there are some
4 references on which those grounds rely upon.

5 Q. Okay. And one of them is called --
6 one of them is -- strike that.

7 And one of the prior references is
8 U.S. 2017/0202023 to Inventor Zhou. Does that sound
9 right to you?

10 A. One of those references is Zhou. I
11 don't take the position whether it's -- is or is not
12 prior art, sir.

13 Q. So you have no position as to whether
14 that reference qualifies as a prior art or not?

15 A. I do not analyze it, sir.

16 Q. And then the second reference is U.S.
17 2017/0325264 to an inventor with the last name
18 Cherian?

19 A. That's my understanding, another
20 reference. Again, I do not have a position whether
21 this reference is or is not a prior art.

22 Q. Okay. And the third reference that
23 is part of all grounds is U.S. 2018/0034595 to an
24 inventor with the last name Kim.

25 A. That's my understanding. One of the

1 references is named Kim.

2 Q. Okay. And throughout the deposition
3 I'll refer to each of these prior references by the
4 inventor's last name.

5 A. That's fair. I just want to add with
6 respect to the Kim reference the same answer, that I
7 did not analyze whether it is or is not a prior art,
8 sir.

9 Q. Okay. Do you understand that Wilus
10 filed patent owner's preliminary response in response
11 to Samsung's petitions?

12 A. That's my understanding, that there
13 was some filing from Wilus, sir.

14 Q. Have you reviewed that filing?

15 A. No, I did not review. To my
16 recollection, I did not review the patent's owner
17 preliminary response, sir.

18 Q. So you did not review that in
19 preparing your declaration?

20 A. That's my recollection, sir.

21 Q. And you did not review that in
22 preparing for this deposition?

23 A. I did not review this particular
24 reference that you are referring to in preparation
25 for today's deposition, sir.

1 Q. And based on Samsung's petition, do
2 you understand that the board instituted both IPRs?

3 A. That's my understanding, sir.

4 Q. And after the institution, Wilus
5 filed a patent owner's response in each case, right?

6 A. I'm sorry. Say it again, please.

7 Q. After the institution, Wilus filed
8 patent owner's response in each of the cases?

9 A. That's my understanding, sir.

10 Q. Have you reviewed those patent
11 owner's responses?

12 A. Are you referring to the patent owner
13 preliminary response? Is this what you are referring
14 to?

15 Q. No, I'm not referring to the patent
16 owner's preliminary response.

17 A. I do not recall reviewing patent
18 owner responses filed with the board, sir.

19 Q. You submitted a declaration in each
20 of the IPRs, correct?

21 A. I submitted two declarations, one for
22 each of the IPRs, sir.

23 Q. Do you have copies of those
24 declarations with you today?

25 A. I have it on my computer, but I

1 presume you're going to provide me copies if I need
2 to look at this.

3 Q. Okay. But you don't have a paper
4 copy with you?

5 A. I don't have a paper copy, no, sir.

6 Q. I'm going to introduce a bunch of
7 exhibits to make it easier. I'm going to start with
8 Exhibit 1. I'm going to just drop it -- dropped it
9 into the wrong chat window.

10 A. I just want to make sure that I know
11 how to access it.

12 Q. Yeah, sure. I just sent it to a
13 different person. Hold on.

14 I just sent you one file. Let me
15 know if you received it.

16 A. How do I look at this? Where am I
17 supposed to look at this?

18 Q. I dropped it into the chat window.

19 A. Yeah, I see. Okay. Yes. Okay. Can
20 I download it? Is this okay --

21 Q. Yes, please. If you can download it
22 and put it in your local drive where it's accessible,
23 that would be very helpful.

24 A. I've downloaded it right now. Yes, I
25 have it, sir.

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1 MR. YOUNG: I'm going to mark this as
2 Exhibit 1.

3 (Whereupon, Exhibit Haas 1 was so marked
4 for identification, being U.S. Patent
5 No. 11,116,035.)

6 MR. YOUNG: U.S. patent No. 11,116,035.

7 THE WITNESS: I am opening this right
8 now, sir.

9 BY MR. YOUNG:

10 Q. Yeah, if you could open that.

11 A. I did.

12 Q. Dr. Haas, have you seen this document
13 before?

14 A. Yes. This is the 03 -- what we refer
15 to as '035 patent, sir.

16 Q. I'm going to drop a second file into
17 the chat window. Let me know if you receive it.

18 A. Yes. I am downloading it right now,
19 opening it. This is the -- I'm sorry.

20 MR. YOUNG: So I'm going to mark this
21 file as Exhibit No. 2.

22 (Whereupon, Exhibit Haas 2 was so marked
23 for identification, being U.S. Patent
24 No. 11,516,879.)

25 THE WITNESS: This is the '879 patent

1 that we are referring to.

2 BY MR. YOUNG:

3 Q. So you recognize this document?

4 A. I recognize this as the '879 patent,
5 sir.

6 Q. Great. I'll drop a third file into
7 the chat. Let me know when you receive it.

8 A. I see it in the chat. I am
9 downloading it, saving it, opening it. This -- let
10 me just look. The signature page. Yeah, this is my
11 declaration.

12 MR. YOUNG: Hold on. Let me mark it
13 first. So I'm going to mark the third file
14 as Exhibit 3.

15 (Whereupon, Exhibit Haas 3 was so marked
16 for identification, being a declaration of
17 Zygmunt J. Haas, Ph.D. for the '035 patent.)

18 BY MR. YOUNG:

19 Q. Do you recognize this document, Dr.
20 Haas?

21 A. Yes. This is -- I recognize it as my
22 declaration with respect to the '035 patent, sir.

23 Q. The last file I'm going to drop into
24 the chat, let me know when you receive it.

25 A. I'm downloading it, saving it,

1 opening it. Let me just look at the signature.

2 MR. YOUNG: First of all, I'm going to
3 mark the fourth file as Exhibit 4.

4 (Whereupon, Exhibit Haas 4 was so marked
5 for identification, being a declaration of
6 Zygmunt J. Haas, Ph.D. for the '879 patent.)

7 BY MR. YOUNG:

8 Q. Please let me know when you have
9 opened it.

10 A. I have opened it. This is my
11 declaration with respect to the '879 patent, sir.

12 Q. Okay. Just to make sure the record
13 is clear, I'm going to just read -- Exhibit 1 is the
14 '035 patent that's the subject of one of the IPRs,
15 correct?

16 A. '035 patent, which is the subject of
17 one of the IPRs.

18 Q. And Exhibit No. 2 is the '879 patent
19 that is the subject of the other IPR, correct?

20 A. The patent '879 is the subject of the
21 other IPR, sir.

22 Q. Do you agree that that's the file you
23 have open?

24 A. I'm sorry?

25 Q. Do you agree that that's -- strike

1 that.

2 Do you agree that Exhibit No. 2 is
3 the '879 patent that is subject of the other IPR?

4 A. Yes, the second exhibit is the patent
5 '879, which is the subject of the second IPR, the
6 other IPR.

7 Q. And Exhibit 3 do you agree is your
8 declaration filed in the IPR of the '035 patent?

9 A. That's correct. The cert file which
10 you marked as Exhibit 3 is my declaration with
11 respect to the '035 patent, sir.

12 Q. And then finally Exhibit 4 do you
13 agree is your declaration filed in the IPR of the
14 '879 patent?

15 A. The file which you marked as Exhibit
16 4 is my declaration with respect to the '879 patent,
17 sir.

18 Q. Okay. Great. I introduced those
19 exhibits. So you can refer to them anytime if you
20 like.

21 A. Thank you, sir.

22 Q. Are your declarations a complete
23 statement of the opinions that you offer or intend to
24 offer in these IRPs?

25 A. My declarations are the statements

1 that I was asked to make with respect to those
2 patents, sir.

3 Q. When you say those are the statements
4 that you were asked to make, what do you mean by
5 that?

6 A. Well, I was -- as I state here,
7 it's -- let's open the '035 declaration. As I say
8 here in the beginning, I have been asked by the
9 patent owner, owner's counsel, to offer technical
10 opinions related to the '035 patent, the alleged
11 prior art, and the argument and opinions presented by
12 petitioner and its expert, Dr. Matthew Valenti. So
13 those were -- those two declarations, the one with
14 respect to the '035 patent, and the other one with
15 respect to the '879 patents, those are the
16 declarations, what they contain.

17 Q. Okay. That didn't quite answer my
18 question. Let me ask that again. Are your
19 declarations a complete statement of your opinions
20 that you offer -- that you intend to offer in the
21 IRPs?

22 A. Well, I cannot state this, sir,
23 because I don't know what questions you are going to
24 ask me. So I cannot say that I'm not going to
25 offer -- offer other opinions, if you ask me a

1 question which I didn't refer to in my declaration.

2 Q. Are you aware of any corrections to
3 your declarations?

4 A. Nothing major that's -- there's some
5 punctuations which I put that were incorrect.
6 There's a missing period somewhere, I believe, if I
7 remember correctly, at the end of one sentence.
8 Essentially just minor typographical, grammar-type
9 of, you know, issues.

10 Q. But nothing substantive, right?

11 A. Not that I recall as I sit here right
12 now, anything which is really substantial, that I can
13 say I need to change.

14 Q. Beyond the declarations and the
15 exhibits -- strike that.

16 Beyond the documents cited in your
17 declarations, have you reviewed anything else in
18 drafting the declaration?

19 A. Not that I recall right now as I sit
20 here. I mean, of course there might be things which
21 I looked at and I didn't refer to in my declaration,
22 but I know that I examined and analyzed the documents
23 that are referred to in my declaration or listed in
24 my declaration, declarations, plural.

25 Q. Beyond documents cited in your

1 declarations, have you reviewed any other documents
2 in preparing for the deposition today?

3 A. I have reviewed several documents in
4 preparation for today's deposition. I would need to
5 check whether those documents are listed in my
6 declaration or not. I presume they are, but -- but I
7 cannot make a general statement like this, whether
8 those are or are not in my declarations, sir.

9 Q. What documents did you review to
10 prepare for today's deposition?

11 A. Okay. So let me tell you what I
12 remember. Of course I cannot say what I don't
13 remember. I reviewed the patent, both patents. I
14 reviewed the references that you discussed a moment
15 ago, and I reviewed all the references that were the
16 grounds in the petition we're relying upon. I
17 reviewed the petition. I reviewed Dr. Valenti's
18 declarations. I reviewed just partially
19 Dr. Valenti's deposition, transcript of the
20 deposition. I reviewed portions of the file history
21 of both patents. That is what comes to my mind.

22 Let me try to go to my declaration
23 and see if there is something that I can recall. I
24 reviewed the claim construction also, claim
25 construction order, sorry, claim construction order.

1 There was also a patent which was referred to as --
2 actually a patent application, which was referred to
3 as Merlin, which I reviewed as well. That's all that
4 comes to my mind right now as I sit here. There
5 might have been some other things that I reviewed,
6 but those are the things that I recall right now,
7 sir.

8 Q. You noted that you reviewed the
9 prosecution history, correct?

10 A. I'm sorry. Say again, please?

11 Q. You noted that you reviewed the
12 prosecution history of both patents, correct?

13 A. I reviewed the prosecution history of
14 both patents when I was writing my declaration,
15 declarations, plural, but for today's deposition I
16 reviewed portion -- portions of the file history,
17 histories, plural.

18 Q. How did you select the portion of the
19 history, file history to review?

20 A. Well, some of the portions that I
21 reviewed I refer to in my declaration. So as I was
22 reading my declarations, plural, it's sort of say,
23 you know, let me refresh my memory of what was
24 written in the file history that I'm referring to in
25 my declarations. So's how I selected the portions.

1 But when I was looking at the file history, you know,
2 you sometimes look at other portions as well, you
3 know. So I cannot say that I just reviewed, I
4 referred to in my declaration. I might have gone to
5 other pages as well.

6 Q. You also noted that you reviewed the
7 claim construction order, correct?

8 A. This is correct, sir. I reviewed the
9 claim construction order. Let me just -- for
10 completeness, it's claim construction order Wilus
11 Institute of Standards Technology, Inc., versus HP,
12 and there's a case number here, the docket number, so
13 on. It's listed on my -- on page No. 7 of my '035
14 declaration, sir, this claim construction order.

15 Q. Did you review the briefings that are
16 filed associated with that order?

17 A. For today's deposition, sir?

18 Q. Ever.

19 A. I might have reviewed when I was
20 preparing the declaration. I do not recall. But for
21 today's deposition I did not review the briefings
22 which refer to the claim construction order.

23 Q. I see. Let me clarify that. Did you
24 review the briefings that were filed in the district
25 court that is the -- let me strike that.

1 Did you review the claim construction
2 briefs filed by the parties in the case, in the
3 district court case, that you are referring to?

4 A. Again, my question is, are you asking
5 me with respect to today's deposition, or when I was
6 -- in general when I was preparing my declaration?

7 Q. In general.

8 A. So I do not recall if I did or I did
9 not review those briefings when I was working on my
10 declaration. I might have or might have not. I
11 don't recall simply, but I can state in preparation
12 of today's deposition I did not review the briefings.
13 I did review the claim construction order, though, as
14 I said.

15 Q. Dr. Haas, you are serving as an
16 expert for Wilus in the IPRs, right?

17 A. This is correct, sir. I was retained
18 as an expert in those IPRs, sir.

19 Q. Have you served as an expert for
20 Wilus in a case other than these two IPRs?

21 A. Yes, I did, sir.

22 Q. Which case is that?

23 A. So I don't remember the case number,
24 but another case in which I served or am serving, I
25 presume still, as an expert and I was also deposed in

1 that case as well.

2 Q. Well, is that an IPR as well?

3 A. No, this was not an IPR case. It
4 was, I believe, if I remember correctly -- I might be
5 wrong, but if I remember correctly, it was a district
6 court, district court case, but it's not -- it was
7 not an IPR.

8 Q. Do you remember the parties in that
9 case?

10 A. Again, I am saying what I remember.
11 It may be wrong. I may not recall correctly. I
12 believe that Samsung was the other party that was on
13 that case. And that's my -- no. Wait a second. I'm
14 confused. I take it back. I don't recall. I'm not
15 sure what -- who the other party was. I can check if
16 you want me to. I can look through my files and see,
17 but I just -- I think I'm wrong with respect to the
18 party, the other party. I know I was working for
19 Samsung or -- represent -- I was an expert on behalf
20 of -- take it back. Let me start from the beginning.

21 I, of course, was engaged as an
22 expert on behalf of Wilus, on behalf of Wilus, but I
23 don't recall exactly who the other party was. I
24 might be wrong. So I take it back, the identity of
25 the party. I don't recall right now.

1 Q. Okay.

2 A. I also want to mention that some
3 other things in -- in which I may be involved in,
4 which I am bound by confidentiality, and I cannot
5 disclose.

6 Q. Are you saying there are cases that
7 you are involved in that you cannot disclose because
8 of the protective order or confidential order?

9 MS. XU: Objection. I'll just instruct
10 the witness not to disclose any
11 attorney-client privileged information, and
12 to the extent you can answer that question
13 without disclosing privileged information,
14 you may do so.

15 THE WITNESS: So let me be clear. You
16 asked me what were the cases, what were the
17 other cases in which I was involved on
18 behalf of Wilus. As I stated, I'm involved
19 in those two IPRs that we are discussing
20 today, subject to today's deposition. I
21 have been involved in another case of Wilus,
22 in which I believed it was a district court,
23 in which I was deposed, and I just -- as I
24 said, I don't recall the other party as I
25 sit here right now. I said that there might

1 be other case or cases in which I may or may
2 not be involved with, which I cannot
3 disclose because I am bound by
4 confidentiality.

5 BY MR. YOUNG:

6 Q. The district court case that you are
7 involved in and representing -- sorry. Strike that.

8 The district court that you are
9 involved in on behalf of Wilus, does that case
10 involve the same patents in this case?

11 A. I am trying to recall. So the
12 district court that I am referring to does not
13 involve the same -- does not involve the same patents
14 that we are -- that are subject to today's
15 deposition, sir, with respect to this IPR.

16 Q. In that case have you testified as to
17 infringement or noninfringement of Wilus's patents?

18 A. No, I did not testify in this other
19 case with respect to infringement. Well, that's
20 not -- I -- I will need to go to my record. I'm not
21 sure right now. I believe that that case -- please
22 don't hold me, you know, with 100 percent. I believe
23 the other party was Askey, A-S-K-E-Y. That was the
24 other party, if I remember correctly.

25 Q. Okay.

1 A. I am not sure whether it involved or
2 did not involve, you know, infringement, but I do
3 remember that I submitted a declaration, and I was
4 deposed on that declaration, sir.

5 Q. Okay.

6 A. There might be in that case I'm
7 referring to, there might have been other parties as
8 well. I remember there was Askey, that I remember.
9 I was deposed by Askey, yeah, by Askey's counsel.

10 Q. Okay. In preparing for today's
11 deposition, did you meet with anyone other than
12 counsel?

13 A. No. In preparation for today's
14 deposition?

15 Q. Yes.

16 A. No. I just met with counsel. I
17 mean, there might be more than one person. When we
18 talk about counsel, we refer to as in general
19 necessarily, not one person. More than one person.
20 But I -- I met only with lawyers, if this is what
21 your question is.

22 Q. How many times did you meet with
23 lawyers?

24 A. In preparation for today's
25 deposition?

1 Q. Yes.

2 A. So I met with lawyers yesterday, but
3 there was more than one meeting yet.

4 Q. How long was each meeting?

5 A. So I'm just going to tell you what I
6 remember. Please don't hold me to exact minutes,
7 because I don't remember exact time. I believe that
8 the first meeting was something around, I would say,
9 between an hour to two hours, maybe around an hour
10 and a half, around this sort of approximately. Then
11 there was another meeting with a lawyer which lasted,
12 I believe, somewhere around an hour, hour, maybe
13 less, around an hour I would say. There was also one
14 phone call that we talked on the phone.

15 Q. There were three meetings, two
16 meetings, and then one phone call; is that right?

17 A. Two meetings and one phone call. The
18 phone call was very brief.

19 Q. In those two meetings, were they in
20 person?

21 A. They were online. They were on
22 video, in video. So I'm not sure if you call it in
23 person or not. I was -- I saw them with a video
24 call.

25 Q. In the first meeting who was with

1 you?

2 A. So there were two lawyers. I don't
3 remember the last name, but the first name was
4 Philip, Philip. I don't remember his last name. The
5 second lawyer was Ms. Linda Xu. She's on call right
6 now here.

7 Q. In the second meeting who was with
8 you, who was in the meeting with you?

9 A. The second video meeting was only
10 Philip and me.

11 Q. Who was the call with?

12 A. The call was also with Philip. Also
13 -- we exchanged also some emails, but I cannot tell
14 you how many. I just don't recall.

15 Q. Okay. How much time did you spend
16 drafting the two declarations that are filed in these
17 IPRs?

18 A. I can -- honestly, I cannot give you
19 a number. I know that it was a big project. I spent
20 quite a bit of time on those declarations. I would
21 definitely say it was more than ten hours, but I
22 cannot give you an exact number, because, you know,
23 clearly it involves reading references, reading file
24 history, reading, you know, other material, drafting,
25 reviewing, so on, you know. So I cannot give you a

1 number, but it was -- you know, it was a substantial
2 amount of time. I can say this. Please understand
3 also that we are talking here of months ago. I
4 believe -- let me see when I signed it. I believe it
5 was in February, but let me just verify this. One
6 second. Yeah, it was February 18. So it was two
7 months ago. You know, my memory may not be 100
8 percent clear, but it was a substantial amount of
9 time.

10 Q. Dr. Haas, aren't you paid per hour?

11 A. Sorry?

12 Q. Aren't you paid per hour?

13 A. Yes, I am paid on an hourly basis
14 plus expenses.

15 Q. So you record time on how much you
16 spend on the work, on the project, correct?

17 A. I submit invoices on this project,
18 yes, sir.

19 Q. And your testimony is that you cannot
20 recall the amount of hours you spent on a declaration
21 you wrote two months ago; is that right?

22 A. I cannot give you a definite answer
23 on the amount of hours, number of hours that I spent.
24 I simply do not recall the exact number.

25 Q. Can you give me a range?

1 A. I feel uncomfortable giving you a
2 range without knowing that I'm truthful, but again we
3 established I believe it was more than ten hours, you
4 know. That's what I can say as I sit here right now.

5 Q. Was it more than 20 hours?

6 A. I don't want to say yes or no. I
7 just don't recall, sir.

8 Q. Dr. Haas, you submitted your CV along
9 with each of the declarations, correct?

10 A. I believe this is correct. I believe
11 that my CV is appended to each one of those
12 declarations. Yes, my CV is appended to each one of
13 the declarations.

14 Q. Do you have any updates to the CV?

15 A. Yes, I have an update, several
16 updates. I believe -- well, the main update is that
17 I am right now professor and distinguished chair in
18 computer science emeritus at the University of Texas
19 in Dallas. That's one -- one correction. I believe
20 that I have -- may have some additional publications.
21 Yeah. I believe that there's some additional
22 publications that needs to be added. I believe also
23 that there are some additional technical program
24 engagement that I should add. There are also some
25 other courses that I taught. Maybe not. Courses are

1 okay actually, I believe. But I believe that the --
2 that the technical program committee membership needs
3 to be updated. That's what I can think right now of.
4 There might be some other things that need to be
5 updated, but those are the things, you know. As I
6 mentioned, the major thing is the emeritus status at
7 the University of Texas in Dallas.

8 Q. So you're now a professor emeritus at
9 both Cornell University and UT of Dallas; is that
10 right?

11 A. This is correct, sir.

12 Q. Does that mean you retired as a full
13 professor at UT Dallas?

14 A. That's correct. I retired end of
15 February.

16 Q. Do you have a -- any new position at
17 a different institution?

18 A. No. I am not -- I did not accept any
19 employment at another institution. I of course am
20 engaged as expert witness. I am working as an expert
21 witness in cases.

22 Q. So other than being professor
23 emeritus at Cornell University and UT Dallas, you
24 have no other full-time employment?

25 A. Current employment?

1 Q. Let -- sorry. That was not a good
2 question.

3 So other than your positions at
4 Cornell and UT Dallas, are you employed by any other
5 organization?

6 A. Currently employed or in the past?

7 Q. Currently.

8 A. Currently, no. I am not employed by
9 any of those universities either. I am emeritus at
10 both universities.

11 Q. Did you create any notes during your
12 preparation for this deposition?

13 A. Notes?

14 Q. Uh-huh.

15 A. I mean, when I review documents, I
16 sometimes put notes on the margin of documents that I
17 review. I'm not sure what you are asking me.

18 Q. Do you have that document with you?

19 A. As I sit here right now, no, I don't.

20 Q. Have you spoken to anyone other than
21 your attorneys regarding Wilus's patents?

22 A. As a rule, I do not discuss cases in
23 which I consult with anyone except lawyers. This is
24 a valued statement with respect to this case as well.

25 Q. Dr. Haas, you have obviously been

1 deposed before. How many times have you been
2 deposed?

3 A. So I don't want to give you a wrong
4 number, sir. So I'll give you an approximate number,
5 but please take it with a big grain of salt, so to
6 speak, because I just don't remember the exact
7 number. I would say around 30 or 35 times I was
8 deposed all together. This includes IPRs, district
9 court cases, ITC cases. You know, that's my
10 recollection. That's my estimate, but again, it's a
11 very, very rough estimate.

12 Q. And they were all patent cases,
13 right?

14 A. I was only deposed -- to my
15 recollection, I was only deposed with respect to
16 patent cases, or intellectual property, to be more
17 precise, intellectual property. That's -- we
18 understand that the deposition is under oath. That's
19 what you are referring to. I testified in private
20 matters in court, but if we are talking about
21 depositions, my depositions under oath were only with
22 respect to intellectual property, sir.

23 Q. Did any of the cases that you were
24 engaged to work on involve technology that was part
25 of 802.11 specification?

1 A. Many of the cases in which I was
2 involved in, consulted on, involve Wi-Fi
3 technologies, sir.

4 Q. Did any of the cases that you worked
5 on involve technology that was part of 802.11ax
6 specification?

7 A. Of what I had, I would say yes.

8 Q. Any cases that involved multi-user
9 updating transmission technology?

10 A. I would need to check on this
11 particular topic. I'm not sure, sir.

12 Q. Did any of the cases that you worked
13 on involve trigger frames?

14 A. Involve what?

15 Q. Trigger frames.

16 A. My answer is I would need to check.
17 I'm not sure. As you can imagine, those topics that
18 you are referring to are a big part of the 802.11
19 standards.

20 Q. What about MU EDCA timer?

21 A. Same answer. I would need to check.
22 I'm not sure. All those topics are important topics
23 in 802.11. I don't want to give you a wrong answer.
24 Some of those cases may or may not have involved
25 those topics. I just don't recall every single case

1 in which I consulted on.

2 Q. Dr. Haas, what is your field of
3 expertise?

4 A. So let's go to my CV. That's
5 probably the best way to answer your question. As my
6 CV states on my first -- second page, I guess, of my
7 CV, my main research interests are wireless mobile
8 system and networks, which are wireless
9 communication, communication protocols for wireless
10 networks, security of mobile and wireless networks,
11 ad hoc and sensor record technologies and energy
12 efficient protocols. The second topic is information
13 assurance and network security. The third topic is
14 cyber-physical systems and internet of things. The
15 fourth topic is design, modeling and implementation
16 of multimedia protocols and systems. Next topic,
17 modeling of communication system. And the last
18 topic, cross-disciplinary research.

19 Q. When you say wireless communications,
20 that includes both the cellular communication and
21 Wi-Fi communication?

22 A. Of course, of course. Cellular is a
23 big part of wireless communication, wireless
24 communication, wireless communication networks in
25 both cases. Of course Wi-Fi or wireless LAN is a big

1 part of wireless communication, wireless
2 communication networks and protocols as well.

3 Q. What about IEEE 802.11? Are you an
4 expert in IEEE 802.11 specifications?

5 A. I believe that I am an expert in
6 802.11 specifications, sir.

7 Q. Specifically 802.11ax?

8 A. I believe that I qualify as an expert
9 in 802.11ax.

10 Q. Have you reviewed IEEE 802.11ax
11 specifications before you were engaged for these
12 cases?

13 A. For these two cases? Yes, I believe
14 I did, sir.

15 Q. So you are familiar with the
16 technologies that are embodied in 802.11ax?

17 A. I understand the technology. I
18 understand the standards. I did not memorize the
19 standards of course. So I cannot testify here that I
20 recall every statement in this. This would be
21 incorrect for me to say, but I read standards related
22 to 802.11ax.

23 Q. You did testify that trigger frames
24 are a big part of the 802.11, correct?

25 A. This is correct, sir.

1 Q. You have also said the same thing
2 about MU EDCA timer, correct?

3 A. I believe that's a correct statement,
4 sir.

5 Q. So as an expert, you are very
6 familiar with these concepts?

7 A. I am very familiar with those
8 concepts, yes, sir.

9 Q. And you knew about these concepts
10 before you were engaged to do this work for Wilus?

11 A. I believe that the answer is yes. I
12 knew about those concepts with respect to the
13 802.11ax standard before I started to work on those
14 two IPRs, sir.

15 Q. Have you reviewed the '035 patent or
16 the '879 patent before you were engaged to do the
17 work for these two cases?

18 A. I want to be truthful. I do not
19 recall reviewing those two patents, but I cannot
20 guarantee that I never saw those patents before. As
21 you can imagine, in my work, consulting work, I
22 review many, many patents. And sometimes I just read
23 a portion of the patent and go to the next one and so
24 on. So I cannot testify that I never saw those
25 patents before, but as I sit here right now, I do not

1 recall specifically reading those patents before I
2 was engaged for these two IPRs, sir.

3 Q. Did you know who Wilus was before you
4 were engaged to do this work before?

5 A. Before I was engaged on those two
6 IPRs?

7 Q. That's right.

8 A. As I said, I worked for Wilus on
9 other cases as well.

10 Q. When was the first time you were
11 engaged to do work for Wilus?

12 A. I cannot give you an answer on this,
13 sir. I just don't recall. I will need to go to my
14 records. As I said, the IPRs are not the only cases
15 for Wilus that I worked on their behalf, or was
16 engaged on their behalf, more precisely. So I just
17 don't remember the exact dates that I was first
18 engaged with Wilus.

19 Q. Dr. Haas, are you a member of IEEE?

20 A. Yes, I am a member. Not only a
21 member. I am a fellow of IEEE.

22 Q. Are you a member of IEEE's standard
23 association?

24 A. No, I am not a member of IEEE's
25 standard association, sir.

1 Q. So you have never participated in a
2 working group associated with IEEE; is that right?

3 A. That's not correct, sir. I did
4 participate in working groups of IEEE before.

5 Q. But none of the working groups that
6 are associated with the standard association,
7 correct?

8 A. So again, this is going back years.
9 I believe that I did participate in working groups
10 which worked on standard, IEEE standards or standard
11 before, but this is -- this goes back many, many
12 years, sir.

13 Q. Were you part of the Task Group ax at
14 IEEE?

15 A. No, I was not part of the Task ax. I
16 also want to clarify my previous answer. When I said
17 I was -- I participate in IEEE activity, meetings,
18 this did not refer to 802.11ax. There were other
19 technology that I participated in.

20 Q. Have you ever spoken to anyone
21 working at Wilus other than to counsel in this case?

22 A. Ever, ever?

23 Q. Yes.

24 A. Yes, I did.

25 Q. With whom?

1 A. I'm not sure if I -- by me saying who
2 this person is, I am going to break confidentiality.
3 It's not in this case, though. On this case I did
4 not communicate with anyone at Wilus, on those IPRs.
5 I did not directly communicate with anyone at Wilus
6 on those two IPRs, sir.

7 Q. Okay. Have you ever heard of SK
8 Telecom?

9 A. Please say again?

10 Q. Have you heard of SK Telecom?

11 A. Askey?

12 Q. No. SK Telecom?

13 A. SK Telecom? I might have heard, but
14 I -- I cannot tell you in which context. I just
15 don't recall right now which context was it.

16 Q. If you open up Exhibit 1, which is
17 the '035 patent --

18 A. I see. Yes, sir.

19 Q. -- go to the assignee, the code box
20 73, so that --

21 A. Yes.

22 Q. You see that Wilus is listed,
23 correct?

24 A. There's Wilus. There's also written
25 here SK Telecom. I see what you are referring to.

1 Maybe this is where I heard about them. Maybe in
2 another, you know, point, some other reference. I'm
3 not sure where I heard about it. I'm not sure.

4 Q. So it's --

5 A. I remember hearing the name SK
6 Telecom.

7 Q. So it's fair to say you haven't
8 spoken to anyone working at SK Telecom provided that
9 you -- that you knew they were working there,
10 correct?

11 A. Not that I specifically recall that
12 this person was working for SK Telecom. Let me
13 clarify. I go to many conferences, as you can
14 imagine. I speak with a lot of people. I may speak
15 with someone who happened to be from SK Telecom.
16 That person may have been presenting a talk, and I
17 discussed with him afterwards. So I cannot
18 particularly say that I never spoke with anyone in SK
19 Telecom. But as I sit here right now, I do not
20 recall specifically talking with anyone that I know
21 now was an employee of SK Telecom.

22 Q. Dr. Haas, I want to go back to you
23 mentioning about the confidential agreement. Do you
24 remember talking about that just a short moment ago?

25 A. I remember that you asked me a

1 question, and I said that there is information that I
2 cannot provide with respect to cases, other cases
3 other than this case, because I am bound by
4 confidentiality agreement.

5 Q. Is that pursuant to a court order
6 confidentiality order, or is this a private agreement
7 between you and the other parties?

8 A. I believe that it refers to an
9 engagement agreement that prevents me from disclosing
10 information.

11 Q. And that engagement is not associated
12 with any case?

13 MS. XU: So I am going to instruct the
14 witness, to the extent the answer has
15 anything to do with attorney-client
16 privilege or your expert consulting work for
17 the witness -- not from the witness -- for
18 the relevant entities, I will instruct you
19 not to answer, but to the extent you can
20 answer without revealing any privileged
21 information, you may do so.

22 MR. YOUNG: Counsel, what is the basis
23 of the privilege?

24 MS. XU: Oh, the basis is, like I said,
25 there might be attorney-client privilege,

1 and if he's doing expert consulting work for
2 the entity, it's governed by that.

3 MR. YOUNG: He testified that he spoke
4 directly with Wilus without counsel.

5 MS. XU: Yeah, none of these -- like I
6 said, your question did not ask that. More
7 importantly, it's not relevant to this case.
8 He submitted an IPR declaration.

9 MR. YOUNG: It's completely relevant to
10 this case. It goes --

11 MS. XU: Then point to me where it is in
12 his declaration. It's not.

13 MR. YOUNG: No. It goes to his
14 credibility. Of course --

15 MS. XU: It has nothing to do with his
16 credibility.

17 MR. YOUNG: We can talk about it off the
18 record. Let's go off the record.

19 (Whereupon, a discussion was held off the record.)

20 BY MR. YOUNG:

21 Q. Could you clarify what you meant when
22 you said you directly -- let me go back to -- so you
23 testified that you did not directly communicate with
24 anyone at Wilus on these two IPRs, correct?

25 A. That's a correct statement, sir.

1 Q. So have you communicated directly
2 with anyone at Wilus outside of these IPRs without
3 counsel present?

4 A. As I said, there might be a case in
5 which I communicate with someone, with a Wilus
6 employee, in another case.

7 Q. In counsel -- with counsel?

8 A. The counsel was present, yes. A
9 counsel was present, yes, in this communication,
10 correct.

11 Q. Okay. All right. So it's been like
12 an hour. Would you like to take a break, Dr. Haas?
13 I'm happy to --

14 A. It's up to you. It's up to you, sir.
15 I don't need a break, but if you want to take a
16 break, I'm perfectly okay taking a break, sir.

17 MR. YOUNG: Linda?

18 MS. XU: I'm okay.

19 MR. YOUNG: Okay.

20 BY MR. YOUNG:

21 Q. Dr. Haas, I'm going to continue --
22 I'm going to continue.

23 Have you spoken to any of the
24 inventors of the '035 patent or the '789 patent?

25 A. If I spoke to any inventor of those

1 two patents?

2 Q. That's right.

3 A. The same answer -- the same answer
4 that I gave before with respect to inventors on those
5 two patents. I did not speak to any inventors, Wilus
6 inventors on those patents, as part of my work on
7 this IPR, IPRs, plural.

8 Q. And you cannot reveal whether you
9 spoke to any inventors outside of these IPRs?

10 A. I cannot talk about other cases in
11 which I may or may not be bound by confidentiality
12 agreements.

13 Q. Do you know any of the authors of the
14 prior references that are asserted in this case?

15 A. Do I know any of the authors?

16 Q. Yes.

17 A. Let me just -- one second, please.
18 So I would need to look again at the names. I don't
19 have those -- I'm sorry.

20 Q. I can list them for you. Do you know
21 George Cherian?

22 A. I do not believe that I know Cherian,
23 sir. But again, have I ever communicated with him or
24 not, the same answer. I go to conferences. I might
25 have spoken with someone. But as I sit here right

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1 now, I do not recall communicating with Cherian, Mr.,
2 whoever it is, Cherian.

3 Q. What about Alfred Asterjadhi?

4 A. Alfred who?

5 Q. A-S-T-E-R-J-A-D-H-I.

6 A. Oh, is he listed on one of those
7 references?

8 Q. Yes.

9 A. Probably better if you can download
10 or upload those references so I can look at the
11 names, because you just said those names, and I may
12 not necessarily remember. If I see the name, I can
13 give you a more --

14 Q. Okay. I can -- but that name doesn't
15 ring a bell, right?

16 A. Doesn't ring a bell, but, you know,
17 again, I need to see the name written.

18 Q. I might do that later. I'm going to
19 go to the next name. Do you know Mr. Simone Merlin?

20 A. Personally?

21 Q. Yes.

22 A. No, I do not recall as I sit here, I
23 do not recall communicating with Mr. Merlin.

24 Q. Yes.

25 A. I do not recall communicating with

1 him. I believe I saw some of his other patents or
2 some of the other things that he published, but I
3 never communicated with him directly to my
4 recollection, as I said.

5 Q. What about Gwendolyn Barriac?

6 A. The same answer. Does not ring a
7 bell.

8 Q. What about Yan Zhou, Y-A-N, Z-H-O-U.

9 A. Again, does not ring a bell. Z-H-O-U
10 is a very popular name. So I might have communicated
11 with someone which I just don't recall, but as I sit
12 here right now, I do not recall specifically
13 communicating with Y-A-N, Z-H-O-U.

14 Q. What about Jeong Ki Kim?

15 A. Again, the same answer, Kim is a very
16 popular name. So I might have communicated with
17 someone who is called the name Kim that I just don't
18 remember, but I don't remember specifically
19 communicating with this person specifically.

20 Q. What about Kiseon Ryu, K-I-S-E-O-N,
21 R-Y-U?

22 A. Okay. I might -- this sounds
23 familiar. Can you spell it again, please?

24 Q. K-I-S-E-O-N, R-Y-U.

25 A. I might have communicated with this

1 person. I believe I did. I just don't recall right
2 now.

3 Q. In what context have you communicated
4 with him?

5 A. I might have communicated with this
6 person -- again, as I said, there were cases which I
7 cannot disclose specifically, and this name sounds
8 somewhat familiar. I am not sure if this is the same
9 person or not. I'm not sure.

10 Q. Do you remember which company he
11 might have worked for?

12 A. Again, I will be -- this other person
13 that I have in mind?

14 Q. Kiseon Ryu, the person that I
15 mentioned that you may know --

16 A. I -- I'm not sure. Again, I prefer
17 -- if I speak with respect to this particular person,
18 I may or may not be referring to something which I am
19 under confidentiality agreement.

20 Q. Okay. The last name is Hangyu Cho,
21 H-A-N-G-Y-U. The last name is C-H-O.

22 A. Again, very popular name. I do not
23 recall specifically knowing this person or
24 communicating with this person. I cannot guarantee
25 that I ever did, but I don't recall as I sit here

1 right now.

2 Q. Dr. Haas, if you could open Exhibit
3 3, which is your '035 declaration, and turn to page
4 86.

5 A. I'm sorry. Page 86?

6 Q. It's part of your CV.

7 A. Okay.

8 Q. I'm sorry. 84.

9 A. Yes, I'm here, 84, sir.

10 Q. What are Professional & Service, what
11 are you listing under that heading?

12 A. Okay. So as it says, it's service to
13 professional committees, scientific communities. So
14 this includes, as you can see here, university
15 committees on page 84 of the document. It would
16 include editorial service on page 85. It will
17 include what I call service to the scientific
18 community at large, which is typically participation
19 in advisory committee, steering committee, general
20 chair, international advisory committees, things like
21 this in general, workshop chair, co-chair, things
22 like this. Then we have technical program
23 committees, which of course is participating in
24 program committees of conferences, typically workshop
25 conferences and so on.

1 Q. Okay.

2 A. Some of those -- the editorial work
3 will include, of course, being on editorial board,
4 member of editorial board, leading guest editor,
5 things like this.

6 Q. If you turn to page 86, there's a
7 heading called Service to the Scientific Community At
8 Large.

9 A. Yes, sir.

10 Q. It seems like you were part of a lot
11 of interaction on advisory committees, correct?

12 A. There is a large number of advisory
13 committee membership, participation, yes.

14 Q. What is an advisory -- interaction on
15 an advisory committee?

16 A. Well, conferences have typically
17 what's called advisory -- some conferences, not all
18 conferences. Some conferences have what's called
19 advisory committee, which is typically a committee
20 that is responsible for setting general directions of
21 conferences, selecting future location of
22 conferences, advising the technical program committee
23 chair on how to do the review process of papers,
24 things like this. This is typically -- you know,
25 typically the task of advisory committee, but as you

1 can imagine, an advisory committee would deal with
2 essentially all aspects of conferences or workshops
3 that need to be solved.

4 Q. Do IAC -- I'm going to call
5 interaction on advisory committees IAC. Do IAC
6 members select conference papers?

7 A. Advisory committees typically do not
8 select papers. The selection of the papers is the
9 task of the technical program committee, which of
10 course has a chair, typically chair and co-chair. As
11 you can see, as I mention, I have been on many, many,
12 many technical program committees, which starts on
13 page 88 of my CV. Those committees do select papers.

14 Q. I see. Do IAC members have any role
15 in selecting keynote speakers?

16 A. Often, yes, or sometimes, yes, I
17 would say. You know, again as I mentioned, the
18 advisory committee, whether international or not
19 international, the advisory committee typically would
20 be a group of people that is responsible of many
21 aspects of conferences and make sure that the
22 conference -- and not only one conference -- the
23 whole series of conferences are successful.

24 Q. Do keynote speakers get paid at these
25 conferences?

1 A. So it's a good question. It really
2 depends on the conference. Okay. Some conferences
3 offer honorarium to keynote speakers. Some
4 conferences offer additional perks, quote, unquote,
5 to keynote speakers, meaning, you know, there would
6 give -- pay for their room, for their hotel room.
7 They will pay sometimes airfare and so on. Again,
8 sometimes there's an honorarium involved. In other
9 case they don't pay anything. They just invite
10 speakers. So it really depends. I cannot give one
11 answer fits all, so to speak.

12 Q. So on the same page, if you go to the
13 fourth star, I guess, it says, International Advisory
14 Committee Member of the 11th International Conference
15 on ICT Convergence (ICTC 2020) Conference. Do you
16 see that?

17 A. So one, two, three, four. This is
18 the --

19 Q. Under the Scientific Community At
20 Large, International Advisory Committee Member of the
21 11th International Conference on ICT Convergence
22 (ICTC 2020) Conference?

23 A. Yes.

24 Q. Do you remember this conference?

25 A. I remember -- I did not -- I do not

1 remember attending this conference, if this is what
2 you are asking me. I -- I was not there. But I --
3 let me just check. Yeah, this was in Korea. I
4 remember -- I remember the conference, what it is
5 about, so to speak. This conference takes place in
6 Jeju Island. I believe I did participate in one
7 conference in the past that was on Jeju Island, but
8 it wasn't in 2020, I'm pretty sure.

9 Q. You didn't like Jeju Island?

10 A. I love Jeju Island. It's really a
11 very, very nice experience. It was -- it was very
12 beautiful, honestly.

13 Q. But you didn't go to that particular
14 conference?

15 A. Not in 2020, sir, no. I'm not even
16 sure this was the -- this particular series, ICTC
17 conference, if I participated. As you can imagine, I
18 went in my professional career to many, many
19 conferences. I don't recall each one of those. But
20 I know I wasn't to this one because I would remember
21 five years ago, six years ago.

22 Q. So for this conference, what was your
23 role as an ICTC committee member?

24 A. So again, we're talking about six
25 years ago. So I don't specifically recall what I

1 contributed, you know, to this conference. But
2 again, typically sometimes, you know, there isn't
3 anything to do on a particular conference. We don't
4 do anything. There's nothing that is brought up to
5 advise a committee. So this might be the case here
6 as well. I just don't recall. I don't recall
7 specifically what I did or didn't do for this
8 conference. Maybe I didn't do anything. I'm not
9 sure.

10 Q. I'm going to drop a document. Give
11 me a second. Let -- I'm going to mark this as
12 Exhibit 5.

13 (Whereupon, Exhibit Haas 5 was so marked
14 for identification, being an ICTC 2020 11th
15 International Conference of ICT Convergence
16 Final program.)

17 THE WITNESS: I'm going to open the last
18 exhibit. I am opening it. ICTC 2020
19 Conference. I see it, sir.

20 MR. YOUNG: I'm going to mark this
21 Exhibit 5. This document bears the text
22 ICTC 2020, the 11th International Conference
23 of ICT Convergence, Final Program.

24 THE WITNESS: I see.

25 BY MR. YOUNG:

1 Q. Dr. Haas, do you recognize this
2 document?

3 A. I recognize in general this document.
4 Well, I recognize, you know, the conference clearly.
5 We just talked about it a moment ago. Was I
6 specifically on this program or not, I just don't
7 know.

8 Q. If you could turn to page 4.

9 A. Page 4, yes, sir, I'm here.

10 Q. At the bottom on the left column,
11 that's your name, correct?

12 A. Well, the surname in the left column,
13 Zygmunt J. Haas, that's my name, correct.

14 Q. That's you?

15 A. This is me, yes, sir.

16 Q. On the right column, in the IAC
17 co-chairs list there's a person named Jeongho Park
18 associated with SK Telecom. Do you see that? He's
19 about fourth from the bottom of that list. Jeongho
20 Park.

21 A. Jeongho Park, I see this, sir.

22 Q. Do you know Mr. Park?

23 A. Again, as I mentioned before, Park is
24 a very -- it's a very popular name. I know people
25 whose name is Park, last name is Park. As I sit here

1 right now, I do not recall ever directly
2 communicating with Jeongho Park, but I cannot say I
3 did or didn't. I don't recall specifically
4 communicating with this person.

5 Q. Can you turn to page 32?

6 A. 32 of this document, sir?

7 Q. That's correct.

8 A. One second.

9 Q. Talk --

10 A. I'm looking. Okay. 32 of the PDF,
11 right?

12 Q. 32 of PDF and also the document.

13 A. Yes, yes, yes. I see, 32. I'm here.

14 Q. So do you see the part talking about
15 Invited Talk 15?

16 A. Invited Talk 15, I see it, yes, sir.

17 Q. That's given by Dr. Jin Sam Kwak?

18 A. That's what's listed here, sir.

19 Q. Have you -- do you remember this
20 talk?

21 A. As I said, sir, I did not attend this
22 conference. So probably the correct statement would
23 be I did not attend this talk as well, if I did not
24 attend the conference.

25 Q. It looks like he was an invited

1 keynote speaker, correct?

2 A. You say invited keynote speaker. It
3 says key invited talk, sir. That is not necessarily
4 keynote speaker. I would say that he might have
5 given a talk which was -- which was classified as a
6 keynote talk. Let's see if I can try to see the
7 program more specifically. Invited talk. Those
8 talks were invited -- there is a difference between
9 invited talk and invited keynote talk.

10 So let's go, for example, to page --
11 what is this here? To page 11 of this document that
12 you just sent me. As you can see from 10:30 to 11:20
13 there's plenary session, keynote speeches and opening
14 ceremony. Those would be keynote talks. Then you
15 have -- from 12:40 to 14:10 you have industrial
16 session. You have a number of invited talks, one,
17 two, three invited talks. Those are not keynote
18 talks. These are just invited talks. And we
19 probably can find the specific person that you are
20 referring to -- okay. I don't even see it here. I
21 am sure it's somewhere here. So there is a second
22 day here, also invited talks. This is on page 12.
23 Let's see. Invited Talk 15 you are referring to,
24 right? I don't even see when this invited talk was
25 given.

1 But again, to answer your question,
2 there's a difference between invited talk and keynote
3 talk clearly. Keynote talks clearly would be
4 considered much more prestigious than just invited
5 talks.

6 Q. Did you have any role in selecting
7 invited talks?

8 A. For this particular conference?

9 Q. Yes.

10 A. I do not believe I did. Again, I
11 don't recall, as I said before, as I testified
12 before, I don't recall exactly what I did for this
13 conference in terms of advisory, being on the
14 advisory committee or being -- if I was on the
15 technical committee as well. I don't recall. But as
16 I sit here right now, I don't recall being involved
17 in selecting those talks, sir.

18 Q. Do you know Dr. Jin Sam Kwak?

19 A. Jeongho Park?

20 Q. The speaker of the Invited Talk 15,
21 do you know him?

22 A. You just asked me this question
23 before, I believe.

24 Q. I don't think so.

25 A. With respect to the -- isn't it the

1 same person that was on --

2 Q. I might have asked it as part of the
3 inventor. Right. But you don't know him; is that
4 right?

5 A. One second. You see I -- again, as I
6 sit here right now, I do not recall ever talking to
7 this particular person.

8 Q. Okay.

9 A. Jeongho Park. Again, I -- this is,
10 again, subject to the caveat that I said before, that
11 I talk to many people at different conferences. But
12 I specifically -- I did not specifically recall
13 talking to this person as I sit here right now.

14 Q. I have a couple more questions, and
15 let's take a break after that.

16 If you could turn to Exhibit 4. Is
17 that your '879 declaration?

18 A. All right. '879. I am here now,
19 sir.

20 Q. If you could go to page 16. That's
21 not the PDF page. That's the document page.

22 A. Yes.

23 Q. So that is page 18 of the PDF. Are
24 you there?

25 A. I'm sorry. Page 16 of the document?

1 Q. Yes, page -- so page 16 that's listed
2 in the center bottom of the document, but it's page
3 18 --

4 A. I see.

5 Q. Yeah.

6 A. I see. Yes, I'm on page 16 of my
7 declaration, sir.

8 Q. And that -- that page has a footnote
9 3. Do you see that?

10 A. I see the footnote, yes, sir.

11 Q. Could you explain to me what this
12 footnote is saying?

13 A. Well, as it says, the footnote 3 says
14 that those two patents, '879 and '035, which are the
15 two IPR cases, are closely related, and I am also
16 submitting declaration for the '035 patent, and so
17 the -- there are differences in claim limitations of
18 those two patents, '879 and '035. The petitioner and
19 Dr. Valenti assert references and invalidity grounds,
20 the same arguments or similar arguments for both
21 IPRs, and therefore my opinions, what I respond to
22 Dr. Valenti's references and his arguments about
23 invalidity grounds, invalidity arguments, seem to be
24 the same, and therefore I discuss with respect to the
25 '879 patent and the invalidity issue. In this

1 declaration I focus on the common limitation and
2 specification disclosures that I shared between those
3 two -- those two patents. Simply said, I mean, it's
4 much more than I am just trying to paraphrase right
5 now, but one aspect of what this footnote says is
6 that it seems that the arguments of the petitioner
7 and Dr. Valenti seem to be the same, similar, and
8 therefore my opinions with respect to those two
9 declarations were also very similar, because they
10 respond to very similar arguments. There's much more
11 in this footnote here, but I am just trying to
12 paraphrase, you know, some of the aspect of this
13 footnote.

14 Q. Do you think it's fair to say that
15 your opinions in your declaration for the '035 patent
16 IPR is the same as your opinions in the IPR for the
17 '879 patent?

18 A. Well, I wouldn't use the word the
19 same. In the argument that is presented by the
20 petitioner and Dr. Valenti are -- to the extent that
21 those arguments presented by petitioner and
22 Dr. Valenti for those two cases, those two patents
23 are the same, and rely on the same grounds and on the
24 same references and so on and so on, then naturally
25 my response would be very similar.

1 Q. Well, there are differences between
2 the '879 patent and the '035 patent, correct?

3 A. There are differences. Absolutely
4 there are differences in the limitations, you know,
5 and in the language of the limitations and so on,
6 yes.

7 Q. And Dr. Valenti addressed all claim
8 elements in both patents, correct?

9 A. Well, he addressed elements. Whether
10 he addressed all or not I would need to check, you
11 know, but he addressed elements, I agree.

12 Q. But that footnote is saying that your
13 opinions are focused on the common limitations of
14 both patents; is that fair?

15 A. Right. What I'm saying is -- when I
16 say common limitations, you know, this probably would
17 have been maybe written, you know, a little bit more
18 precisely. I focus on the similar limitations for
19 those declarations. Again, if I -- I think that the
20 statement that I made a moment ago clarifies this to
21 a better extent. To the extent that the petitioner
22 and Dr. Valenti presents an argument regarding prior
23 art, invalidity grounds and invalidity arguments,
24 where prior art -- what he called prior art, prior
25 art, invalidity grounds and invalidity arguments, my

1 response would be the same for the same arguments and
2 for the same grounds, for the same argument.

3 You know, saying differently, if you
4 have the same argument in both cases, I'm going to
5 respond in a very similar way to both -- to the same
6 argument, very similar argument.

7 Q. Okay. Dr. Haas, you understand that
8 Dr. Valenti addressed some claim elements in the --
9 strike that. Let me ask that again.

10 A. I'm sorry.

11 Q. I'm going to ask that question again.

12 A. Sure.

13 Q. So in Dr. Valenti's declarations, he
14 addresses all claim elements in both of the patents,
15 correct?

16 A. He addresses elements of the -- of
17 the patents. If you will give me access to his
18 declaration, I will refresh my memory and can look
19 whether those are all the elements. I believe he
20 does, but I'm not sure. So I would need to look
21 again at his declaration to refresh my memory.

22 Q. The '879 patent and the '035 patent
23 have some differences, correct?

24 A. There are some differences between
25 those patents, correct.

1 Q. But despite these differences, the
2 footnote says, "I focus on the common limitation and
3 specification disclosure that the '879 patent shares
4 with the '035 patent," correct?

5 A. That's what it says.

6 Q. And so it seems to me that what
7 you're saying is that even though Dr. Valenti
8 addressed all of the claim elements, you chose to
9 focus on the common limitations, limitation and
10 specifications that are common to both patents; is
11 that fair?

12 MS. XU: Objection. Mischaracterized
13 testimony.

14 THE WITNESS: What I focused on in my
15 declaration, an aspect which I believe shows
16 why Dr. Valenti and the petitioner did not
17 prove invalidity. To the extent that they
18 use the same arguments for the '879 patent
19 and the '035 patent, naturally I am going to
20 use the same reasoning why I believe they
21 did not prove invalidity.

22 BY MR. YOUNG:

23 Q. Does that mean that you've challenged
24 every single opinion that Dr. Valenti has rendered in
25 his declarations?

1 A. No, absolutely not. I am sure that I
2 disagree with Dr. Valenti on other issues as well.
3 But I believe that in my declaration I focused on
4 what in my opinion is sufficient to show that neither
5 the petitioner nor Dr. Valenti proved invalidity.

6 Q. And the opinions of Dr. Valenti that
7 you focussed on were issues that are common to both
8 the '035 and '879 patent, correct?

9 MS. XU: Objection. Mischaracterized
10 testimony.

11 MR. YOUNG: Linda, that's not a proper
12 objection.

13 MS. XU: Well, we can agree to disagree.
14 I think it's fine.

15 MR. YOUNG: You can look at the trial
16 guide. Form objection is form.

17 MS. XU: Okay. Then objection to form.
18 I take what you say as true. It's fine.
19 We'll just await more dispute. Objection to
20 form.

21 THE WITNESS: I am not sure if I can
22 clarify this further really. What I'm
23 saying is I looked at Dr. Valenti's
24 testimony, meaning both declarations and of
25 course his deposition testimony, and I

1 looked at those arguments which he used for
2 both cases, for both of those patents, and
3 if to the extent he used the same argument
4 for both of those cases, and I believe that
5 this -- that such an argument is flawed for
6 whatever reason I believe it is and does not
7 prove invalidity, I naturally, as I am
8 saying, use the same discussion for the same
9 argument that he raises with respect to both
10 cases. So that's as much as I can explain
11 this.

12 MR. YOUNG: Okay. All right. Let's
13 take a quick break.

14 THE WITNESS: How much time, sir?

15 MR. YOUNG: How long would you like?

16 THE WITNESS: I don't really need a
17 break. It's up to you, sir.

18 MR. YOUNG: Ten minutes.

19 (Whereupon, a recess was taken.)

20 BY MR. YOUNG:

21 Q. Do you understand the concept of a
22 POSITA?

23 A. I believe I do, sir.

24 Q. What is it?

25 A. I believe I do, sir. I believe I do

1 understand the concept of a POSITA, sir.

2 Q. What is a POSITA?

3 A. Okay. So if we go to page 8 of my
4 declaration --

5 Q. Which declaration are you referring
6 to?

7 A. This would be -- okay. This would be
8 the declaration -- go to the first one actually.
9 This will be the '035 declaration, and on page 8 of
10 my declaration I state here, in paragraph 21, I was
11 informed by counsel and I understand that the POSITA
12 is a hypothetical person presumed to have known all
13 the relevant art at the time of the invention. I
14 have been informed by counsel that in determining the
15 level of ordinary skill in the art, the following
16 factors needs to be considered, and there are five
17 factors here that I listed, sir.

18 Q. Okay. When is the time of the
19 invention?

20 A. Okay. So the previous paragraph says
21 I have been informed by counsel that my analysis of
22 the challenged claims should be viewed from the
23 perspective of a person of ordinary skill in the art
24 (POSITA) as the earliest claimed priority date, which
25 I have been informed by counsel is either September

1 12th in this part, parentheses here, or September
2 '16. So this other -- either of those two dates
3 would be the earliest claimed priority date.

4 And I also say here under paragraph
5 45, the '035 patent is a continuation filed on
6 September 7. In paragraph 46 I say, Petitioner and
7 Dr. Valenti used September 7 as the priority date.
8 And in paragraph 47 I say, For the purpose of this
9 declaration, I similarly assume that the '035 patent
10 is entitled to a priority date of September 7, 2016,
11 sir.

12 Q. So in paragraph 20 you say, "The
13 claim should be viewed from the perspective of a
14 POSITA as the earliest claimed priority date,"
15 correct?

16 A. Right.

17 Q. In paragraph 21 you say, "A POSITA is
18 a hypothetical person presumed to have known all the
19 relevant art at the time of the invention," correct?

20 A. Sorry. Which paragraph are you on
21 now?

22 Q. Paragraph 21.

23 A. Paragraph 21 I say I was informed who
24 the POSITA is, was the definition of POSITA.

25 Q. But are you looking at it from the

1 earliest claimed priority date or the time of the
2 invention?

3 A. Well, so I assumed that the time of
4 the invention is -- the priority date is either
5 September 2016 or September 2017. So my analysis is,
6 as I said, the assumption of being September 7, 2016.
7 I also state here in paragraph 20, paragraph 20, my
8 opinion would not change regardless of the priority
9 date adopted. Said differently, whether it was 2016
10 or 2017, or even I would say it was just around this
11 time, you know, a few days before, few days later, by
12 few months, one, two months later, whatever, you
13 know, my opinions would not have changed. You know,
14 the opinions would remain the same whether it's
15 September 2016 or September 2017.

16 Q. That's a whole year, right, Dr. Haas?

17 A. That's -- that's a whole year.
18 That's correct.

19 Q. Have you independently analyzed the
20 priority applications to see whether these patents
21 are entitled to these priority dates?

22 A. Sorry. I state here, I have been
23 informed by counsel that the priority date is either
24 September 2016, '16, or September 2017. I have not
25 done my own analysis which -- what is the priority

1 date. I relied on counsel's representation
2 instructing me what to assume. As I said, as I said
3 before, that Dr. Valenti and petitioner, both of them
4 used September 7, 2016 as a priority date, and
5 therefore I assumed the same in my analysis, that
6 it's September 7, 2016.

7 Q. Have you reviewed these Korean parent
8 applications that the '035 patent and the '879 patent
9 claimed priority to?

10 A. Korean -- which Korean application
11 are you referring to, sir?

12 Q. Let me back up a little bit. Let's
13 go to Exhibit 1, which is the '035 patent.

14 A. I am on Exhibit 1, sir.

15 Q. So if you go to the left column on
16 the first page, with the code 30, it says, "Foreign
17 Application Priority Data." Do you see that?

18 A. I see it, sir.

19 Q. So I think you testified that counsel
20 informed you that the priority date of the '035
21 patent is September 7, 2016; is that correct?

22 A. I'm not sure that that's correct,
23 what you are saying. My statement was that counsel
24 informed me that either September 2017 or September
25 2016 is the earliest claimed priority date.

1 Q. So you don't know where those dates
2 come from?

3 A. I do know where they came from. In
4 paragraph 20 I specifically say where it comes from.
5 The 2016 comes from when the Korean patent
6 applications were filed, and 2017, September 2017,
7 when the PCT/KR 2017/009841 was filed.

8 Q. And do you know what the Korean
9 parent applications -- strike that.

10 Which Korean parent applications are
11 you referring to there?

12 A. I'm not exactly sure I understand
13 what you are asking.

14 Q. Okay. That's okay. So I'll go back
15 to the patent, Exhibit 1. If you see on the left
16 column with a code 30, it says, "Foreign Application
17 Priority Data," correct?

18 A. Right.

19 Q. And under it, it lists two numbers,
20 right, with two dates?

21 A. Two dates and two numbers, correct.

22 Q. Do you know what those are?

23 A. I presume that those are foreign
24 application priority dates.

25 Q. Okay. If you go to the next page,

1 the Code 30 section continues and lists five more of
2 the foreign applications. Do you see that?

3 A. I see that, yes.

4 Q. There are seven foreign applications
5 listed there total, correct?

6 A. There are seven applications listed.
7 That's correct, sir.

8 Q. Have you reviewed those applications?

9 A. No, I did not, sir. I believe that
10 if I -- if I understand those correctly, I believe
11 that those applications are in Korean, sir, and I
12 would not -- I don't read Korean, sir.

13 Q. You have not seen translations of
14 these Korean applications, correct?

15 A. If you go to line 63, which is one
16 below -- above it, it says, Continuation of
17 application No. PCT/KR2017/009841 filed on September
18 7, 2017. So this would be the date, the earliest
19 date, that I am referring to, the September 7. And
20 as you can see, under certain of those seven dates
21 that we just mentioned, the earliest of those dates
22 is September 7, 2016. So it's fair to assume that
23 this is the earliest date listed anywhere here.

24 Q. Okay. But my question was, you have
25 not seen translations of these Korean applications

1 that are listed here?

2 A. Not to my recollection, sir, not to
3 my recollection. If I saw them somewhere or not, I'm
4 not sure. You can understand if I would see a Korean
5 text, I would probably assume I cannot read it.

6 Q. In Exhibit 3, which is your '035
7 declaration, if you could turn to the table of
8 contents. I think it's the page "i."

9 A. '035, yes, page -- yes, I am here,
10 sir, yes.

11 Q. So looking at sections 9-B and -C, it
12 seems to me that you're only addressing claim
13 limitation 1.4, 1.5, 8.3 and 8.4; is that fair?

14 A. In -- in -- in this section, 9, I --
15 under A, I address, first of all, the motivation to
16 combine, which we can go through this, of course, but
17 as I am saying there, I do not believe that a POSITA
18 would have combined Zhou, Cherian and Kim. Part B, I
19 am -- I am referring to a particular aspects of claim
20 1, or aspects of claim 1, and aspects of claim 8.
21 Similarly in part C, I am referring to particular
22 aspects of claim 1 and particular aspect of claim 8.

23 Q. Those aspects are claim limitations
24 1.4, 1.5, 8.3 and 8.4, correct?

25 A. In part B and in part C, that's

1 correct.

2 Q. So let's turn to section B, which is
3 page 29.

4 A. Okay. Yes, I am -- one second. I am
5 here, yes.

6 Q. So if you go to paragraph 76 and
7 77 --

8 A. Yes.

9 Q. And paragraph 77 in particular lists
10 the claim limitation 1.4 and 1.5, correct?

11 A. Right. I say here in paragraph 77
12 those are labels that were used by the petitioner,
13 and I simply used those same labels in my
14 declaration.

15 Q. Those two claim elements are what you
16 are addressing in this section?

17 A. In this section I am addressing those
18 two limitations.

19 Q. If you scroll down to the next page,
20 it also lists claim elements 8.3 and 8.4, correct?

21 A. That's correct. On the following --
22 on the following page we have 8.3, 8.4.

23 Q. Those elements are identical to 1.4
24 and 1.5, correct?

25 A. You say identical. Well, I am not so

1 sure that they are identical. I see a little bit
2 different language. So I wouldn't say that --

3 Q. Let me withdraw that question.

4 So is it fair to say the elements 1.4
5 and 1.5 are substantially and materially the same as
6 claim limitation 8.3 and 8.4?

7 A. All I can say is that they have a
8 similar language.

9 Q. How are they different?

10 A. Well, you can see one it uses the
11 word "set" in claim limitation 1.4, as an example,
12 and uses the word "set." So set a second parameter
13 and set the second parameter. In 8.3 it talks about
14 setting a second parameter and second -- setting the
15 second parameter. So those are, you know -- those
16 are differences with respect to this language.

17 But of course, you know, I'm -- I
18 hope that you're not implying that claim 1 is the
19 same as claim 3, because it's not. I'm sorry. Claim
20 1 is the same as claim 8, because they are not.
21 Those are just two limitations from claim 1,
22 including limitations from claim 8, and the language
23 is similar, as I say, as I'm saying, with, you know,
24 with exceptions, so to speak, that one uses "set a
25 second parameter" and the other one says "setting a

1 second parameter." Then "set the second parameter"
2 and "setting the second parameter."

3 Q. Is it your opinion that those
4 differences are immaterial to your analysis?

5 A. No, they are not immaterial to my
6 analysis. This is why I say -- this is why I analyze
7 those limitations together. As you see in 78, I said
8 limitation 1.4, 1.5 include "set." Limitation 8.3
9 and 8.5 include "setting." I discuss those
10 limitations together, so to speak, meaning 1.4 and
11 1.5 together and 8.3, 8.5. No. Let me repeat. Let
12 me state it again.

13 I refer to those 1.4 and 8.3 and --
14 and 1.5 and 8.5 together, so to speak. So -- but I
15 am just saying that I am looking here on the -- on
16 the particular terms in those limitations, which I
17 believe neither Dr. Valenti nor the petitioner proved
18 that those limitations are met in what they consider
19 to be prior art.

20 Q. If you could turn to page 31 of
21 Exhibit 3, which is your '035 declaration.

22 A. Yes, sir.

23 Q. Sorry?

24 A. Page 31?

25 Q. Yeah, 31 of the document. So that's

1 the number that's at the bottom of your center?

2 A. Yes. I am here.

3 Q. I'm sorry. If you can turn to the
4 next page.

5 A. 32. I'm on page 32, yes, sir.

6 Q. You see footnote 5. Do you see that?

7 A. Yes, I see it, sir.

8 Q. Could you explain what you mean --
9 could you explain a little bit what your opinion is
10 in that footnote 5?

11 A. Sure. So let me first read it. "As
12 I discussed above, the examiner originally rejected
13 the claims over the combination of Zhou and Cherian,
14 making arguments similar to those made by petitioner
15 and Dr. Valenti." There's references here. And then
16 it says "(July 23, 2020, Examiner concluding
17 limitation is obvious in view of Zhou and Cherian).
18 After the inventors added limitations [1.4], [1.5],
19 [8.3], and [8.4] and explained why the combination of
20 Zhou and Cherian did not render these limitations
21 obvious." That's all it says. Sort of
22 self-explanatory, what it says.

23 There was original rejection by the
24 examiner over the same references, the same two
25 references, Zhou and Cherian, which is used in

1 this -- in the petition, and over those two
2 references the examiner first rejected the claims.
3 The inventors then amended the claims by adding those
4 four limitations and explained why those two
5 references, Zhou and Cherian, do not disclose those
6 amended new limitations, and the examiner issued a
7 notice of allowance.

8 Q. But without those limitations, the
9 examiner rejected the claim that was pending as being
10 disclosed in the prior art, correct?

11 A. I'm sorry. Say it again?

12 Q. Without -- before limitations 1.4,
13 1.5, 8.3 and 8.4 were added to the pending claims,
14 the examiner rejected the pending claims over Zhou
15 and Cherian, correct?

16 A. That's my understanding. Before
17 those amendments were made, the examiner on July 23,
18 2020 rejected the pending claims over this
19 combination of those two references.

20 Q. And so the remaining claim elements
21 in claims 1 and 8, that is not 1.4, 1.5, 8.3 or 8.4,
22 were disclosed in Zhou and Cherian according to the
23 examiner?

24 A. I wouldn't go that far, to say it
25 that they are disclosed in Zhou and Cherian. I don't

1 know whether the other limitations were disclosed in
2 Zhou or Cherian or not.

3 Q. So are you doubting that the
4 examiner's rejection was incorrect?

5 A. No, I am not doubting that it's
6 incorrect. I am not doubting that it's correct. I
7 don't have an opinion on whether he was correct or
8 incorrect in rejecting those claims. I am just
9 saying that the statement, that just because some
10 claims were rejected over those two references, does
11 not mean that -- I'm sorry -- some limitations were
12 in view -- in the eyes of examiner were disclosed in
13 Zhou and Cherian does not mean that other limitations
14 were disclosed by Zhou and Cherian. There might be
15 other reasons why they are disclosed.

16 Clearly after the amendment was done,
17 the examiner issued a notice of an allowance, and it
18 is my understanding, and I believe this would be the
19 understanding of the POSITA as well, a different
20 examiner allowed claims that the examiner did not
21 find that those claims are covered by, you know,
22 references that they examined at least. There may be
23 others as well.

24 Q. You consider in your analysis of
25 obviousness or nonobviousness the fact that examiner

1 allowed these claims over Zhou and Cherian?

2 A. That's not my only argument, so to
3 speak, only justification to my opinion. I am saying
4 that this is additional justification why Zhou and
5 Cherian did not disclose or was determined not to
6 disclose 1.4, 1.5, 8.3, 8.4, at least those four
7 limitations, because after those limitations were
8 added, the examiner issued a notice of allowance.
9 Again, as I said a moment ago, it would be a logical
10 conclusion that if the examiner believed that those
11 limitations were present in Zhou and Cherian, the
12 examiner would not have issued a notice of allowance.

13 Q. And you did -- and you took that into
14 account when you were rendering an opinion about
15 nonobviousness as one of the factors?

16 A. I'm sorry. As what?

17 Q. As one of the factors that you
18 considered for nonobviousness, you took into account
19 the fact that examiner allowed the claims over Zhou
20 and Cherian?

21 A. I'm saying that this is one
22 justification why I do not believe that Zhou and
23 Cherian disclosed -- the combination of Zhou and
24 Cherian discloses those limitations. There are other
25 reasons as well. But I'm saying this is just one

1 justification, so to speak.

2 Q. Okay.

3 A. Maybe "justifications" is a wrong
4 word here. One reason.

5 Q. I'm going to go to page 19. That's
6 paragraph 55.

7 A. Paragraph 55. I'm here, sir.

8 Q. So the reason I wanted to go to this
9 page is because it lists all the claims, claim
10 elements. Can you see the table that lists the claim
11 language and the identifiers that are associated with
12 it?

13 A. Yes, I see this, sir.

14 Q. So claim element 1.1 is a processor,
15 right?

16 A. Element 1.1 is a processor, sir.

17 Q. Was a processor known at the time of
18 the earliest priority date?

19 A. One second. If we go to the patent
20 '035, there's a processor. We go to Figure 4,
21 there's a processor, and then when we go to --

22 Q. Dr. Haas, my question is very simple.
23 Was a processor known before 2016?

24 A. I believe that the term "processor"
25 was known in 2016.

1 Q. What about a transceiver?

2 A. I believe that the term "transceiver"
3 would be understood by POSITA at the time.

4 Q. And I think previously you testified
5 that this '035 and '879 patents claim priority to
6 certain applications, correct?

7 A. No. I -- no, that's not what I said.
8 I said that I was informed by counsel of the date,
9 the priority date to assume in my analysis.

10 Q. Do you understand what is required
11 to -- strike that.

12 Do you know the legal requirement for
13 a patent to get those priority dates?

14 A. What are the legal requirements?

15 Q. Yes.

16 A. So let me be specific. As I say in
17 my declaration in paragraph 25, I am not a lawyer and
18 offer no legal opinions. So the only thing that I
19 can say I understand is what I was informed by
20 counsel, and this will be in section 4 and throughout
21 my declaration, when I say I was informed by counsel
22 and so on. So I do not believe that in this section
23 I state what other legal reasons or legal -- legal
24 requirements to secure a patent.

25 Q. So you have no understanding as to

1 whether -- or whether or not a priority application
2 needs to supply a written description support or
3 enabling disclosure to the claims, correct?

4 A. I believe that the claims need to be
5 disclosed in the specific -- in the claims -- not the
6 claims. The -- there needs to be written description
7 provided in the specification of the claims.

8 Q. I think my question is a little bit
9 different. Do you know whether or not a priority
10 application needs to supply a written description
11 support or enabling disclosure to the claims in the
12 patent, issued patent?

13 A. Whether the original application
14 needs to disclose the claims in the patent? Is this
15 what you are asking me?

16 Q. Yeah. Do you understand that to be
17 the case?

18 A. I did not analyze it here, sir. So I
19 cannot say one way or another. I did not analyze --
20 as I said, I did not analyze the priority date.

21 Q. But that's not my question. I'm
22 asking you as to your understanding of what is
23 required and what is not required. So I'm -- because
24 you have -- you have asserted in your declaration
25 that the '035 and '879 patent is entitled to 2016

1 September date, which is the filing date of one or
2 more of the Korean priority applications. I am
3 asking you whether you are aware of the legal
4 requirement for the patent to be entitled to that
5 date?

6 A. I never said anything to the extent
7 that I believe that the patent -- that this patent is
8 entitled to any priority date, like you mentioned.
9 You said that I stated that it's entitled to a
10 priority date. I never stated this. All I stated is
11 that I was informed by counsel to assume a priority
12 date. That's what I did. I did not analyze the
13 priority date. So I cannot say whether it's entitled
14 or not. That's something that, you know, can be
15 analyzed I'm sure. I didn't.

16 Q. If you go to paragraph 20 of your
17 declaration.

18 A. Yes, sir.

19 Q. It says, I have been informed by
20 counsel is either -- skip that. September '16, 2016,
21 when the Korean parent applications were filed, end
22 parentheses, correct?

23 A. Yes.

24 Q. So you're saying you don't understand
25 any of the requirement for this '035 and '879 patents

1 to be entitled to the September 2016 date other than
2 the fact that counsel told you that's the case?

3 A. As I sit here, I was -- which I have
4 been informed by counsel is either September '17 or
5 September '16. I relied on the presentation by
6 counsel that the priority date, the earliest priority
7 date, earliest claim priority date, is either
8 September '16 or September '17. I've not analyzed
9 whether the patent is or is not entitled to any
10 particular date.

11 Q. So when you say, "I have been
12 informed by counsel," can I take that as meaning that
13 you did not carry out your own analysis, but you were
14 just told that to be the case? Is that a fair
15 reading of your opinion there?

16 A. As I stated, I have not analyzed what
17 is the priority date of this patent, what is the
18 priority date that this patent is entitled to. I was
19 informed by counsel that it is either September '16
20 or September '17.

21 MR. YOUNG: Okay. Let's go to -- is it
22 okay if we take a two-minute break?

23 (Whereupon, a recess was taken.)

24 BY MR. YOUNG:

25 Q. Dr. Haas, welcome back.

1 A. Thank you, sir.

2 Q. Let's turn to your opinions related
3 to claim construction. That's paragraph 61, I
4 believe.

5 A. I'm on paragraph 61, sir.

6 Q. So here you say, "I have construed
7 setting a timer as assigning a duration and starting
8 the timer," correct?

9 A. Right. It says here, "For the
10 purposes of this declaration, I have construed
11 'set[ting] [a/the]. . . Timer' as 'assign[ing] a
12 duration to and start[ing] [a/the] timer.'"

13 Q. And you're relying on the District
14 Court's claim construction order for that
15 construction, correct?

16 A. Yes. So as I said here in paragraph
17 58, "I have been informed by counsel and I understand
18 that the District Court adopted Patent Owner's
19 proposal, holding that in the context of the claim
20 language, setting 'would necessarily include both
21 choosing for how long the timer will run and
22 starting it.'" So this is a quote from the claim
23 construction order.

24 Q. You are adopting that construction,
25 correct?

1 A. As I said in the paragraph 61, it
2 implied that claim construction, in my opinion.

3 Q. You have not considered any other
4 construction for those terms, correct?

5 A. So I have not considered -- I in my
6 analysis believe that this construction, which was
7 ordered by the Court, is the correct one, and this is
8 what I applied. I do know that Mr. Valenti --
9 Dr. Valenti and the petitioner likely disagree with
10 me or may disagree with me. I'm not sure if they
11 will. May disagree with me.

12 Q. Okay. But your analysis of the claim
13 elements relied on this construction, correct?

14 A. This is correct. My analysis of the
15 claim element relies on this construction. As I
16 said, I applied that construction in my opinions.

17 Q. And your analysis did not rely on --
18 strike that.

19 You did not have an alternate opinion
20 relying on a different construction, correct?

21 A. What I say, I apply that construction
22 in my opinions. So that says it all.

23 Q. So if the board adopts a construction
24 that is different than the one that the District
25 Court ordered, you have no opinion about the validity

1 of this patent, correct?

2 A. If the board adopts a different
3 construction for this claim, setting a timer, set or
4 setting a timer, then I would need to look at my
5 opinions and see whether my opinions remain the same
6 or not.

7 Q. Okay. In the same paragraph 61 it
8 says, "For all other claim terms, I have applied
9 plain ordinary meaning to POSITA." Do you see that?

10 A. I see it, sir.

11 Q. So is it fair to say you did not
12 engage in any claim construction analysis for these
13 other claim terms?

14 A. Well, the constructions for all the
15 other terms would be plain and ordinary meaning of
16 the POSITA.

17 Q. But you have not found it necessary
18 to construe those terms, meaning what the plain and
19 ordinary meaning is?

20 A. For all other claim terms, those
21 claims that are analyzed, I have not seen -- I did
22 not see -- I did not see a need to construe other
23 terms except for what has been construed by the
24 Court. Again, setting the timer and for all other
25 claims, claim terms I applied plain and ordinary

1 meaning.

2 Q. And counsel did not inform you about
3 a construction of any other terms, correct?

4 A. Not for the claims that I have been
5 analyzing.

6 Q. Could you turn to paragraph 48?

7 A. 48.

8 Q. That is the Overview and Exemplary
9 Benefits section.

10 A. I see this, sir. Yes, I'm on
11 paragraph 48.

12 Q. So in this section, I think
13 paragraphs 48 to 54, you provide opinions regarding
14 the benefits of the '035 patent, correct?

15 A. Well, in those paragraphs I
16 describe -- I provide a short overview of the '035
17 patent, '035 patent, and I provide some exemplary
18 benefits. Those are not necessarily all the benefits
19 of those, of the patent.

20 Q. I think I lost you for a little bit.
21 Let me just catch up on the transcript and make sure.
22 That's fine. In paragraph 48 you mentioned
23 then-known standard such as the 802.11ac standard and
24 its use of the Legacy EDCA parameters. Do you see
25 that?

1 A. Right. I mean, I -- the term
2 "Legacy" is in the footnote, but it says here those
3 parameters are called enhanced -- Enhanced
4 Distribution Channel Access or EDCA parameters. The
5 footnote says that those are referred to in this
6 patent as Legacy EDCA parameters set.

7 Q. What is 802.11ac?

8 A. This is the -- this is a prior
9 standard of the 802.11ax.

10 Q. Why did you call it "then-known"?

11 A. Because if we go to -- we go to the
12 patent, the patent in column 2, line 50 talks about
13 802.11ac. So this is one of the -- this is one of
14 the standards that was prior to what -- when this
15 patent was filed. So this is why I am referring to
16 this standard as the -- as the then-known or the
17 then-known standards.

18 Q. In 802.11ac used EDCA parameters,
19 right?

20 A. Sorry. What?

21 Q. 802.11ac used EDCA parameters, right?

22 A. 802.11ac uses EDCA parameters,
23 correct.

24 Q. In fact, the use of EDCA parameters
25 has been part of 802.11 for multiple generations,

1 correct?

2 A. I believe that that's correct, what
3 you are saying, but I would need to confirm this,
4 what you are saying.

5 Q. Let me just say it's well known, EDCA
6 parameter is well known to a POSITA?

7 A. I'm sorry?

8 Q. Would you -- would you agree that a
9 EDCA parameter is well known to a POSITA?

10 A. Yes. EDCA parameters are well known
11 in the -- you know, to the POSITA.

12 Q. Dr. Haas, are you typing something,
13 by any chance? I see --

14 A. I am trying -- I am trying to find in
15 my declaration what I -- what I said about the EDCA
16 parameters.

17 Q. Okay. Let me know when you are
18 ready.

19 A. I am ready. I was trying to see if I
20 specifically said this in my declaration, when it was
21 first introduced. I was trying to answer the
22 question, but I believe you're correct. It existed
23 for generations.

24 Q. So what are EDCA parameters?

25 A. So EDCA parameters are parameters

1 that are used to access the channels or parameters
 2 used to access channels. I can give you two
 3 examples. Okay. One of those parameters will be,
 4 for example -- I believe I do discuss it here. Let
 5 me just see if I can find it. Maybe not. So let's
 6 go to the patent itself, in the patent. So those are
 7 parameters which are used to access the channels. So
 8 one of those would be the parameters that tell you
 9 how to choose the congestion window. So in 802.11,
 10 when a station wants to access a channel, what it
 11 will do, it will, first of all, sense whether the
 12 channel is busy or not, meaning if there's energy --
 13 it's called Clear Channel Assessment, CCA. If it
 14 finds that the channel is busy, it would then employ
 15 what's called collision avoidance. It will choose a
 16 number which is between CW minimum and CW maximum --
 17 well, I'm sorry. It will choose a number which is
 18 within the collision window, so between zero and this
 19 collision window, and will randomly, choose randomly,
 20 then start counting. When it reaches zero, then it
 21 will access the channel. Presumably every other
 22 station -- I'm sorry?

23 Q. I didn't say anything.

24 A. I heard someone saying something.
 25 Presumably any other stations it

1 wants to access the channel will do the same. And
2 you have two stations. Two stations want to access
3 the channel. Someone else is transmitting. Both of
4 them will determine the channel is busy. Both of
5 them will randomly choose a number within this
6 contention window, CW, and there's a small chance
7 that both of those stations will choose the same
8 number. Therefore, when they are now trying to
9 access the channel, those two stations trying to
10 access the channel, it's unlikely that they will
11 collide, because they will wait different times to
12 access the channel. So this CW is determined based
13 on the EDC parameter, you know, EDC parameter.

14 You have another -- so this is all
15 explained in the patent in column 3, sort of starting
16 in -- in line 55.

17 Q. I want to get your view of what that
18 technology is. Also for my benefit.

19 A. That's what I'm trying to explain.

20 Q. Let me continue there. So you talked
21 about this contention window. What does the role of
22 CW mean? I think that is part of EDCA parameters,
23 too, right?

24 A. You have the -- those -- the two
25 values, which are CWmin and CWmax. CWmin is -- so CW

1 is a contention window. The value of the CW is not
2 fixed. It is -- it depends on how many collisions
3 the station encountered or how many failed attempts
4 that the station encountered. Once it has a
5 particular CW set, and it encounters collision, it
6 will then take the CW and multiply it by 2W. So now
7 the range in which you're choosing, the CW would be
8 larger. The larger the range that you are choosing
9 randomly, your lack of parameter or lack of counter,
10 the less chances are the two stations or any number
11 of stations will collide again. So this simply, the
12 larger the CW is you spread, so to speak, the
13 stations who are accessing the channel over longer
14 periods of time, and therefore you have smaller
15 likelihood that you will collide again.

16 The CW minimum is the minimum
17 number -- minimum value of the CW window. CW max is
18 the maximum number of the CW window. You are going
19 to take the window, and you are going to multiply by
20 two, multiply by two, multiply by two. Eventually
21 you are going to hit the CWmax value. The algorithm
22 says you cannot go above CWmax. If it goes above
23 CWmax, you go back to CWmin. It doesn't allow it to
24 spread your range from which you choose this random
25 number to too large a range, because if this were to

1 happen, you can imagine that if the medium is very
2 congested, you have a lot of collisions, you are
3 going to start increasing your window C -- your
4 window, your lack of value, and then it will take you
5 infinite time, infinite, quote, unquote, very long
6 time to access the medium, which you don't want to do
7 it.

8 It also has another purpose that if
9 there is something really wrong, you know, you want
10 to have the ability to abort the whole process. If
11 you were to increase your window to very, very large
12 values, your abortion will take way too long to kick
13 in, so to speak.

14 Q. If the CW value is larger, then I
15 guess you have to wait longer potentially, right?
16 Statistically, I guess you have to wait longer before
17 you can talk on the channel, right?

18 A. Well, so -- well, if your CW is
19 large, then you will be choosing numbers, random
20 number, from a long range. Therefore, your
21 likelihood of many of those stations that want to
22 access choosing exactly the same number goes
23 drastically down.

24 Let's assume that CW is one, okay?
25 So -- and the minimum is zero. So you either choose

1 zero or 1. If there are more than two stations that
2 want to access the channel at the same time, you have
3 very high probability of one. The two stations will
4 choose the same counter. They are going to collide
5 again. If your range is from zero to 1,000, the
6 likelihood the three stations will choose the same
7 number is infinitely small. I shouldn't say
8 extremely, but very small. The larger the range is,
9 the probability of collisions go down.

10 Q. Do you think the larger contentions
11 window is -- let me strike that.

12 Does the size of the contention
13 window affect performance?

14 A. Well, it does. The size of the
15 contention window does affect performance. The --
16 but this has to be taken in the context of -- in the
17 context of the load, how many stations want to access
18 the channel. If you have some load, let's say
19 relatively significant load, right, and your
20 contention window is too small, then you have high
21 probability of collisions, more collisions when you
22 have your throughput, right? Because collisions take
23 time from the network, which nothing is being
24 transmitted. It's wasted time, right? So if you --
25 so the CW does affect performance, of course.

1 Affects -- not only this, CW also affects the delay,
2 right? If you have this large CW, you choose a long
3 time to wait, to do this collision avoidance, then it
4 will affect your delay. You know, your best
5 situation would be high throughput, low delay. But
6 those are conflicting -- two conflicting parameters,
7 performance parameters. So if you sacrifice one as
8 opposed to the other, right? So you are saying if my
9 performance is so much affected by collision, I am
10 willing to wait a little bit longer by increasing the
11 CW, right? So wait a little bit longer, the -- it
12 reduces the amount of collision, and therefore having
13 higher throughput at the expense of also higher
14 delay, also vice versa. So it's the CW -- so CW
15 should be matched to load on the network.

16 Here's the kicker, if you wish, okay?
17 A station does not know what the load is when it
18 attempts to access the channel. If it knew what the
19 load is, it would be able to set the CW optimally,
20 but it doesn't know. So it has to understand from
21 the mechanism of collision trying to access in
22 colliding what is the load. The more time it
23 accesses the channel and collides, the station is
24 going to say, ah, the load is higher. And I need to
25 increase my -- my lack of -- my CW, increase the CW,

1 so that I can disburse those stations across time.

2 Q. That's the doubling of the CW
3 mechanism you are talking about, right?

4 A. I'm sorry?

5 Q. That's the doubling of the CW you are
6 talking about?

7 A. That's exactly. This is the process.
8 Each time that I experience collision, I say, well,
9 maybe the load is much higher than what I think it is
10 as a station, I as a station, and therefore I am
11 going to increase this interval from which I randomly
12 choose my lack of and likely reduce the probability
13 of collision at the expense of longer delay.

14 Q. Who sets the CWmin then? Strike
15 that.

16 So how does a machine know what its
17 CWmin value is?

18 A. So typically those values will be
19 part of this, you know, this set of parameters that
20 we discussed.

21 Q. And does all the devices on the
22 network have the same CWmin?

23 A. No, no. So ECDA parameters, you
24 know, ECDA parameters will -- would be set -- so
25 this -- the CWmin and CWmax would be referred to as

1 the contention window. Those are part of the EDCA
2 parameters, so to speak. Those are typically, you
3 know, set based on whatever configurations the
4 network has, okay? But there are other parameters
5 which are part of the EDCA. Another one is called
6 AFI -- AI -- AIFSN, AIFSN. What it stands for, I
7 would need to figure it out. But anyway, it's a
8 parameter which tells you how much time I need to
9 wait before I respond for certain action on the
10 network. So imagine that you have two traffic types,
11 okay? And you want to give priority to a particular
12 traffic type. You are going to allow this traffic
13 type to have this AIFSN parameter shorter. It will
14 give priority to this traffic type in acquiring the
15 channel because it's way shorter and grabs the
16 channel, so to speak. When the channel becomes busy,
17 no one can access the channel. That's another
18 parameter.

19 There's also another parameter, which
20 is TXOP, which is transmission opportunity, which
21 essentially says how long the duration of the
22 transmission can be. So that's another EDCA
23 parameter. So those are parameters which are, you
24 know, EDCA parameters.

25 Q. So I think in your declaration you

1 mentioned that the EDCA parameters may be determined
2 according to the type of data being transmitted. Is
3 there a set of these parameters for each access
4 category --

5 A. Yes, you typically will have set
6 parameters for each access category. Why? Because
7 you can have voice, as an example. You can have
8 voice, for example, which is interactive traffic.
9 Then let's say you have another traffic which
10 is batch. You can have more than just two. I'm just
11 taking two as an example. Voice is very sensitive to
12 delay, right? When we talk right now, we use voice
13 over IP, right, the protocol, for example, as an
14 example, right? If my packets were to be delayed,
15 right, you would not be happy with me saying and my
16 lips not being in sync with what you are hearing. So
17 you want this to be synchronized. So you want to
18 give priority to voice traffic as opposed to let's
19 say batch traffic. You transmit some file, an image
20 or -- not a big deal if your image appears 10
21 milliseconds, 20 milliseconds later on your screen.
22 You won't even notice it. But in voice you may
23 notice when it's -- when it's too long, so to speak.
24 You want to give priority to certain traffic types.
25 This is why the EDCA parameters are pared -- are

1 timed to the particular traffic type, so to speak.

2 Q. Very helpful. So that was part of
3 802.11ac for sure. I think there's question about
4 whether it was still part of previous generation of
5 802.11 --

6 A. No. I believe that you are correct
7 in saying that it was way -- that was before ac as
8 well. I am nearly 100 percent sure. I don't like to
9 say things without checking, right, but I --
10 especially when I am in a deposition, but I am pretty
11 sure it was before ac as well.

12 Q. If you go to the next paragraph,
13 paragraph 49 of the declaration, you talk about
14 multi-user communication. Do you see that?

15 A. Yes, I see this, yes.

16 Q. What is multi-user communication?

17 A. Okay. So multi-user communication.
18 So typically with this characteristic of 802.11
19 protocols before ax and before ac was that you only
20 can have one station transmitting on a particular
21 channel at a particular time. Okay. So you
22 typically would have only one station accessing the
23 channel and transmitting, and, you know, and other
24 stations have to wait, so to speak.

25 Let's now go to 802.11ax. In

1 802.11ax there's something that is called OFDMA,
2 which allows you to take a channel and divide this
3 channel into different sub-channels. And on this
4 sub-channels you can allocate different -- we call it
5 resources to different stations. So you can have one
6 channel in principle transmitting on those -- we have
7 multiple stations transmitting at the same time on
8 this one channel using different resources. Okay.
9 Now, the idea is how to schedule those users to
10 accessing the single channel to transmit at the same
11 time. This is the multi-user communication.

12 Now, in 802.11ac this type of
13 multi-user communication was only in the downlink.
14 Downlink means from the access point to the stations.
15 In 802.11ax, which is known as Wi-Fi 6 today, right,
16 they also allow this to happen in the uplink, from
17 the stations to the base station, to the access point
18 of base station.

19 So now there needs to be a protocol,
20 right, that tells which stations are allowed to
21 transmit together at the same time. What are the
22 resources that it can use so they don't collide,
23 right? You don't want this to collide. This
24 multi-user communication is a very characteristic
25 feature of 802.11 or Wi-Fi 6 because it allows you to

1 significantly improve the throughput of Wi-Fi 6
2 because now you can have multiple stations transmit
3 at the same time on the same channel rather than only
4 one station.

5 Not only this. You avoid collisions,
6 right? If those stations were to be scheduled, were
7 to be not scheduled, were to access the channel
8 independently in a colliding -- in a contention
9 manner, right, they can collide and waste resources,
10 but when the base station schedules those stations to
11 transmit, you are effectively avoiding collision.
12 This is yet another advantage of Wi-Fi 6.

13 Q. So if the device in 802.11ax is not
14 scheduled, for example, I mean, for one reason or
15 another, they can still communicate through a
16 different channel, correct?

17 A. Yes, they can still communicate.
18 They would need to -- if they are not scheduled, they
19 would need to go through what's called contention
20 protocol, which is what we know, you know, the
21 Legacy, so to speak, 802.11. You would compete on
22 the channel. As we said before, you will try to
23 access the channel. You find the channel busy. You
24 will start count. You will draw your lack of -- lack
25 of interval. You would try -- lack of counter. You

1 would start counting until you reach zero. You
2 access. Hopefully you're not going to collide. If
3 you do collide, you are going to try again later.

4 Q. So in 802.11ax you have two ways to
5 talk to other devices. One is through that, I guess,
6 the contention process you described. Then the
7 second way is through the OFDMA multi-user
8 communication; is that correct?

9 A. Right. So I actually, I believe, if
10 I remember correctly, I specifically talk about it
11 here somewhere. Maybe not. So yeah, so I talk here
12 about that. So, by the way, I -- AIFS is an
13 arbitration interface space. Now I remember that.

14 Yeah, so I talk about this having
15 those two type of stations. So I don't talk about it
16 in this particular section, but I know there's
17 another section where we talk about this, having
18 those two type of accesses at the same, you know, in
19 the same network, two type of stations.

20 Q. So Wi-Fi 6 or 802.11ax device, you
21 have two channels that you can communicate on versus
22 a Wi-Fi 5 device or 801.11ac device where you only
23 have one channel that you can communicate through?

24 A. I wouldn't call this a channel.
25 There are two different access measures, two

1 different transmission measures. You can either
2 transmit using the contention base, which we refer to
3 in my declaration, in the patent as Legacy stations.
4 And then you can have 802.11ax stations which can do
5 multi-user communication, which is again this
6 scheduled communication. But they can also -- those
7 stations can also at the time that they don't do
8 multi-user communications, they can do regular access
9 as well.

10 Q. I think the patent mentions something
11 about fairness. Is that related to the fact that
12 802.11ax has two access mechanisms versus 802.11ac
13 has one?

14 A. Fairness is a very big topic. We can
15 sit here for half a day and discuss fairness,
16 honestly. It's not -- it's a very broad term
17 clearly. But the main idea is that if you have
18 stations that have the ability to monopolize the
19 channel, for example, in access, of course fairness
20 goes down. So there's different mechanisms by which
21 fairness is a problem, so to speak, or comes about to
22 be a problem in those networks.

23 So you would need to point me to a
24 particular passage that talks about fairness. I'd be
25 happy to explain it. But fairness is a very broad

1 term in this field. It refers to different
2 mechanisms.

3 Q. Correct me if I'm wrong. I think the
4 fairness that the patent is talking about is really
5 referring to the fact that 802.11ax should not get
6 the same priority in the contention process if it is
7 able to communicate via the scheduled communication;
8 is that right?

9 A. I am trying to find here -- it talks
10 about fairness multiple times. Let me try to find
11 the first time. In column, for example, in column 14
12 it talks about fairness. It talks about -- so
13 fairness would also be driven by the fact of, you
14 know, what are those EDCA parameters, right? If all
15 the stations get very favorable access parameters,
16 then of course this would be unfair to stations which
17 do not get such parameters. And you can indeed even
18 create a situation in which you, quote, unquote,
19 starve certain stations from accessing the channel
20 because they have so unfavorable parameters. But
21 again, fairness is a very, very big topic, and --

22 So another issue with -- yeah, here's
23 -- here's another on fairness, especially with the
24 context of multi-user parameters, multi-user EDCA
25 parameters. Let's assume that you are a station that

1 you always get scheduled, okay? Then you can think
2 that if the base station always schedules you for
3 transmission, you have very low probability of
4 collision, essentially no probability of collision
5 because you are scheduled to transmit, right? Then
6 you have another station that's never scheduled.
7 Then I would have to compete on the channel all the
8 time. So this would create unfairness, right, that
9 you're getting a preferred treatment, so to speak,
10 because you don't need to compete on the channel, and
11 I need to compete on the channel.

12 This is, by the way, why we have
13 those different EDCA parameters that we switch
14 between, right, to reduce your -- you're getting some
15 favorable treatment by being scheduled, but let's --
16 now this reduces the attractiveness of your
17 parameters, right, so to equalize our fairness, if
18 there's anything like this, equalize fairness.

19 Q. If you are scheduled, then because
20 you have another access mechanism available, your
21 EDCA parameter is getting downgraded, so to speak?

22 A. Right. Not only because you have
23 another manner of accessing the channel. You have
24 another -- you don't have to go through contention.
25 I have to go through contention, because I'm not

1 scheduled. You are scheduled. You're not going to
2 contention. You will transmit whenever you are
3 scheduled. No going through contention. That's it.

4 Q. But in the ideal world, if you're
5 stopped being scheduled, then you would want your
6 EDCA parameters, I guess, upgraded back to what it
7 was before, right?

8 A. Right. So, yeah, eventually, when
9 you stop being scheduled after some time, you say
10 well, fine, you know, I got some preference over at
11 that time. Now I am back to everyone else, so to
12 speak. I need to use parameters, which would be a
13 little bit more favorable to me, as opposed to
14 stations that continue to be scheduled.

15 Q. Does a station know that they will
16 continue to be scheduled?

17 A. Typically not, right? But it really
18 depends. Now, we are talking about a little bit more
19 complicated. So -- and also we are already talking
20 sort of out of context here, honestly. Are we
21 talking about the standard? Are we talking about the
22 patent?

23 Q. 802.11ax.

24 A. Right. So typically -- typical way
25 of implementing networks, you will not know as a

1 station whether you will or will not get scheduled.
2 This is why you have this timer that you can say,
3 okay, I'm going to reduce my parameters from the
4 single user to the multi-user parameters, but after
5 some time I go back to it as everyone else, to the
6 single-user parameters, so to speak.

7 Q. I see. Okay. So let's go back to
8 the scheduling part. So how do you schedule a --

9 A. So typically what will happen is the
10 base station will send -- it really depends on a
11 different type of mechanism. There's more than one
12 mechanism. Just take one mechanism. One mechanism
13 they will have, frame, which goes from the base
14 station to all the other base station -- to all the
15 other stations that want to get scheduled, okay? So
16 the base station needs to know who wants to transmit,
17 okay? So I say here are three stations that will
18 transmit. I am a base station. Three stations want
19 to transmit. I know how much traffic they want to
20 transmit. So I decide as the base station I want to
21 schedule them. So I am going to send a frame that
22 will tell all those stations you, you, you are going
23 now to transmit in a multi-user communication manner,
24 okay? And I'm going to tell them which resources you
25 are going to use, okay, and when to start. All of

1 you to start transmitting at the same time, okay?

2 Now, they may have different amounts
3 of information to transmit. So then those stations,
4 now each one of them will access their resources,
5 transmit on those resources. They will start at the
6 same time. They may not end at the same time.
7 That's another issue, okay? Because each one of them
8 may have different amounts they are trying to
9 transmit. But at least they will start at the same
10 time.

11 Once a station finishes transmitting,
12 okay -- well, when they transmit, they may ask, I
13 want to have an acknowledgement to what I am
14 transmitting. Or the station may say I don't need to
15 have acknowledgement. So then the base station will
16 reply to those stations that transmitted and tell
17 them, yeah, you received this packet. I received
18 packets from you, but not everything. I received
19 some packets from you and didn't receive any packets
20 from the other station. Okay. This goes now from
21 the base station back to the stations. Okay. And
22 essentially the stations need to wait if they are
23 going to be rescheduled for transmission. If those
24 stations have something more to transmit, then they
25 may indeed be scheduled again for new multi-user

1 transmission, or may not. It depends on the base
2 station, how the base stations implement. But this
3 is the protocol, so to speak. Now, there are many
4 variations to what I said. I just provided one
5 example.

6 Q. Typically how frequent are these
7 frames transmitted to --

8 A. I -- I really cannot tell you. It
9 really depends on many, many, many factors.

10 Q. Just one frame and then not for a
11 while?

12 A. Often this may be the case.
13 Sometimes there will be cases where frames come very
14 often, one after another. It really depends on
15 implementation. It depends on the architecture of
16 the particular network. It depends on resources. It
17 depends on many, many things.

18 Q. But nothing prevents an access point
19 from sending a series of trigger frames one after the
20 other so that you're kind of regularly scheduled?

21 A. Well, yeah. I mean, of course you
22 don't want to -- as a base station, you don't want to
23 abuse this schedule mechanism because please
24 understand that there are other stations there who do
25 not participate in the multi-user communication, and

1 they also want to access the channel. So you don't
2 want to only schedule some stations, and then
3 penalize those other stations that are not scheduled.
4 So, yes, you would schedule. Scheduling mechanism is
5 definitely more efficient in terms of resources. But
6 you don't also -- also don't want to abuse it and
7 schedule it too often because then you don't allow
8 other stations to participate in the contention-base
9 access.

10 Please also remember there are
11 stations that cannot be scheduled from other
12 generations of 802.11, right? Those stations from
13 previous generations, they cannot be scheduled. So
14 the base station has to be fair. It has to be fair
15 enough to allow those stations access also.

16 Q. And this frame that you sent from AP
17 to the terminal, that's called trigger frame?

18 A. That's one example of a frame that
19 will do this, trigger frame.

20 Q. The data that's sent from the
21 terminal to the AP that contains the data frame, is
22 that, quote, trigger-based PPDU?

23 A. It would also be trigger-based PPDU,
24 correct.

25 Q. I think you mentioned acknowledgement

1 coming back from AP to the terminal. Is that
2 referred to as Ack?

3 A. Well, typically acknowledgement is
4 Ack, but you have different types of acknowledgement.
5 You have block acknowledgement which will acknowledge
6 blocks and so on. You have multi-user, so to speak,
7 acknowledgement that will acknowledge transmission
8 from different users. So it's different version of
9 acknowledgement, but in general acknowledgement is
10 A-C-K, Ack, yes.

11 Q. You mentioned that the multi-user
12 communication was used for downlinking 802.11ac,
13 correct?

14 A. Correct. I think -- I am pretty sure
15 I did explain it in my declaration. Let me just see.

16 Q. In 49?

17 A. In 49. "The then-known 802.11ac
18 standard uses multi-user communication only in the
19 downlink. The next generation of the 802.11 standard
20 (which today is known as Wi-Fi 6) was to extend the
21 multi-user communication to the uplink as well."

22 Q. So we talked about switching between
23 the EDCA parameters. Do you remember that?

24 A. Yes.

25 Q. So when would you switch from one

1 parameter to another in the context of multi-user
2 uplink communications?

3 A. Well, typically, I mean -- so we can
4 look at the patent. So if you -- I'll just give you
5 one example here. So this will be for example. I
6 mean, all those figures are really the same thing --
7 not the same thing. All those figures are examples.
8 I didn't mean to say the same thing. All those
9 figures are examples of how this could be used. But
10 so here is example, Figure 12. You have an (a). You
11 have the trigger frame initiation. And before the
12 trigger frame came, you have Legacy EDCA parameters
13 being used. After the initiation, and after
14 transmission, of course, the stations will use the
15 multi-user EDCA parameters. So that's an example.

16 Then you have also -- let's say
17 Figure 18, which is a good example. You will have
18 the trigger frame. The PPDU transmitted. All this
19 uses Legacy mode. After this you will start using
20 the MU EDCA mode. Eventually you're going to switch
21 back to some sort of Legacy mode parameters.

22 Q. What if you get another trigger frame
23 before you switch back?

24 A. Well, then you will continue to use
25 MU parameters.

1 Q. So this -- we're in Figure 18 of the
2 '035 patent. Is that what you have open right now?

3 A. That's correct. Again, you know, I
4 just want to be very clear. These are just examples.
5 This is not an exhaustive way of using it and
6 definitely not an exhaustive way of all the patent
7 claims are, you know, using or proposing.

8 Q. Understood. Right now I am just
9 trying to understand the technology. So in Figure 18
10 there are four figures, correct?

11 A. Yes.

12 Q. And it says, "Update EDCA parameter"
13 for each of those figures?

14 A. Yes.

15 Q. Is that what you were referring to as
16 a switching of the EDCA parameters?

17 A. The -- when it says, "Update EDCA
18 parameter Legacy to MU," this is where you start your
19 parameters from the Legacy parameters to the
20 multi-user parameters, okay, and then you need to
21 know where to revert back to the Legacy parameters.
22 This way you have the timing. That's exactly what
23 those claims are doing. By the way, they do it in a
24 specific way, in a way which, you know, we can talk
25 about it, but in a way in which all the other

1 references do not. They don't do it the same way.
2 They do it differently.

3 Q. In Figure 18(a), for example --

4 A. Yes.

5 Q. -- after the system goes from the
6 Legacy mode to MU mode, the EDCA parameters go from
7 Legacy to MU mode, right?

8 A. Yes.

9 Q. And then if you receive a trigger
10 frame before it switches back to the Legacy mode, the
11 MU mode stays, right?

12 A. Yeah. It would continue to use
13 the -- because your timer did not expire, right?

14 Q. What happens to the timer?

15 A. Well, so it really depends. We can
16 look, you know, at the different references. You
17 will typically, you know, restart the timer or start
18 the timer again. You will start the timer again.

19 Q. Okay.

20 A. So, you know, if another frame comes
21 in, you will just, you know, start again. You will
22 set the timer, you know, set the timer, set a value
23 to the timer, and start the timer running. That's
24 what we call setting the time.

25 Q. So in figure 18(a)2(d) it just gives

1 you different options of when the timer started and
2 when the switch occurs?

3 A. Right. In general, I mean, in
4 general. So if you take (a), for example, this is
5 the case in which you do not get -- you know, you do
6 not -- so (c), for example, is a case in which you
7 get block acknowledgement, multi-user M-BA,
8 multi-user block acknowledgement. When you get the
9 block acknowledgement in this particular example --
10 again, I am just wanting to make sure that we are
11 always talking about examples here. That's not the
12 only way to do it according to the patent. In this
13 example you will start the timer after you receive
14 the block acknowledgement. In part (d) you do not
15 have block acknowledgement. Okay. Because, for
16 example, the PPDU did not ask for acknowledgement.
17 Then you are going to -- sorry. In part (a) then you
18 are going to start the timer immediately after you
19 finish receiving the PPDU.

20 So those are different scenarios, if
21 you wish. Okay. And again those are not exclusive.
22 There are other ways to do it as well, or possible --
23 other possible ways to do it.

24 Q. So in (c), 18 (c), that is a scenario
25 where the acknowledgement is received, correct?

1 A. Right. This is the scenario in which
2 the PPDU requested acknowledgement, and then when the
3 acknowledgement now comes back from the base station,
4 then at the end of the acknowledgement, the timer,
5 the EDCA timer, will start.

6 Q. Is it possible for a PPDU to request
7 an acknowledgement but not receive it?

8 A. Yes, of course it's possible.

9 Q. What are some of the reasons for
10 that?

11 A. What are the reasons for this?

12 Q. The reason why a terminal would not
13 receive an Ack even though it requested it.

14 A. I am sure there are more than two,
15 but I can give you two, two simple ones. The base
16 station did send the acknowledgement. The base
17 station received the PPDU, sent the acknowledgement.
18 And we're talking about wireless communication. So,
19 you know, there's a lot of noise, a lot of
20 interference, blah, blah, blah. You -- base station
21 sent the acknowledgement, and someone turns on the
22 microwave. There's a lot of interference. The
23 acknowledgement is lost. And the base station -- and
24 the station never receives the acknowledgement.

25 Another possibility is that the

1 frame, the PPDU, never reached the base station in
2 the first place. So it's not going to receive an
3 acknowledgement for this particular frame. So there
4 may be different reasons.

5 Q. So Ack, acknowledgement -- strike
6 that.

7 Why would you ask for an
8 acknowledgement? What is the purpose of the
9 acknowledgement?

10 A. What is the purpose? Okay. Well,
11 there can be many purposes for acknowledgements. I
12 can give you some examples, but again it's much more
13 complicated than this, of course. Let's assume I am
14 a station, and you are the base station. I am
15 sending two frames. I sent you a frame, and I need
16 to keep this frame that I sent you in my memory, my
17 buffer, not memory, my buffer, because you can say I
18 want -- I didn't get this frame. I didn't get this
19 frame correctly. So I cannot get rid of this frame.
20 I have to keep it in my buffer.

21 When you sent me an acknowledgement,
22 and I take this acknowledgement, I know that this
23 frame was correctly received by you, and I don't need
24 to keep it in the buffer anymore. Okay. So that's
25 one reason.

1 There are other reasons. Certain
2 protocols limit the amount of traffic that can be
3 outstanding. Outstanding means not acknowledged.

4 So, for example, the simplest
5 mechanism I can only send you one frame at a time.
6 So if I send you one frame, I cannot send you the
7 next frame until I know that you received this prior
8 frame. How I know that you received the first frame?
9 When you tell me through the acknowledgement. That's
10 another. There are many other options. We can talk
11 about the other.

12 Q. Is the concept of acknowledgement
13 specific to 802.11ax?

14 A. No, acknowledgements are definitely
15 not specific to 802.11ax. That's part of the
16 networking protocols in general.

17 Q. But there are scenarios where you
18 would not request an acknowledgement, correct?

19 A. There are scenarios in which you
20 would not need acknowledgement. I want to mention to
21 be precise we're talking about just the concept of
22 acknowledgement. We are not talking about multi-user
23 block acknowledgements, because that's a different
24 story. Okay. Just the concept of acknowledgement,
25 that's not specific to 802.11.

1 Q. But there are scenarios where packets
2 or PPDU's do not request an acknowledgement?

3 A. Yes. There are scenarios in which
4 you don't -- you don't need acknowledgement, yes.

5 Q. Why would you not request an
6 acknowledgement?

7 A. Well, again, we can talk about for
8 half an hour different scenarios. I'll give you one.
9 One scenario is let's assume that I am a sensor that
10 reads temperature in the room, and you are a cell
11 phone that expects those readings of the temperature.
12 So I'm a sensor, and I'm sending these readings every
13 minute to you, okay? Let's assume that one of those
14 readings that I send you is lost. Okay. Not a big
15 deal, because the next one is coming immediately
16 afterward. Okay. So therefore there's no need for
17 me to actually receive acknowledgement from you
18 because, hey, you know, if one of those is lost, not
19 a big deal. Next one is coming in a minute later.
20 Okay.

21 There are other scenarios in which
22 acknowledgements are useless to a large degree -- not
23 large degree, but some degree. Let's assume that
24 we're talking about voice communication, right?
25 Acknowledgement is also good in terms of ability for

1 me to retransmit if something was lost. Okay. If I
2 send you packet No. 1, and then I send you packet
3 No. 2, and then packet No. 3, and you receive packet
4 No. 1. You didn't receive packet No. 2, but you
5 received packet No. 3, right? If you don't issue
6 acknowledgement of packet No. 2, how will I know that
7 I need to retransmit packet No. 2? So after some
8 time I am going to retransmit it.

9 Now, in certain scenarios lost
10 transmission doesn't make sense to be retransmitted.
11 When -- when we have traffic such as voice, for
12 example, where there's a very strict deadline by
13 which you have to receive this communication. If you
14 receive it afterward, it's useless, right? If you
15 receive my, you know, voice, digital voice, right,
16 and when I send you a packet, and it's -- it's time
17 to be replayed in your place, it's already gone.
18 You're not going to ask for a transmission. It's
19 useless. It's gone. That's it. The time for it to
20 be retransmitted is gone, right? In some scenarios
21 acknowledgements do not make too much sense, because
22 there's no reason for me to ask for acknowledgement,
23 because I'm not going to ask for a transmission
24 anyways.

25 Q. In that case it would just not make

1 sense to wait for one, because you haven't requested
2 for one?

3 A. Yeah, right. My voice will be a
4 little bit distorted when it is being replayed, but
5 that's the best we can do.

6 Q. What are typical -- let me strike
7 that.

8 Is the delay between the time you
9 send a PPDU and receive acknowledgement measured in
10 milliseconds?

11 A. It really depends on the network,
12 honestly. And, you know, if you are talking about
13 wider network, milliseconds, a hundred milliseconds.
14 I don't know. Talking a short network, milliseconds.
15 Might be a fraction of a millisecond. It really
16 depends on the span of the network and the delays in
17 processing, the throughput, how fast it transmits,
18 how long it takes it to transmit acknowledgement, so
19 on. A lot of factors.

20 Q. If you go to Figure 18 again, there's
21 a trigger frame on the left side, and then HE-trigger
22 PPDU. Do you see that?

23 A. Yes.

24 Q. The HE-trigger PPDU, that's the
25 trigger-based PPDU that we were talking about before,

1 correct?

2 A. Right.

3 Q. So what that figure is representing
4 is, I guess, from the perspective of a mobile
5 terminal that receives a trigger frame on the left
6 side, and then it is sending out the HE-trigger PPDU;
7 is that correct?

8 A. Right. You can think of this as what
9 is going on on the channel, so to speak.

10 Q. On the channel. I see.

11 A. The channel, yes, because the trigger
12 frame is sent by the base station. The PPDU is sent
13 by the station to the base station.

14 Q. What is a typical time range --
15 strike that.

16 MS. XU: When will be a good time to
17 take a break?

18 MR. YOUNG: A couple questions. Is that
19 okay?

20 MS. XU: Sure.

21 BY MR. YOUNG:

22 Q. How fast can a terminal receive the
23 trigger frame and then send out the HE-trigger PPDU?

24 A. The station will send its PPDU based
25 on what the trigger frame tells it to do. So the

1 trigger frame will say this is the time we need to --
2 not only you. All the stations that participate in
3 the multi-user communication, all of them start at
4 the same time, but this time is determined by trigger
5 frame by the base station.

6 Q. I see. So the base station knows
7 when the devices are going to send out the HE-trigger
8 PPDU?

9 A. Typically, yes, yes.

10 Q. So if the terminals are configured to
11 switch from the Legacy parameter to the multi-user
12 parameter, when it -- when a -- strike that.

13 MR. YOUNG: Let's take a break. Is
14 it a one-hour difference in Texas?

15 THE WITNESS: Are you on the east coast?

16 MR. YOUNG: I'm on the east coast.

17 Right now it's going to be 1:00. Off the
18 record.

19 (Whereupon, a recess was taken.)

20 BY MR. YOUNG:

21 Q. Dr. Haas, welcome back.

22 A. Thank you, sir.

23 Q. So before -- actually, have you
24 had -- have you talked to your attorney during the
25 break?

1 A. No, I have not.

2 Q. Before the break we discussed the
3 multi-user uplink communications. Do you remember
4 that?

5 A. Yes.

6 Q. And we talked about how access point
7 can schedule a multi-user uplink transmission by
8 sending a trigger frame to terminals, correct?

9 A. Yes.

10 Q. And then in response to a trigger
11 frame, the terminals that are participating in the
12 multi-user communication will send trigger-based
13 PPDU's which contains data, correct?

14 A. Yes.

15 Q. And then the access point in some
16 cases will -- would send an acknowledgement in
17 response to the trigger-based PPDU, correct?

18 A. Yes.

19 Q. In that exchange of frames -- well,
20 strike that.

21 Is there any other type of frame
22 involved in multi-user communications other than
23 those three?

24 A. I mean, there can be different
25 frames, I presume. It depends on the communication.

1 It's sort of difficult to answer. It's an abstract.

2 Q. But for the multi-user
3 communications, those three frames I discussed are
4 the three key frames that are exchanged between AP
5 and terminals, correct?

6 A. Well, those are frames which are
7 exchanged between the AP and the station, between
8 access point of base station and a station. Of
9 course in multi-user communication typically there
10 will be more than one station. So there will be
11 multiple stations. There will be multiple
12 transmissions of stations going towards -- you know,
13 sent presumably by a station to a base station or
14 vice versa. So that's sort of -- those are frames.
15 I mean, it really depends on the situation. There
16 may be other frames. I'm not sure.

17 Q. Sitting here, you can't name a
18 particular frame that would be exchanged as part of a
19 multi-user communication between the AP and the
20 terminal?

21 A. I mean, there may be other frames,
22 control frames. I'm not sure. It really depends on
23 the situation. It's sort of difficult to talk in
24 abstract.

25 Q. Let me see if I can clarify my

1 question. Once an AP sends a trigger frame to the
2 terminal, other than the HE-trigger PPDU or
3 trigger-based PPDU, is there any other frame that the
4 terminal would send back to the AP in response to the
5 trigger frame?

6 A. So if you look at the standard -- if
7 you look in general, the exchange may include other
8 frames, may include, you know, frames that make
9 sure -- for example, control frames, right? Make
10 sure that other stations do not attempt to transmit
11 on the channel. So there may be other frames.

12 Q. Those control frames are sent by
13 access point to the terminals?

14 A. Some of them can be sent by access
15 points. Some of them can be sent by stations.

16 Q. But a frame that is responsive to the
17 trigger frame is the trigger-based PPDU, right?

18 A. Put a little bit differently,
19 trigger-based PPDU is responsive to the trigger
20 frame.

21 Q. Okay. Then the acknowledgement frame
22 sent from access point to the terminal is responsive
23 to the trigger-based P PDU?

24 A. The acknowledgement frames would be,
25 if they are sent -- again, we already discussed

1 that the acknowledgement may not be sent. If they
2 are sent, they would be responsive to the
3 transmission of the PPDUs.

4 Q. Is there any other frame that is
5 responsive to HE-trigger PPDU?

6 A. I would need to look at the standard.
7 There may be some other frames. I'm not sure.

8 Q. But you are not sure?

9 A. You know, it's a little -- the point
10 is it's very difficult to talk in, you know, in
11 abstract, because different scenarios will have
12 different situations. In certain situations there
13 will be control frames. There will be some other
14 frames as well. In other situations, maybe not. So
15 it's very difficult to say -- you know, you need to
16 give me a particular example of the standard. Then
17 we can discuss it.

18 Q. Okay. All right. Dr. Haas, if you
19 could turn to Figure 12 of the '035 patent.

20 A. Figure 12, sure.

21 Q. Specifically Figure 12(a).

22 A. Okay. Yes. 12(a).

23 Q. I think we briefly discussed this
24 figure before. Do you remember that?

25 A. Yes.

1 Q. This 12(a) is describing an
2 embodiment where the switch from the Legacy EDCA
3 parameter set happens after the trigger frame is
4 received; is that correct?

5 A. So you have a trigger frame which is
6 received before then the Legacy EDCA parameter set is
7 being used. After, then the -- at some point the
8 EDCA -- the multi-user EDCA parameter set would be
9 used. And as you can see, those -- it looks like
10 tilted slots. Those tilted slots -- first of all,
11 you have the backward timer. At that point the
12 station will select a random number, as we discussed,
13 in the contention window. And then you have those
14 slots, which the station starts counting until it
15 reaches zero, at which point the station will access
16 the video.

17 As you can see, it says here above
18 it, "Lower Access Probability." This indicates that
19 the MU EDCA parameters set is such that it lowers the
20 probability of a station being successful in
21 accessing the video. This is again because
22 presumably the trigger frame schedule -- it's
23 probably not shown here, but scheduled the
24 transmission. And, therefore, after this the
25 fairness will require the station to have lower

1 probability of being able to access. So it can
2 compensate for the fact that it was already
3 scheduled, and therefore, you know, allows another
4 station to be more successful in contention. So
5 that's what this figure says.

6 Q. In that figure when is the switch
7 from Legacy EDCA parameter set to MU EDCA parameter
8 set happening?

9 A. So I would need to see. At some
10 point after the trigger frame is sent, there will be
11 switch of the parameters. I -- you know, I will have
12 to look at the text and see what they say about this.
13 This is more of a very general kind of a figure, you
14 know. Let me see.

15 Q. Let me put -- so the Figure 12(a)
16 says, "Initiation." There's a little dotted bar.
17 Would that be when the switch is happening in that
18 figure?

19 A. Not necessarily. Again, I -- I need
20 to go to -- I need to go and find where it discusses
21 Figure -- what it means to discuss. So in column 17
22 it says, Figure 12 shows an operation in which a base
23 station terminal -- in which a base station --
24 base -- shows an operation in which a wireless
25 communication terminal, according to another

1 embodiment for the present invention, obtains
2 information on the MU EDCA parameters set from a
3 trigger frame and applies the information on the MU
4 EDCA parameters set.

5 Okay. So I will need to read all of
6 this. The different -- there are different
7 embodiments in the patent.

8 Q. Dr. Haas, which column are you
9 reading from?

10 A. Column 17 of the '035 patent,
11 starting at line 678, at 8. So it clearly says that
12 the station will obtain information on the parameters
13 set from the trigger frame and would apply this
14 parameter set.

15 Q. Let me point you to line 21. It
16 says, "In a specific embodiment the wireless
17 communication terminal may apply the MU EDCA
18 parameter set when receiving the trigger frame." Do
19 you see that?

20 A. I'm sorry. In which column?

21 Q. Column 17.

22 A. Column 17, yes.

23 Q. And line 21.

24 A. Okay. May -- when -- yeah. So
25 that's one embodiment.

1 Q. Okay. So in that embodiment the
2 switch from the Legacy EDCA parameter to MU EDCA
3 parameter is happening based on the receipt of the
4 trigger frame; is that correct?

5 A. In this embodiment, correct.

6 Q. All right. And then if -- let's turn
7 to Figure 16 -- Figure 18. Sorry. That was a figure
8 that we were on before.

9 A. Figure 18. Okay.

10 Q. These are different embodiments than
11 the one that we just discussed in column 17, right?

12 A. Well, it's the different
13 embodiment -- if you look at column 24, line 59,
14 "When a quality of service data frame included in the
15 trigger-based PPDU transmitted by the wireless
16 communication terminal does not request an
17 acknowledgement, the wireless communication terminal
18 may apply the MU EDCA parameter set at the time point
19 at which transmission of the trigger-based PPDU
20 ends." Right. This is when, in this embodiment, the
21 set MU EDCA is applied at the time in which the
22 trigger-based PPD U ends.

23 Q. Okay. So in Figure 12 it's showing
24 an embodiment where the switching of the parameter
25 occurs at the time the trigger frame is received. In

1 contrast, these figures show that EDC parameters
2 switch from the Legacy to MU mode at different times,
3 right?

4 MS. XU: Objection, form.

5 THE WITNESS: Well, I'm not sure of
6 different times. There are several
7 scenarios in Figure 18. I just want to
8 mention something. The switching -- there
9 are two switches, two switches here, so to
10 speak. They're switching from the SU to the
11 MU EDCA, and then there is a switch for
12 the -- from the MU EDCA later back into SU.
13 So I just want to be clear that the switch
14 that we discussed with respect to Figure --

15 BY MR. YOUNG:

16 Q. 12?

17 A. Well, Figure 18, this is a switch --
18 or Figure 12, yeah, Figure 12. This switch is from
19 the Legacy EDCA parameter to the MU EDCA parameter
20 side. I'm sorry?

21 Q. And Figure 18 is showing the same
22 switch, right, at different times?

23 A. Well, it's a different embodiment, I
24 believe. I'd have to reread the whole thing again,
25 but it looks like it's a different embodiment. Even

1 in Figure 18 you have several embodiments.

2 Q. I think we're in agreement. So
3 Figure 12 shows one embodiment where Legacy mode is
4 switching to MU mode based on a timing of the trigger
5 frame, correct?

6 MS. XU: Objection, form.

7 THE WITNESS: In Figure 12, the way that
8 I read it, in Figure 12, it says here in
9 Figure 12, I mean, the lines that you
10 pointed me to, "In a specific embodiment the
11 wireless communication terminal might apply
12 the MU EDCA parameter set when receiving the
13 trigger frame." So that's what it says in
14 this specific embodiment.

15 BY MR. YOUNG:

16 Q. So in your understanding, when does a
17 switch from the Legacy mode to MU mode happen in that
18 embodiment that you just read?

19 A. So in the embodiment of Figure 12,
20 the switch from the SU, of the Legacy EDCA parameter,
21 to the MU EDCA parameter set would be when receiving
22 a trigger frame.

23 Q. Okay. And is that when the MU EDCA
24 timer would be started as well?

25 A. Not necessarily.

1 Q. In Figure 18, though, the switch
2 occurs not based on the receiving of the trigger
3 frame, but transmission of HE trigger-based PPDU,
4 right?

5 A. So in Figure 18 the switch occurs --
6 well, let me be more precise here. In Figure 18(a).

7 Q. Yes, 18(a).

8 A. Because again there are different
9 embodiments, as we discussed. The switch may occur
10 in different types. In 18(a) it seems that the
11 switch occurs when the PPDU frame is received.

12 Let me go back here again to make
13 sure. It -- it says, "The time point in which
14 transmission of the PPDU ends." So again in 18(a),
15 when the PPDU ends, the switch will occur at some
16 point.

17 Q. And the timer is started at the time,
18 too, right?

19 A. Again, there are different
20 embodiments in this figure.

21 Q. In one embodiment. I am just asking
22 you about one embodiment in --

23 A. In one embodiment here, the timer
24 will start when the PPDU is received.

25 Q. Okay.

1 A. At least in one embodiment. Other
2 embodiments would be different on this figure.

3 Q. What benefit, if any, does Figure
4 18(a) embodiment have over the embodiment in Figure
5 12?

6 A. Well, it sort of depends on different
7 parameters. I would need to think a little bit more
8 about this. I cannot give you an answer. Sorry?

9 Q. Please finish your sentence.

10 A. I have not considered this in my
11 declaration. And, you know, I don't want to give
12 you -- I don't want to speculate. So rather than
13 speculate, I will need some time to read this
14 description and make sure that what I am saying makes
15 sense. But again, an embodiment may start -- may
16 start the application of the MU EDCA at different
17 times and may start the EDCA timer at different
18 times.

19 Q. And you have not considered for your
20 declaration advantages and disadvantages associated
21 with starting the MU EDCA timer at different times?

22 A. No. At certain times, at certain
23 points, I did consider it. It depends on the
24 situation. The situation I believe that I did
25 consider it, when the timer starts at the end of the

1 PPDU and after the -- if the -- if there's no -- if
2 there's no acknowledgement or immediate response,
3 whatever, when there's no immediate response
4 required, and in another case where immediate
5 response is required. So those are embodiments in
6 which I did consider advantages and disadvantages in
7 those cases, but you are pointing me here to an
8 embodiment which it's not in my declaration. So I
9 don't want to speculate.

10 Q. So you are referring to the
11 embodiment in Figure 12(a) in comparison with the
12 embodiment in Figure 18(a); is that right?

13 A. That's one thing that could be
14 considered in such a comparison. Again, there are
15 some things that I -- I did not -- I believe I did
16 not discuss Figure 12 in my declaration. You know, I
17 just need to read it and make sure that I'm not
18 speculating. That's all.

19 Q. So I think before the break, where we
20 left off was whether the access point knows when the
21 trigger-based PPDU was going to be sent out. Do you
22 remember that conversation?

23 A. I'm sorry. Say it again. The access
24 point?

25 Q. We were talking about whether the

1 access point knows when each terminal will send out
2 the trigger-based PPDU.

3 A. The access point is the one that
4 schedules those terminals to transmit.

5 Q. Because of that, they know the timing
6 of that HU PPDU, right?

7 A. Because they will know what?

8 Q. Because they are the ones -- let me
9 restart the question.

10 Because access point is the one that
11 scheduled terminals to transmit the trigger-based
12 PPDU, access point knows when those PPDUs will be
13 transmitted; is that correct?

14 A. A more accurate statement would be
15 that the base station or the access point schedules
16 the transmission of the frames, and it knows when the
17 transmission will start.

18 Q. Okay. Is there a scenario where
19 access point sends a trigger frame, but for some
20 reason the terminal does not transmit the
21 trigger-based PPDU at the scheduled time?

22 A. I'm sure that there can be
23 circumstances like this, yes.

24 Q. So the access point knows when the
25 trigger-based PPDU is going to be transmitted, but

1 not certain, not certainly, right?

2 A. Well, a station may not receive the
3 trigger frame, simply. Therefore, it's not going to
4 transmit.

5 Q. So it's expectation?

6 A. I'm not sure about expectation. The
7 base station schedules those, and those stations that
8 need to transmit and can transmit and receive the
9 frame, the trigger frame, are going to transmit. But
10 again there may be abnormal situations. There may be
11 an error. A station may not receive a trigger frame,
12 or may receive it, you know, incorrectly, or so there
13 may be different situations.

14 Q. Is there a reason why the frame that
15 access point sends to terminals -- strike that.

16 If you could turn to paragraph 52 of
17 your '035 declaration, which is Exhibit 3.

18 A. Paragraph 52?

19 Q. Yes.

20 A. Yes, I am here.

21 Q. This is the section you call,
22 Overview and Exemplar Benefits Associated with the
23 '035 Patent; is that correct?

24 A. That's the section.

25 Q. In the last sentence in paragraph 52

1 it says, "Due to the different settings of the EDCA
2 parameters, the claimed invention of the '879 patent
3 ensures that the base station is aware of when
4 a terminal station will revert to using Legacy EDCA
5 parameters." Do you see that?

6 A. Yes.

7 Q. How does the base station know when a
8 terminal station will revert to using Legacy EDCA
9 parameters?

10 A. The base station knows whether the
11 terminal expects -- expects an acknowledgement,
12 because the base station received the PPDU from --
13 could I --

14 One second. I need to -- I have a
15 problem here with the connection. Just one second,
16 okay?

17 Q. Okay. So the last was -- so I think
18 my last question was to paragraph 52 of your
19 declaration, the last --

20 A. I was explaining -- I'm sorry. I was
21 explaining how the base station is aware of when the
22 terminal will revert, yes. So the base station -- so
23 the base station knows -- so the base station
24 received the PPDU from the terminal. Based on the
25 PPDU it will know whether there is a request on the

1 block of the acknowledgement or not.

2 When the -- and, therefore, the base
3 station will know when the station will start the
4 timer. More precisely, the term here is will set the
5 timer, meaning it will set the value of the timer and
6 start the time. So the base station is aware when
7 this will happen because the -- based on the plain
8 language, if the frame requires immediate response,
9 requires acknowledgement, it will start at one point.
10 If it does not require acknowledgement, it will start
11 at a different point. So the base station knows it,
12 because it knows whether the acknowledgement is
13 required, and of course the station itself knows
14 whether it asked for acknowledgement or not. So it
15 will know. So then we now have a situation with both
16 the base station and the station itself knowing when
17 the timer will start.

18 Q. So the knowledge of the access point
19 is because it knows the rule that the terminal is
20 operating, right?

21 A. That's one of the factors, if you
22 wish. That -- well, the length of the time, for
23 example, how long the time is being set, right?
24 That's another issue. Right.

25 Q. Let's say an access point receives a

1 trigger-based PPDU that does not request an immediate
2 response.

3 A. Okay, okay.

4 Q. That means the timer has started
5 already in the terminal, correct? I'm sorry. Strike
6 that.

7 So by the time an access point
8 receives the trigger-based PPDU, the timer has
9 already started in the terminal, correct?

10 MS. XU: Objection to form.

11 THE WITNESS: No, that's not correct,
12 no. I'm sorry. That's not correct. Let's
13 go to the claim language, okay?

14 BY MR. YOUNG:

15 Q. Sure.

16 A. So the claim language. I need to go
17 to the right exhibit. One second.

18 Q. Exhibit 1 is '035 patent. Is that
19 where --

20 A. I am looking at '035 patent, Claim 1.
21 Your scenario was when immediate response was not
22 required?

23 Q. Not required.

24 A. Not required. So this would be when
25 a MAC Protocol Data Unit (MPDU) included in the

1 trigger-based PPDU does not request an immediate
2 response, the second parameter is set timer for an
3 access category of the PPDU when the transmission of
4 the trigger-based PPDU ends. So the timer will start
5 after or at the time, not after, at the time when the
6 PPDU ends.

7 Q. Okay. But it takes some time for
8 that transmitted trigger-based PPDU to arrive at the
9 access point, correct?

10 A. Well, we are talking here of network.
11 So the delay of sending a PPDU, the -- we call it
12 propagation time. This is the time. The propagation
13 time of a signal between the station and base station
14 is very -- it's relatively very fast. Right. So,
15 you know, so it's essentially -- practically occurs
16 at the same time, or at least occurs nearly the same
17 time.

18 Q. Is --

19 A. It occurs at the same time, you know.

20 Q. Is the '035 patent limited to --
21 strike that.

22 A. Yes, it is limited to a network --
23 it's --

24 Q. That wasn't my question. The --

25 A. When I say limited, it's 802.11.

1 Q. That wasn't my question. My question
2 is, the propagation delay, I understand you're saying
3 it's small, but it is there, right?

4 A. So is there a propagation delay?
5 Theoretically, yeah, but, you know, but it, you know,
6 it -- yes, there would be some, I mean, negligible
7 amount of time for the PPDU to go from the -- from
8 the station back to the base station, to the access
9 point. Practically, I mean, essentially both of them
10 will know that this occurs when this occurs. So, you
11 know, again, if we are talking about, you know,
12 kilometers or miles or whatever, this distance would
13 be different, but we are talking here about local
14 network. The distance is practically at the same
15 time.

16 I am trying to show you that even
17 the -- I'm not sure the patent has a figure to
18 illustrate this. I'm not sure it does. I cannot
19 find it right now. But again, this is like common
20 sense and practically this is what happens locally on
21 the network.

22 Q. What happens in the local area?

23 A. The propagation delay is extremely
24 small.

25 Q. Okay. So let me back up then. So if

1 the propagation delay is so small, an access point
2 will also know when the terminal receives a trigger
3 frame, correct?

4 A. Access point will know when a
5 terminal receives the trigger frame under the
6 assumption that the terminal indeed received the
7 trigger frame, because, as I said before, trigger
8 frame could be lost.

9 Q. That's the same assumption that would
10 apply in the previous example where access point
11 knows when the trigger-based PPDU is sent, right?
12 That's -- we're assuming that it received the trigger
13 frame, right?

14 A. Right. I mean, wireless
15 communication may be subject to being destroyed,
16 being -- received in error, destroyed or --

17 Q. So let me make sure I ask -- make
18 sure I have the record clear. I think we -- so
19 assuming that the trigger frame sent by access point
20 to the terminal is received by the terminal, the
21 access point knows when the terminal received the
22 trigger frame; is that correct?

23 A. Yes. I think it's a quaint
24 statement --

25 Q. Let me ask a similar question.

1 Assuming that trigger frames sent by the access point
2 to a terminal is received by the terminal, the access
3 point knows when the terminal transmits the
4 trigger-based PPDU?

5 MS. XU: Objection, form.

6 THE WITNESS: Okay. I may have not
7 understood your question. Can you please
8 repeat the second --

9 BY MR. YOUNG:

10 Q. Yeah. So let's assume that the
11 trigger frame sent by the access point to a terminal
12 is received by the terminal.

13 A. Okay.

14 Q. In that scenario the access point
15 knows when the trigger-based PPDU will be sent out?

16 A. The access point knows when the
17 station -- when a station will start transmitting in
18 PPDU.

19 Q. Okay. And based on that knowledge,
20 the access point knows when the MU EDCA timer was
21 started?

22 MS. XU: Objection, form.

23 THE WITNESS: The base station will know
24 when -- no. Would be able to -- should be
25 able to understand when the timer starts at

1 the -- at the station. I mean, this is the
2 whole essence of the base station and the
3 station knows when the timer is running and
4 when it's going to expire. I mean, it's --
5 it's written in my declaration.

6 BY MR. YOUNG:

7 Q. I think that was the sentence I was
8 referring to.

9 A. Right, right, exactly. And it's --
10 even states that this is one of the advantages of
11 this patent, of this claim of the patent.

12 Q. Where does it say these are the
13 advantages of the --

14 A. Okay. I mean, you need to give me a
15 few moments. It's a long declaration. So I know
16 that I do it more than once here, at least I recall.
17 Look at 79 of my declaration.

18 Q. This is the '035 declaration?

19 A. '035, correct.

20 Q. I'm there.

21 A. Okay. So the 79, the second sentence
22 in this paragraph, in this manner the claimed
23 limitation provides certainty as to when the terminal
24 will revert back to the first parameter set, right,
25 at the time known to both the terminal and the base

1 station.

2 Q. So, Dr. Haas, I'm not seeing a
3 citation there. Where is that -- where is that
4 opinion from?

5 A. Citation to what?

6 Q. I think you believe that -- I think I
7 believe that you said that advantage is set forth in
8 the patent.

9 A. No, I didn't say that. I'm sorry.
10 This is not what I said. If I said that -- if I said
11 this, then I didn't mean to say this. I don't think
12 I said it. What I said, I think, was that this is an
13 advantage which I listed in my declaration.

14 Q. I see. But this advantage is not
15 expressly disclosed in the patent, correct?

16 A. I cannot say one way or another. I
17 would have to go through the whole patent. I just
18 don't remember. It's a long patent. I just don't
19 remember whether -- I mean, it's pretty obvious that
20 one of the advantages are -- that this is an
21 advantage of the patent, but it might be expressly
22 stated in the patent, may not. I just don't recall,
23 sir. I'd have to go through the whole patent.

24 Q. All right. So I'm going to go back
25 to the patent, Figure 18.

1 A. I'm sorry. Patent, '035 patent.

2 Q. Figure 18, that's the one we are
3 looking for.

4 A. Figure 18, sure. I have Figure 18,
5 yes, sir.

6 Q. If you look at Figure 18(c) versus
7 (d), the difference between the figures is that in
8 (c), it's a scenario where the request is --
9 immediate request is requested, and in (d) immediate
10 request is not requested. Would you agree with that
11 characterization?

12 A. Well, that's one difference between
13 Figure 18(c) and Figure 18(d). Figure 18(c) is, as
14 stated, the M-BA is received. In Figure 18(d) -- it
15 is actually stated here -- if you see under the right
16 part of the figure, it says, "No M-BA received."

17 Q. And because of that, the timer would
18 start a little bit late, later in 18(c) than it would
19 in (d), correct?

20 MS. XU: Objection, form.

21 THE WITNESS: I am not sure whether this
22 is -- I would need to read the whole
23 description of Figure 18 and those different
24 embodiments here. I mean, it looks like
25 this, that the timer starts later, and in

1 part (d) as oppose -- I'm sorry -- part (c)
2 as opposed to part (d), and I believe that
3 might be the case under certain
4 circumstances, but again, I would need to
5 read again the description in the text of
6 Figure 18. I mean, it looks from the figure
7 as you are saying, but it may be just, you
8 know, the way that they drew it. I don't
9 know. I need to look at it -- this more
10 specifically.

11 I don't believe, as I mentioned before a
12 couple times, I do not believe that I
13 addressed Figure 18 or Figure 12 in my
14 declaration.

15 BY MR. YOUNG:

16 Q. Understood. I'm using Figure 18
17 because it's a -- it makes it easier to talk about
18 and ask questions on it. I understand you're
19 hesitant to answer questions about that. All right.
20 So let me proceed.

21 So in Figure 18 I will represent to
22 you that example -- actually, strike that.

23 Let's consider an example where you
24 have a terminal that is not really doing what the
25 claim says, and instead of waiting for an

1 acknowledgement, that it just starts the timer
2 regardless of whether the trigger-based PPDU requests
3 any immediate response or not. Does that example
4 make sense to you?

5 A. It doesn't make sense to me, but I
6 understand your example. Typically, the assumption
7 is that a station would follow protocol.

8 Q. Let's say there's a terminal that
9 does not follow the protocol.

10 A. Okay. I hear you, hear you.

11 Q. What is the negative impact of that
12 on the network?

13 A. Well, I can think of, you know, one
14 possible negative effect. I don't mean to be
15 exhaustive, because this is clearly not a scenario in
16 which I analyzed in my declaration. But I can -- we
17 can understand that in general if a station does not
18 follow protocol, it may -- several things can happen.
19 At least the advantages of what the protocol is
20 trying to accomplish may be void, eliminated or
21 reduced.

22 Q. I'm referring to a very specific part
23 of the protocol where the timer is started after or
24 when the acknowledgement is received. Let's say the
25 terminal is ignoring just that part of the protocol.

1 Do you understand my example?

2 A. I understand your example. Look,
3 the -- as we discussed before, the advantage of
4 one -- one advantage of the claim, the scheme, the --
5 part of those claims, is that it allows to better
6 enforce -- enforce fairness in the network. If
7 stations do not follow the protocol, it will affect
8 one -- one outcome of this would be -- one result of
9 this would be that there would be degradation in
10 fairness, so to speak. I can think of many others,
11 but I -- again, I just want to mention it. That's
12 not something that I analyzed, and I feel a little
13 bit reluctant to speculate. I wanted to answer your
14 question. So I gave you one reason.

15 Q. So your answer assumes that one of
16 the -- one -- the specific protocol that's claimed is
17 adopted by the standard; is that right?

18 A. I never said this. I just -- you
19 asked me a particular question, what happens if the
20 assumption is that the protocol enforces
21 or advocates, whatever, lack of a better word,
22 advocates the use of claim 1, and one station does
23 not follow it. I said the result of this -- would be
24 one result -- there may be other results, but one
25 result would be that the fairness would not be as

1 good as it could have been.

2 Q. I see. So let me ask you a different
3 question then. Let's say there's a protocol where
4 the terminal starts the EDCA timer after transmitting
5 the HE trigger-based PPDU regardless of whether the
6 trigger-based PPDU requests an immediate response or
7 not. Do you understand that example?

8 A. Okay. What you are telling me, if I
9 understand you correctly, that you have a protocol in
10 which the timer will start always at the end of the
11 PPDU; is this correct?

12 Q. Yes.

13 A. I hear you.

14 Q. Why is that protocol better or worse
15 than the claim protocol?

16 A. Well, you know, again, with the
17 caveat I did not analyze a different protocol,
18 hypothetical protocols that you are telling me right
19 now, so I -- I feel a little bit reluctant to
20 speculate. I'd rather talk about scenarios which I
21 did analyze rather than scenarios that I didn't. I'm
22 sure that could be analyzed, and I'm sure I could
23 analyze it, but I didn't, and I'd rather stick to
24 what I did analyze and I feel sure in what I am
25 saying, you know, rather than just speculating.

1 Q. Okay. If you could go to paragraph
2 66 of your '035 declaration, that is Exhibit 3.

3 A. Paragraph 66?

4 Q. Yes, 66.

5 A. 50 or 60?

6 Q. 66.

7 A. Yes, I am on paragraph 66, yes.

8 Q. So paragraph 65 to about 75 discusses
9 your argument relating to motivation to combine Zhou,
10 Cherian and Kim, correct?

11 A. Paragraph 65 to paragraph 75 discuss
12 why I believe that the motivation to combine the
13 combination that has been proposed by Dr. Valenti and
14 the petitioner, why in my opinion a POSITA would not
15 have made such a combination.

16 Q. And if you go to paragraph -- sorry.
17 Strike that.

18 If you go look at the paragraph 66 --
19 this is the last sentence -- it says, "Petitioner and
20 Dr. Valenti do not explain why a POSITA would have
21 been motivated to modify Cherian's disclosed system."
22 Do you see that?

23 A. I see the sentence.

24 Q. Is it your understanding that to show
25 POSITA would have combined the references, that

1 Samsung was required to show that a POSITA would have
2 modified the Cherian's disclosed system?

3 A. Sorry. Let me be more specific here.
4 It is my understanding that if someone proposes a
5 combination, there need to be sufficient explanation
6 and justification for such a combination. In other
7 words, I just cannot say combine A and B because I
8 like to combine A and B. That's not work. Not only
9 this. That the POSITA would have been motivated to
10 do such a combination. So there need to be something
11 in the references or some reason for a POSITA, to
12 motivate POSITA to do such a combination.

13 If a reference presents a fully
14 operational system, device, whatever it is, or
15 apparatus, okay, then there would be no motivation
16 for POSITA to look to other references to change
17 whatever the scheme is and combine. If, on the other
18 hand, a scheme is not complete, is missing things or
19 whatever, yeah, this would be a motivation for POSITA
20 to go and look to other references. But here, as I
21 said in the previous sentence, similarly, they would
22 disclose parameter transmission based on performance.
23 Therefore, if someone wants to change this transition
24 method to something else, there needs to be
25 sufficient motivation for a POSITA to do it. I have

1 not seen such a motivation in petitioner's submission
2 or Dr. Valenti's submission.

3 Q. So it is your understanding that to
4 show why a POSITA would combine the references, a
5 petitioner or petition expert has to show why the
6 disclosed method has drawbacks. Is that your
7 opinion?

8 A. That's not the only way to justify --
9 to motivate POSITA to do it. But yes, if a
10 particular scheme would not be operational, poorly
11 operational or explain enough or missing things or
12 whatever, this might have been motivation for POSITA
13 to look to other references to combine. But if a
14 scheme is perfectly operational with no reason for
15 POSITA to change it, then there would be -- would not
16 be a motivation for POSITA to combine.

17 Q. And that is the understanding of the
18 obviousness frame to be applied in the -- in your
19 declaration?

20 A. Well --

21 MS. XU: Objection to form.

22 THE WITNESS: Let me go here. I
23 apologize. I am just trying to find it. So
24 as an example -- I might have seen this in
25 other places as well. There's -- as an

1 example, in paragraph 38 I say, "I have been
2 informed by counsel and I understand that it
3 is impermissible to use hindsight to arrive
4 at the claimed invention. My understanding
5 from counsel is that the claims of the
6 patent cannot be used as a roadmap to
7 interpreting the prior art for purposes of
8 obviousness. I also understand that, when
9 assessing whether there was a motivation to
10 combine references to teach a claim
11 element, defining the problem in terms of
12 its solution reveals improper hindsight."

13 So, in other words, there needs to be
14 motivation to combine, and it cannot be
15 based on hindsight clearly. So you cannot
16 go to the claims and say, well, I'm doing
17 what the claims are saying. That would be
18 hindsight.

19 BY MR. YOUNG:

20 Q. If you go to paragraph 68.

21 A. Paragraph 68, sure.

22 Q. So here you talk about how both
23 Cherian and Zhou already disclose methods for
24 optimizing transition between Legacy and MU EDCA
25 parameters, correct? That's the second sentence.

1 A. Both Cherian and Zhou already
2 disclose methods for transition between Legacy and MU
3 EDCA parameters, yes.

4 Q. The next sentence says, "Petitioner
5 and Dr. Valenti identify no drawbacks to these
6 individual methods"?

7 A. That's what this says, yes.

8 Q. So there you are looking for
9 petitioner's argument or Dr. Valenti's argument
10 explaining why the disclosed method in Cherian and
11 Zhou was inferior so as to require modification; is
12 that correct?

13 A. Yeah. The second part of the
14 sentence says they do not explain why a POSITA would
15 have found advantages, advantages to modify either
16 Cherian or Zhou method.

17 Q. Does that modification -- motivation
18 must be in one of the references?

19 A. It doesn't have to be in the
20 reference. If it is in the reference, it clearly is
21 good. Can use it. Could use it by -- would be used
22 by POSITA to make such a -- you know, such a
23 combination. It could also stem from POSITA's
24 knowledge. But as I said in the sentence, neither
25 petitioner nor Dr. Valenti identify the reason to do

1 such a -- to motivate -- to motivate POSITA to make
2 such a combination.

3 Q. In paragraph 67, which is the
4 paragraph preceding the one that we discussed -- can
5 you see that? It spans both pages 24 and 25.

6 A. Yes. I'm on paragraph 67.

7 Q. And there you say petitioner and Dr.
8 Valenti conclude the existence of motivation based
9 on several factors, and also note that they rest on
10 generic labels such as optimizing performance and
11 increasing efficiency. Do you see that?

12 A. I see, "They rest on
13 generic labels such as optimizing performance and
14 increasing efficiency that may apply to nearly any
15 computer or communications system and suggest
16 improper hindsight bias."

17 Q. Is that your understanding, that
18 generic labels such as optimizing performance and
19 increasing efficiency are impermissible rationale to
20 combining references?

21 A. There are permissible rationale to
22 combine references if they are sufficiently justified
23 and explained. If I just use a label -- combining
24 reference A with reference B to optimize, and I don't
25 explain how it will optimize it and what is the

1 reason that those systems are not already optimal as
2 they are in whatever, that is insufficient. But if
3 there is sufficient explanation why combining will
4 optimize, one combination -- such a combination will
5 optimize the system, then would -- that might be
6 possible rationale for combining. But I cannot just
7 throw, you know, as I sit here, generic labels and
8 say it's going to optimize things, and we better do
9 it. That's not sufficient. That's conclusionary, so
10 to speak.

11 Q. Go to paragraph 69. If you see --
12 can you see the sentence that starts with "Indeed" in
13 paragraph 69? That's three lines from the bottom of
14 page 25.

15 A. Yes, I see "indeed," yes.

16 Q. It says, "Indeed, this
17 second factor would have more likely led a POSITA to
18 other simpler solutions, such as the overall MU EDCA
19 timer disclosed in Cherian, rather than the claimed
20 invention in the '879 patent." Do you see that?

21 A. Yes.

22 Q. So are you saying that the Cherian's
23 solution is simpler than claimed invention?

24 A. So we need to look at the footnote
25 here. "Though simpler, the MU EDCA timer in Cherian

1 has other drawbacks that are addressed by the claimed
2 invention of the '879 patent." As I said, this issue
3 is outside the scope of my report, and so on. But I
4 reserve the right to address it later if necessary.

5 So if you make a combination that
6 makes the system more complex unnecessarily, because
7 it does not improve anything, or at least you did not
8 explain how it improves, then a POSITA would not have
9 done such a thing, would have preferred a simpler
10 solution rather than, you know, combining things
11 which do not lead to any good result, so to speak, or
12 any improvement. So as I say, a POSITA would have
13 been aware, typically, a simpler solution is more
14 efficient and requires less overhead. So we don't
15 combine things just for the purpose of combining, if
16 there's no reason, motivation, and, you know, and
17 advantageous outcome, because this is not how a
18 POSITA would have done it.

19 Q. In that footnote that you just read,
20 you state that, "The MU EDCA timer in Cherian has
21 other drawbacks that are addressed by the claimed
22 invention of the '035 patent," correct?

23 A. Right.

24 Q. Could you list all the drawbacks of
25 Cherian that are addressed by the claimed invention

1 of the '035 patent?

2 A. I'm sorry. You want me to list all
3 the drawbacks?

4 Q. Yes.

5 MS. XU: Objection to relevance.

6 THE WITNESS: I'm not sure that I can
7 list all the drawbacks of Cherian, okay,
8 because that's something that, as I sit
9 here, is outside the scope of my -- of this
10 report. However, I can tell you that the
11 claimed invention '035 has limitations which
12 are not in Cherian.

13 BY MR. YOUNG:

14 Q. I understand there are limitations
15 that are not in Cherian, but --

16 A. I'm sorry. Go ahead.

17 Q. -- I'd like your opinion on the
18 advantages of the '035 patent over the approach
19 that's disclosed in Cherian.

20 A. And those limitations, to finish, and
21 those limitations present advantages of the '035
22 patent which are not -- which are not present in
23 Cherian.

24 Q. And what are they?

25 A. I can give you one example. Again,

1 I'm not prepared to be exhaustive here. One example
2 would be using timers which are based on the type of
3 traffic. If we go to the claim language to be more
4 accurate, the claim language says that the second
5 parameter set timer for access category of the MPDU.
6 This is not in Cherian.

7 Q. I understand that's a limitation of
8 the claim, but I don't think you are telling me what
9 the benefit is in using that protocol versus --

10 A. Well, I can't explain what is the
11 benefit of using a second set parameter timer for
12 access category of the MPDU. If you have a timer
13 which is based on the access category of the MPDU,
14 you are using the appropriate access parameters for
15 the traffic which is being sent, rather than just
16 setting some access parameters in general. So this
17 element missing from Cherian is advantageous in terms
18 of the operation of the network.

19 Again, this is just one limitation,
20 one term of the limitation, and one advantage of this
21 term in the limitation. As I said in my report, this
22 comparison is outside the scope of my report.

23 Q. Sitting here today, can you think of
24 any other advantages?

25 A. I am sure I can, but I would be

1 speculating, and I would need to go back to Cherian
2 and make sure that I am not saying things which are
3 not correct. I am pretty confident that whatever is
4 missing from Cherian and is in the limitation,
5 it's -- there is some purpose for this being in the
6 limitation of the patent. It's therefore specific
7 advantages with.

8 Q. Dr. Haas, have you or have you not
9 analyzed those differences and considered the
10 benefits of the '035 patent over Cherian?

11 A. As I said, I did analyze it, but I'm
12 not prepared to give an exhaustive list here, because
13 it's not in my report, and, you know, I would be
14 doing analysis as we go. I don't think this is the
15 right thing to do.

16 Q. So you have not analyzed this issue
17 before?

18 A. That's not what I said. I said I did
19 analyze it. I just said a moment ago I did analyze
20 it. I did think about the advantages of Cherian
21 vis- -vis the patent claim. I gave you one
22 advantage, and I said there are other advantages as
23 well, but if you ask me for an exhaustive list, as
24 you mentioned, all advantages, I am just not prepared
25 to do it as I sit here, because I don't have this

1 analysis in front of me.

2 Q. You mentioned that one example
3 advantage was that in the '035 patent the primary set
4 timer was based on access category, correct?

5 A. That's one advantage which is in the
6 claim language of the '035 patent.

7 Q. Can you point me to that claim
8 language?

9 A. I just did a moment ago. The
10 disadvantage or the --

11 Q. The claim language where it says
12 parameters set timer based on access category, right?
13 That's what you said, right?

14 A. Yeah. I just read it a moment ago.
15 For example, in one limitation -- there are others as
16 well, but one limitation is when a MAC protocol data
17 unit MPDU included in the trigger-based PPDU does not
18 request an immediate response, set a second parameter
19 set timer for an access category of the MPDU, when
20 the transmission of the trigger-based PPDU ends. It
21 says here a second parameter set timer for an access
22 category of the MPDU.

23 Q. And so are you equating parameter set
24 timer for an access category with a second parameter
25 set timer based on an access category?

1 A. I am sorry. I --

2 MS. XU: Objection to form.

3 THE WITNESS: I don't get the question.

4 I'm sorry.

5 BY MR. YOUNG:

6 Q. Dr. Haas, what you said was that the
7 claim requires a second parameter set timer based on
8 access category, right?

9 A. A second parameter set timer for an
10 access category of the MPDU.

11 Q. That's what --

12 A. The timer is -- the timer that is
13 going to be set is the timer which is for an access
14 category of the MPDU. There are multiple timers
15 based on the different access categories of the MPDU.
16 To set it, choose the timer which is for the access
17 category of the MPDU. And I believe I discuss it
18 quite extensively in my report.

19 Q. I am just trying to understand where
20 you got -- because you -- strike that.

21 Previously you have said -- mentioned
22 a second parameter set timer based on access
23 category, and that that was one of the advantages of
24 the '035 claim, claimed invention over Cherian. I am
25 just reading the transcript. And -- but the claim

1 language says second parameter set timer for an
2 access category. So I am just trying to understand
3 that distinction.

4 MS. XU: Objection. Mischaracterized
5 testimony.

6 THE WITNESS: There's no --

7 MR. YOUNG: Sorry. That is a speaking
8 objection.

9 MS. XU: Well, I disagree.

10 MR. YOUNG: We can look at the trial
11 practice guide right now or call the board,
12 but please stop.

13 MS. XU: Maybe you should consider not
14 mischaracterizing testimony.

15 MR. YOUNG: Again, that is not a proper
16 objection.

17 MS. XU: Well, we'll agree to disagree.

18 MR. YOUNG: You can file a motion after,
19 but this is my cross-examination.

20 MS. XU: Yeah, and that's my objection.

21 MR. YOUNG: You have the right to
22 object. You have no right to object with a
23 speaking objection.

24 MS. XU: I don't -- I think that
25 whatever objection I lodged is compliant

1 with the trial practice guide, which
2 requires an objection and a very brief term,
3 describing the reason for the objection,
4 which is exactly what I did.

5 MR. YOUNG: And you continue to lodge
6 that objection?

7 MS. XU: Well, if you stop
8 mischaracterizing, then I wouldn't.

9 MR. YOUNG: So your position is that an
10 objection, calls for mischaracterizing
11 testimony, is a proper objection in the IPR?

12 MS. XU: Well, the issue here is the
13 trial guide specifically says I can make an
14 objection and then a very short term stating
15 the reason for objection, and obviously form
16 is one reason. And, you know, you can
17 disagree, and I have been pretty restraint
18 on myself to make any objections on IPR. I
19 have probably made a handful.

20 MR. YOUNG: That has no relevance to the
21 type of objection you can make in the IPR.

22 MS. XU: Okay. We can fight it out, but
23 it's not going to help moving your depo
24 along.

25 BY MR. YOUNG:

1 Q. Dr. Haas, if you could go to
2 paragraph 94.

3 A. 94?

4 Q. Yes. That is on page 39.

5 A. Okay. Paragraph 94. Yes, sir.

6 Q. It says, "Without hindsight knowledge
7 of the claims, a POSITA would have had yet further to
8 modify the disclosures of Zhou, Cherian, and Kim to
9 use a parameter set timer for each access category."
10 Do you see that sentence?

11 A. Yes, I see.

12 Q. Is that your opinion, that the claim
13 requires a parameter set timer for each access
14 category?

15 A. That's what the statement says. Not
16 only this statement. We can follow further as well.
17 But as it says here, "A POSITA would have had yet
18 further to modify the disclosure of Zhou and Cherian
19 and Kim to use the parameter set timer for each
20 access category, a feature not disclosed anywhere in
21 Zhou, Cherian and Kim." Let me just finish. "Again,
22 there were other design choices, including using a
23 single timer (as Cherian does), using access
24 categories to alter the value of the single timer, or
25 numerous other factors dependent on the design

1 choices discussed above."

2 Then we can go to paragraph 1 of 2 of
3 my declaration. But neither -- so this is the second
4 sentence in this paragraph. But neither Zhou nor
5 Cherian discloses the claim timer based on the access
6 category of the MPDU. The choice my -- what I'm now
7 explaining to you, the choice of the claim timer
8 which is based on the access category. Next
9 sentence: Zhou does not disclose the use of
10 access-based category timers, plural, for how long
11 the MPDU remains valid. Zhou offers a number of
12 potentials and so on.

13 The other sentence, last sentence in
14 this paragraph: But like Zhou, despite being aware
15 of access categories, Cherian discloses only using a
16 timer for the overuse of the MU EDCA parameter.

17 Yes, all this is consistent with what
18 I said. The claim requires timers, and those timers
19 are characterized, if you wish -- I use the word
20 based in my declaration in what I said, but a better
21 word maybe is "characterized," each one of those
22 timers is characterized by the access category.

23 Q. So if there are two access
24 categories, you have to have two timers?

25 MS. XU: Objection, form.

1 THE WITNESS: If there are access
2 categories, if an access categories, there
3 may be different timers, may be different
4 timers.

5 BY MR. YOUNG:

6 Q. So if a prior art discloses one timer
7 for multiple access categories, in your view that's
8 outside the scope of the claim?

9 A. That's exactly what the sentence says
10 here that we just read, instead -- in paragraph 96.
11 I'm sorry. Paragraph 94. Again, there were other
12 design choices, including using -- other design
13 choices, meaning not the design choices which, you
14 know, would have been corresponding to the claim
15 language, including using a single timer, as Cherian
16 does, using access category to alter the value of the
17 single timer, and numerous other factors, depending
18 on design choices discussed above.

19 Q. If you could go to Exhibit 1 -- I
20 apologize for this dingy sound. I can't seem to
21 get rid of it.

22 If you go to Exhibit 1, that's the
23 '035 patent, column 38, lines 5 to 7.

24 A. 38.

25 Q. Lines 5 to 7.

1 A. 9 -- there's no sentence which starts
2 at 9.

3 Q. Sorry. Line 5 to 7.

4 A. Oh, 5 to 7. Okay. In addition, the
5 wireless communication terminal may set the second
6 parameter set timer for each access category.

7 Q. That's what you believe the claim
8 requires; is that right?

9 A. I believe what?

10 Q. That's what you believe the claim
11 requires?

12 A. Well, I mean, it's sort of taken out
13 of context. I would need to read the whole context
14 here, but it says here, "Set a second set parameter
15 timer for each access category."

16 Q. So that is consistent with your
17 understanding of what the claim requires?

18 A. I mean, that's not the only
19 understanding of the claim language, but that clearly
20 talks about setting parameter -- sorry -- second
21 parameter set timer for each access category, timer
22 for each access category. There may be other -- I'm
23 sure there are other -- you know, other, you know,
24 other references like this here.

25 Q. All right. I'm going to switch gears

1 a little bit. Can we go to paragraph 25 of your '035
2 declaration?

3 A. Just give me -- also, if you look,
4 for example, in column 37, line 64, In addition, the
5 wireless communication terminal may determine when to
6 set the second set parameter -- the second parameter
7 set timer based on the type of responding request
8 requested by the MPDU -- and there's another one. I
9 just had it before. I'm sorry. I just lost it.

10 Okay. Anyway, there are other
11 references as well. So that's not the -- but it's
12 definitely the reference that you mentioned in column
13 38, line 5, and so on. It's a reference which says
14 set -- set second parameter set timer for each access
15 category, yeah.

16 Q. Okay. If you could turn to paragraph
17 25 of your declaration.

18 A. 25, yes.

19 Q. So this section is titled,
20 "Applicable Legal Standards," these represent your
21 understanding of the relevant law in this case,
22 correct?

23 A. Well, as I sit here, I'm not a
24 lawyer. I don't know legal opinion, and I was
25 advised by counsel of some legal standards which are

1 outlined in areas of the section which I use -- I
2 used those legal standards in my work on this
3 declaration.

4 Q. If you go to paragraph 32, it says,
5 "There must be a showing that a person of ordinary
6 skill in the art at the time of the invention would
7 have been motivated to either combine two or more
8 references or modify a reference to achieve the
9 claimed invention." Do you see that?

10 A. I see this reference, sir.

11 Q. Based on that understanding, do you
12 think it's sufficient to show obviousness if a
13 reference merely teaches or suggests that an
14 embodiment in a reference can be combined without
15 disclosing a motivation to do so?

16 A. I'm confused by your question. I'm
17 sorry.

18 Q. So let me give you an example. Let's
19 say a reference cites to another reference and says
20 we should combine them. It is suggesting that it
21 should be combined, right? Do you understand the
22 example?

23 A. If the reference suggests the
24 combination, then this might be, again I'm -- you
25 know, we are sort of speaking in a very hypothetical

1 way here, but if a reference suggests a combination,
2 it might be a motivation for POSITA to combine those
3 references.

4 Q. But what if the reference doesn't
5 talk about any benefit or any advantages in combining
6 with the reference? Is that a sufficient rationale
7 to combine?

8 A. I believe I would have to think a
9 little bit more about this, honestly, you know. So
10 it's sort of a legal kind of question that you're
11 asking me.

12 Q. You can reference your legal
13 understanding section which says there must be a
14 showing that a person -- person of ordinary skill in
15 the art would have been motivated to combine
16 references.

17 A. Right.

18 Q. My question is about whether you must
19 have a motivation in the reference to combine it or
20 whether a suggestion that to -- might be combined or
21 combinable is sufficient?

22 A. I think you misinterpret the sentence
23 that I said here.

24 Q. What does that mean?

25 A. What this sentence says is that you

1 cannot propose a combination without showing that the
2 person of ordinary skill in the art would have been
3 motivated to combine. There needs to be a
4 motivation. This need to be is the must. Must be a
5 showing that the person of ordinary skill in the art
6 would have been motivated to combine.

7 Now, this showing, if it is in the
8 references themselves, okay, that's good. If it is
9 not in the references themselves, there needs to be a
10 clear reason for combining. Look at the previous
11 sentence. "There must be a reason for combining the
12 elements in the manner claimed." There must be a
13 reason. There is. In the previous sentence, there
14 is. There must be a showing that the person of
15 ordinary skill in the art as a term of the invention
16 would have been motivated to either combine, blah,
17 blah, blah, or modify, okay? So the must here is --
18 does not say that there must be a statement in the
19 reference that say please combine. That's not what
20 it means. The must means that you have to provide
21 motivation. You have to provide reason for
22 combining. If you just say I'm combining two
23 references without justifying, without providing a
24 reason why a POSITA would have been motivated to
25 combine, that's insufficient.

1 Q. Okay. So, Dr. Haas, that was a long
2 answer. Let me -- if I got that right. So I'm just
3 going to confirm what you said at the end, that if a
4 reference just says please combine this embodiment
5 with another reference, in your view that's not
6 sufficient?

7 A. No, that's not what I said. It may
8 be sufficient under certain circumstances.

9 Q. And what circumstances would that be?

10 A. Well, it depends on a particular
11 circumstance. We are talking in the abstract here,
12 okay, what it proposes to combine. Does it propose
13 to combine two references which, you know, which are
14 clearly stated what those references are and so on?
15 As I said before, a statement in a reference that
16 proposes a combination might be under certain
17 circumstances sufficient reason to combine.

18 Q. In paragraph 34 you mention a design
19 need. Do you see that?

20 A. Paragraph 34, yes.

21 Q. It says, "When there is a design need
22 or market pressure to solve a problem and there are a
23 finite number of identified, predictable solutions,
24 it may be obvious to a person of ordinary skill to
25 try the known options." Do you see that?

1 A. I am -- paragraph 34. I have been --
2 I see. "I have been further informed by counsel and
3 I understand that when there is a design need or
4 market pressure to solve a problem and there are a
5 finite number of identified, predictable solutions,
6 it may be obvious to a person of ordinary skill to
7 try the known options." Yes.

8 Q. What is a design need?

9 A. What is a design need?

10 Q. Yeah.

11 A. A design need means if there is a
12 problem open -- for example, as an example -- it's
13 not exhaustive, but as an example, if there is a
14 known problem in the technical literature that is
15 being -- solution to which being sought by many, you
16 know, many different researchers or many different
17 engineering terms or whatever, right? And there's a
18 finite number of identified predictable solutions,
19 then it might be obvious for a person of ordinary
20 skill in the art to try those small, finite, small,
21 finite number of predictable identified solutions.
22 Then such a solution would be obvious.

23 Q. What about market pressure? Can you
24 give us an example of market pressure?

25 A. I'm sorry. What is market pressure?

1 Q. So the word that comes right after
2 the "design need" is "market pressure."

3 A. Oh, okay. Well, market pressure
4 would be -- as an example again. I don't mean to be
5 exhaustive here, because I'm not. Market pressure
6 would be, for example, if you tell me that I can find
7 that there's a big problem everyone is facing -- I
8 don't know -- energy shortage, or I don't know.
9 Whatever. Right? Disease that everyone is looking
10 for to cure. That would be market pressure, right?
11 Everyone wants to find, you know, a solution, right,
12 because there would be a big return if you find the
13 solution, a solution for the problem. That's market
14 pressure. If there's a small number of identifiable
15 solutions such as, for example, a small number of
16 medications to try for a particular disease, right,
17 then it would be obvious to try those medications and
18 see if one of those work, an example. Again, I'm not
19 exhaustive here, I'm sure.

20 Q. Is there market pressure to improve
21 the efficiency of a wireless communication system?

22 A. There is some market pressure. You
23 know, under certain circumstances there may be market
24 pressure. However, the question is whether we have a
25 number, a finite number, of identified predictable

1 solutions. If you tell me I can only solve this
2 problem by three different approaches, okay, well,
3 that would be obvious to do it. Okay. If those are
4 the only three approaches, but I don't think that's
5 the case here.

6 MR. YOUNG: Can we take a ten-minute
7 break?

8 (Whereupon, a recess was taken.)

9 BY MR. YOUNG:

10 Q. Dr. Haas, could you turn to paragraph
11 48 -- I'm sorry -- 49 of your declaration.

12 A. Sure.

13 Q. Exhibit 3.

14 A. Yes, sir, I'm here.

15 Q. So I think we looked at this
16 paragraph before. In it you say that multi-user
17 communication existed in 802.11ac but only in
18 downlink?

19 A. That's correct.

20 Q. The next generation of the 802.11
21 standard was to extend the multi-user communication
22 to the uplink as well, correct?

23 A. That's correct.

24 Q. Why was that going to be extended to
25 uplink?

1 A. Why what?

2 Q. Why did 802.11 decide to extend
3 multi-user to uplink?

4 A. Oh, because -- when you say why, I
5 don't know what you mean by this. I can explain that
6 the -- the significant benefit in having multi-user
7 communication in the uplink as well. We sort of
8 discussed this before, that you can transmit multiple
9 things on the same channel -- I'm sorry -- multiple
10 stations can transmit on the same channel at the same
11 time rather than only one station.

12 Q. Do you know who made that decision?

13 A. Do I what?

14 Q. Do you know who made that decision to
15 extend --

16 A. Who made? Who made the decision?

17 Q. Yes.

18 A. Well, there are -- there are
19 committees in the 802.11 that discuss various aspects
20 of the standard. I would need to go and look which
21 one of those committees this, you know, this -- I
22 don't know -- approach or this whatever, improvement
23 was first discussed. I just don't know. I don't
24 remember. I'm not sure I know which proposed it
25 first.

1 Q. And the decision to extend 802.11 --
2 sorry. Strike that.

3 The decision to extend the multi-user
4 communication to uplink would have been done earlier
5 in the standard setting process, right?

6 MS. XU: Objection, form.

7 THE WITNESS: Okay. I'm not sure what
8 you mean by, "Would have been done." There
9 was certain reasons why it was introduced in
10 ax. This is why I didn't -- when I was
11 answering your previous question, it wasn't
12 clear to me what you mean by why. I said I
13 don't know what you mean by why.

14 There were certain technological changes
15 in 802.11ax which facilitated the multi-user
16 communication in the uplink as well.

17 BY MR. YOUNG:

18 Q. Dr. Haas, if you could go to claim 1
19 of the '035 patent -- that would be in your Exhibit
20 1, column 39.

21 A. Yes, I'm here, sir.

22 Q. So the claim has three elements that
23 start with "when." Do you see that?

24 A. I see there are three limitations
25 that start with "when."

1 Q. And in the first claim element that
2 starts with "when," there is another term "when" in
3 that claim element, right?

4 A. There's another use of the word
5 "when," yes.

6 Q. Do those terms mean the same thing --
7 strike that.

8 Do all four uses of "when" mean the
9 same thing in those claim elements?

10 A. A moment ago we discussed three uses.
11 Now you are saying four. I'm a little bit confused.
12 I see. The three limitations plus the additional
13 "when" in the first "when" limitation. I see. In
14 those does "when" have the same meaning?

15 Q. Yes.

16 A. No, they don't.

17 Q. The first "when," what is your
18 understanding of that term?

19 A. So I -- I don't want to change the
20 claim language, because claim language is what it is,
21 right? But the first "when" means to me, how I
22 interpret this, in the case of a MAC protocol data
23 unit including and so on. So this is this "when."
24 Again, I'm not changing the claim language. I want
25 to be very clear. The claim language is very

1 accurate. But that's my understanding of this
2 "when," since you asked.

3 Q. What does the second "when" mean to
4 you?

5 A. The second "when" is --

6 Q. Let me ask the question again. What
7 does the second "when" mean to you?

8 A. So the second "when" meaning --

9 MS. XU: I object to the form.

10 THE WITNESS: Okay. The second "when"
11 which says, "When the transmission of a
12 trigger-based PPDU ends," this second "when"
13 means to me when the timer is set.

14 BY MR. YOUNG:

15 Q. I think that was a little bit
16 circular --

17 A. Well, it sort of is circular, but
18 I -- because you're asking me and asking me to change
19 the claim language, and I don't want to change the
20 claim language.

21 Q. I will ask you a different question
22 then. You testified that those four whens have
23 different meanings, correct?

24 A. Yes, they have different meanings.

25 Q. How do they differ?

1 A. So "when" can be in general. When
2 you say "when," it can mean at what time. "When" can
3 also mean in what circumstances.

4 Q. There are two ways you can interpret
5 the term "when," correct?

6 A. These are the two that come to mind
7 right now, come to my mind right now. There may be
8 more, but this is what comes to me, to my mind right
9 now in general, not related to the claim language at
10 all. In general, "when" can mean time, and "when"
11 can mean the case, circumstances.

12 Q. So the first "when," which one of the
13 two is the correct meaning?

14 A. The first "when" would be the
15 circumstance.

16 Q. What about the second "when"?

17 A. Would be related to time, timing,
18 time.

19 Q. The third "when"?

20 A. Again, the case of the circumstances.

21 Q. What about the last, fourth "when"?

22 A. The last "when" is related to time,
23 the timing.

24 Q. Is your understanding of those terms
25 based on your analysis of intrinsic evidence related

1 to the '035 patent?

2 A. My understanding of what I said with
3 respect to the term "when" is based on the intrinsic
4 evidence, which is part of the specification, is
5 based on the claim language itself, and how I believe
6 a POSITA would have understood those terms, and it's
7 based on my knowledge of people who use those terms.

8 Q. Okay. So in the beginning of our --
9 beginning of the deposition you indicated that you
10 did not engage in a claim construction for any other
11 term than the setting of the timer, correct?

12 A. When you use the word "engage," I'm
13 not sure -- I didn't engage even in the claim
14 construction itself. That was done by the Court, of
15 course, and I was not involved in those proceedings
16 at all.

17 Q. So in your view, your understanding
18 of the term "when" did not require a claim
19 construction analysis?

20 A. As I said, it's based on, among other
21 things, of what my opinion is that a POSITA would
22 have understood those terms to mean.

23 Q. Let me ask the question slightly
24 different. So your understanding that the different
25 whens in the claim have different meaning is based on

1 what you think a POSITA would have understood those
2 terms to mean; is that right?

3 A. I guess in general that's correct.
4 This is how I believe a POSITA would have understood
5 those terms, and therefore I would guess the -- the
6 term is plain and ordinary meaning. So if you look
7 at paragraph 41 of my declaration, "I have been
8 informed by counsel and I understand that the claims
9 define the invention and that the terms used in the
10 claims are generally given their plain and
11 ordinary meanings that they would have had to a
12 person of ordinary skill in the art at the time of
13 the effective filing date of the application. I
14 understand that the context of a claim can be
15 particularly helpful, and other claims may inform the
16 meaning of a term in a particular claim."

17 Q. So your -- correct me if I'm wrong.
18 Your testimony is that the plain and ordinary meaning
19 of "when" differs for those four whens; is that
20 correct?

21 A. No, that's not what I said. I said
22 that plain and ordinary meaning of the term "when,"
23 as we discussed before, have at least those two
24 meanings that I explained, and based on the context
25 of the claim language, this is my opinion that the

1 POSITA would have understood each one of those terms
2 as I explained.

3 Q. In your view that is different from
4 claim construction?

5 A. So I'm not sure, when you say it's
6 different from claim construction --

7 Q. Let me ask it again, a different
8 question. You did not engage in claim construction
9 analysis for the term "when"?

10 A. I did not write an analysis of claim
11 construction for the "when" in my declaration,
12 because I believe that the meanings that are
13 attributed to those claims -- to those terms is plain
14 and ordinary meaning that would have been given by a
15 person of ordinary skill in the art at the time of
16 the effective filing.

17 Q. But you did explain the construction
18 for setting a timer, correct?

19 A. I did explain the construction of
20 setting the timer because it's a court order in this
21 regard.

22 Q. Is it your understanding that court
23 order is binding in these IPRs?

24 A. That's a legal question, sir. I
25 cannot answer this. I believe that I was given the

1 court order by the counsel for a reason.

2 Q. Do you agree with that instruction?

3 A. Do I what?

4 Q. Do you agree with the Court's
5 instruction?

6 A. I believe that this is exactly what I
7 say. In paragraph 78, "For the reasons stated by
8 district court, I agree with the district court's
9 construction, and have applied this construction in
10 my analysis."

11 Q. Why did you feel the need to construe
12 that term?

13 A. I did not construe this term. The
14 Court construed this term, sir.

15 Q. But, Dr. Haas, are you adopting the
16 Court's construction as your own?

17 A. Yes, because this was given by the
18 Court, and the Court has provided, as I said here,
19 the reasons stated by the District Court. The Court
20 in their opinion provided reasons why they adopted
21 this construction. Those reasons are reasons that I
22 agree with. As I said here, for the reasons stated
23 by the Court, I agree with the District Court's
24 construction.

25 Q. Is the reason why you agree with

1 construction is because it was ordered by the Court?

2 A. No. I agree with the Court's
3 construction because the reasons, because I agree
4 with the reasons behind the Court's construction.

5 Q. So you have done an independent claim
6 construction analysis as to whether this is a correct
7 construction for the term "setting timer"?

8 A. I have reviewed the reasons given by
9 the District Court. I agreed with the reasons, and I
10 adopted the construction of the District Court.

11 Q. So why does that setting a timer
12 require a construction?

13 A. Well, one reason is because clearly
14 there is a misunderstanding on the part of petitioner
15 and of Dr. Valenti of what this means.

16 Q. So if there's an ambiguity as to what
17 the term means, construction is needed?

18 MS. XU: Objection, form.

19 THE WITNESS: If a POSITA would have had
20 concern regarding what a particular claim
21 term means, then a construction may be
22 necessary, and especially in a situation
23 where there's a dispute between the parties
24 on the meaning of a claim term.

25 BY MR. YOUNG:

1 Q. Could you turn to paragraph 83.

2 A. 83, yes, sir, I'm here.

3 Q. So in this paragraph you say that,
4 "Dr. Valenti testified that he did not consider how
5 the examiner's contrary findings might affect his
6 opinions."

7 A. "Dr. Valenti testified that he did
8 not consider how the examiner's contrary findings
9 might affect his opinions."

10 Q. Then it continues: Especially in
11 light of the examiner's rejection of what is
12 tantamount to petitioner s argument, it is my opinion
13 that petitioner has not met its burden to prove
14 combination renders the claims obvious. Do you see
15 that?

16 A. I see that sentence, sir.

17 Q. In assessing obviousness, is it fair
18 to say you considered the fact that the claims were
19 previously allowed by the examiner over similar prior
20 references?

21 A. We sort of discussed this before.
22 Let me first state that it is a presumption of
23 validity, that there's a presumption of validity that
24 the issued patent has, meaning if a patent was
25 issued, was, you know, approved, you know, was

1 allowed, there was notice of allowance, then there's
2 a presumption that this patent is valid. And it's
3 the -- the burden is on whoever is trying to
4 challenge this validity opinion. Furthermore, if the
5 examiner considered the very combination that's being
6 proposed by the petition, or at least the same
7 argument with respect to those references, in the
8 petition, then the examiner allowed the patent in
9 spite of the fact that those references were
10 considered, then this has to be given some weight.

11 Not only this. If the examiner
12 actually considered the arguments which are being
13 brought now by the petitioner, and still allow this
14 patent, then there's even further weight that has to
15 be given to this fact. Also considerations are
16 considerations that has to be addressed when someone
17 is challenging a patent. And the statement says here
18 that I have not seen Dr. Valenti doing this,
19 especially as Dr. Valenti testified that he did not
20 consider how the examiner's contrary finding might
21 affect his opinions.

22 Q. Do you think because the examiner
23 allowed the claims over similar or same references
24 Samsung now has a greater burden to show obviousness?

25 A. Has greater what?

1 Q. Burden.

2 A. What I think is that Samsung or
3 Samsung's expert need to explain why they think that
4 in spite of the fact that those same references and
5 the same arguments were brought with the examiner,
6 and the examiner allowed those patents, and now they
7 are challenging it, why the patent needs to now be
8 found invalid based on the same arguments as
9 referenced.

10 Q. So are you saying Samsung has more --
11 sorry.

12 Are you saying Samsung's burden to
13 show obviousness is heightened because of the
14 examiner's use of the same references?

15 A. I don't want to use the word
16 "burden," because legal burden is a legal term,
17 which -- and I am not a lawyer. So I don't opine on
18 the law. All I'm just saying is that due to the fact
19 that there is presumption of validity, due to the
20 fact that the examiner considered those references
21 which are being brought now again against this
22 patent, and due to the fact that the examiner
23 considered the same arguments which are of the same
24 references that are now brought against this patent,
25 there needs to be some kind of an explanation how to

1 reconcile the fact that the patent was still issued
2 in spite of the same argument which are now being
3 brought against this patent.

4 Q. Okay. So you mentioned presumption
5 of validity. Are you saying that there's a greater
6 presumption of validity over the references that's
7 been cited by the examiner during examination?

8 A. Again, I don't want to use legal
9 terms, because I'm not a lawyer. I am just saying
10 that there is what's known as presumption of
11 validity. Whether there's more presumption or less
12 presumption, I don't know how to -- that's a legal
13 question. I don't opine on the law.

14 What I am saying is that there is
15 challenge to this patent based on the same
16 references, the same arguments, and therefore this
17 needs to be addressed by the challenger.

18 Q. And in your view, if the challenger
19 does not address that, they fail to show obviousness?

20 A. Well, I wouldn't go that far. I
21 would say that that's a point in -- in the -- you
22 know, in the con side rather than pro side. If you
23 look at the pro and the con, right, and here's a
24 challenge, and they didn't address it, that's on the
25 side of the con, of the negative side, why their

1 challenge may not be correct.

2 Q. How important was this factor in your
3 analysis? Let me reask that.

4 A. Important for what?

5 Q. Let me ask that again. How important
6 was it to your analysis that the examiner allowed the
7 claims over the same references?

8 A. When you say important, important for
9 what? I am just -- I am just bringing my reasons why
10 I believe the petitioner and Dr. Valenti did not
11 prove invalidity. It is not my task to give weight
12 to evidence. That's for the board to do it. I
13 just --

14 Q. Well, Dr. Haas, you are providing
15 your conclusion that Dr. Valenti is wrong, right?

16 A. Right.

17 Q. And one of the factors that you
18 considered, as you testified, is that the examiner
19 has already rejected the argument that Dr. Valenti is
20 making, right?

21 A. Right.

22 Q. So how much weight are you putting
23 into the examiner's view of whether the claims are
24 obvious over these two references in your
25 conclusion -- in concluding that Dr. Valenti is

1 wrong?

2 A. Again, it is not my job to give
3 weight to evidence. That's the job of the board, of
4 the judges. My job is to present evidence that I
5 believe is showing that the petitioner and its expert
6 did not do sufficient job in proving invalidity. I
7 have not seen -- I have not seen evidence that I
8 would accept as proving invalidity of this patent.
9 Therefore, there's no reason for me even to assign
10 any kind of weight, even if I had -- if it would be
11 my job. It's not. It's the board's job to do it. I
12 have not seen any evidence. So, therefore, the
13 conclusion is very simple. No evidence, no
14 invalidity.

15 Q. You're testifying that you have seen
16 no evidence showing that '035 patent is invalid?

17 A. I have seen no evidence presented by
18 the petitioner and its expert that I agree proves
19 invalidity of the patent.

20 Q. Those are two different statements,
21 Dr. Haas. Is it that you have seen no evidence that
22 proves invalidity of the patent, or have you seen the
23 evidence, but you are not persuaded by it? Which is
24 it?

25 MS. XU: Objection, form.

1 THE WITNESS: Evidence -- you can phrase
2 it the way that you want. The only evidence
3 that I have seen being presented or put
4 forth by the petitioner and by Dr. Valenti,
5 I believe are flawed.

6 BY MR. YOUNG:

7 Q. In determining that the evidence is
8 flawed, you considered the fact that the examiner had
9 already rejected Dr. Valenti's argument based on same
10 prior art, correct?

11 A. That's one of the evidence. That's
12 one, one factor. Again, it's not the only factor.
13 There are many factors.

14 Q. I'm asking you how important that
15 factor was to you in deciding that you -- that you
16 did not find Dr. Valenti's opinion persuasive?

17 A. If I had a list of pros and a list of
18 cons, then I needed to assign weight to those pieces.
19 I don't have anything in the pro invalidity column.
20 So there's no reason for me to assign weight. I do
21 realize that Dr. Valenti and the petitioner may
22 disagree with me, but that's what I have seen when I
23 read, you know, the petition and Dr. Valenti's report
24 and his deposition.

25 MR. YOUNG: Okay. I'm almost done. Is

1 it okay if we take a five-minute break so I
2 can confer with my colleague? Then I think
3 we're almost done.

4 THE WITNESS: Absolutely, sir.

5 MS. XU: That's fine.

6 MR. YOUNG: Off record.

7 (Whereupon, a discussion was held off the record.)

8 MR. YOUNG: So we're back on the record.
9 Dr. Haas, thank you for your time. I have
10 no more questions. I pass the witness.

11 THE WITNESS: My pleasure, sir.

12 MR. YOUNG: Maybe Linda is not there.

13 THE WITNESS: I'm sorry?

14 MR. YOUNG: Linda might not be there.
15 Let me wait.

16 MS. XU: I have no further questions.

17 MR. YOUNG: Okay. Great. With that,
18 thank you so much for your time, Dr. Haas.
19 You are free to go.

20 THE WITNESS: It would be my pleasure.
21 Thank you, sir.

22 (Whereupon, the deposition concluded at 4:20 p.m.)
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25

CERTIFICATION

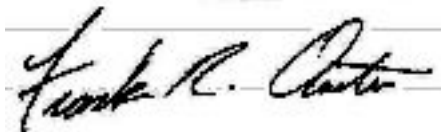
COMMONWEALTH OF VIRGINIA

COUNTY OF ROANOKE

I, Frank R. Austin, Registered Merit
Reporter, Certified Realtime Reporter, and Notary
Public in and for the Commonwealth of Virginia, do
hereby certify that the witness, ZYGMUNT J. HAAS,
PH.D., was duly sworn by me and that the foregoing
transcription is a true and correct transcription of
the testimony of said witness, as well as a true and
correct transcription of the proceedings at large.

I further certify that I am not a relative
or attorney for either party or otherwise interested
in the outcome of this action.

In witness whereof, I have hereunto set my
hand in Roanoke, Virginia, on the 21st day of April,
2026.

A handwritten signature in black ink, appearing to read "Frank R. Austin", is written over a horizontal line.

FRANK R. AUSTIN, RMR-CRR

VIRGINIA NOTARY PUBLIC, ID NO. 7067124.

My Commission expires December 31, 2026.

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Deposition of: ZYGMUNT J. HAAS, PH.D.
Date: Friday, April 17, 2026

I have read the foregoing deposition, and I wish to make the following changes:

Page	Line	Change	Reason
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(DATE)

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ATTESTATION OF WITNESS

I, ZYGMUNT J. HAAS, PH.D., do hereby attest that I have read and examined the foregoing transcript of my testimony given via Zoom Video Communications, Inc., on Friday, April 17, 2026, commencing at 9:00 a.m.

I further attest that any corrections or amendments of my testimony, with the reasons for such corrections or amendments, appear on the attached errata sheet signed by me, and, together with those corrections or amendments of my testimony, if any, the foregoing transcript is a true, correct, and complete transcription of the testimony given by me.

ZYGMUNT J. HAAS, PH.D.

Sworn and subscribed before me on this the _____ day of _____, 2026.

NOTARY PUBLIC

My commission expires _____

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