UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

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TP-LINK CORPORATION LIMITED : Petitioner, : Case No. IPR2023-01469

v. : U.S. Patent No.

NETGEAR, INC., : 10,681,698 B2

Patent Owner. :

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Deposition of ZHI DING, Ph.D.

Conducted Virtually

Friday, May 31, 2024

12:07 p.m. EDT

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Pages 1 - 118

Reported by: Debra A. Whitehead

Netgear, Inc.
Exhibit 2007
TP-Link v. Netgear
IPR2023-01469
Ex. 2007-001

Deposition of ZHI DING, Ph.D., conducted virtually.

Pursuant to notice, before Debra Ann Whitehead, E-Notary Public in and for the State of Maryland.

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ALSO PRESENT:

NACHE BUIE, A/V Technician

C O N T E N T S

EXAMINATION OF ZHI DING, Ph.D. PAGE

By Mr. Davis 6

By Mr. Nguyen 111

EXHIBITS MARKED IN TODAY'S SESSION

(None Marked)

EXHIBITS MARKED IN PRIOR SESSIONS

(Not attached)

TP-LINK EXHIBIT PAGE

Exhibit 1001 U.S. Patent No. 10,681,698 20

Exhibit 1002 Declaration of Zhi Ding, Ph.D. 20

Exhibit 1003 Expert/Consultant Curriculum Vitae, Professor Zhi Ding 20

Exhibit 1009 U.S. Patent No. 9,247,440 20

Exhibit 1014 U.S. Patent Application Publication No. 2016/0007273 20

P R O C E E D I N G S

ZHI DING, Ph.D.,

having been duly sworn, testified as follows:

EXAMINATION BY COUNSEL FOR PATENT OWNER

BY MR. DAVIS:

Q Good morning, Dr. Ding.

Could you please state your name, for the record.

A Good morning, Mr. Davis. My name is Zhi Ding, last name is D-I-N-G.

Q And you were retained by counsel for TP-Link in this IPR proceeding?

A Yes, I am retained, I have been retained by TP-Link through their counsel as an expert.

Q Have you had your deposition taken before?

A Yes, I have.

Q About how many times?

A I didn't actually count, but about 25-ish.

Q And were those in IPR proceedings or in district court or ITC investigations?

A Mostly in IPR proceedings, some in District Court or others, other circumstances.

Q When is the last time you had your deposition taken before today?

A Before today, approximately six, seven weeks ago, I think.

Q What case was that for?

A I don't recall exactly, and I'm not even certain I am at at -- I forgot what case, but I did remember it was also an IPR case.

Q Do you know who you were retained by in that case six or seven weeks ago?

A I do know, just I can't recall that at the moment. I can always find out from my record. I just -- I have -- Counsel, I've had depositions quite regularly, that's why occasionally I could get confused as to which case started first and which one was the second and so forth. I just want to be accurate.

I don't remember it. That doesn't mean that I won't be able to find out.

Q We're taking this deposition today by

video.

Is that right?

A I also have taken deposition by video, yes.

Q And today we are right now taking the deposition remotely over Zoom?

A Yes. Let me turn up my speaker a little bit. Thank you.

Yes.

Q And do you have any applications on your computer open other than the Zoom window?

A This is a computer from the law firm. I am not actually familiar with that. So I first have to apologize in case when we start I might fumble a little bit. But if I'm looking at it, I see -- I see one application that's open that is Acrobat Reader. And that appears to be the only application open.

Q Do you have any --

A Besides Zoom. Besides Zoom. Sorry.

Q Are there any documents that are open in Acrobat?

A No. It says, Welcome to Acrobat, Adobe accurate. So that's the document. I guess that's a test document.

Q Having been deposed 20 to 25 times, you're familiar with the basics of deposition procedure?

A I like to think so.

Q Just going through a couple of them hopefully relatively quickly, you understand this is a formal proceeding and you're here to testify under oath?

A Yes.

Q And you intend to testify as truthfully as you can under penalty of perjury?

A Yes.

Q I am going to try to ask clear questions. But please let me know if you don't understand a question, I'll try to rephrase. Okay?

A Of course.

Q If you don't ask me to clarify or rephrase, then I'll assume that you have understood the question.

Is that fair?

A It is.

Q And you understand that your counsel might object from time to time. But unless he instructs you not to answer, you still need to answer my question?

A Correct.

Q And then to make the court reporter's job as easy as we possibly can, we will try not to speak over each other. Fair?

A Yes.

Q Is there any reason that you can't give truthful testimony today?

A No.

Q No medications or anything that may be affecting your judgment or ability to recall?

A No.

Q And then if you want to take a break, I'm going to try to take a break every hour. I'm hoping to get us out of here before the end of the day. But if there's a need to take a break before then please let me know, and I'll try to take a

break as long as there isn't a question pending.

Okay?

A Yes.

Q How did you prepare for your deposition today?

A I prepared for deposition today by reading a number of documents that are associated with my declaration; namely, I reviewed my own declaration in support of the petitioner's petition. And I reviewed the PTAB's institution decision. I reviewed the patent owner's preliminary response. And I also reviewed their expert report by Dr. Haas.

And then in terms of the associated prior arts, of course I reviewed the patent itself, and then the prior arts I have cited in my declaration; specifically Gatewood that's Exhibit 1005 and Ho that's Exhibit 1009. Let me think.

That's about it. That's the extent of my preparation by myself reading through these documents. Let's see. I should also explain I was able to read the exhibit number because here

counsel for the petitioner has kindly provided a binder for me here.

And this was, I just want to let you know that I have access to here in case there is some technical issues regarding Acrobat. And this document, this particular copy I examined it yesterday and earlier this morning, is basically -- it's an unmarked, it's an unmarked copy.

That's it.

Q And what exhibits specifically are in the binder in front of you?

A Exhibit 1001, that's the patent itself. Exhibit 1005, that's to Gatewood. And Exhibit 1009, that's to Ho.

Q And those are, you said, unmarked, so they don't have any of your own notes or any notes from anybody else on those documents?

A No. As far as I know, this is a -- this is not my copy, and I have my own set of copies. So, yeah, I didn't check every page, obviously.

Q Other than the binder that we're talking

about right now, do you have any other paper documents in front of you or notes that you can see?

A There's nothing front of me that I can see or read. If necessary, I can grab a note pad. But my -- it's kind of a large conference room, so my -- how should I put it? My other documents that I read and they have marks and so forth, they are not here. They're away from me, let's just say, I cannot read them.

Q In the binder that's in front of you, do you have a copy of your declaration, which is Exhibit 1002?

A Yes, I should -- I should have mentioned that. Yes, I do have my declaration. And let's see what else I have. Yeah, I have a copy of the items I mentioned, the institution decision, the petition by TP-Link, and my declaration. And I don't think I have -- oh, and also Dr. Haas declaration as well as the patent owner's preliminary response. That's all the documents in the binder. And I don't -- I don't think I'm

missing anything else.

Q And you understand that the declaration that you submitted in this IPR proceeding was relied on by TP-Link in its petition for inter partes review?

A Yes.

Q Have you read the actual petition or just your declaration?

A Have I read? As of today, I have read both -- I prepared my declaration, so of course I read my declaration. But the petition, I have gone through it. I'm not super familiar with that as far as my own declaration is concerned, but I have read it.

Q Do you understand that there's a pending ITC investigation relating -- actually, let me actually start over.

The patent that this IPR proceeding that we're talking about today relates to U.S. Patent Number 10,681,698.

A Yes.

Q And if I refer to that as the '698

patent, does that work?

A Yes.

THE WITNESS: Can we go off record. I think we missed somebody.

MR. DAVIS: I think Mr. Marina may have dropped off.

THE WITNESS: All right. I just see some changes, so that got me nervous about the system. Pardon me.

MR. DAVIS: Bao, do we need to pause or should we continue?

MR. NGUYEN: No. We should continue.

Q Do you understand that the '698 patent is the subject of an ITC investigation?

MR. NGUYEN: You can answer the question, but again I caution you not to reveal any attorney-client communication.

A Yes, I -- I have been informed there is such a proceeding. I'm not a party to it, that's how I understood it.

Q Are you aware that the administrative law judge in that ITC investigation issued an initial

determination yesterday, May 30th, 2024?

MR. NGUYEN: You can answer yes or no.

A I understood there was some initial ruling in fact during my preparation for today's deposition.

Q And have you reviewed that initial determination?

A No.

Q Do you understand that the ALJ, the administrative law judge, determined that Claims 12, 15, 17, and 19 of the '698 patent have not been shown to be invalid over Ho?

A No, I did not know the specific of the ruling. And if that was her preliminary finding, I disagree.

Q In terms of your preparation, did you have any -- did you meet with anybody to prepare for your deposition?

A Yes; I have spoken to counsel for TP-Link, Mr. Bao Nguyen here, who is present at our proceeding today.

Q And when did you meet with him?

A In person I met with Mr. Bao Nguyen yesterday in preparation for today's deposition.

Q How long did you meet with him for?

A I think -- let me quickly count. I was -- okay. I can't count exactly the hours, but I was here at the Kirkland office for about eight hours. And during that eight hours, there are other things that Mr. Bao Nguyen has to attend to. So I would say our meeting perhaps lasted between six-and-a-half to seven hours.

Q Other than Mr. Nguyen, was there anyone else who was at that meeting yesterday?

A Mr. James Marina, who is also present at the call here, he was not -- he was not present in the room, but he was connecting remotely during our -- during our discussion -- during my discussion with counsels.

Q Other than Mr. Nguyen and Mr. Marina, anyone else?

A Could you repeat that? I think the voice got interrupted.

MR. DAVIS: Yeah, I think there might be

interference coming from Mr. Marina's microphone. If he could mute, it might be helpful.

Q Other than Mr. Marina and Mr. Nguyen from Kirkland, was there anyone else present at the meeting yesterday?

A They are technicians setting up the video conference today. I mean, there are other people, but none related to this particular preparation, nor do I believe that they were related to the legal or technical profession.

Q And other than the meeting yesterday, were there any other meetings to prepare for this deposition?

A We -- I did not have a person, in-person meetings with counsel, if you are asking -- if you are asking about, say, teleconference-style meeting, I have some short meetings with Mr. Bao Nguyen before yesterday.

Q About how many of those meetings did you have?

A Well, I think real meetings, perhaps once. We often have telephone calls just --

MR. NGUYEN: I just want to caution you to not reveal any attorney communications. Just answer yes or no.

THE WITNESS: Yes. Yes. Thank you, Mr. Bao Nguyen.

A So we have telephone conversations beside video conference. So all I was going to say is that some of these are pretty short about schedulings, mostly --

MR. NGUYEN: You should -- again, I caution you to not reveal attorney communications.

THE WITNESS: Okay.

Q And were those additional meetings, were those in the last couple of weeks?

A Yes.

Q Other than attorneys, did you talk to anybody about preparing for your deposition or the opinions that you've offered in this case?

A Well, no, I did not talk to other people about this case with anyone else.

Q And then I'm planning to use in this -- as exhibits the same exhibits that have already

been submitted by petitioner and already have exhibit numbers. That's partly for the court reporter's sake. So we aren't going to need to I think mark any exhibits separately. We'll just refer to those as the exhibits that have already been marked.

MR. DAVIS: But with that, could we please put into the chat so Dr. Ding can have them Exhibit 1001, Exhibit 1002, Exhibit 1005, Exhibit 1009, and Exhibit 1014.

(A discussion was held off the record.)

(TP Link Exhibit 1001, Exhibit 1002, Exhibit 1005, Exhibit 1009, and Exhibit 1014, previously marked, not attached.)

A Okay, yeah, I have just downloaded all of them locally. Thank you.

Q And Exhibit 1001 is the '698 patent.

Is that right?

A Yes, it is.

Q And Exhibit 1002 is the declaration that you submitted in sort of support of TP-Link's IPR?

A Yeah. There is a slight discrepancy

between the bottom and the document name. Yeah. Okay.

Q Yeah. I think that the stamp in the bottom right corner, it states Exhibit 1001, which I think was a mistake, and it's supposed to be 1002.

A Yes. No. Yeah, agree. Yes.

Q And so you'll understand when I refer to Exhibit 1002, I'll be referring to your declaration?

A Yes.

Q And then Exhibit 1005 is the Gatewood reference?

A Yes.

Q Exhibit 1009 is the Ho reference?

A Correct.

Q And then Exhibit 10014 is the Farid reference?

A Yes.

Q And you're familiar with each of Exhibit 1001, Exhibit 1002, Exhibit 1005, Exhibit 1009, and Exhibit 1014?

A Yes.

Q Have you read all of these documents carefully?

A I have read all of them carefully in preparation for my declaration. So, yes, I have.

Q Were there any parts of these documents that you didn't understand?

A No.

Q Before we jump into some of these exhibits, I just want to do a little bit of background.

Can you explain to me what your understanding of a backhaul is?

A Yeah. Yes. Typically a backhaul represents a link that communicates information between network devices.

Q And can a backhaul be wired -- can a backhaul be wired?

A Yes, it can be.

Q Can a backhaul also be wireless?

A Yes.

Q Is an example of a wired backhaul

Ethernet?

A Ethernet can certainly carry backhaul information, but Ethernet itself is not -- I would not equate Ethernet as a backhaul, but it certainly can be used for that purpose.

Q And are you familiar with PLC, or power line communications?

A Yes.

Q Is PLC, is that a wired protocol?

A PLC is a -- it's a wired network typically deployed at home.

Q And can PLC be used for backhaul?

A If PLC is used for the purpose of connecting two or more network -- network devices, then it serves -- it can serve as a backhaul link or as part of the backhaul link.

Q And if a PLC is used in the way that you just described, it would be a wired backhaul?

A If PLC is the only form of linking network devices, then that would be -- PLC will be a backhaul. Although PLC and other modes of communication may form a hybrid backhaul.

Q But a PLC alone, that could be used by itself as a backhaul?

A It depends on the application. It depends on the network configuration and deployment.

Q So but it is -- it is an option, that PLC -- there is nothing that prohibits PLC from itself acting as a backhaul.

Is that right?

A I am not aware of any prohibition from using PLC as part of the backhaul.

Q And so PLC can be used as part of a backhaul. Can it be the entire communication for backhaul?

A I'm sorry, could you clarify that question? I didn't quite either hear it or understood it.

Q In your answer you mentioned that PLC can be part of a backhaul. My question is, can PLC be used as the only backhaul between network devices?

A I think it's possible. It's a possible configuration.

Q A backhaul can also be wireless.
Is that right?
A The backhaul can be wireless.
Q And an example of a wireless link that can be used for backhaul would be WiFi or WLAN.
Is that right?
A Example of backhaul, a wireless backhaul, has been -- has shown up in, for example, a specific wireless LAN, or WiFi standard, at 802. -- as in 802.11s.
Q Are you familiar with the concept of fronthaul?
A Yes.
Q What is your understanding of a fronthaul?
A I assume you're talking about a wireless fronthaul?
Q I'm talking about fronthaul in the context of networking.
A Okay. Could you repeat the question again? I apologize for the interruption.
Q What is your understanding of a fronthaul

in the context of networks?

A Yes, typically a fronthaul is for client-facing communication purposes.

Q So what's the difference between a backhaul and a fronthaul?

A As I mentioned earlier, the fronthaul is for a network device to communicate with -- with its clients. So I used the word "client facing," I believe that was also in some of the prior arts itself -- themselves. And then the backhaul as we discuss it is for linking network devices.

Q What's the difference between a client and a network device?

A Well, by way of example, client devices can be, by example, your Apple Watch, and your network device can be your home router.

Q And so just practically speaking, how would I determine whether something is a client or a network device?

A Well, okay. Let me make certain that -- that I'm not making it too hard by skipping my own declaration.

Did I describe the difference between the two in my declaration?

Q I think that you used client and network device maybe in your declaration. I'm not sure if you specifically described the difference between them.

A Okay.

Q But, of course, you do have your declaration, if you want to look through it.

A Okay. Well, let's make sure I wasn't repeating myself. Sometimes -- oh.

Okay. It does appear that the document you sent is not a searchable document, so I couldn't figure that out.

Q And I'll say that we -- these are all just downloaded from what was provided to us. And I don't actually know what it is. It seems like maybe there was some sort of compression, but it did make it so it's impossible to search the documents in the way that they were provided to us and provided to the patent office -- or the PTAB.

A I see. No. I wasn't complaining about

what you said as opposed to the nature of the document.

So I was just going to ask whether you are referring to a specific part of my declaration that explains the difference between fronthaul/backhaul -- I'm sorry, between client devices and network devices and in what context.

There are many ways, if we can look at the differences, there are different ways you can define their differences. But for the purpose of this particular proceeding, I just want to make certain that I'm taking a consistent position to explain that difference.

Q Yeah. The context that I'm asking the question is just you mentioned the difference between backhaul and fronthaul --

A Yes.

Q -- based on client-facing versus a network device.

I'm just trying to figure out how you determine what device is what.

A How would you know whether -- you would

know if you -- you know yourself. Most of the time you know yourself only as a client device. You know, your laptops typically serve as a client device.

Q Is it possible for a device to serve as both the client device or a network device?

MR. NGUYEN: Objection. Vague.

A In the broadest -- broadest sense, right, I will take an example of a -- say a downstream retailer. So a wholesaler may have a retailer as a client. And the retailer would view itself as -- as a nonclient because he is serving, you know, his customers directly.

So in terms of network device versus client devices, it depends on the perspective.

Q So not -- maybe I can clarify my question. I'm not talking about in the context of, like, stores or wholesalers, but in the context of networking.

Is it possible for a device to serve as both a client device or a network device?

A Well --

MR. NGUYEN: Objection.

A -- I know you are not talking about the store, but the analogy still holds. Right?

By way of example, you're -- my Bluetooth headphone typically connecting with my computer, it typically -- the computer can view the Bluetooth headphone as a client. And but, then, on the other hand, my computer can be viewed as a client on the WiFi network.

So that, the analogy I gave you about retailer versus wholesaler, is exactly the same thing. It really depend on the network configuration and what network -- which network you're looking at.

Q Turning back to the concept of fronthaul in networking, home networks. Can a fronthaul be wired?

A Is it -- it depends on whether the entire network is a wired network or not. But generally in our -- in the field of wireless networking, then your fronthaul should be a wireless -- should be a wireless interface.

Q But as an example, I could connect my computer to my router using Ethernet. Would that then be a wired fronthaul?

A I have never heard that known as a fronthaul, not in that context.

Q What would it be referred to there?

A It would just be another downstream devices plug into the Ethernet. I do not know if anybody referring you plug in your computer to Ethernet as, Oh, let me plug into the fronthaul. I have never heard of that.

Q So "fronthaul" is a term specific to wireless communications?

A I do not know that, there has been that specific connection that says fronthaul has to be wireless. I just, as I explained, I just never heard people use the fronthaul to refer to my connection to an Ethernet.

Q Okay. So at least in your experience in the field, fronthaul is generally referred to as a -- referring to a wireless connection to a client device?

A No, to my recollection that's what I see the most frequent. That's the most frequent reference to fronthaul versus backhaul.

Q And so a wireless fronthaul, that can be the same types of communication protocols as a backhaul; for example, WLAN or WiFi.

Is that right?

A Back to your analogies. Can you clarify what you mean by -- by that question?

So are you asking whether the fronthaul and backhaul are all 802.11? No, I am not totally clear on what you mean by "protocol."

Q Can you just give me an example of what a wireless fronthaul might use for the link between a client device and a network device?

A Yes, certainly.

So in the context of Ho as a prior art, Exhibit 1009, for example, the fronthaul is the -- can be a wireless connection between one of the network devices that came in the form of a -- of this hybrid device, as Ho described. So one of the hybrid device would be a network device. And

that would serve the fronthaul connection with a number of clients. And so that will be the example. That can be 802.11, but not necessarily so.

Q So in Ho what are some of the other ways that a fronthaul connection can be made between hybrid devices?

A I believe Ho mention Bluetooth, or BLE, in some -- in some of that context.

Q You have Exhibit 1009, Ho, in front of you?

A Yes.

Q I think we can probably, it would be great to ask some questions about it, actually.

You're familiar with Ho?

A Yes.

Q Read it cover to cover?

A Yeah. Yes.

Q And you feel like you understand what it's disclosing?

A Yes.

Q And Ho is describing what it refers to as

a hybrid communication network.

Is that right?

A It talks about hybrid communication network in the background section, yes.

Q And, also, in the context of what Ho is sort of disclosing in its written description, it's talking about hybrid communication networks?

A Well, to me a hybrid communication network is -- is a broader network, as opposed to a single protocol network. But it doesn't mean it has to be hybrid. It's clearly could be. You see multiple protocols. But certainly it covers various -- various possibilities of how one would likely configure a hybrid network.

It could be all wireless with perhaps the exception of the connection to the gateway.

Q And I'm just basically looking at what Ho is describing. It seems like it's discussing a -- it's discussing in the various context of its embodiments hybrid communication networks; for example, at Column 1, 46 to 47, it's talking about the figures and it says that this is an example of

a hybrid communication network.

Is that fair?

A It's an example, yeah. It's fair. And I -- as I explained earlier, you know, a hybrid is -- just means it's very -- it can be very flexible. It allows -- it allows different configurations, so.

And a hybrid, because of -- because the hybrid device potentially can have many modes of communication, as Ho shows in Figure 1, you could have the PLC, something you asked me earlier. And you could also have interface as Ho shows, that would be the WLAN interface.

And furthermore, there's also the Ethernet interface, the I/F in Figure 1 above Boxes 110, 120, 114, 116 are indicating the interfaces.

So reading Ho, one would -- one would understand, and it is actually quite clear, that these hybrid devices allows flexible configuration. And one configuration would be -- could be entirely wireless, as I said, with

perhaps the exception of the connection from the central access point, also known as CAP, to the network gateway.

Q So in what you were describing in -- I guess in Figure 1, what is the PLC, what is that used for?

A That's 112. Okay.

I go to Column 3, Line 54. Ho explained that in the specific example of Figure 1, that's by way of example, the PLC interface 112 of the hybrid device 102 is coupled with the PLC interface, though not shown, of the hybrid device 118, and the PLC interface, not shown, of the hybrid device 120.

Q And I think in your declaration you point to the hybrid device 102 as being the central access point, or CAP.

Is that right?

A Yeah, in my declaration I point to one example where 102, one exemplary configuration is that the hybrid device 102 can serve as a central access point, also known as CAP.

Q And then the hybrid devices 118 and 120, those would be non-CAP devices?

A That's one possible configuration, as shown in -- as shown in my annotated example.

Q And that's the configuration that you've relied on in forming your opinions in your declaration. Right?

A Yes, that was the mapping I was trying to make clear in my declaration, just by way of a clear illustration from Ho that 102 can serve as a CAP if for, as Ho explained, it has a network gateway connection to 124. But which one is a CAP or non-CAP, Ho explained that that's the determination you have to do with basically every hybrid devices, and this is known as the personality of the hybrid device.

Q And I'll sort of come back to I think some of the personalities.

But so at least in the context of Figure 1, the PLC provides the connection between the CAP and a non-CAP 118 and 120.

So would that be -- could be used for a

backhaul communication?

A I'm sorry, I think I lost you on that question. If you don't mind repeating it.

Q Yeah. The PLC in Figure 1 that connects between the hybrid device 102 as a CAP and the non-CAP hybrid device 118 and 120, that could be used as a wired backhaul?

A If -- if one wished to use part of the -- PLC as part of the backhaul of this entire hybrid network, it's possible.

Q And in Figure 1 of Ho, there's a dotted line between the hybrid device 120 and the WLAN STA interface 114.

Do you see that?

A Yes.

Q It's possible that the -- to disable the WLAN STA interface 114 in a hybrid device. Right?

A I believe you're referring to some of the specifications in Ho. I think your question is whether some of these interfaces may be enabled or disabled. And I would agree that Ho described various scenarios under which certain interface

may be abled, may be disabled, including Ho's discussion about bridging functionalities, the flooding -- let's see, some discussion about the flooding algorithm is implementing. So, yes, very often some of the interfaces may be enabled and disabled by the -- by the I guess user who configures these devices.

Q So the WLAN STA interface can be disabled. Right?

MR. NGUYEN: Objection. Vague.

A Well, it can also be enabled. So it really depends on what is the -- what is the -- which one is the central CAP, or central access point, CAP, and which one is noncentral CAP. So in -- I believe you referred to discussions in Ho that explained that if -- if the hybrid device 102 happens to be the CAP, then you would -- you could disable the interface 114.

But I would like to make it clear that this is only an illustrated example of Ho. So, in other words, the connection between hybrid device 120 and the hybrid device 102, that connection,

that link, could well be between the wireless LAN AP I/F and the line stationing interface of the hybrid device 120.

So it really depend on the position and the role that these hybrid devices play.

Q So let me try again.

A Yeah.

Q Because I'm really not trying to make this difficult.

If you can go to Column 6, Lines 38 to 41. You can see that it says that the WLAN STA module, the CAP may be disabled.

Do you see that?

A Column 6, Line 38?

Q Six, 38 through 41.

A Yeah, it does say may be disabled. But the earlier -- early on it explains that if the hybrid device designated as a CAP. And so, therefore, if -- if a hybrid device serves as a CAP, the description by Ho is that its WLAN STA module may be disabled.

In other places of same Ho patent, the

same patent, the specification also describes that because all the hybrid devices have the same kind of interface, they all similar, they all have similar interfaces and similar functionalities, each one of them would have a communication unit in which there is a -- just like hybrid device 102, hybrid device 120 would also have a communication unit in which there is a configuration unit, there is a monitoring unit, and they are four different interfaces here.

And that's why they can all perform much of the same functionalities, depending on whether they are CAP or non-CAP. I was trying to get -- find quickly because searchable -- searchability, I was trying to point to the disclosure by Ho which also says that while 102 can be the non-CAP, where 120 becomes CAP, in that case you have the exact dotted line that's going between hybrid device 120 to 114.

But on the other hand, if the roles are reversed, in 120 is a CAP and 102 is a non-CAP, the wireless LAN AP interface 116 of the 102

device would serve to connect with the hybrid device of 120, which also has -- the hybrid device 120 also has a wireless LAN station interface, or STA interface. And that connection could serve at the backhaul between these two hybrid devices.

MR. DAVIS: I'll move to strike.

Q Because my question was just, if you can go to Column 6, Lines 38 to 41, you can see that it says that the WLAN STA module of a CAP may be disabled.

Do you see that, yes or no?

A Do I see those sentences? I do.

Q And so you agree that Ho discloses that the WLAN STA module can be disabled in Figure 1.

Right?

MR. NGUYEN: Objection. Vague. And he provided the explanation.

But objection, vague.

A As I explained, the sentence simply says there that -- that the WLAN station interface may be disabled if it is a CAP, if it serve as a CAP hybrid device.

MR. DAVIS: Counsel, I sort of let it go the first couple of times, but I need you to ensure that you are complying with your objections to the PTAB's Consolidated Trial Practice Guide. "Objection, vague," specifically is an example of an objection that is not proper. And you need to follow that because it's improper to be providing examples of a -- examples to a witness with an objection that suggests an answer.

So I'd ask going forward for you to follow that, that objections should be limited to a single word or term such as "objection, form." "Objection, hearsay"; "objection, relevance," and "objection, foundation." The PTAB is really clear about this. You can go to Page 128 of the Consolidated Trial Practice Guide.

Q Can you please turn to Column 4, Lines 9 through 14 of Ho.

Let me know when you're there.

A Yeah.

Q And Ho describes that its hybrid communication networks will be composed of hybrid

devices.

Is that correct?

A I am at -- sorry, Counsel, I am at Column 4. You asked me about specific sentence or line?

Q Yeah. Four, 9 through --

A Four, 9. Okay.

Q All right.

A I am reading 4 -- Column 4, Line 9, to line maybe, 14.

Q Yeah.

A Okay. The hybrid devices can each be electronic devices configured to implement a plurality of communication protocols or access technologies. Yeah, I am reading that. Thank you.

Q So hybrid devices in Ho aren't limited to access points; they can also be things like laptop computers or tablet computers or mobile phones.

Is that fair?

A Hybrid devices as examples given by Ho can be many of these. In my report, honestly, I focused on them potentially being an access point.

But certainly here it says it can be a gaming console.

Q And so you agree that hybrid devices in Ho are not limited to access points?

A No, I didn't. Yeah. No; I agree. That's -- but my declaration does not rely on whether the hybrid devices are limiting or not.

I would agree that it can be many of these examples, such as a tablet computer, a gaming console. But more importantly, it explicitly states that it can also be an access point.

Q And a hybrid device can also be a client device in Ho?

A No.

MR. NGUYEN: Objection. Vague.

A No. The -- in Ho it's -- Ho describes a network in which the hybrid devices serve as network devices. And so in the context Ho having a hybrid network connecting a number of network devices, these devices are network devices; they're not clients. That's why they need

backhaul.

It wouldn't make sense for client devices to look for -- to build its own backhaul. It would be -- it's up to the network devices to form backhauls.

Q So a hybrid device in Ho cannot be a client device.

Is that your opinion?

A My opinion, as I stated, is that -- earlier, that it depend on the perspective. But in the context of having a hybrid network, a network that service many clients, client-facing service, provide client-facing services, these hybrid devices are network devices, as described by Ho.

Q So in Ho, a hybrid device like a gaming console, you're saying that cannot act as a client device?

MR. NGUYEN: Objection. Form.

A I think -- I think the -- we are not construing -- I'm not construing client devices. What I'm describing is the functionality that's

needed for -- that's needed in Ho, where the hybrid devices are forming backhaul, or backhaul links. So client devices, as we discuss earlier, client devices are served via fronthaul.

Q So Ho does not disclose a fronthaul?

A I did not say that.

Q Can you point me to an example of where Ho provides a fronthaul?

A I don't recall Ho use those words explicitly. I would need to -- since it's not searchable, I would have to find more relevant wording that indicate a fronthaul.

Okay. So it's quite clear if we go to Column 2, just from the get-go, for the, like, Column 2, Line 26, the Ho begin by saying, "In a communication network (e.g. a home network) that comprises multiple hybrid devices, each hybrid device may support multiple network interfaces."

And so right there you have the example of Ho disclosing a network comprising multiple devices serving a home network. And the home network, as we clearly know, has fronthaul for --

fronthaul to serve many -- potentially many client devices.

So that will be one example. I believe there are many other examples throughout Ho that discusses homework -- home network and services to client devices.

Q And are those client devices also referred to as hybrid devices in Ho?

A I believe I answered that, Counsel. No. It depends on the context. But to all the device, to all the hybrid devices that form a network, form the network, and each of them serving as a network devices, they can serve clients. So they have each -- they may each have different client devices.

Q And my question is, in Ho are client devices something that are different than a hybrid device?

A There is a difference in Ho between what we discuss as a network device versus client device. I think it's not -- my opinion is it's not just in Ho. But in general, the network

devices are devices that provide network services to clients. So there is -- there is already a difference between network devices and client devices. It's a service/client distinction.

MR. DAVIS: Let's take a break. We can go off the record.

(A recess was taken.)

BY MR. DAVIS:

Q Welcome back, Dr. Ding.

A Thank you.

Q Staying with Ho. So in a hybrid communication network in Ho, there will be a device -- the hybrid device that's configured as what's called the central access point, or CAP?

A Yes.

Q And is there just one hybrid device that acts as the CAP?

A That's what Ho's example shows.

Q And then there can be many non-CAP hybrid devices in the network?

A Yes.

Q And the CAP is what provides internet

access to the non-CAP hybrid devices?

A In Ho, that shows that -- sorry. In Ho, for example, by way of Figure 1, you -- the hybrid devices has to determine whether -- you know, which one is a CAP, which one is a -- which one is a central access point or not.

So in this example of Figure 1, if the hybrid device 102 is directly connected to a network gateway, as in Figure 1 shows that is connected to 124, in that particular instance, then 102 becomes a CAP. And that is my -- that's a position I've given in the -- in my declaration.

But I think -- but that's only one exemplary reading of Figure 1. Figure 1 is somewhat complicated. So I think early on we talked about, like -- I talked about whether CAP -- whether 102 can also be a non-CAP when another node like 120 becomes a CAP. And I have trouble finding, just pointing to what they are in Ho.

And then I did some quick search in -- I mean, glancing over it, and saw that in Column 12

of Ho, that in the beginning of Column 12, Ho is -- Line 2 it states that, "In this embodiment after the CAP is configured, the wireless LAN communication link can be established (i.e. between the hybrid devices 102 and the CAP)."

So in a different configuration or embodiment, 102 would not be the CAP anymore. And if 102 is not the CAP, then the connection between 120 as shown in Figure 1 would require the -- would have wireless LAN station interface 114 be enabled to make that connection.

MR. DAVIS: I'll move to strike the answer as nonresponsive.

Q The CAP in Ho's hybrid communication network is directly connected to the internet through the gateway.

Is that correct?

A The CAP is connected to a network gateway.

Q The non-CAP hybrid devices would not be connected directly to the gateway; they would connect indirectly through the CAP hybrid device.

Is that right?

A Well, Ho's hybrid network allows the -- allows a non-CAP to access the gateway through backhaul with the CAP.

Q But the non-CAP hybrid devices wouldn't have, like, their own direct connection to the internet; they would connect through the CAP?

A It's -- it's not that absolute. In a -- when you say "the internet," it really depends on what -- how we visualize this hybrid network.

So all we -- all I rely on, all we're discussing in the context of the -- of Figure 1's embodiment, is that if you have a network gateway, so if a hybrid device that wishes to go through the -- to connect to the network gateway of 124, and that particular -- to that particular gateway that is directly connected by 102, then the hybrid devices that are -- that wish to or interact with that particular gateway is connected with the CAP.

So there is that connection. It doesn't say that it cannot have other network -- other network capabilities.

Q So Ho is describing where the non-CAP hybrid devices don't have to communicate with the CAP to be accessing the internet?

A No.

MR. NGUYEN: Objection. Form.

A I did not say that.

What I'm explaining is that Ho is -- the Ho prior art provides a very -- various examples and a number of embodiment. And what is clear in Figure 1 and in my declaration that is -- that is cited numerous places from Ho, is that if 102 is a CAP, central access point, as a hybrid device, and if it connects to the network gateway 104, then it serves as central access point, and other hybrid devices can connect -- would no longer be CAP, and they will be known as non-CAP.

Q And those non-CAPs would then connect via -- would connect to the CAP in order to get internet access.

Is that right?

A Well, they will be connected as a non-CAP network device of this particular hybrid network.

Q And they will be connected as a non-CAP network device of this particular hybrid network to the CAP?

A Yes, they will be connected to -- the non-CAP will be connected to the CAP in this hybrid network. And the connections can take the form of a wireless LAN interface where the CAP's AP interface is enabled and the non-CAP STA interface is also enabled to -- to enable the wireless LAN connection between the non-CAP to the CAP. That's what I was referring to in Column 12.

Q Okay. And so on the WLAN AP and WLAN STA interfaces, those are interfaces that are on each of the hybrid devices?

A Yes, that's supported by the specs of Ho.

Q But sometimes in Ho it refers to the WLAN STA and the WLAN AP as modules rather than as interfaces.

Do you know if there is a difference between interface and module when it's discussing that in Ho?

A I don't believe in Ho's discussion it

specifically talks about the differences of module versus interface.

MR. NGUYEN: Can you point to where it is, Counsel, that you're asking?

MR. DAVIS: So I'd ask counsel not to have speaking objections or suggesting --

MR. NGUYEN: You're saying that Ho teaches, say something. So I would appreciate it if you point the witness to where it is.

MR. DAVIS: If Dr. Ding needs assistance, he can ask. I'd ask again that you don't suggest answers to the witness, consistent with the trial practice guide. It's improper to coach the witness. The PTAB has made that very clear.

A I'm sorry, are you asking -- waiting for my answer? I believe I already responded.

Q My question is just, do you know if there's a difference between when Ho refers to something, for example, as the WLAN STA interface as compared to the WLAN STA module?

A Yeah, I believe I answered already. I don't have the transcript. But to the extent I

said, I don't recall Ho making that distinction. And, also, I don't recall making that distinction myself in my declaration.

Q And what I'm asking is just, as when you read Ho, is a WLAN STA interface, did you read it to mean the same thing as the WLAN STA module, or are those different things?

A Oh, I read it as a person of ordinary skill in the art would have understood, that there's interface. So the hybrid devices have the WLAN interface, and it also has the WLAN AP and STA interface. So they basically at least have two WLAN interfaces.

It talks about the module. So a plain and ordinary meaning of a module is that it can -- it should have capabilities to -- it should include interface.

Q So the interface is part of the module?

A That's a possibility. I don't think I express that opinion. I haven't thought about what's a major difference between module and interface -- and interface.

What I -- what I relied on is the -- in my declaration, is Ho's disclosed -- Ho's disclosure. And when it says module, I cited module. When it says interface, I cite interface.

Q So are you -- are those -- as a person of ordinary skill in the art, did you interpret those to be referring to the same thing, or are you mixing and matching between different interfaces and modules?

A I don't think -- I do not mix and match. In my declaration I basically cite what -- what's in -- what's in Ho's teaching. And I do that in the context of Ho's teaching. Therefore, there is no need for me to do mix and match or even in my opinion I didn't even need to give my dictionary definition of module or interface.

Q And I'm not asking you to define either of those terms. I'm just asking if you understood them to refer to the same thing?

A I don't. I don't. I cannot believe I said they are the same thing in my declaration, nor did I say -- I just haven't thought about

how -- whether they are exactly the same thing. So, for example, is interface, you know, something that has a power supply or does a module have a power supply? I just did not go -- I just did not go to that depth of analyzing that.

And if you can point me to -- point me to in the declaration where we have the context, I will be happy to explain that, and to the court.

Q So if you go to Paragraph 183 of your declaration. Maybe we can just pull it up. This would be Exhibit 1002.

A Paragraph 120?

Q Paragraph 183, PDF Page 89.

A Okay.

Q So here you have, "The WLAN STA module 114 (magenta) of a hybrid device (blue) is a WiFi (WLAN) interface."

Do you see that?

A Yeah, I see 114 and 116. One is the WLAN AP interface, one is marked as 114, the STA interface.

Q So you used the word "module" and

"interface" here.

You understand those to be referring to the same thing?

A Yeah, I see what you're -- where you're getting at. So Paragraph 114 I stated that as Ho teaches, switching on the WLAN STA module of a non-CAP hybrid device allows a network device to form a direct wireless connection with a CAP. I quoted Ho from --

Q Sorry, what paragraph are you reading from?

A 114 -- 184. Yes?

Q Oh, I -- so that's fine. I was referring to 183. But if, yeah, you're referring to 184, that's fine, too.

So are the modules and interfaces, are those referring to the same thing?

A Okay. Oh, I see. 183. The WLAN STA module 114 of a hybrid device is a WLAN interface that allows the hybrid device to connect to another hybrid device over WLAN communication bands. That's what I said, yes.

Q So the answer is, yes, an STA module is the same as the WLAN STA interface, that's how you understood it?

A In the context of my -- my analysis for this particular part, I did not draw a distinction between the module and interface.

Q So I just want to make sure that we're not getting confused that we're talking about different things in Ho between, like, the STA interface versus an STA module. I think they're the same thing, and I just want to make sure we agree on that.

A Yeah, I don't think I drew a distinction, Counsel, as I said here. But I think early on my response to your question was based on my premise that you would like me to give a dictionary definition of them, and I did not do so in my declaration. Which is why there was a -- a lengthy answer as to, you know, do I have the definition and are they -- can they potentially be different or do they have to be different.

Q And all I'm asking is just whether in

like, not a dictionary definition, but just in the context of Ho as you were reading it, did you draw distinctions between modules and interface. And I think the answer is no. Right?

A No, not -- not where we're looking at Paragraph 183. In that context I did not draw a distinction -- draw a distinction between the module of WLAN STA versus the WLAN -- the magenta box WLAN STA interface.

Q Okay. So then in the context of Ho's hybrid devices, there's the WLAN STA interface, and then there's a separate WLAN AP interface.

Right?

A Yes, there is a WLAN STA interface and a WLAN AP interface as shown in Figure 1.

Q And the way that the WLAN STA module is used is for wireless downstream connections from the non-CAP hybrid device towards a CAP.

Is that right?

A Yeah, sorry. Are you -- are you reading from my declaration now? I am trying to figure -- I am trying to find -- I'm only trying to find out

where is the word "downstream." But I'm not disagreeing with that; I'm just looking for it.

Q I'm not reading from your declaration. I am just trying to understand how it works.

A Okay. Could you repeat the question again? I apologize.

Q Sure. The way that the WLAN STA module is used in Ho is for wireless downstream connections from the non-CAP hybrid device towards the CAP?

A Right. For the -- for the CAP it has a wireless LAN AP interface, and that is -- that can be used for connection with a non-CAP -- non-CAP access point, such as 120.

And I think if you referred that as -- I think you're referring that as a downstream. That is a connection from a non-CAP to a CAP.

Q Yes. Yeah, I guess I probably should refer to that as upstream, huh?

Is that typically -- no. Would it -- it would be upstream or uploading to go from the non-CAP towards the CAP.

Is that right?

A I can -- I can accept that characterization, sure. It's quite clear that -- from the spec and from the diagram and in Ho that a non-CAP hybrid device 120 would connect to the CAP device when the CAP device's WLAN AP interface is connected with the WLAN station interface of the hybrid device.

Q And so in Ho, whenever there's a connection between two like -- two of the hybrid devices using WLAN, it's one of the devices is using the WLAN AP interface, and then that connects to the other hybrid device's WLAN STA interface.

Is that right?

A No, it's not necessarily whenever. But if -- if there is a connection such as in -- in the mesh configuration of Ho's hybrid network, wherein all other, for example, PLCs and so forth are not the primary connections, we actually build such a hybrid network as a mesh network, where CAP is basically like a root AP and the non-CAP are

the nonroot APs that connects, then Ho has shown that the connection, I think as you talk about downstream, between the -- between the CAP or the root AP was a non-CAP, would be through a -- through this 116 to -- of the CAP, to the WLAN station interface on the non-CAP hybrid device.

Q So let me ask it this way: In Ho you don't connect a WLAN STA interface of one hybrid device to another WLAN STA interface of another hybrid device.

Is that fair?

A I do not -- I think that's -- I do not believe Ho states such a connection between two hybrid devices.

Q You don't connect, like, the STA module to the STA module, and you don't connect the AP module to the AP module; you connect STA to AP and AP to STA.

Is that right? And I can direct you to Column 3 --

A Please do.

Q -- Lines 58 through 62, which I think is

what that's describing.

MR. DAVIS: And this would be of Exhibit 1009.

MR. NGUYEN: Sorry, which column, Counsel?

MR. DAVIS: Column 3. Line 58 through 62.

MR. NGUYEN: Thank you.

MR. DAVIS: Page 10.

A Okay. Column 3. I think you're there. Right? Column 3?

Q Yeah.

A Line 54-ish?

Q Line --

A Fifty-eight.

Q Yeah.

A That's right, yes.

Q So you connect -- this was something that confused me for a while. You don't go STA to STA or AP to AP; you go the STA interface connects to an AP interface of another hybrid device?

A That's -- that's what -- that's what Ho

says here. That it actually started as -- as you mention, in -- starting from Line 54. Like in this specific example of Figure 1. And it first talks about the PLC. But then it does say that the WLAN station interface 114 of the hybrid device 102 is coupled with a WLAN AP interface (not shown) of a hybrid device 120.

Q And then in terms of sort of the -- it would be the device that is -- if you have a connection that's going from a non-CAP to the CAP, you would have the non-CAP's WLAN -- the WLAN -- is it the WLAN station module would then be connected to the CAP's AP module?

A Yes, that's -- that's -- I think we did go over that a little bit earlier when you asked me that the CAP -- the CAP's STA interface may be disabled. And I -- when there -- at that time I explained that the connection between a non-CAP hybrid device to the CAP device can then go through the -- as you -- as your question stated, by using the CAP's AP interface connecting with the non-CAP's STA interface.

Q And then you would use the -- if you're going to be sending data basically in the direction away from the CAP, from the CAP to a non-CAP, it would be from the WLAN AP module to the WLAN STA module of the non-CAP?

A I'm sorry. Can you repeat that question again?

Q Yeah.

A I didn't quite get which one is the -- whose module is the AP versus the -- which module is the CAP module versus the non-CAP module.

Q Yeah. So if you're sending data in the direction away from the CAP, which I think would be the -- like the download direction.

A Okay.

Q Then you would be connecting -- or you would be sending that data from the WLAN AP module of the CAP to the WLAN STA module of the non-CAP.

Is that right?

A I see. I think I understand.

Yeah, in the mesh configuration of Ho, whereby you don't have PLC and the connection

between CAP and non-CAP is through that -- through the link between the AP modules of the CAP with the non-AP -- with the STA module of the non-CAP, the data transmission would happen exactly as you described. The backhaul communication would be as you described. And the -- but because it is backhaul, it isn't just one-way street. There is a backhaul link formed by the AP modules of the CAP hybrid devices with the STA modules of the non-CAP device. And that is part of the backhaul. And that backhaul would communicate management messages.

Q You mentioned that there's a configuration in Ho where you don't have PLC.

Where does it -- where does Ho describe that PLC shouldn't be used? Where is that embodiment, if you can point me to it?

A In Column 9. Column 9, Line 33. Sorry about that. Column 9, Line 30. Column 9, Line 30.

In this example, the bridging functionality between the Ethernet interface and

the PLC interface of the standby CAP can be disabled. So there is a discussion of the PLC interface may be disabled.

Q So if PLC is disabled and the non-CAP hybrid device has its STA module disabled, how does it communicate with the CAP?

A Okay. So the question is if the PLC module of the non-CAP is disabled. Correct?

Q Correct.

A And the STA module of the non-CAP is also disabled?

Q Right.

A Then how would a non-CAP communicate with the CAP?

Q Yes.

A Basically if they're not connected, how would they communicate?

Q Right. If those two interfaces are both disabled.

MR. NGUYEN: Objection. Form.

A Well, we understand that for any devices, network devices or not to communicate, there has

to be some types of connection.

And so if none of the interfaces between two hybrid devices are enabled, then you are not forming a network anymore. Therefore, they would not be communicating, if you don't want them to be communicating. Right?

So it would only make sense to form a hybrid network if a hybrid devices for in this case the non-CAP as a part of the -- as a member of the hybrid network, has some form of connectivity with the -- with the CAP.

Q So does that mean that if the -- if you had the WLAN STA module of the non-CAP disabled, then you could use the PLC connection?

A You could -- let's -- a non-CAP would -- as Ho described, has a number of secondary personalities. And I think that's where -- what you're talking -- I think that's where you're discussing with your question, you're pointing to with your question.

Am I correct?

Q Yeah. So I -- if you go to Column 8.

A Right.

Q Line 13, and it goes on to 23. I think this is where it's talking about the non-CAP hybrid device second-level personalities.

A Correct.

Q And the first one is that the non-CAP hybrid device can be an access point where the WLAN AP module is enabled and the WLAN STA module is disabled.

A Yes.

Q So in that circumstance, how is the non-CAP hybrid device communicating towards the CAP?

Would it be with the PLC?

A Yeah, it can be. Thank you for the clarification. Thank you for taking me to that column.

Indeed, according to the description by Ho, the non-CAP hybrid device can be an access point, but it can also be a relay, where both the WLAN AP module and the WLAN STA module of the hybrid devices are enabled and operating on the

same communication channel band.

So in my declaration I relied on this particular secondary personality to describe a mesh network formation or configuration that Ho's teaching allows us to construct.

But to your question whether -- what would happen if this -- if a non-CAP devices can be access point, but it disables the WLAN STA module, is it connected to the CAP.

The answer is clear from Figure 1. The Figure 1 of Ho prior art shows that there are multiple modules, interfaces, and that those are also by way of example. I think Ho even talk about MoCA or other potential connections, too. And but in this -- in this specific example you have delineated, if we look at Figure 1, if PLC is available to provide that backhaul, then PLC could be used.

In fact, in addition there's also the Ethernet interface. In other words, there will be -- there can be a wired link, potentially, connecting between the CAP and the secondary

personality of a non-CAP.

So that means that they can maintain connections despite that they have disabled their individual WLAN interfaces.

Q So then the second personality -- I think you mentioned this -- is the relay personality, where it has the WLAN AP module and the WLAN STA module enabled?

A Yes.

Q And it also specifies that those are operating on the same communication channel band.

Do you see that?

A Yes.

Q So that's where the -- it's just kind of, it's relaying information on the same -- like both from the non-CAP -- or sorry, from the CAP to the non-CAP, then, for example, the non-CAP to the clients?

MR. NGUYEN: I think you cut out.

MR. DAVIS: Oh.

Q The non -- in the relay personality, it's sort of acting as a relay where it will use the

same communication channel band from the CAP to the non-CAP, and then from the non-CAP to the clients.

MR. NGUYEN: Objection. Form.

A This particular secondary personality as a relay is explaining parenthesis, it states that e.g. the WLAN AP module and the WLAN STA module of the hybrid devices are enabled, and are operating on the same communication channel/band, that shows a variety of potential possibilities. They may operate on the same channel or same band, or they may operate on different channels of the same band. And they may be operating in different band.

And that was -- that, the selection of the secondary personality and their channel band, is clearly illustrated in Figure 5 of the configuration stage. Step 1 -- sorry, Box 508 of Figure 5 shows that you are, in fact, making the determination about the configuration for the -- for the non-CAP, that is the network device that have mapped to, I think it was Claim 12. Yeah,

the network that's Claim 12 of the '698 patent.

Q Where does Figure 5 show that a relay can be on different channels and bands?

A Figure 5 shows -- Figure 5 is actually described at length I believe starting from Column -- let me make sure. Starting from Column 13, illustrating how the non-CAP performs its determination first at Box 502. It determines whether there is an identified CAP or not. And then so that's starting from Column 13, Line 54. It makes that determination.

And then it moves -- so once the non-CAP understood that the -- a CAP device in the -- in Ho's mesh network or hybrid network has been identified, it moves down to Box 506, it start with the measurement. And the measurement considers the quality of various channels here.

So this -- so this is described in Column 14, starting from Line 11. It talks about the non-CAP hybrid device can determine one or more of the WLAN connection quality to the CAP on all communication bands.

So that's -- that's why -- that's how -- that is my answer to your question.

Q And the Figure 5 discussion on -- at Column 13, that continues through Column 14, 15, 16 --

A I don't think it ends.

Q I think 17, Line 2, from Block 508, the flow ends.

A Okay. Did you say Column 17, when it says the flow ends. Right?

Q Yeah. Line 2. I think that's where it stops talking about Figure 5.

Is that fair?

A There are -- I think there are further explanations about Figure 5. So it isn't clear to me that -- I don't think it's fair to say that the discussion about, you know, the functionalities executed by Block 508 ends there. It just says that -- it says from block -- from Block 508 the flow ends.

And later on, if you look at further downwards, one could see that there is discussion

about the configuration. Right? There is further configuration. And, in fact, alludes to the -- who does the configuration. You went to configuration unit 106 that does the configuration. And it start to discuss the -- starting from Line 15, or Lines -- I think it's 15, the quality of the PLC connection to the CAP, and then the 2.4-gigahertz WLAN coverage and/or the 5-gigahertz WLAN coverage.

So it continued on to discuss the -- which band the non-CAP may prefer to use as a backhaul. And when the quality deteriorates, you may reassess the situation and pick a backup backhaul in a second attempt.

And if we go to Column 18, it kept on saying that -- the Line 18, the embodiment Ho uses is that, in some embodiment the non-CAP hybrid device can be a dual-band dual concurrent device. So you asked me earlier, like, where does it say it can have -- it can operate on different band. This one it says a non-CAP hybrid device. It did not say, only one mode.

It basically stated that a non-CAP device, hybrid device, can be a dual-band dual concurrent device. And there it shows it can be -- it can operate simultaneously -- sorry. Let me do. A DBDC device can be a WLAN device that can simultaneously operate in the 2.4-gigahertz WLAN communication band and the 5-gigahertz WLAN communication band, and so on.

Q So, Dr. Ding, let's just try to stick with the questions that I'm asking rather than whatever other columns and discussions you might want to make.

Do you agree that Column 16 is describing the Figure 5? It starts at Block 508? So, like, Column 16, Lines 39. Do you see it discusses Block 508?

A Yes. It start to discuss Block 508, I agree.

Q And that's part of Figure 5?

A It is part of Figure 5.

Q And if you go down that paragraph to Line 53, it says, For example, the configuration unit

106 can identify a preferred channel.

Do you see that?

A Yes.

Q Do you understand that to be referring to the configuration unit 106 that's in the non-CAP?

A Yes.

Q And then it says that -- it identifies a preferred channel from the candidate channels. Those candidate channels, those can be channels that are not the same as what's -- what the CAP currently operates on.

Is that right?

A Would you like me to read that part? It is -- it's actually quite long. But Ho said that the configuration unit 106 can identify a preferred channel, explaining what a preferred channel means, including the highest received signal strength indicator. That is the signal strength as disclosed -- as required by Claim 1 and 12 of the '698 patent.

And it does so from a -- from the candidate channels. Which means there is already

a candidate channel. Whether he got -- where he got that from is actually from the CAP. So we can look that -- we can look back at where Ho taught that later.

But the way it works is that CAPs -- CAP in the hybrid networks does its own configuration in the beginning. As I -- as we went over in Block 502 of the non-CAP takes place in the beginning by checking to see whether there is already a CAP for the hybrid device -- or for the hybrid network, sorry.

But if there's already a CAP of -- of this hybrid network, CAP has already done its own configuration, its own selection of preferred channel. And this has done its own job of setting up what channel -- or what channel and what band it prefer to use as a backhaul.

And so here the non-CAP simply comes in and look at the candidate and see the preferred channel the non-CAP actually matches the channel on which the CAP currently operates.

Q And if the -- so the channel that the

non-CAP picks, it can either match or not match the channel of the CAP. Right?

MR. NGUYEN: Objection. Form.

A The -- indeed, in the disclosure of Ho, starting from Line 60 of Column 16, it gives several possibilities. It says the preferred channel of the non-CAP hybrid devices matches. So if it matches, then the non-CAP hybrid device can be configured as a relay. And then it also states that if a preferred channel of the non-CAP hybrid device does not match the channel on which the CAP currently operates. So it does give these two possible outcomes.

Q And if the non-CAP -- the preferred channel that the non-CAP hybrid device identifies doesn't match the preferred channels of the CAP, then what Ho says is that non-CAP device can be configured as an access point. Right?

A As not the access point, just as an access point, e.g., and so forth. And that's what -- that's what Ho said.

Ho said that if the preferred channel of

the non-CAP hybrid device does not match the channel on which the CAP currently operates, the non-CAP hybrid device can be, I emphasize the word "can be" -- configured as an access point. So that is an access point, and it just says can be. It's not necessary, but it can be configured as an access point.

Q And so in Column 16, Lines, you know, 60 to 17, 2, where it refers to the relay and access point, those are the personalities of the non-CAP hybrid device. Right?

A I'm sorry, could you say that? Which column? Column 16?

Q Column 16, Lines 60 to Column 17, Lines 2.

A Okay.

Q What we were just talking about, where that's referring to the personality of the non-CAP hybrid device?

A It's referring to a non-CAP device, non-CAP hybrid device of the hybrid network.

Q And when the non-CAP hybrid device has

a -- selects a communication channel and band that matches the communication channel and band of the CAP, then it can be a relay?

A It can be configured as a relay, yes, that's what Ho states here. And that will be consistent with Ho's teaching that this hybrid network can form wirelessly as a mesh network and it service clients. But the main thing about -- the main point about Ho is that it can be a backhaul through these -- through these different configurations.

Q And if the non-CAP hybrid device selects or identifies a preferred channel that doesn't match the channel of the CAP, what personality does Ho state it can take?

A Okay. So the first-level personality is whether a hybrid device should be a CAP or a non-CAP. And Ho teaches that there's also what he called the secondary personality, or second-level personality, I think. And over -- and where we're looking at Column 16, Line 60 to Column 17, Line 2, the -- the execution of this flow shown in

Figure 5 is, as you questioned me earlier, is alluding to the actions the execution by the non-CAP.

So the non-CAP is doing all that. And I believe your question is if the preferred channel of the non-CAP hybrid device does not match the channel on which the CAP currently operates -- that's exact wording from Ho -- then the non-CAP hybrid device can be configured as an access point.

So I -- I think we -- I agree that this is what Ho literally says here. So I'm just confirming that I'm reading exactly the same as you're reading.

Q Yeah.

MR. DAVIS: And I think we can probably take another break.

THE WITNESS: Okay.

MR. NGUYEN: Ten minutes as well?

MR. DAVIS: Yeah.

THE WITNESS: Thank you.

(A recess was taken.)

BY MR. DAVIS:

Q If you can pull up your declaration on -- which is Exhibit 1002, at Paragraph 57. Let me know when you're there.

A Yes, I'm here.

Q And here you have claim construction where you list in Paragraph 58 the parties' disputed constructions in the ITC litigation.

Do you see that?

A Yes. Paragraph 57, 58, yes.

Q And you identify patent owner's construction, and you identify petitioner's construction.

Do you see that?

A Yes.

Q Have you formed an opinion about which construction is how a person of ordinary skill in the art would understand the term "default frequency band"?

A My opinion is that under both construction, whether it's petitioner's construction that the band is the preset frequency

band used automatically in the absence of a choice made by the user, or under patent owner's construction that this band is a preferred frequency band, Ho and Gatewood, they both teach -- they both teach it, and they both disclose them. So that is my opinion.

My opinion did not depend on either one may be wrong, one may be right. As I stated in my report, that I considered both construction -- both construction, and my opinion is that under both patent owner's and petitioner's construction, that Gatewood and Ho teach the feature, teach default frequency band.

Q So you considered both constructions, but you do not form an opinion about which one should be adopted or how a person of ordinary skill in the art would have understood default frequency band.

Is that fair?

A I mean, do I have a preference? Of course I do. But that wasn't my job in the sense that counsel asked me to consider these, so I

considered them.

If you asked me for a preference, I agree with the petitioner that the band should be a preset frequency band used automatically in the absence of a choice made by the user.

Q And why is that?

A That's from the -- I'm reading this simply as a person of ordinary skill in the art, reading the claim language, reading the specification of the '698 patent. And you would find that the default frequency band would have this particular plain and customary meaning.

MR. DAVIS: We bring up Exhibit 1000 --

Q Well, let me ask. There are no other terms in the asserted claims that you determined should require construction other than noting that the default frequency band was disputed.

Is that right?

A That was my declaration. I was informed by counsel that this default frequency band is the only dispute involving claim construction.

MR. DAVIS: If we can pull up Exhibit

1001 and go to Claim 1.

Q And if you go to the top of Column 11, that is part of the limitation that starts with, "performing an attempt." It goes on, and then it has, "as opposed to a fronthaul that provides wireless data communications to clients in the network."

Do you see that?

A Yes, I see it.

Q What is your understanding of what "as opposed to a fronthaul" means in Claims 1 and 12 of the '698 patent?

A Right. Claim 1, start from Line 64, states that, Performing an attempt to utilize a first channel in a default frequency band as a backhaul with second node in the network, wherein the backhaul is to provide communication of management functions between the nodes in the network, as opposed to a fronthaul that provides wireless data communication to clients in the network.

So the -- my opinion as a person of

ordinary skill in the art, reading the claim, is to understand that, wherein the backhaul is to provide communication of management functions between nodes in the network, as to describe that the backhaul -- as a way to explain what the backhaul would do, is supposed to do. The backhaul is to provide communication of management functions between nodes in the network. That's -- that's the description or explanation about the backhaul.

And the second part about, as opposed to the fronthaul that provides wireless data communication to clients in the network, is describing what a fronthaul should do. The fronthaul should provide wireless data communication to clients in the network.

Therefore, my understanding of this particular "wherein" clause is describing -- is the attempt by the patent -- by the inventor that -- to describe, explain what they meant by backhaul and what they meant by a fronthaul in Claim 1. And I think it's also in -- in Claim 12.

So they have done that to -- to explain what is fronthaul and what is backhaul in Claim 1 and Claim 12 between the two independent claims.

Q And so in Claim 1, what does -- if you were to remove the phrase "as opposed to a fronthaul that provides wireless data communication to clients in the network," would there be any impact on how you understood -- what you understand the claimed backhaul has to be?

A In that hypothetical -- yeah, I don't think I provide on opinion on hypothetical.

But in terms of reading here, I felt like Claim 1 in terms of -- and 12 in terms of claim element, would cover 1.1 versus 12.1, explained explicitly what would constitute a backhaul and what constitute a fronthaul.

I mean, I don't -- I don't know why you would like me to strike certain things from the claim. That wasn't in my analysis. My analysis not performed by trying to take out certain things or even insert certain aspect from the specs into the claim. A claim is written as it is.

So then I have not done analysis where I said, Well, what if I take out this one, would this claim -- you know, why don't we do that analysis. As a technical expert and working as a person of -- and viewing claims and viewing the '698 patent as a person of ordinary skill in the art, I simply do not -- did not consider this as a specific exercise.

Q So when the -- so just starting with the beginning of the claim, it talks about performing an attempt to utilize the first channel.

A Yes.

Q What is it that's performing the attempt to utilize the first channel? Is it the -- is it the -- and actually, sorry, looking at Claim 12.

A Okay. Okay. Good.

Q In Claim 12 it says, "Performing an attempt to utilize a first channel in a default frequency band."

Is it the network device that's performing the attempt?

A It does say it's a network device that's

performing this -- this attempt. And that network device, in my analysis, in the mapping of my analysis in the declaration, is that that network device is the -- is a non-CAP hybrid device. And so that relates to -- I'm sorry. I apologize. In fact, I started to drag out Ho. But since we just talked about Ho. Right?

So in the context of Ho, that will be the non-CAP hybrid device that's performing this attempt.

Q And then just looking at Claim 12, it says, "Wherein the backhaul is to provide communication of management functions between the nodes in the network."

Do you see that portion of the clause?

A Yes.

Q The nodes in the network, those are the nodes in a mesh wireless network that are talked about earlier in the preamble?

A Yeah, that's what -- that's what the claim -- that's what Claim 12 says, is a network device capable of establishing a backhaul

communication among nodes in the mesh wireless network. And this will be the nodes.

The nodes referred to in the "wherein" clause refers to the nodes in -- not all, but nodes in the -- referring to these network nodes in a mesh network.

Q And then is it your opinion that the channel that is attempted to be utilized can also be a channel that is used by the network device as a fronthaul?

A It is my opinion that the -- first channel, are we talking about that? Right?

Q Yes. The first channel in a default frequency band that is attempted to be utilized as a backhaul, does that -- can that first channel in your opinion also be used as a fronthaul and still satisfy --

A Yeah, well, so my analysis explains that this particular network would attempt to utilize a first channel for -- for backhaul.

The claim does not require this first channel to be exclusively used. It doesn't

require it to be used by a -- for backhaul. So it doesn't prevent a situation where a different network device uses -- or even a different network, but a different network device uses it for other purposes.

Q And so in your opinion, the backhaul -- the first channel in a default frequency band can be shared as both a backhaul and a fronthaul?

A Thank you, Counsel. I think there are two levels here. Because this particular claim talks about channel and band. So there's a default frequency band. There's also a first channel.

So at the first level there is a frequency band out of which there is a channel. And the network device of Claim 12 perform the attempt to use a channel from that frequency band for backhaul.

And my opinion first -- at first level is that that frequency band is not exclusively reserved and dedicated -- sorry, not dedicated. It's not reserved. It's not exclusively used for

backhaul. And nowhere in this claim prohibits other network nodes or other -- or even other nodes in the network, to use this particular band, the quote/unquote default frequency band, for other purposes; that is, for nonbackhaul purposes. There is none -- so that is my opinion.

And then in terms of the channel, in a WiFi network situation, channels are shared, or can be shared; therefore, it is possible for other network nodes to also have access to a given channel in the default frequency band. And that's the second level, where there's also no exclusivity.

Q And so you don't understand, as opposed to a fronthaul that provides wireless data communication to clients in a network, to provide any restrictions on what the first channel in a default frequency band -- any characteristics of the first channel in a default frequency band?

MR. NGUYEN: Object to the form.

A That, reading -- reading the claim language here, a person of skill in the art would

have understood, and in fact it's very clear from the claim language, that the "wherein" clause is explaining what a backhaul does versus -- as opposed to what a fronthaul does.

There is no constraint or limitation on what the default frequency band can do or cannot do, or cannot be used for certain other traffics. And it also does not require even the first channel to be specifically used only for -- only for backhaul.

But, of course, it's entirely possible at a given -- in a given configuration, at a given time, that first channel is used by a non-CAP -- sorry, I shouldn't use that -- by a node, all right, only for backhaul. So one node can -- as the claim says, This network node can perform an attempt to utilize a first channel for backhaul.

He may have to share with other nodes, he may not. But from this -- in the particular instance, a network device as a node of the mesh network, as a node of the -- such a mesh network, can utilize the first channel only for backhaul

and other channels for fronthaul.

But that doesn't make the default frequency band an exclusive band that only used by this one network node and only for backhaul.

Q Could it be possible for a first channel in a default frequency band to meet the, Wherein, the backhaul is to provide communication of management functions between the nodes and the network, but not satisfy as opposed to a fronthaul that provides wireless data communication to clients in the network?

MR. NGUYEN: Objection. Form.

A I believe I answered that question, Mr. Davis. I think the -- I explained one -- sorry. It is -- there can be a situation at given time, at a given home, a certain time a network node said, Okay, for this particular setup -- right, you're not moving these -- you're not moving these network too much. It's generally quite stable because it's a -- like a mesh network.

So it's quite possible for a network node

on the mesh network to use a channel for a duration that only for backhaul communication, and the network doesn't use that for fronthaul communication. That's -- that's possible, but that's not what the claim requires.

So even if, right, one wants to read it like, okay, so would a -- would it be possible for one network node to say, I'm never going to use some channel for my channel for fronthaul communication. But that node can make that determination for itself, but it cannot make that -- it cannot make that determination in a vacuum, because it's not an independent network. That it has to -- one has to look at what other activities may be going on in between other network nodes or when other network serves their clients.

So they can be different from other network nodes communication with their clients where fronthaul is taking place.

Q So in your opinion, the part of the claim where it says "Wherein the backhaul is to provide

communication of management functions between the nodes of the network," that describes what a backhaul is. And then "as opposed to a fronthaul that provides wireless data communications to clients in the network" describes what a backhaul is not?

MR. NGUYEN: Objection. Form.

A Yeah, Mr. Davis, I think I answer that question.

I think my opinion as a person of skill in the art, reading the plain and customary meaning of this claim language, is that the "wherein" clause where the patent -- as Claim 12 says, the "Wherein the backhaul is to provide communication of management functions between the network nodes in the network," is describing where the fronthaul is as opposed to -- sorry, describing the -- it's providing explanation about what the backhaul does as opposed to what the fronthaul does; that is, to provide wireless data communication to clients in a network.

I don't know how many different ways I

can explain that. But this is the explanation about fronthaul/backhaul specifically stated in the claims, both Claim 1 and Claim 12.

Q If we can go to your declaration, Exhibit 1002, at Paragraph 47, which is on PDF Page 22.

A Okay.

Q You have at the last sentence it says, "While the specification discusses that the default frequency band can be a band dedicated for backhaul communication (i.e., it is not also used for fronthaul client-facing communication), the claims do not claim a dedicated backhaul."

Do you see that?

A Yes.

Q And so you considered, in forming your opinions, whether the claims require or don't require a dedicated backhaul, and you concluded that they do not require a dedicated backhaul?

A That's -- that's what -- that is my opinion in Paragraph 47. And for a person of skill in the art, reading the claims, Claims 1 and 12, there is no back -- there is no dedicated

backhaul.

Q And so in forming your opinions, you didn't analyze whether Gatewood or Ho disclose a dedicated backhaul?

A That's not true.

So in my analysis I have analyzed both Gatewood and Ho. But speaking -- talking about Ho as a prior art in particular, Ho discloses a -- if I can go back. I think my opinion -- in my opinion, Ho discloses that a network -- a non-CAP network node could use a band for backhaul. So I did -- I believe I did provide that analysis.

Q So you analyzed whether Ho discloses a backhaul but not a dedicated backhaul, because that, you concluded, is not part of the claims.

Right?

A No. No. That's incorrect.

So even if a network -- so in -- Ho teaches that in a -- in the discussion of CAP versus non-CAP -- so this lack of searching is a little bit annoying. But, again, to summarize --

Q Well, can you identify for me in your

declaration where you analyze or discuss Ho's disclosure of a dedicated backhaul specifically in your declaration?

A All right. So if I go to Page 71, and ...

So, first of all, I have explained that the claim does not require dedicated band, and that's very important in my analysis. So then we go to the -- the hypothetical I think you're saying, that if I have the -- whether Ho teaches -- teaches if somehow a channel or band is dedicated for backhaul. Is that right? That's we're getting to that, we're getting to that point, if I understand correctly?

Q Yes. Where in your declaration you addressed whether Ho discloses a dedicated backhaul.

A Okay. As shown starting from Paragraph 147, I wrote, and this is citing Ho. "For example, as shown in Ho's Figure 4, the CAP may only be configured to use 5-gigahertz band for backhaul."

So in that case CAP decided to -- that -- that this particular 5-gigahertz band is for backhaul. And therefore, it cannot use the 2.4-gigahertz band.

So in that -- that's supported also by Figure 4. I have shown that you can check the first flow coming down by -- in Figure 4, on Page 72 of my declaration, that a CAP decided that it's not configured to operate in a 2.4-gigahertz WLAN communication band. Then it goes to check to see whether the CAP is a hybrid device configured to operate in a 5-gigahertz wireless LAN. So that 5-gigahertz wireless LAN is now used for backhaul.

So then in Paragraph 148 I stated that in that case a non-CAP hybrid device must choose the only band, 5-gigahertz band, supported by a CAP to establish backhaul communication between itself and CAP.

So that band, 5-gigahertz band, is now used by the non-CAP device for backhaul.

Q And where does it say that that band is not used for fronthaul? Where do you analyze

that?

A But I think as I've mentioned, that that's not required in the claim.

Q Okay. So that's not something that you needed to analyze in your declaration?

A As I think I already mentioned that they are -- there are situations in Ho, I mean Ho describes many embodiment, that there are configurations that Ho teaches where you can have a specific node at a given time that uses a band or a channel only for backhaul. But that's limited to a -- say a period of time, say it could be month or years in his network, for backhaul. And he is not using that. This particular node is not using that particular band or channel for its fronthaul communication.

So from that particular node's perspective, he has selected the particular channel or band only for backhaul communication and not for fronthaul.

Q Can you --

A Pardon?

Q Can you identify where in your declaration you discuss this?

A Yeah, Counsel, I may not have wrote this analysis down explicitly. But since you asked me the question whether I have analyzed it or not, my answer is I have analyzed it and give you my answer --

Q I can stop you right there. I'm really just looking for where it is in your declaration. And so I think we have addressed that.

If we can go back to Exhibit 1001. And go back to Claim 12. Actually, no. Let me -- actually, can we pull up your declaration, Exhibit 1002, at Paragraph 112.

A Yes.

Q And in Paragraph 112 you're discussing whether Gatewood discloses or renders obvious Claims 2 and 13.

Is that right?

A This particular section discusses Claim 2 and 13, which are dependent claims of Claim 1 and 12. Yes.

Q And in Claims 2 and 13 it uses -- it refers to a first radio.

Do you see that?

A Yes.

Q And then I think Claims 1 and 12 use the terms "channel" and "frequency band." Right?

A It does.

Q You understand channel, band, and radio to refer to different things.

Is that fair?

A Radios operate on channels and bands.

Q Yeah, the radio would be like the hardware component, or like the hardware configuration or hardware component that allows operation on a frequency channel of a frequency band.

Is that fair?

A Radio could be a hardware or hardware/software combination. And so if any -- if any methods or device claims to perform certain operation functionalities on a band or channel, that's disclosing a radio.

Q And in your analysis, you discuss a -- like, the wireless backhaul link in Gatewood. You can -- it's your opinion that the wireless link is the same thing as the channel in the claims of the '698 patent. Right?

A No, I don't think I wrote that. That's not my opinion.

Q So if you look at even on the screen, but at the top of Page 54?

A Yeah.

Q You have -- you put it -- you added in brackets. So it says, "Can comprise a second IEEE 802.11 wireless link," and then you have brackets, parenthesis, "channel, using the same or similar first wireless frequency spectrum."

So is the wireless link not the channel?

A Well, wireless link here is -- oh, the parenthesis I put in here is explaining that the 802.11 wireless link would use a channel. Basically a link has to be at least one channel.

Q So you are reading the link to disclose a channel.

Is that fair?

A A link would include channels.

Q And then the channels are part of a frequency band?

A Channels are -- channels are on -- or can be on various frequency band, or as Gatewood shows, wireless frequency spectrum.

Q And then the radio is the hardware or software configuration that is in the device that allows you to operate on the channel within a band?

A Radio is -- radio would be the means to implement communication functionalities on a channel, which is -- which is also part of the -- part of a particular wireless frequency spectrum or band.

Q And you agree that different hardware configurations are generally required to operate in different frequency bands. Right?

MR. NGUYEN: Objection. Form.

A I'm sorry, different hardware configurations are required to operate in

different bands?

Q You agree -- I'll just restate the question.

You agree that different hardware configurations are generally required to operate in different frequency bands. Right?

A I see what you mean.

Well, for -- to operate in different frequency band, you may have -- so the answer is no, not necessarily. You could have a very wide band radio, or software/hardware that can operate in multiple frequency bands.

I mean, take example -- take example of let's just say 5-gigahertz high band and low band. And you could have one radio that operates across the high band and low band -- high 5-gigahertz band and low gigahertz band as described in the '698 patent.

Q So it's -- if a device is able to operate on two different frequency bands, it's not necessarily obvious the device is going to have two separate radios?

A It does not have to be. That is -- that's my opinion. And I think I just explained and I gave you a very specific example.

I also believe that in the context of something simpler, we have your cellphone. Your cellphone devices can operate on, you know, the -- let's just say if you are using T-Mobile versus AT&T, they're different -- they have different bandwidth allocations, and your radio -- sorry, your cellphone does not have to really have multiple radios, one for, you know, AT&T, one for T-Mobile, one for Verizon, so forth.

MR. DAVIS: How about we take another five-minute break.

(A recess was taken.)

BY MR. DAVIS:

Q Dr. Ding, during the breaks today did you at any time talk with your counsel about the substance of your testimony?

A No, not about the substance of testimony.

MR. DAVIS: I think with that, I'll pass the witness.

MR. NGUYEN: Let me take a few minutes, just think for a little bit. Maybe five minutes. I didn't think you were going to stop that quickly.

MR. DAVIS: Sure.

MR. NGUYEN: Thank you.

(A recess was taken.)

MR. NGUYEN: So, Counsel, I just have a couple of questions.

EXAMINATION BY COUNSEL FOR PETITIONER

BY MR. NGUYEN:

Q So, Dr. Ding, I just have a few questions. If you could turn to Paragraph 155 of your declaration. Specifically --

A Yes.

Q I want to look at the Figure 1 that you have annotated in color.

A Yeah, I'm there. Page 75.

Q Right. So on Page 76 you have the Figure 1 of Ho. Right?

A Yes.

Q And counsel asked you about -- earlier

about the -- your mapping of 102 as the CAP device. Correct?

A Yes.

Q And then 120 as the non-CAP device and claim network device. Correct?

A Yes.

Q And then you have a magenta line in between them. That's the backhaul between the two network device. Right?

MR. DAVIS: Objection. Leading.

A The magenta line that goes between the hybrid devices 120 and hybrid device 102 I think I highlighted, that's a dotted line, can form the backhaul between these two hybrid devices.

Q Right. So I just want to follow up on the question that counsel asked before. That line, what AP module or STA module is it connecting -- is connecting, that line connecting? Strike that. Let me start that again.

Can you explain the STA module or AP modules of the CAP and the non-CAP that are used to connect that backhaul?

MR. DAVIS: Objection. Form.

A Yeah. I understand the question is about the WLAN interface between hybrid device 120 and hybrid device 102.

As I answered earlier when counsel for the patent owner asked me, that the connection between a CAP hybrid devices and non-CAP devices depends on the secondary hybrid -- the secondary -- sorry, the secondary personality.

But in short, this figure basically shows that the hybrid device 120, if it's a non-CAP and hybrid -- and the hybrid device 102, if that's the CAP, will be connected through the wireless LANs, wireless and AP module of the CAP device that is 102 and the WLAN station interface of the non-CAP device that will be hybrid device 120.

So the connection will be from the AP interface of the CAP to the STA interface of the non-CAP hybrid devices. I hope that's clear.

Q Okay. Just to be clear, is that consistent with Paragraph 183 and 184 of your expert report that counsel asked you about?

MR. DAVIS: Objection. Leading.

A Oh, yes. Paragraph 183 again discusses the WLAN STA module 114 magenta of a hybrid device blue is a WiFi WLAN interface that allows a hybrid device to connect to another hybrid device such as the CAP or another non-CAP over the wireless communication bands.

So yes, my answer as discussed earlier to your first question, is in fact further explained here. It's exactly consistent.

Q So let me ask you, counsel asked you about Ho's teaching of relay.

Do you remember that?

A Yeah, I remember we discussed the different secondary personalities of a non-CAP hybrid device. If you let me do -- pardon me. Column 8, around Line 13. It says, "As will further be discussed below in Figure 5, the non-CAP hybrid device can be an access point," and then the second one is a relay. So, yes, we discuss a relay.

Q Right. And what is a relay, what does it

connect?

A Well, in the context of Ho, a relay is another network device. So as a part of the mesh network, then this relay would -- in Ho would simply be connecting one non-AP hybrid device with another either -- sorry. This relay will be providing a backhaul connection between the downstream non-CAP hybrid device and another hybrid device upstream of this particular relay. That upstream hybrid device can be a CAP, it may be a non-CAP. But the relay will be -- will be providing the connection that allows backhaul communication between these two hybrid devices, one below and one above.

MR. NGUYEN: I have no further questions.

Thank you.

THE WITNESS: Thank you.

MR. DAVIS: Give me just a second.

I don't have any further questions.

Thank you, Dr. Ding.

THE WITNESS: Thank you, Counsel.

(Off the record at 3:59 p.m. EDT.)

ACKNOWLEDGMENT OF DEPONENT

I, ZHI DING, Ph.D., do hereby acknowledge that I have read and examined the foregoing testimony, and the same is a true, correct and complete transcription of the testimony given by me, and any corrections appear on the attached Errata sheet signed by me.

_____ _____

(DATE) (SIGNATURE)

C E R T I F I C A T E

I, Debra Ann Whitehead, E-Notary Public in and for the State of Maryland, do hereby certify:

That ZHI DING, Ph.D., the witness whose deposition is hereinbefore set forth, was duly sworn by me before the commencement of such deposition and that such deposition was taken virtually and is a true record of the testimony given by such witness.

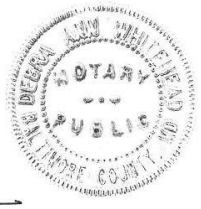
I further certify that the adverse party, TP-LINK CORPORATION LIMITED, was represented by counsel at the deposition.

I further certify that the deposition of ZHI DING, Ph.D., occurred virtually, on Friday, May 31st, 2024, from 12:07 p.m. to 3:59 p.m. EDT.

I further certify that I am not related to any of the parties to this action by blood or marriage, I am not employed by or an attorney to any of the parties to this action, and that I am in no way interested, financially or otherwise, in the outcome of this matter.

IN WITNESS WHEREOF, I have hereunto set my hand this 12th day of June, 2024.

My commission expires:
April 30th, 2027



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