

UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE PATENT TRIAL AND APPEAL BOARD

QUALCOMM INCORPORATED	)	
	)	
Petitioner,	)	
	)	
vs.	)	No. IPR2024-00343
	)	
NETWORK SYSTEM TECHNOLOGIES, LLC	)	
	)	
Patent Owner.	)	
_____	)	

DEPOSITION OF NADER BAGHERZADEH, Ph.D., taken
remotely via Zoom at 9:06 a.m. Pacific Time,
Thursday, December 12, 2024, before Theresa
JoAnn Phillips-Blackwell, CSR 12700.



Page 2 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 APPEARANCES OF COUNSEL: For Petitioner: DEREK VANDENBURGH, ESQ. AARON PEDERSON, ESQ. (Appearing via Zoom) CARLSON CASPERS VANDENBURGH & LINDQUIST, P.A. 225 South Sixth Street Suite 4200 Minneapolis, Minnesota 55402 (612) 436-9600 dvandenburg@carlsoncaspers.com apederson@ccvl.com For Patent Owner: ANGELO CHRISTOPHER, ESQ. PETER KRUSIEWICZ, ESQ. (Appearing with Deponent) NIXON PEABODY LLP 70 West Madison Street Suite 5200 Chicago, Illinois 60602 (312) 977-4400 achristopher@nixonpeabody.com	Page 4 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 (Nader Bagherzadeh, Ph.D., deponent, was sworn, examined and testified as follows:) DEPOSITION OFFICER: You do solemnly state that the evidence you shall give in this matter shall be the truth, the whole truth, and nothing but the truth? THE WITNESS: I do. MR. VANDENBURGH: We'll see how it goes. EXAMINATION BY MR. VANDENBURGH: Q. Good morning. My very first question, can you pronounce your last name for me. A. Yes. Bagherzadeh. Bagherzadeh. Q. All right. I'm going to write that on a Post-it note, and I apologize if I mess it up. A. Sure. No problem. Q. It is just like -- just like it's written. It shouldn't be hard. A. Just like -- yes. Q. All right. Okay. First of all, you've -- you've been deposed a number of times before; right? A. Yes. Q. So I'll skip the usual deposition speech.
Page 3 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 INDEX DEPONENT EXAMINED BY PAGE Nader Bagherzadeh, Mr. Vandenburg 4 Ph.D. Mr. Christopher 211 EXHIBITS DESCRIPTION PAGE 1050 - Element 6.pre.2 75 1005 - Document Entitled "An Efficient 119 On-Chip Network Interface Offering Guaranteed Services, Shared-Memory Abstraction, and Flexible Network Configuration" 1006 - Specification for Release 1 of OCP 160 MARKED AT THE REQUEST OF COUNSEL PAGE LINE 49 25	Page 5 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 Can you tell me where you are physically located today. A. I am in the Peabody's offices in Los Angeles -- Downtown Los Angeles, yeah. Q. And are there others there in the conference room with you? A. Yes. I have two attorneys here. Q. Is that Mr. Christopher and Mr. Krusiewicz? My apologies, Peter. A. Yes. Mr. Peter Krusiewicz and Mr. Angelo Christopher. That's correct. Q. Perfect. All right. Just -- now, you understand that it would be inappropriate for you to receive any sort of communication from them while I'm asking you the questions other than they can object on the record? But beyond that, they should not be communicating with you; right? A. Yes. I understand. MR. VANDENBURGH: Can we take a break from the record here real quick. (A recess is taken.) MR. VANDENBURGH: Back on the record. BY MR. VANDENBURGH: Q. Now, we sent copies of things that are already exhibits in the IPR for you to be able to use today.

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Page 6 1 Doctor, did you receive those? 2 A. Yes. I have them right here in front of me. 3 Q. Okay. Great. 4 So if -- I'm going to just start referring to 5 various exhibits from the IPR. If you don't have any of 6 them handy, let me know; but you should. 7 A. Okay. 8 Q. So, now, you have rendered opinions regarding 9 all of the claims in the '052 patent at issue; correct? 10 MR. CHRISTOPHER: Objection to form. 11 THE WITNESS: I have rendered opinions for the 12 claims that I've stated in my report. 13 BY MR. VANDENBURGH: 14 Q. And you've provided opinions on Claims 1 15 through 7; correct? 16 A. Let me refer to my report, please. Claims 1 17 through 7 -- hold on a second, please. I do cite them, 18 but I just want to know -- I know Claim 6 is in there 19 and -- and -- 20 Q. You can't say with confidence that you have 21 opined on all the claims? 22 MR. CHRISTOPHER: Objection to form. 23 THE WITNESS: I have, but I want to make sure 24 of that. 25 ///	Page 8 1 THE WITNESS: I have some understanding, not to 2 the level of legal that one would expect from a lawyer. 3 BY MR. VANDENBURGH: 4 Q. Okay. 5 A. I have some understanding. 6 Q. Do you understand that it is improper to read 7 limitations from the specification into the claims? 8 MR. CHRISTOPHER: Objection to form. Calls for 9 a legal conclusion. 10 THE WITNESS: I really -- it's -- I mean, I can 11 look over what I've said about that; but I have some 12 understanding of that, yes. 13 BY MR. VANDENBURGH: 14 Q. I'm going to be asking some of the meanings of 15 those words, so this is going to be important. Let me 16 start with this -- this term "interconnect." 17 Now, interconnect appears in the claims of the 18 '052 patent in connection with something called an 19 interconnect means; right? 20 A. Interconnect appears in '052 patent. That's 21 correct. 22 Q. And in the claims as well? 23 A. Yes. I believe so, yeah. 24 Q. Okay. The patent uses the term "interconnect" 25 to describe point-to-point wires, buses, and switches;
Page 7 1 BY MR. VANDENBURGH: 2 Q. Well, this is important because I want -- I 3 also want to know if you understand the scope of the 4 claims. 5 A. You're asking me a question on that? 6 Q. That's going to be my next question once we 7 confirm that you, in fact, opined on all the claims. 8 A. Yes. I do understand the scope, yes. 9 Q. Okay. 10 A. So 1 through 7, yes. 11 Q. All right. I also want to ask a couple of 12 questions regarding your understanding of claim 13 construction. Because you've also provided opinions on 14 claim construction in this case; right? 15 A. That is correct. 16 Q. Okay. And that's -- Paragraphs 50 and 58 of 17 your report deal with claim construction. Just a couple 18 other principles I want to make sure you understand. 19 You do know that claims can be broader than the 20 specification of a patent; correct? 21 A. I believe that is the case. 22 Q. Okay. You understand the difference between 23 construing the words of the claim and reading 24 limitations into the claim? 25 MR. CHRISTOPHER: Objection to form.	Page 9 1 correct? 2 MR. CHRISTOPHER: Objection to form. 3 THE WITNESS: No, it doesn't. 4 BY MR. VANDENBURGH: 5 Q. I'm talking about the word "interconnect" 6 alone. 7 In your opinion, is -- the patent doesn't use 8 interconnect to describe a point-to-point wire, bus, or 9 switch? 10 MR. CHRISTOPHER: Objection to form. 11 THE WITNESS: The patent is very clear. It's 12 referring to multi-hop networks with one or more nodes. 13 BY MR. VANDENBURGH: 14 Q. I understand that that might be your opinion 15 with respect to interconnect means, but I'm only asking 16 you about the word "interconnect" right now. 17 Your testimony is that the patent doesn't use 18 interconnect to describe wires, switches, or buses? 19 MR. CHRISTOPHER: Objection to form. 20 THE WITNESS: A POSITA reading '052 will 21 understand interconnect that they're referring to is not 22 bus, wires, or point-to-point. 23 BY MR. VANDENBURGH: 24 Q. Okay. Let me get more specific. Can I direct 25 your attention to Column 1, sentence beginning at

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Page 10 1 Line 50. 2 A. I'm sorry. Counsel, you're referring to the 3 patent; right? 4 MR. VANDENBURGH: Correct. So I'm in -- and 5 that's a good point. 6 For the record, I'm referring to Exhibit 1001, 7 which is the '052 patent, Column 1, Line 50. 8 A. Okay. Yes. 9 Q. I'm going to read it for the record. 10 "This is because, in contrast to existing 11 on-chip interconnects (e.g., buses, switches, or 12 point-to-point wires), where the communicating modules 13 are directly connected, in a NoC the modules communicate 14 remotely via network nodes." 15 First of all, did I read that correctly? 16 A. Yes, you did. 17 Q. And it is true, isn't it, that that statement 18 refers to buses, switches, or point-to-point wires as 19 examples of existing on-chip interconnects? 20 A. It -- it is just giving you an example, but the 21 interconnect that is mentioned throughout this '052 is 22 all about a NoC. You could say that you could connect 23 any way you want, but '052 will come out for a POSITA 24 that it's -- it is a Network-on-Chip. 25 Q. Again, I'm going to get to what interconnect	Page 12 1 MR. CHRISTOPHER: Objection. Scope. 2 THE WITNESS: In what context, Counsel? 3 Switches where? 4 BY MR. VANDENBURGH: 5 Q. In the -- in any sort of networking technology. 6 A. I need more information than that. Switches 7 could be part of something else. It's just not clear. 8 Q. You got your report there; correct? 9 A. Yes, sir. 10 Q. If you turn to Paragraph 67, that's an example 11 in -- in your language where you refer to a bus as a 12 interconnect -- correct? -- in the first sentence? 13 A. Yes. It -- it says the bus is an interconnect. 14 Q. And if we turn to Paragraph 70, again, you 15 refer to a bus interconnect; correct? 16 A. Paragraph? 17 DEPOSITION OFFICER: I'm sorry? 18 THE WITNESS: Repeat the question, Counsel. 19 BY MR. VANDENBURGH: 20 Q. In Paragraph 70 of your report, you refer to 21 bus interconnect? 22 A. Yes. I say bus interconnect is a shared 23 communication interconnect. 24 DEPOSITION OFFICER: Is a shared communication 25 what?
Page 11 1 means is in the claims; but right now I'm just talking 2 about the word "interconnect." Let me ask you this 3 question. 4 Prior to 2004 was the use -- was the word 5 "interconnect" used to describe buses? 6 MR. CHRISTOPHER: Objection to form. 7 THE WITNESS: I have not checked that. 8 BY MR. VANDENBURGH: 9 Q. You can't answer my question as you sit here 10 today? You don't know one way or the other? 11 MR. CHRISTOPHER: Objection to form. 12 THE WITNESS: Have I referred to it in my 13 document anywhere -- the definition of interconnect 14 before 2004? 15 BY MR. VANDENBURGH: 16 Q. That is not my question. 17 My question is whether you were aware of the 18 word "interconnect" being -- buses being described as an 19 interconnect prior to 2004. 20 MR. CHRISTOPHER: Objection to form. 21 THE WITNESS: Buses are a form of an 22 interconnection. I'm not disputing that. 23 BY MR. VANDENBURGH: 24 Q. Okay. Are switches also referred to, prior to 25 2004, as providing interconnect?	Page 13 1 THE WITNESS: Interconnect. 2 BY MR. VANDENBURGH: 3 Q. Yeah. So I just want to be clear, then. 4 You're not arguing that the common, ordinary meaning of 5 "interconnect" excludes a bus; correct? 6 MR. CHRISTOPHER: Objection to form and scope. 7 THE WITNESS: I have not offered an opinion 8 that '052 referring to interconnect means a bus. But if 9 you're saying that interconnect, in general, means a 10 bus, you recited it several times. In the eyes of the 11 POSITA, the interconnect is very clear what it is, 12 meaning, '052. 13 MR. VANDENBURGH: Theresa, can you please read 14 my last question back. 15 (The record is read by the reporter as 16 follows: 17 "Q. Yeah. So I just want to be clear, then. 18 You're not arguing that the common ordinary 19 meaning of 'interconnect' excludes a bus; 20 correct?") 21 MR. CHRISTOPHER: Same objections. 22 BY MR. VANDENBURGH: 23 Q. Can you answer my question? 24 A. Interconnect, if it's not in the form of a NoC, 25 has been around as a bus. But that's not what '052 is

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Page 14 1 about. 2 Q. Is it fair to say that what the '052 patent 3 excludes is direct interconnects? 4 MR. CHRISTOPHER: Objection. Form. 5 THE WITNESS: What is your definition of 6 "direct interconnect"? 7 BY MR. VANDENBURGH: 8 Q. Does the patent refer to direct interconnect? 9 A. In -- cite the area? 10 Q. Let's go back to Column 1, that same sentence 11 at Line 50. 12 A. Line 50, yes. 13 Q. So is it -- it's correct that that sentence is 14 describing existing on-chip interconnect as being 15 examples where communicating modules are directly 16 connected? 17 A. That's what that line says; but it's just 18 saying, in general, what has been there before the NoC 19 was transpired into the -- into the reader. But yeah. 20 I mean, interconnects were connected. And, actually, 21 NoC is not a direct connection. It's an indirect 22 connection. 23 Q. And so that's -- in your mind, the fundamental 24 difference between a NoC and these existing on-chip 25 interconnects was having an indirect connection as	Page 16 1 my report. 2 BY MR. VANDENBURGH: 3 Q. Right. Does the word "Network-on-Chip" appear 4 in the claims of the '052 patent? 5 A. No. But -- but I have to say that -- that the 6 interconnect they're talking about, based on what you 7 read when you read '052 -- it is a NoC. 8 Q. So what word, or words, in the claim are you 9 using to read in a Network-on-Chip? 10 MR. CHRISTOPHER: Objection to form. 11 THE WITNESS: Well, as stated earlier, claims 12 are broader; but POSITA reading the description of the 13 '052 and reading the claim will understand that it's 14 referring to description of a NoC. 15 BY MR. VANDENBURGH: 16 Q. Can you not point to me to any specific 17 language in the claim that you believe limits this claim 18 to a NoC. 19 MR. CHRISTOPHER: Objection to form. 20 THE WITNESS: It is -- it is understood by 21 whoever is reading '052 to incorporate it in one way or 22 another, that this is strictly talking about a 23 network -- multi-hop network that has multiple nodes -- 24 one or more nodes, and it sends packets around. It's in 25 the body of the '052.
Page 15 1 opposed to a direct connection; correct? 2 MR. CHRISTOPHER: Objection to form. 3 THE WITNESS: No. It's more than that. 4 BY MR. VANDENBURGH: 5 Q. Okay. 6 A. Can I finish? 7 It has to be a multi-hop network with one or 8 more nodes using packets, so just calling it an indirect 9 connection is not enough. You also have these other 10 attributes. 11 Q. Okay. And -- and you added a couple of things 12 there. I -- I understand multi-hop. I understand that 13 you have to have network nodes. 14 You also added the concept of a packet. So -- 15 A. Yes. 16 Q. -- your opinion is to be an interconnect means 17 it has to communicate via packets? 18 MR. CHRISTOPHER: Objection to form. 19 THE WITNESS: It -- packetization is an 20 important part of NoC. 21 BY MR. VANDENBURGH: 22 Q. Let me ask you this. Does the word -- what 23 does -- what does NoC stand for? 24 MR. CHRISTOPHER: Objection to form. 25 THE WITNESS: Network-on-Chip. It's all over	Page 17 1 BY MR. VANDENBURGH: 2 Q. Okay. So you are -- you can't point to any 3 language in the claims that should be interpreted as 4 requiring a NoC, but your view is just the specification 5 as a whole just says that's what it's -- the claims must 6 be about. Is that your testimony? 7 MR. CHRISTOPHER: Objection to form. 8 THE WITNESS: Let me -- let me search my 9 document, please. 10 So the word "NoC" doesn't appear here; but my 11 understanding by reading the '052 is that it has to be a 12 Network-on-Chip or it doesn't really apply in any way, 13 shape, or form. And then the figure that is -- they 14 have here clearly stating that, Figure 1, with multiple 15 nodes and interfaces and so on. 16 BY MR. VANDENBURGH: 17 Q. So as part of your analysis on the scope of the 18 claim, you read in Figure 1 into the claims? 19 MR. CHRISTOPHER: Objection to form. 20 THE WITNESS: I -- about other things. There 21 is a narrative about why '052 was invented because 22 bus-based networks were not sufficient. They were not 23 scaleable. I mean, that's the whole purpose of this 24 '052, is that we have a solution indirectly connecting 25 processors -- master and slave processors, the term of

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1 art for the patent on this case.

2 And so it says clearly that the limitations
3 required using a packetized network. And so it's
4 talk -- it talks about a network. It says -- in the
5 first limitation of Claim 6, it says plurality of
6 modules M and S but an interconnect means M, and one
7 reading the '052 will understand M means multi-hop
8 network.

9 BY MR. VANDENBURGH:

10 Q. Now I think we're getting somewhere. I
11 expected you to say that -- that the reason you're
12 limiting the claims to a Network-on-Chip is because of
13 the word "interconnect means"; is that correct?

14 MR. CHRISTOPHER: Objection to form.

15 THE WITNESS: Inter -- interconnect here refers
16 to a multi-hop network, as I've said several times.

17 BY MR. VANDENBURGH:

18 Q. So your basis for limiting the claims to a
19 Network-on-Chip is the words "interconnect means"; is
20 that correct?

21 MR. CHRISTOPHER: Objection to form.

22 THE WITNESS: Interconnect was construed to
23 mean connecting -- let me just go through one of the
24 claim constructions for interconnect.

25 The term "interconnect means," as used in '052

1 contrast with prevailing existing interconnects in the
2 next sentence.

3 Q. Right. And -- and so your view is that the
4 '052 patent specifically excludes a mere bus, switch,
5 and point-to-point wire alone from being a network;
6 correct?

7 A. That -- that's what '052 says. These other
8 technologies were available, but they're not scaleable.
9 Here's the Network-on-Chip. Here's the multi-hop
10 network. That's the whole purpose of '052, among other
11 things.

12 Q. And as you indicate in the rest of that
13 sentence quoting the patent, the reason is because those
14 are directly connected to the modules; correct?

15 MR. CHRISTOPHER: Objection to form.

16 THE WITNESS: It's one of the concerns or
17 limitations of the direct connection. There are other
18 reasons as well.

19 BY MR. VANDENBURGH:

20 Q. Okay. Now, it is true the '052 patent
21 indicates that the interconnect means can include a bus,
22 a switch, and/or a point-to-point wire; correct?

23 A. So I think that's a misunderstanding, what that
24 sentence says. I know what you're referring to.

25 What it really implies, as the patentee say,

1 patent, would be understood by POSITA to have a
2 sufficiently definite meaning as the name of the
3 structure. So it is -- it's a structure that describes
4 a multi-hop network.

5 I can go further down in this description.

6 BY MR. VANDENBURGH:

7 Q. For the record, you're reading from
8 Paragraph 103 of your declaration?

9 A. Yes.

10 Q. Okay. So it's the word inter -- it's the
11 phrase "interconnect means" that you are saying is
12 interchangeable with the term "network"; is that
13 correct?

14 A. Interconnect means refers to an interchanging
15 network, as is stated there, yes.

16 Q. Okay. It took us a long time to get there.

17 Let's go to Paragraph 127 of your report, which
18 is in the same section.

19 The first sentence of that says, "The '052
20 patent specifically excludes a mere bus, switch, and
21 point-to-point wire alone from being a network."

22 And that is your opinion; correct?

23 A. Paragraph 126?

24 Q. Yes -- 127.

25 A. I think I stated that. That this is in

1 Well, Network-on-Chip is great; but the NoC could
2 include those components as some sort of a connection to
3 one of the nodes of the NoC. It does not mean that NoC
4 will include that as a primary connection. So you could
5 have a node that is connected to a point-to-point or to
6 a bus or to something else. That's what it means.

7 Q. Okay. So you deny that a claimed network as
8 one of the components can have a bus or a point-to-point
9 wire?

10 MR. CHRISTOPHER: Objection to form.

11 THE WITNESS: I did not say that. All I
12 said -- the periphery of the nodes of a NoC could
13 connect to something else. It's not limited to that.

14 BY MR. VANDENBURGH:

15 Q. Okay.

16 A. But that -- but the communication within the
17 NoC is as I said earlier.

18 Q. Do NoCs include point-to-point wires between
19 switches?

20 MR. CHRISTOPHER: Objection to form. Scope.

21 THE WITNESS: It's -- it's all about indirect
22 connection because the routers are connected point to
23 point but not the two ends. That is actually the
24 essence of NoC. If you don't have a connection from one
25 node to the other node, then how you going to

Page 22 1 communicate? But -- but different from a bus because 2 they're directly connected to that highway in the 3 middle. 4 BY MR. VANDENBURGH: 5 Q. Take this one step at a time. 6 You would agree that an interconnect means of 7 the '052 patent can include point-to-point wires between 8 routers? 9 A. Not all the -- not all the routers. Only the 10 neighbors. It's a misnomer to say -- they only talk to 11 their neighbors direct. That's it. 12 Q. And they talk to each other via point-to-point 13 wires? 14 MR. CHRISTOPHER: Objection to form. 15 THE WITNESS: They only talk to their neighbors 16 north, south, east, west. Contradicting that with other 17 forms is a point to a point or it's a bus, which is all 18 connected from the bus. So it's very different indeed. 19 BY MR. VANDENBURGH: 20 Q. I feel like you're just resisting answering my 21 question, though. 22 My question is simply, in a -- in a 23 interconnect means, as claimed in the '052 patent, would 24 it include a situation where routers communicate with 25 each other via point-to-point wires?	Page 24 1 here, and I cannot look at my document. Okay. Here we 2 go. 3 So I said in order to give you a fair answer, 4 Counsel, I need you to refer you to Figure 1. 5 BY MR. VANDENBURGH: 6 Q. Okay. So your testimony is you cannot answer 7 my question without referring to Figure 1? 8 MR. CHRISTOPHER: Objection to form. 9 THE WITNESS: That's not what I said. In order 10 to explain myself better for you to understand what I'm 11 saying, I'd like to refer you to Figure 1. 12 BY MR. VANDENBURGH: 13 Q. And I will give you that opportunity, but I 14 would like you to answer my question first. 15 A. Visually, pictorially, we have to look at the 16 diagram that I explain my answer to you so it's 17 hopefully better understood. 18 Q. But you are -- you are -- you're not testifying 19 that you can't answer my question without referring to 20 Figure 1? 21 MR. CHRISTOPHER: Objection to form. 22 THE WITNESS: I think it would be a better 23 explanation if I refer to that figure. Or you can 24 visualize what I'm going to tell you without the figure. 25 Would you like to do that?
Page 23 1 MR. CHRISTOPHER: Objection to form. 2 THE WITNESS: It -- Counsel, I can refer you to 3 Figure 1 because that will explain what I'm trying to 4 say. Would you like to go to Figure 1? 5 BY MR. VANDENBURGH: 6 Q. So I'd like you to answer my question, sir. 7 A. Sir, I need to look at Figure 1 to explain it 8 to you, if you allow me. 9 MR. VANDENBURGH: Can you answer -- can I have 10 the question read back again. 11 We'll -- I promise we will go to Figure 1. I 12 want you to say you cannot answer my question without 13 looking to Figure 1. 14 THE WITNESS: Is that a question? 15 MR. VANDENBURGH: No. I'm going to have the 16 question read back. 17 (The record is read by the reporter as 18 follows: 19 "Q. My question is simply, in a -- in a 20 interconnect means, as claimed in the '052 21 patent, would it include a situation where 22 routers communicate with each other via 23 point-to-point wires?") 24 MR. CHRISTOPHER: Same objection. 25 THE WITNESS: We just lost the light switch	Page 25 1 BY MR. VANDENBURGH: 2 Q. Sure. 3 A. Okay. You have Router 1 here, Router 2 here, 4 and Router 3 here. So I have only two hands. One, two, 5 three. The router here connects to this one but not to 6 the other one. Understood? 7 Q. Understood. 8 A. So that's all I was trying to show you in that 9 figure. It was easier than having three hands here. 10 Q. And I -- and I promised you that I -- and I 11 will go to Figure 1, but it sounds to me what you're 12 saying is that the interconnect means of the claims can 13 include a point-to-point wire between two routers? 14 A. The routers will not be able to communicate if 15 they're not connected to each other. I mean, that's -- 16 that's what Figure 1 shows. 17 Q. You seem too resistant to admit that the 18 connection between routers is a point-to-point 19 connection. 20 MR. CHRISTOPHER: Objection. 21 BY MR. VANDENBURGH: 22 Q. Is there a reason for that? You do agree that 23 the connection between routers is point to point? 24 MR. CHRISTOPHER: Objection to form. 25 THE WITNESS: Adjacent routers have to have

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Page 26 1 connections to each other -- direct connection. 2 BY MR. VANDENBURGH: 3 Q. Okay. And that another word for that would be 4 a point-to-point connection; correct? 5 A. I mean, it's -- 6 MR. CHRISTOPHER: Same objection. 7 THE WITNESS: It's just I explained it the way 8 I see it. 9 BY MR. VANDENBURGH: 10 Q. Now, I don't want to not follow through on my 11 promise. Would you still like to go to Figure 1 and 12 explain to me better the answer to my question that -- 13 of whether the claimed interconnect means can include 14 point-to-point connections between routers? 15 A. Counsel, you already told me that I don't need 16 to go to Figure 1. Now you're telling me to go to 17 Figure 1. I already explained as I was doing it with my 18 two hands, so I think there is no reason to do that. I 19 think you got the -- 20 Q. I just didn't want to be accused of not giving 21 you the opportunity that I said I would earlier. 22 MR. CHRISTOPHER: Anyway. 23 BY MR. VANDENBURGH: 24 Q. All right. Would it be possible -- strike 25 that.	Page 28 1 Q. Okay. How many routers do you need to have a 2 network? 3 MR. CHRISTOPHER: Objection to form. 4 THE WITNESS: It depends, Counsel. It really 5 varies. 6 BY MR. VANDENBURGH: 7 Q. What's the minimum number? 8 A. I don't have the minimum number. It depends on 9 the topology. Topology means the geometry of the 10 routers. So it varies. 11 Q. If I have -- can I have a network connecting 12 together just two modules? 13 MR. CHRISTOPHER: Objection to form. 14 THE WITNESS: Let's parse that, Counsel. 15 We have a network. How many -- how many 16 modules or processors do you have? 17 BY MR. VANDENBURGH: 18 Q. Two. 19 A. Two. Okay. 20 Q. What's the minimum number of routers I need if 21 I have two modules? 22 MR. CHRISTOPHER: Same objection. 23 THE WITNESS: The '052 says one or more, so you 24 could have one router. 25 ///
Page 27 1 Would the claim cover a circumstance where two 2 routers in your interconnect means are connected by a 3 bus? 4 MR. CHRISTOPHER: Objection to form. 5 THE WITNESS: I -- I have not seen a NoC where 6 they were connected with a bus, and I don't see '052 -- 7 a POSITA reading that would understand that. But it 8 could be that a router connects to a bus as a periphery. 9 That is possible. But not as a means of communication 10 among the routers. 11 BY MR. VANDENBURGH: 12 Q. Let me direct your attention to Paragraph 122 13 of your declaration. You have three illustrations 14 there. 15 Illustration A is an example of various modules 16 that are directly connected to a bus; correct? 17 A. Yes. 18 Q. And Example B are examples where various 19 modules are directly connected to one another? 20 A. You want me to affirm that? Yes. 21 Q. Yes. Okay. 22 And then -- and then C is an example of a 23 network that includes routers; correct? 24 A. Correct. I actually use the exact same figure 25 for my class.	Page 29 1 BY MR. VANDENBURGH: 2 Q. Okay. Do you understand what a hierarchical 3 bus is? 4 A. Yes. 5 Q. What is a hierarchical bus? 6 A. For lack of better explanation, it's what one 7 of the prior arts talks about: Weber. It's -- it's -- 8 you just have a main bus, and then you have another bus 9 that corresponds to other set of modules or peripherals. 10 It's very, very similar to what a standard motherboard 11 is. You have reaches, north reach, south reach. So it 12 means levels of separate buses. 13 Q. And what is the purpose of a hierarchical bus? 14 A. As -- again, referring to Weber, is to have 15 some level of concurrency because you have certain 16 module basics on one bus, and then you have something -- 17 some other set of peripherals on another bus. So you're 18 trying to create more opportunity for -- for nodes to 19 communicate with each other. 20 Q. Okay. So it allows certain modules to 21 communicate with each other over one bus without tying 22 up the other bus; is that fair? 23 A. That's basically what I've known, and that's 24 what Weber talks about. Yes. 25 Q. What is typically used to divide -- or strike

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1 that.

2 What is typically used to separate two buses in
3 a hierarchical bus architecture?

4 MR. CHRISTOPHER: Objection to form.

5 THE WITNESS: Speed. Speed.

6 BY MR. VANDENBURGH:

7 Q. Speed.

8 That wasn't the answer I was expecting. Can
9 you explain that for me.

10 A. Latency is in the balance of computer
11 engineering. Is that better?

12 Q. Yep.

13 Is there a network -- is there a component that
14 typically is located at the junction between two buses
15 in a hierarchical bus arrangement?

16 A. I believe -- again, sorry. Referring to Weber,
17 it introduces something called a bridge; and that's one
18 of the mechanisms to do that.

19 Q. Are there other mechanisms you're aware of?

20 A. I have not looked into it, but I'm sure there
21 are other mechanisms.

22 Q. Is a bridge a network component you were aware
23 of before you were retained for this case?

24 MR. CHRISTOPHER: Objection to form.

25 THE WITNESS: A bridge is a common structure

1 A. We appreciate it. That would be the one thing
2 positive you've done besides other things we have done.
3 So let me start searching for that, Counsel. I think
4 that would be marvelous.

5 So my exhibit -- 001, yes. I don't see it, but
6 let me search something else.

7 (Discussion held off the record.)

8 THE WITNESS: So, so far -- I don't see if they
9 did.

10 BY MR. VANDENBURGH:

11 Q. All right. The claims of the '052 patent
12 recite as one of the elements --

13 A. Sorry? I didn't catch the rest of the
14 question.

15 Q. -- a plurality of processing modules; correct?

16 A. It's -- it's in the preamble for Claim 6,
17 plurality of processing modules M and S.

18 Q. Okay. And it's also the first element recited
19 in Claim 1; correct?

20 A. Yes.

21 Q. Now, the '052 patent does not purport to have
22 created a new type of module; correct?

23 MR. CHRISTOPHER: Objection to form.

24 THE WITNESS: It's not about processing
25 modules.

1 used in all kinds of courses and books.

2 BY MR. VANDENBURGH:

3 Q. And specifically in the context of -- of
4 interconnects; correct?

5 A. As I mentioned earlier, we've known something
6 about north bridge and south bridge. You can actually
7 look it up. The processors on the north bridge and
8 south bridge is peripherals, and the speed comes into
9 play because peripherals are slower than -- it sounds
10 like one of my class lectures.

11 The peripherals are very slow. They don't need
12 to interfere with the processors that are running very
13 fast. That's why we have these different buses.

14 Q. Now, we've already talked about the fact that
15 the '052 patent talks about buses. Does it specifically
16 talk anywhere about hierarchical buses?

17 A. I can search for it. I -- I don't remember;
18 but to be sure, I can search for it.

19 Q. Can you do that. That would be great. Do you
20 have a -- do you have an electronic copy that you could
21 search?

22 A. Dying for you to say that, as we've been
23 thinking about it all last night. May I start looking
24 at that and use Control F?

25 Q. If you -- yes. That would be great.

1 BY MR. VANDENBURGH:

2 Q. Right. The -- they -- they didn't -- the whole
3 idea was to find a way to better communicate between
4 existing modules; correct?

5 MR. CHRISTOPHER: Objection to form.

6 THE WITNESS: It's agnostic to the modules of
7 the IP.

8 BY MR. VANDENBURGH:

9 Q. Okay.

10 A. What's one of the contributions of the '052.

11 Q. And at a high level, the '052 patent involves
12 processing requests from existing modules using -- that
13 are using existing bus protocols?

14 A. Ouch. Can you -- can you parse that, please.
15 I need a little bit more clarification for that.

16 Q. The modules -- the existing modules that are
17 described in the '052 patent communicate via bus
18 protocols; correct?

19 A. They communicate via -- I would not use the
20 word "bus protocols." I would use "standard protocols."
21 It could be -- one of them could be bus.

22 Q. Okay. It's broader to include -- it includes
23 bus protocols, but it might include other existing
24 protocols?

25 MR. CHRISTOPHER: Objection to form.

1 THE WITNESS: It's not excluding any protocols.
2 I mean, it just gives you a list of the standard
3 protocols; and, I mean, it didn't say that did not
4 include something else.

5 BY MR. VANDENBURGH:

6 Q. Okay. Again, did the invent -- did the patent
7 purport to invent a new sort of protocol that the module
8 communicates with?

9 MR. CHRISTOPHER: Objection to form.

10 THE WITNESS: It's not limiting. I -- I don't
11 see anywhere here saying we're not going to be able to
12 introduce our own protocol.

13 BY MR. VANDENBURGH:

14 Q. Okay.

15 A. The fact that it's agnostic -- it means -- let
16 me call it IP instead of processing modules. That mean
17 the same thing. You could have your own new protocol,
18 including the inventors. But it will handle them as
19 well.

20 Q. But the patent itself doesn't itself purport to
21 invent a new bus protocol; is that correct?

22 A. It's not the main goal, and I did not see
23 saying -- claiming that we introduced a new bus
24 protocol.

25 Q. If you could go to Column 4 of the '052 patent,

1 protocols prior to 2004?

2 MR. CHRISTOPHER: Objection to scope.

3 THE WITNESS: OCP and others that are not
4 listed here -- other protocols.

5 BY MR. VANDENBURGH:

6 Q. Okay. But for the ones that were listed here,
7 the only one that you were aware of at the -- prior to
8 2004 was OCP?

9 A. I believe maybe the DTL as well. I -- I'm not
10 sure. It's been a while, Counsel. It's like 25 years
11 ago. But OCP has been around for a long time.

12 Q. When was OCP introduced?

13 MR. CHRISTOPHER: Objection. Scope.

14 THE WITNESS: I have no idea.

15 BY MR. VANDENBURGH:

16 Q. Regardless of your personal knowledge, do you
17 believe that a POSITA would have been aware of each of
18 those protocols that are listed on Column 4, Line 15
19 prior to 2004?

20 MR. CHRISTOPHER: Objection. Scope.

21 THE WITNESS: May or may not. It's really not
22 that complicated to pick up a new standard and run with
23 it in a few days. It's not. It's like programming
24 languages. If you learn C, then the other language
25 would be much, much easier. So I would not think a

1 Exhibit 1001.

2 A. Four.

3 Which line, Counsel?

4 Q. Line 15.

5 A. Yes. I -- I see it.

6 Q. Okay. I'll read it for the record.

7 "The invention is based on the idea to offer
8 differentiated services for protocols such as DTL, MTL,
9 AXI, and OCP by mapping the identification means of
10 these protocols to connections."

11 Are each of those four protocols identified
12 there -- first of all, are those all bus protocols?

13 A. I have not checked for that.

14 Q. Okay. Did all of those protocols exist prior
15 to 2004?

16 MR. CHRISTOPHER: Objection to form.

17 THE WITNESS: There's a causality issue,
18 Counsel. If it wasn't present, why would they be
19 talking about it?

20 BY MR. VANDENBURGH:

21 Q. I can't disagree with you on that one; but I do
22 want to also understand your personal knowledge because
23 I think you said you were a POSITA in, you know, 2003,
24 2004.

25 Were you personally aware of any of these

1 POSITA could not pick up one of these by knowing the
2 other one. Very standard format.

3 BY MR. VANDENBURGH:

4 Q. Okay. And maybe you anticipated my next
5 question.

6 Even if a POSITA didn't actually know about one
7 of these protocols prior to 2004, they would know prior
8 to 2004 how to locate it and educate themselves on it?

9 MR. CHRISTOPHER: Objection. Scope.

10 THE WITNESS: I have not reviewed what -- where
11 they could find the documentation; but, I mean, they
12 were available as part of the standard body. And if
13 they were IEEE members, they could have look at some of
14 these and perhaps look at the companies. So I couldn't
15 tell you for certain, but it is -- it's, you know,
16 available somehow.

17 (Discussion held off the record.)

18 MR. VANDENBURGH: Can we take a very short
19 break -- like five minutes, or would you rather take a
20 longer break?

21 THE WITNESS: Five is good right now, Counsel.

22 MR. VANDENBURGH: Are you okay with that,
23 Angelo?

24 MR. CHRISTOPHER: I'm good.

25 MR. VANDENBURGH: All right. Five minutes.

Page 38 1 (A recess is taken.) 2 BY MR. VANDENBURGH: 3 Q. Could you turn to Paragraph 81 of your 4 declaration, please. 5 A. May I use the electronic means, please? 6 Q. Yes, please. 7 A. Okay. Thanks. I appreciate that. 8 Which paragraph, Counsel? 9 Q. Eighty-one. 10 A. Eighty-one. Almost there. 11 Yes. 12 Q. So based on what's in this paragraph, is it 13 your opinion that one of the key goals of the '052 14 patent is to decouple computation from communication? 15 A. Yes. It's stated as such, and it's a very 16 important concept. 17 Q. Okay. And that goal is achieved by converting 18 a request from the module to the communication protocol 19 of the network; right? 20 MR. CHRISTOPHER: Objection to form. 21 THE WITNESS: Communication protocol of the 22 network. 23 Can you please explain that a little bit better 24 because I don't know what communication protocol are you 25 referring to. Are you talking about the standard	Page 40 1 '052 patent, it is the adapters that perform this 2 conversion from the protocol of the -- used by the 3 module and the protocol used by the network? 4 A. Let me answer that this way, that the 5 adapter -- adapters take the standard protocol -- when I 6 say "standard protocol," I mean OCPHI, whatever that -- 7 the other side is. It translates it into messages, and 8 then it sends to NI to packetize and depacketize. So NI 9 is the -- is responsible for talking to the nodes, to 10 the routers. 11 Q. The packetization is done in the embodiments of 12 the '052 patent in the -- in the network interface? 13 A. It's -- it's said as such, yes. 14 Q. But it's the -- it's the adapters that perform 15 the translation from the protocol of the module to the 16 protocol of the network? 17 MR. CHRISTOPHER: Objection to form. 18 THE WITNESS: Again, as I said, it translates 19 the standard interface protocols into messages outgoing 20 bound -- outbound, I should say. And then NI adds all 21 its magic for NoC. There are many steps that have to do 22 depending on how it's implemented. 23 BY MR. VANDENBURGH: 24 Q. And, of course, the adapter in some embodiments 25 of the '052 patent is actually inside the network
Page 39 1 interface, like OCP and others; or are you talking about 2 something else? 3 BY MR. VANDENBURGH: 4 Q. Actually, I -- in my view, the module's going 5 to be talking OCP or something like that; but isn't it 6 correct that in the network of the '052 patent, the 7 network itself also has a communication protocol? 8 A. It does. It does have its own networking 9 layers, yes. It does have its own networking layers, 10 so -- yes. So the interface to the standard protocol 11 right in the front and then it has its own networking 12 parameters and whatever, yeah. 13 Q. Okay. And -- and you seem hesitant to say that 14 what the network of the '052 patent communicates with is 15 a protocol. Is there a reason for that? 16 MR. CHRISTOPHER: Objection to form. 17 THE WITNESS: No. It's just, you know, the 18 terminology I -- I wasn't referring to anywhere in my 19 document. If I did, it means the same thing that we 20 just talked about. It means the means of communication 21 across the network. It's a lot more than just OCP. 22 It's a lot more than that. It has to do with routing 23 and other things. 24 BY MR. VANDENBURGH: 25 Q. Is it correct that in the embodiments of the	Page 41 1 interface; correct? 2 A. I believe that's the case. I can check, but I 3 believe that's the case. 4 Q. Okay. 5 A. The location of -- irrelevant in terms of what 6 it does, functionality. 7 Q. So at least in that embodiment, where the 8 adapter is inside the network interface, it's ultimately 9 then the network interface that performs the conversion 10 from the protocol of the module to the protocol of the 11 network? 12 MR. CHRISTOPHER: Objection to form. 13 THE WITNESS: Again, Counsel, I hate to refer 14 you to Figure 1. That's -- that's what it shows. 15 Basically, you have the standard interface going to the 16 box tagged as A; and it goes -- generates messages, and 17 NI deals with the routers. Now, they could be part of 18 the same entity or they could be different part. It's 19 not limiting to where they reside. 20 BY MR. VANDENBURGH: 21 Q. Well -- and the only reason I wasn't referring 22 to Figure 1 is that's an example where the adapters are 23 separate from the network interface; correct? 24 A. It's hard to say. If you're doing a logic 25 design, you could put all of them on one -- this is just

11 (Pages 38 to 41)



Page 42 1 to show structurally how they are separated, but 2 implementation-wise you could do whatever you want, but 3 it's definitely showing the structure of how that's 4 connected. 5 Q. Okay. And then to be more specific, Figure 3 6 shows an embodiment where the adapters are inside the 7 network interface; correct? 8 A. It is another form of a structural that's 9 representation of where they are. Depends how you want 10 to implement it. But it definitely show the 11 connections, the separation of components in terms of 12 how they're connected, and so on. It's a good roadmap 13 to design something like this. 14 Q. Okay. So in the embodiment of Figure 3, it is 15 the network interface that performs the conversion of -- 16 the protocol used by the modules to the protocol used by 17 the network? 18 MR. CHRISTOPHER: Objection to form. 19 THE WITNESS: I disagree with that. We have 20 these boxes called AXI A and B TLA. I think those are 21 the adapters. So they're still distinct structures 22 responsible for handling the -- the for lack of better 23 words, IPs or modules on one side. So we -- we have a 24 clear structure here as well on Figure 3. 25 ///	Page 44 1 Q. Okay. 2 A. Putting the border of the box -- it's just -- 3 just -- it's an implementation detail. 4 Q. Okay. 5 A. The functionality is -- is identical. Where it 6 resides there was more integration here giving another 7 embodiment so we can design it this way. It's 8 perfectly -- perfectly consistent with Figure 1, in my 9 opinion, as an engineer. And a POSITA would be the same 10 way. 11 Q. Then this embodiment of Figure 3 is an example 12 of a situation where the network interface is performing 13 the translation of the protocol used by the module and 14 the protocol used by the network; correct? 15 MR. CHRISTOPHER: Objection to form. 16 THE WITNESS: So it's really about the 17 integration. I don't see any difference in terms of 18 this embodiment than the other one in terms of just 19 where it's residing, but it's -- yes. If you put the 20 boundary for the network interface to include the 21 adapters, that's what this is. You put it out there 22 somewhere else as long as it's before the network 23 interface does its job. It cannot be on the other side 24 of the network interface. That's for sure. 25 ///
Page 43 1 BY MR. VANDENBURGH: 2 Q. Okay. 3 A. It just -- yeah. 4 Q. It's true, isn't it, that those adapters are 5 shown inside a box that's labeled "NI"; right? 6 A. Yes. I don't think -- it's possible that 7 that's the case, yes. I mean, it could be anywhere as 8 long as it performs the function of interfacing the 9 modules, as long as it's in the path of communication 10 from a module through all of this to the other side 11 through multiple routers. 12 Q. Can you take a look at Column 6, Line -- 13 starting on Line 56 of the '052 patent. 14 A. Fifty-six. Yes, sir. 15 Q. That paragraph starting at Line 56 is 16 describing Figure 3 of the patent; right? 17 A. Yes. 18 Q. And the -- one, two -- third sentence says, "In 19 this embodiment, the adapter units or the shells are 20 implemented as part of the network interface NI." 21 A. Correct. 22 Q. So does that help your understanding of 23 Figure 3 being the embodiment where the adapters are 24 part of the network interface? 25 A. Yeah. I'm not disputing that.	Page 45 1 BY MR. VANDENBURGH: 2 Q. All right. Let's go to Paragraph 111 of your 3 report. That's where you say that "In the context of 4 the '052 patent, a POSITA would understand that a 5 network (and thus an 'interconnect means') is a 6 multi-hop interconnection between modules separated by 7 one or more network nodes." 8 A. That's what I said, and that's what the 9 paragraph says. Yes. 10 Q. Okay. So just to confirm, prior to 2004 was 11 that the common, ordinary meaning of network? 12 MR. CHRISTOPHER: Objection to form. Scope. 13 THE WITNESS: I have not reviewed that 14 particular concept related to the statement for -- 15 before 2004; but, certainly, it's not in my report what 16 was called at that time. 17 BY MR. VANDENBURGH: 18 Q. You were a POSITA prior to 2004; correct? 19 A. I had exceeded a POSITA. 20 Q. Had you heard the word "network" prior to 2004? 21 A. Yes. Of course. 22 Q. And that general understanding of network -- 23 was that limited to a multi-hop interconnection between 24 modules separated by one or more network nodes? 25 MR. CHRISTOPHER: Objection to form and scope.

12 (Pages 42 to 45)



1 THE WITNESS: We're talking about multi-hop
2 network within a chip. The notion of networking has
3 been known for a long time. When I was at Bell Labs, we
4 had -- this is in the context of NoC. This is very
5 unique in that respect.

6 BY MR. VANDENBURGH:

7 Q. Okay.

8 A. I'm not denying that there is network and there
9 are different protocols.

10 Q. And that -- I'm not trying to trick you here.
11 I'm just trying to, you know, see if you'll agree with
12 me that network has been used prior to this patent to
13 refer to things other than multi-hop interconnections
14 between modules separated by one or more network nodes.

15 A. I thought you meant outside the '052. I
16 thought you -- within the scope of the '052, which is a
17 Network-on-Chip. We did not have that technology.

18 Q. Right. That's why I'm prefacing my questions
19 prior to 2004 because I'm outside the '052 patent.

20 Prior to 2004 the term "network" was used in
21 different ways and was not limited to a multi-hop
22 interconnection between modules separated by one or more
23 nodes; correct?

24 A. It's hard to say because a network in a -- in a
25 environment where you have -- well, a network where you

1 one or more nodes?

2 MR. CHRISTOPHER: Same objections.

3 THE WITNESS: If you call the network, it had
4 to do with the -- with the target application you're
5 talking about. So you had to -- you had to qualify,
6 What network are we talking about? Are we talking about
7 telephone networks? Are we talking about Internet
8 networks? So you have to qualify it with the type of
9 network you're talking about.

10 If -- if -- if you have to say just network --
11 broad definition of network, it was not -- I would say
12 not very clear to the person responding to it.

13 BY MR. VANDENBURGH:

14 Q. Prior to 2004 are you aware of any instances
15 where a set of components connected by buses was
16 referred to as a network?

17 A. It would have been a personal explanation by a
18 engineer. I -- I mean, I would call that a bus. I
19 would not call it a network.

20 Q. Are you -- you're under oath, sir. Are you --
21 are you -- can you testify as to whether you are aware
22 prior to 2004 of a collection of modules connected by a
23 bus being referred to as a network?

24 A. I would not call it as a network. And I was a
25 POSITA, and I've been working in this field for

1 send your emails is going through multi-hop network. So
2 that idea was known in a broader sense, not on a chip.

3 Q. You're, again, avoiding my question. I -- I
4 I'm not saying whether it might have been used to
5 encompass that.

6 What I'm asking you is, prior to 2004 was the
7 common, ordinary meaning of network limited to a
8 multi-hop interconnection between modules separated by
9 one or more network nodes?

10 MR. CHRISTOPHER: Objection to form and scope.

11 THE WITNESS: I really haven't looked into the
12 notion of network meaning a multi-hop interconnection
13 between modules that belong to the same IC or -- for an
14 integrated circuit, but having a multi-hop -- multi-hop
15 interconnection network has been around before. There
16 is no denying that in the general concept. All the
17 routers --

18 BY MR. VANDENBURGH:

19 Q. I'm going to try one more time. I'm not asking
20 you whether or not multi-hop interconnections between
21 modules separated by one or more nodes was known to be
22 an example of a network prior to 2004.

23 What I'm asking you is, prior to 2004 was the
24 common, ordinary meaning of network limited to a
25 multi-hop interconnection between modules separated by

1 45 years.

2 Q. Again, my question is, are you aware
3 personally, sitting here under oath, whether prior to
4 2004 a collection of modules connected by a bus was ever
5 referred to as a network?

6 MR. CHRISTOPHER: Objection to form and scope.

7 THE WITNESS: Sir, I -- I -- I think I
8 explained to you. I did not check with all the
9 engineers around me at the university and other places,
10 Do you call bus a network? No, I have not done that.

11 I would not call a bus a network. That's my
12 position. Did I -- a vote from all the engineers in
13 IEEE? No, I have not done that.

14 MR. VANDENBURGH: Angelo, should we take a
15 break and you could talk to the -- I will allow you to
16 talk to the witness about answering my questions.
17 Because I don't want to go the Board on the phone to
18 have to ask for an order requiring the witness to answer
19 my question. He can answer this question. He's
20 willfully refusing to.

21 Should we take a break?

22 MR. CHRISTOPHER: I totally disagree with your
23 characterization. I think he's answered the question as
24 best he could.

25 MR. VANDENBURGH: He has not answered my

1 question.

2 Let's just mark the transcript, and we'll
3 decide whether we're going to go to the Board on this
4 one because this is ridiculous.

5 BY MR. VANDENBURGH:

6 Q. Does the '052 patent expressly define what a
7 network is?

8 MR. CHRISTOPHER: Objection to form.

9 THE WITNESS: I can check. It talks about
10 Network-on-Chip, and it has a description of a network
11 in a -- named "Network-on-Chip." So anytime it talks
12 about Network-on-Chip, it's referring to the network
13 that they're talking about.

14 BY MR. VANDENBURGH:

15 Q. I'm asking whether there is a definition of
16 network in the '052 patent.

17 MR. CHRISTOPHER: Same objection.

18 THE WITNESS: It's describing its limitation of
19 the buses and others. It talks about routers, nodes for
20 connecting. So it is defining it in not exactly one
21 sentence but in multiple places that I see.

22 BY MR. VANDENBURGH:

23 Q. Okay. What sentences specifically do you
24 believe define network in the '052 patent?

25 MR. CHRISTOPHER: Objection to form.

1 THE WITNESS: It's an embodiment of that
2 network, and it's good enough for a POSITA to understand
3 what that network they're talking about is. It's
4 not about -- shows that.

5 BY MR. VANDENBURGH:

6 Q. Okay. So what aspects of Figure 1 do we read
7 into the claims, and what do we not?

8 MR. CHRISTOPHER: Objection to form.

9 THE WITNESS: You got the master, then the
10 slave. You got the -- I think it's called processing
11 modules M and S. I think that's what referring to. It
12 talks about the network. So it's referring to that
13 figure with -- with the letter N. And so -- you know,
14 those are the things that I see.

15 BY MR. VANDENBURGH:

16 Q. Okay. Let's talk about -- you've mentioned --
17 we've talked about multi-hop and hops.

18 Did the term "hop" have an ordinary and
19 customary meaning prior to 2004?

20 MR. CHRISTOPHER: Objection to form.

21 THE WITNESS: I have not checked that, but I --
22 I know what a hop is before 2004. I knew that.

23 BY MR. VANDENBURGH:

24 Q. Did it have only a single meaning prior to
25 2004?

1 THE WITNESS: It's a body of paragraphs and
2 sentences. There is not a one single place that it says
3 so.

4 BY MR. VANDENBURGH:

5 Q. Okay. And I think that's maybe the -- so there
6 is not one single place where the patent defines a
7 network; correct?

8 MR. CHRISTOPHER: Objection to form.

9 THE WITNESS: I disagree with that.

10 BY MR. VANDENBURGH:

11 Q. Okay. Can you point me to that one specific
12 place, then.

13 A. Go to Figure 1 description. I'll read it to
14 you. It's Column 5, Line 6. Picture is better than a
15 word -- a sentence. Shows a Network-on-Chip according
16 to a first embodiment.

17 And it talks about the master-slave. It talks
18 about network interface. It talks about adapters. What
19 else does one to know?

20 Q. All right.

21 A. That by itself is very clearly a description of
22 the network they're talking about.

23 Q. Okay. So you consider that description of
24 Figure 1 to be a definition of a network?

25 MR. CHRISTOPHER: Objection to form.

1 MR. CHRISTOPHER: Same objection.

2 THE WITNESS: I have not checked that.

3 BY MR. VANDENBURGH:

4 Q. Okay. How many meanings are -- can you give me
5 right now that you're aware of prior to 2004?

6 MR. CHRISTOPHER: Objection to form and scope.

7 THE WITNESS: Referring to Figure 1, NI leaves,
8 the packet leaves, goes to the first router. That's one
9 hop. Goes to the other one. That's the second hop.
10 And then after that, it's a third hop. So try -- okay.
11 Go ahead. I think that's my answer.

12 BY MR. VANDENBURGH:

13 Q. So I was asking you prior to 2004, when this
14 patent application didn't exist, and you answered
15 relative to the patent. But are you basically saying,
16 well, prior to 2004 you were aware of hop being used in
17 the way it's used in the '052 patent?

18 A. Okay. The notion of packets and networking
19 with packets goes back to the Internet. So we've been
20 doing hops of packets outside the chip. It's a
21 well-known -- and it's been part of the courses in
22 networking. So it's been well-known to the POSITA. So
23 I'm not saying that the notion of hop was invented in
24 2004. That's not --

25 Q. I'm not -- okay. Okay. And that's good. I

1 appreciate that.

2 I'm also just talking about literally the word
3 "hop." Was the word "hop" used in networking prior to
4 2004?

5 A. Yes. It's a -- it's a -- you know, it's a term
6 of art for networking -- computer networking. NoC is
7 computer networking inside of a chip with all its
8 limitations. And the '052 very nicely describes why it
9 makes sense, what are some of the limitations, and so
10 on. So it's -- it is what it is, yeah.

11 Q. Are you aware of specific instances prior to
12 2004 where the word "hop" was used to describe
13 information moving between routers?

14 A. Where?

15 Q. In anywhere. Any sort of networking.

16 A. Not inside of a chip.

17 Q. Okay.

18 A. I'm asking -- I'm getting clarification.

19 Q. Yes. Yes. Yes. No.

20 In -- in any networking field was the -- are
21 you aware of the word "hop" being used to describe data
22 information moving between routers?

23 A. I think I addressed that. It's been known for
24 computer-level networks. What I mean -- a server
25 somewhere, Voice over IP, all kinds of stuff. Yes,

1 the packets are moving from one link to another router.

2 Q. Okay. How many times does the word "hop"
3 appear in the patent?

4 A. Zero times.

5 Q. Well, that can't be right.

6 A. What do you mean? Oh, there is a multi-hop
7 network. Sorry. So the word "multi-hop" is used,
8 correct.

9 Q. How many times is the word "multi-hop" used?

10 A. I think it's just one incident, Column 2,
11 Line 35.

12 Q. And in your view, is that a definition of
13 multi-hop?

14 MR. CHRISTOPHER: Objection to form.

15 THE WITNESS: It's not a -- it's -- it doesn't
16 say multi-hop is defined as such; but when you read the
17 body of this patent, you understand what they're talking
18 about. The POSITA would understand that.

19 BY MR. VANDENBURGH:

20 Q. So you don't agree that that sentence describes
21 multi-hop as a situation where communication modules are
22 not directly connected but are separated by one or more
23 network nodes?

24 MR. CHRISTOPHER: Objection to form.

25 THE WITNESS: That's one indication of what the

1 it's -- "hop" is not a new term of art. It's been
2 around for 30 years.

3 Q. Okay. Are you aware of the word "hop" being
4 used to describe data moving between anything other than
5 routers prior to 2004?

6 A. I have not checked that. No. I don't know.

7 Q. How about since then? Are you aware of the
8 word "hop" ever being used to describe data moving
9 between things other than routers?

10 A. It's not something I looked into. It is
11 possible. I've not looked into it. It is possible, and
12 I would not be surprised if somebody does that. But
13 I've not checked that.

14 Q. Is it your opinion that the '052 patent
15 expressly defines what a hop is?

16 MR. CHRISTOPHER: Objection to form.

17 THE WITNESS: Yes.

18 BY MR. VANDENBURGH:

19 Q. Okay. Again, is there -- how many times does
20 the word "hop" appear in the patent?

21 A. I'm not sure, but the -- it doesn't appear; but
22 the way it's explained, as far as the routers are
23 concerned -- you could easily use the word "hop" in
24 there. It's not a -- limiting that the word "hop" is
25 not used. It's just another terminology to show that

1 multi-hop is. It says so.

2 BY MR. VANDENBURGH:

3 Q. Do you accept that as a definition of
4 multi-hop?

5 MR. CHRISTOPHER: Objection to form.

6 THE WITNESS: It's -- it clearly explains what
7 a multi-hop is. There could be other definitions or
8 explanation in this document. But, certainly, it is
9 communication means of not directly connecting. And it
10 takes one or more network nodes. I mentioned that
11 several times in my report.

12 BY MR. VANDENBURGH:

13 Q. And just to confirm, this is the only instance
14 where either hop or multi-hop appears in the patent;
15 correct?

16 A. When I search that's the only place I saw.

17 Q. Let's talk about the word "node."

18 A. Sure.

19 Q. What's a node?

20 MR. CHRISTOPHER: Objection to form.

21 THE WITNESS: In the context of '052, you mean;
22 right? Or in general?

23 BY MR. VANDENBURGH:

24 Q. Actually, I want to -- I want to ask about
25 both. So which would you like to start with?

Page 58 1 A. You're asking questions, Counsel. You decide. 2 Q. All right. Let's -- let's start with in 3 general. What is a node? 4 A. Okay. How much time do we have? 5 A node could be a computer node. A processing 6 element could be a node. I'm going to stop there. 7 Q. Okay. I -- and maybe we can shortcut this. 8 Outside of the '052 patent, you would agree 9 with me that the word "node" is not limited to routers 10 or switches? 11 MR. CHRISTOPHER: Objection to form. 12 THE WITNESS: It -- it is probably 13 predominantly called -- routers and switches called 14 nodes. 15 Now, I've seen that all over the publications. 16 But depending on the -- the context of what you're 17 talking about, a node could be a processing element. So 18 you -- you have to look at the context of the 19 discussion, the documentation, what you're referring to. 20 BY MR. VANDENBURGH: 21 Q. Does the '052 patent define "node"? 22 MR. CHRISTOPHER: Objection to form. 23 THE WITNESS: Yes. It talks about separated by 24 one or more network nodes. And then we go back to that 25 infamous Figure 1 and we see the two nodes, the two	Page 60 1 on-chip interconnects, like bus, switches, 2 point-to-point wires, where the communication modules 3 are directly connected in an NoC, the modules 4 communicate remotely via network nodes. 5 So establishing where the network nodes are. I 6 think that's a very clear definition. So if I move 7 on -- would you like me to stop here or -- 8 Q. No. Well, what I'm trying to understand is 9 whether the instances where network node appears 10 constitute a definition of network node. 11 And so starting with that instance where 12 network node is used, do you consider that -- that 13 itself to be a definition of what a network node is? 14 MR. CHRISTOPHER: Objection. Form. 15 THE WITNESS: The POSITA who would be -- who 16 would understand networking concepts will understand 17 that. 18 BY MR. VANDENBURGH: 19 Q. Were those cited to be a definitional sentence 20 of what a network node is? 21 MR. CHRISTOPHER: Same objection. 22 THE WITNESS: I -- I don't see a sentence 23 saying, Now we're defining network nodes, no. 24 If you look at the body of this and the 25 figures, you will understand what the network node is.
Page 59 1 routers. So then you say that's what it's referring to. 2 Yes. '052 clearly talks about network nodes, not 3 processing nodes. And these are routers. 4 BY MR. VANDENBURGH: 5 Q. How many times does the word "network node" 6 appear in the '052 patent? 7 A. Okay. I'm really glad we have the electronic 8 version. 9 Twice. 10 Q. Let's talk about both of them. 11 Where are those? 12 A. The first one is in the background of the 13 invention, which would be Column 1, Line -- starting 14 with Line 54, I guess, or 53. Actually, a little 15 higher. Fifty. The sentence starts at Line 50. 16 Would you like me to read it for the record 17 or -- 18 Q. Sure. Yeah. Let's do that. 19 A. I have to go a little higher. 20 "Using network" -- "networks for on-chip 21 communication" -- I'm reading from Line 48 now because 22 it refers to the next sentence. 23 When designing systems on the chip (SoC), 24 however raises a number of new issues that must be taken 25 into account. This is because, in contrast to existing	Page 61 1 It's very clear to me in that respect. But there is not 2 a single sentence saying, Now I'm defining what a 3 network node is. 4 BY MR. VANDENBURGH: 5 Q. Turn to Paragraph 114 of your report. And I 6 think you've indicated this before, that your opinion is 7 that the claims of the '052 patent all require routers 8 or switches; is that correct? 9 MR. CHRISTOPHER: Objection to form. 10 THE WITNESS: It is a multi-hop network. And 11 to implement a multi-hop network, you do need those 12 routers and switches. That's the common practice for 13 designing NoCs. That's what we did. 14 BY MR. VANDENBURGH: 15 Q. So let -- and then, conversely, then, if a 16 system doesn't have routers or switches, it can't be 17 covered by the '052 patent; correct? 18 MR. CHRISTOPHER: Objection to form and scope. 19 THE WITNESS: I have not looked into what other 20 mechanisms one could use for routers and -- and 21 switches; but I just looked at '052, where there could 22 be some other ways of doing it. I'm sure buses and 23 point-to-point connections will not be the case; but if 24 you want to implement the routers some other way, 25 possible. You have to have packets going to --

16 (Pages 58 to 61)



1 BY MR. VANDENBURGH:

2 Q. You have -- okay.

3 You have to have packets. You agree with that.
4 And you agree you have to have something that you could
5 call a router or a switch?

6 MR. CHRISTOPHER: Objection to form.

7 THE WITNESS: It's very clear that if you send
8 packets, you have to go from indirect communication
9 across the network. So -- and that's what the sentence
10 is. Whether there are other methods that are not buses
11 or -- I've not looked into that.

12 BY MR. VANDENBURGH:

13 Q. Under oath your testimony is, "A multi-hop
14 network, otherwise known as an interconnect means, is a
15 type of interconnect where data is transmitted from a
16 source to a destination through one or more intermediate
17 routers or switches."

18 That is your testimony under oath; correct?

19 A. No. Or hops. You didn't read the last --

20 Q. Okay.

21 A. My testimony -- I've signed that document,
22 Counsel.

23 Q. Okay. And so can something be a hop and not
24 be -- not involve a router or a switch?

25 A. I've not looked into that, Counsel.

1 Q. Okay. So you can -- you're not disputing --
2 if, for example, our expert says that a hop can be
3 something other than a router or a switch, you're not
4 disputing that?

5 MR. CHRISTOPHER: Objection to form.

6 THE WITNESS: It would be hard to imagine that
7 it is something like a bus; but if it's something else
8 that does the routing, it's -- it is going -- I mean, it
9 could be something else; but it's not a bus. That's for
10 sure. That I -- that. So...

11 BY MR. VANDENBURGH:

12 Q. But you're not saying that you have to have a
13 router or a switch to fall within the scope of the
14 claims of the '052 patent; correct?

15 A. Counsel, I have not seen an NoC that did not
16 have a router or switches. Now, if somebody is working
17 on something like that that is not a bus and is not a
18 router, I would be glad to review that.

19 Q. Let me ask this.

20 Do you have to have both a router and a switch
21 to infringe the '052 patent?

22 MR. CHRISTOPHER: Objection to form and scope.

23 THE WITNESS: It's the implementation detail.
24 Some routers have crossbar switches -- you can look at
25 some of the references I have -- and it could be not

1 implemented that way. But it has to generate packets,
2 receive packets, and do the routing.

3 BY MR. VANDENBURGH:

4 Q. So you could have -- you could have just a
5 switch and be covered by the claims of the '052 patent?

6 MR. CHRISTOPHER: Objection to form.

7 THE WITNESS: Well, the switch -- if it does
8 the functionality of the router -- because it has to do
9 routing algorithms and so on. It's a little confusing
10 to say just a switch. But it does the function of the
11 router with all the bells and whistles for the protocol.

12 You mentioned the word "protocol." It's not just
13 connecting. It has a lot of other stuff going on. It
14 has to handle flow control. It has to deal with virtual
15 storage and so on. So yeah. If it does what the router
16 does, then that switch is a router.

17 BY MR. VANDENBURGH:

18 Q. So you mentioned that you have to have a
19 routing algorithm; is that right?

20 What is a routing algorithm?

21 A. I have like half a dozen papers on that.

22 It's a method of finding the destination for
23 the packet. It's the address on the envelope. If you
24 think of a packet as mail being sent from one house to
25 another house or to another organization, it's the

1 address. And then if I use the word -- postman
2 basically moves that to the site for the post office.
3 Then it gets mapped. It gets routed to somewhere else.
4 So it's the address. So we need to follow the address.

5 And what algorithm you use is the routing
6 algorithm, and that's what -- we worked on that for ten
7 years.

8 Q. You'll agree with me that -- well, let's start
9 with this -- strike all that.

10 It sounds like your opinion is you can't
11 practice the claims without using a packet, packet-based
12 communication; is that correct?

13 A. Packetization is -- it's a hallmark of NoC. I
14 mean, that's -- that's basically it. But you could use
15 an NoC some other ways, but the packet is always
16 synonymous with NoC, but I'm not saying -- not always.
17 Most of the -- most of the time, yes.

18 Q. Yes or no. Do the claims of the '052 patent
19 require packetization?

20 MR. CHRISTOPHER: Objection to form.

21 THE WITNESS: They used to have packets because
22 that's what '052 talks about, packets.

23 BY MR. VANDENBURGH:

24 Q. You'll agree with me that the word "packets"
25 don't appear in the claims of the '052 patent?

Page 66 1 A. I don't have to check. It doesn't. 2 Q. Okay. Is there a single sentence that 3 defines -- strike that. I think I got ahead of myself. 4 Is there a particular word in the claims that 5 you are using to read in a requirement for packets into 6 the claims? 7 MR. CHRISTOPHER: Objection to form. 8 THE WITNESS: Let me check to see. 9 Okay. We have six incidents of packet or 10 packets used in the '052. Packets -- go over that with 11 you, Counsel? Is that okay? 12 BY MR. VANDENBURGH: 13 Q. I'm going to get back to that, but my question 14 actually related to the claims. 15 A. Oh, to the claims. 16 Q. What I'm asking you is, is there a particular 17 word or phrase in the claims that you believe justifies 18 reading a requirement for packets into the claims? 19 MR. CHRISTOPHER: Objection to form. 20 THE WITNESS: When it talks about interconnect 21 means, it's referring to a packetized network with 22 multi-hops. 23 BY MR. VANDENBURGH: 24 Q. Okay. So you are -- you view interconnect 25 means as being -- requiring packets; is that correct?	Page 68 1 paragraph should be read. 2 Q. Okay. So it is your opinion that the 3 requirement for packets should be read into the claims 4 through the word "interconnect means"? 5 MR. CHRISTOPHER: Objection to form. 6 THE WITNESS: I've stated as such here. I -- I 7 can read it again. But a POSITA would understand. I 8 think that's the most important part. So a POSITA 9 reading the claims would understand that it's a 10 multi-hop network and originates packets, receives 11 packets, and so on. 12 BY MR. VANDENBURGH: 13 Q. All right. Now let's go back to where I think 14 you started to head before, which is, is there a 15 definition of interconnect means that uses the word 16 "packets" in the '052 patents? 17 MR. CHRISTOPHER: Objection to form. 18 THE WITNESS: So let's go -- I have six 19 incidents of that word "packet." So we can go through 20 that one by one, Counsel. Is that okay? 21 BY MR. VANDENBURGH: 22 Q. Sure. 23 A. Let's parse this. 24 So the first incident of packet is Column 1, 25 Line 28. I'm going to read it and try to explain to you
Page 67 1 A. Just one second, please. Sorry. Just -- yes. 2 As I stated in 114 -- Paragraph 114, a POSITA would 3 understand that a hop is a router switch that a packet 4 originating from arbitrary protocol may traverse. So 5 yes, that's my understanding. And I've stated as such 6 in the report. 7 Q. Okay. The word "interconnect means" does not 8 appear in that sentence. 9 I was asking you whether -- if the word 10 "interconnect means" that you are relying on to read the 11 word "packet" into the claims. 12 MR. CHRISTOPHER: Objection to form. 13 THE WITNESS: The word "interconnect means" 14 does not appear in that sentence that I just read? Is 15 that what you're asking me, Counsel? 16 BY MR. VANDENBURGH: 17 Q. No. I stated that as a fact. I assumed you 18 would agree with me that the words "interconnect means" 19 do not appear in that sentence. 20 A. I'm reading 114. It says, "Multi-Hop network 21 (i.e., interconnect means) is a type of interconnect." 22 It's in the parentheses. 23 Am I missing something here? 24 Q. Yeah. You read the second sentence of 114. 25 A. Okay. Sorry about that. So the whole	Page 69 1 how I see that or a POSITA would see that. 2 "The routers are transport packets of data from 3 one network interface to another." 4 So a POSITA reading this would understand these 5 routers are sending packets to each other. Such a 6 packet consists of one or more flits. That's even more 7 than what you asked. So flits are being transferred. 8 So that's the first incident that quite clearly says 9 what they're doing. 10 Q. Okay. And to be clear, though, just -- this 11 isn't describing the embodiment of Figure 1; correct? 12 MR. CHRISTOPHER: Objection to form. 13 THE WITNESS: I -- I believe so. 14 BY MR. VANDENBURGH: 15 Q. Okay. All right. Next instance. 16 A. Continuation of that, yeah. 17 So the next hit I have is Column 6, Line 30. 18 Yeah. The NIs -- sorry -- the network interfaces, NIs, 19 are responsible for packetization and depacketization. 20 So it's the -- open the envelope, put the data in the 21 envelope. It's both functions. For implementing the 22 connections and services. So I think it's another 23 incident why interconnect -- interconnection means 24 refers to these multi-node hops and packetizations all 25 intertwined with understanding a POSITA would have from

18 (Pages 66 to 69)



Page 70 1 '052. 2 I can go to the next incident. I -- 3 Q. Hang on. Just before we move on, I just want 4 confirm. Again, that's an instance that's describing 5 the embodiment of Figure 1; correct? 6 MR. CHRISTOPHER: Objection. 7 THE WITNESS: Figure 1 is -- is -- yes. It -- 8 but it's not limited to that. 9 BY MR. VANDENBURGH: 10 Q. Correct. 11 A. It could be any -- 12 Q. And it's in the section of the patent that is 13 described -- that is called "Description of the 14 Preferred Embodiments"; correct? 15 A. Preferred embodiment. Let's see. Do you have 16 the line for that? 17 Q. Yeah. It's back on Column 4, Line 4. 18 A. Column 4, Line -- 19 Q. -- 4. 20 A. -- 4. Sorry. 21 So it's -- it's one of the embodiments, yes. 22 Q. So it's in the section labeled "Description of 23 the Preferred Embodiments"; correct? 24 A. I believe that's what it says. Line 4. I 25 don't see the word "embodiment." What am I missing? My	Page 72 1 A. Okay. Let's see one more time. And I think 2 this is Column 6 again. Yeah. It talks about 3 conversion of the packets to the standard interfaces. 4 That's -- we talked about that. That's Figure 1. I 5 think we've gone through this several times; but if you 6 want, I can read it. 7 "The network interface (NI) provides a 8 conversion of the packet-based communication of the 9 network (N) to the higher-level protocols that have 10 interfaces that the IP modules of Figure 1 use." 11 And that's about it. There is one last one -- 12 Q. Hang on. Hang on. Let's take a breath there. 13 First of all, you -- for the record, you just 14 read from Column 6, Lines 61 to 64; correct? 15 A. Sixty -- yes. 16 Q. Okay. And, again, that sentence is in 17 connection with actually discussing Figure 3 of the 18 patent; correct? 19 A. It -- okay. Well, it says -- let me read what 20 it says there. 21 "In Figure 3 a block diagram of network 22 interface according to the second embodiment." This is 23 the second embodiment. "The network interface (NI) 24 according to" -- so this is the second embodiment. I 25 think it's because the eight -- the -- the adapter is --
Page 71 1 Column 4? What line, Counsel? Column 4 -- 3? 2 Q. Forty. 3 A. Forty. I'm sorry. Yeah. Yes. I see the 4 title, yes. 5 Q. Okay. So you agree that the description -- 6 this next description of packetization you referred to 7 is in the section of the patent titled "Description of 8 the Preferred Embodiments"? 9 A. It's there. 10 Q. Okay. Now, let's go on to the other remaining 11 ones that you identify. 12 A. Yes. Sorry. 13 I think I've covered the one on Column 6, 14 Line 30; but I'll -- I'll go over it again. 15 The network interfaces, NI, are responsible for 16 packetization and depacketization for implementing the 17 connections and services for altering the standard 18 interface, such as OCP. 19 So on to the IP modules connected to the NoC. 20 So, again, it's telling you the NIs that are part of 21 that Figure 1 handle packetization and the reverse of 22 that. 23 Q. All right. That's the one you already talked 24 about. Let's go on to the last instance where packet 25 appears in the patent.	Page 73 1 is part of the NI. 2 Q. Okay. So when it's talking about packet-based 3 communication in that paragraph in Column 6, Lines 56 to 4 64, it's talking about the second embodiment of the 5 patent? 6 A. Yes. It's -- it states as such at the 7 beginning of that paragraph. 8 Q. And is that -- are there any other instances 9 where packet is talked about in the patent? 10 A. One more incident, Counsel; and that happens 11 Column 7, Line 30, I guess. I can read it for the 12 record. 13 "The NI kernel provides the basic 14 functionality, including arbitration between 15 connections, ordering, end-to-end flow control, and 16 packetization." 17 So, again, supports previous discussions for 18 these other two embodiments. 19 Q. So, again, a discussion of packetization in the 20 context of the preferred embodiments; correct? 21 A. And the second embodiment, Figure 3. 22 Q. Yes. Okay. 23 A. That's all I have. 24 Q. And do you rely on that sentence to -- to 25 support the idea that packetization is a required

19 (Pages 70 to 73)



Page 74 1 element of the claims? 2 MR. CHRISTOPHER: Objection to form. 3 THE WITNESS: The totality of the '052 is what 4 tells POSITA what's going on, not just those paragraphs. 5 BY MR. VANDENBURGH: 6 Q. Okay. You will agree with me that packets are 7 not referred to in the '052 patent outside of the 8 section entitled "Description of the Preferred 9 Embodiments"? 10 A. I think -- I think that's what it shows from my 11 search. It's those columns that I stated earlier. And 12 we established that -- that's about it. 13 Q. Move on with different topic. 14 Could you turn to Paragraph 146 of your report. 15 A. Okay. Just -- I'm there. 16 Q. And I actually want to ask you about Limitation 17 6.3.2, which is reproduced immediately above 18 Paragraph 146. 19 Do you see what I'm talking about? 20 A. Yes. 21 Q. Okay. I -- I find that paragraph very 22 difficult to follow and -- and to parse, to use the word 23 that you used earlier. 24 Let me start by asking you this. Do you think 25 that paragraph is clear?	Page 76 1 try to pull that exhibit up. 2 A. Is it one zero -- 2050? 3 Q. It should be 1050. It's the only document in 4 the chat, so... 5 THE WITNESS: Okay. Angelo, I don't have it on 6 my -- 7 MR. CHRISTOPHER: Do you have it -- if you have 8 the Zoom, you should be able to click "chat" and you'll 9 see -- 10 THE WITNESS: But it's not on the things that I 11 had already loaded; right? 12 MR. CHRISTOPHER: Correct. 13 Derek, this is a new exhibit; correct? 14 MR. VANDENBURGH: Correct. Correct. 15 THE WITNESS: Okay. Thank you for 16 clarification. Because I was looking at -- let me -- 17 Counsel, let me save this. 18 Okay. Now it's in my -- so it's just Element 6 19 highlighted. 20 BY MR. VANDENBURGH: 21 Q. Correct. Correct. 22 Do you have -- do you have Exhibit 1050 open? 23 A. Yes. 24 Q. Okay. So what I'm hoping we can do is get 25 agreement on how we should parse Element 6.pre.2 of the
Page 75 1 A. Yes. 2 MR. CHRISTOPHER: Objection to form. 3 BY MR. VANDENBURGH: 4 Q. And you understand what it covers and doesn't 5 cover? 6 MR. CHRISTOPHER: Same objection. 7 THE WITNESS: Yes. Of course. 8 MR. VANDENBURGH: Okay. Actually, I've got -- 9 I've got an exhibit I want to get my hands on here, but 10 it's after one o'clock Minnesota time. I wouldn't mind 11 taking a break for lunch at this point. 12 Is that acceptable with people? 13 MR. CHRISTOPHER: I don't think we have our 14 lunch here, but we could go off the record and talk 15 about it. 16 MR. VANDENBURGH: Let's go off the record. 17 THE WITNESS: Okay. 18 (A recess is taken.) 19 MR. VANDENBURGH: All right. I have -- Aaron 20 has put in the chat a document that I have marked as 21 Deposition Exhibit 1050. 22 (Whereupon the document referred to is marked 23 by the reporter as Exhibit 1050 for identification.) 24 A. Do I have that? 25 Q. Dr. Bagherzadeh, can you look in the chat and	Page 77 1 claims and specifically of Claim 6. So what I've done 2 is I've added some paragraph breaks and I've added some 3 brackets in a way that I think might be the appropriate 4 way to parse this paragraph. But I just want to see 5 where you and I agree and disagree. 6 A. Okay. 7 Q. So you agree the very first paragraph I've got 8 there is unchanged from the claim. 9 It reads, "Wherein at least one first of said 10 processing modules (M) requests at least one 11 communication service to at least one second processing 12 module (S)." 13 Do you agree that's the -- that's the first 14 requirement of Limitation 6.pre.2? 15 A. Seems correct, yes. 16 Q. Okay. Then the claim language goes on to just 17 say, "Based on specific communication properties and at 18 least one communication service identification." 19 I want to get clarity as to what needs to be 20 based on those two things. 21 Am I correct, as I've drafted it here, that 22 what the claim is saying is that the request is based on 23 specific communication properties and at least one 24 communication service identification? 25 MR. CHRISTOPHER: Objection to form.

20 (Pages 74 to 77)



1 THE WITNESS: The word "request" doesn't appear
2 in the preamble; right?

3 BY MR. VANDENBURGH:

4 Q. Correct.

5 A. Request is. So I don't know why you're
6 inserting here -- is it on behest of the processing
7 modules? Because the previous sentence talks about
8 this. It refers to that; right?

9 Q. Let me maybe take a step back.

10 A. Yeah.

11 Q. And if you just want to turn to claim -- your
12 copy of Claim 6 in the patent.

13 A. Okay.

14 Q. And you see at Line 11 there is the phrase,
15 "Based on specific communication properties and at least
16 one communication service identification."

17 Do you see that?

18 A. At least on one communication service to at
19 least one second processing module.

20 Is that what you're referring to?

21 Q. I'm referring to the portion of Claim 6, Column
22 10, starting at Line 11, that reads, "Based on specific
23 communication properties and at least one communication
24 service identification."

25 Do you see that?

1 MR. CHRISTOPHER: Objection to form.

2 BY MR. VANDENBURGH:

3 Q. Are you going to refuse to answer my question?

4 A. No. Counsel, I'm thinking. Do I have a chance
5 to think about this?

6 Q. You told me earlier this was clear and you
7 understood it.

8 A. I do understand it. I'm just trying to see if
9 my understanding is going to be different from what I've
10 reported.

11 I just -- so M is requesting. Do we agree with
12 that?

13 Q. I'm asking for your opinion. So you're saying
14 that the "based on" refers to the module, or are you
15 saying it refers to the request?

16 A. The modules request.

17 Q. Okay. So the -- the requests need to be based
18 on specific communication properties and at least one
19 communication service identification?

20 MR. CHRISTOPHER: Objection to form.

21 THE WITNESS: The request initiates the process
22 of those services. Now, at what point the information
23 about the specific communication properties are passed
24 on, this could be part of the network interface
25 engagement with -- with this. So I -- I'm assuming that

1 A. Yes.

2 Q. My question for you is, what is based on
3 specific communication properties and at least one
4 communication service identification?

5 A. So the initiator (M) is requesting. That's for
6 sure; right? Because that's how the whole thing starts.

7 Q. So is it correct that it requests based on
8 specific communication properties and at least one
9 communication service identification?

10 MR. CHRISTOPHER: Objection to form.

11 THE WITNESS: I -- I believe that the request
12 initiates this process; but then there are communication
13 services IDs, travel, address range; and then depending
14 on what particular needs there are, it would select
15 certain connections to satisfy the requirements, whether
16 it's the best effort, whether it's the latency, and so
17 on.

18 BY MR. VANDENBURGH:

19 Q. You're jumping ahead to other limitations of
20 the claim, and maybe you're doing that intentionally to
21 not give a clear answer, but let me just -- I'm just
22 trying to parse the claim language. And when I read the
23 portion of the claim, starting at where it says, "based
24 on," I'm just trying to understand, as you parse that
25 language, what needs to be based on those two things.

1 the request comes along and in a -- we will tell that we
2 want certain services; and we expect this kind of a
3 delay, a latency, and it will be handled by the next
4 layer.

5 BY MR. VANDENBURGH:

6 Q. Again, I'm just trying to understand how to
7 parse this language. If I want to understand what needs
8 to be based on specific communication properties and at
9 least one communication service identification, what
10 does this claim tell me I should look to?

11 MR. CHRISTOPHER: Objection to form.

12 THE WITNESS: It tells you to look into the
13 particular communication properties and service
14 identification. Those are the two things that are being
15 discussed here. And it was initiated by M.

16 BY MR. VANDENBURGH:

17 Q. Yeah. There is a -- there is a request from
18 the module M; right?

19 A. Yes.

20 Q. And then a request is for at least one
21 communication service; right?

22 A. At least one communication service.

23 Q. And --

24 A. Yeah.

25 Q. -- that request, at least one communication

Page 82 1 service, is to at least one second processing module; 2 right? 3 A. That's what it says, the first two modules, 4 yeah. 5 Q. Okay. And then it goes on to say, "Based on 6 specific communication properties and at least one 7 communication service identification." 8 I'll try one more time. What is based on those 9 two things? Can you tell me? 10 MR. CHRISTOPHER: Objection to form. 11 THE WITNESS: It's part of the process of 12 providing those communication services and properties to 13 that requester. So -- 14 BY MR. VANDENBURGH: 15 Q. Okay. 16 A. The requester expects those capabilities, 17 basically, specific communication properties; and they 18 have to provide the communication service 19 identification. 20 Q. You use the word "requester." What element of 21 the claim are you talking about when you refer to the 22 requester? 23 A. M -- 24 Q. Okay. 25 A. -- the process --	Page 84 1 BY MR. VANDENBURGH: 2 Q. To the previous portion of the sentence, 3 correct. 4 A. Well, the request has other parameters. It has 5 to provide the communication service identification. It 6 has to have information about the communication 7 properties. And it kind of enhances the request with 8 those two pieces of information. 9 Q. Okay. So if we go back, then, to Exhibit 1050, 10 if I understood your answer, you basically agree with 11 how I've done that, that it's the module's request that 12 is based on specific communication properties and at 13 least one communication service identification. 14 Do you agree with that? 15 Maybe I should put the word "module" in there, 16 but it's the -- it's the module's request that's based 17 on those two things? 18 MR. CHRISTOPHER: Objection to form. 19 THE WITNESS: The modules -- well, I can search 20 the -- the patent to make sure that I understand this 21 preamble better in case there is something here that I'm 22 missing. Okay? 23 BY MR. VANDENBURGH: 24 Q. Take all the time you want. 25 A. Yeah. I think so.
Page 83 1 Q. So the -- the processing module's request needs 2 to be based on specific communication properties and at 3 least one communication service identification? 4 MR. CHRISTOPHER: Objection to form. 5 THE WITNESS: It's -- it's -- basically, the 6 request starts the process. And at some point, based on 7 the communication service ID and the available 8 communication properties, those requests get handled to 9 the expected requirements, whether it's some 10 specification. And I think you didn't want me to go 11 there, but there are certain requirements in terms of 12 meeting those requirements in terms of -- 13 BY MR. VANDENBURGH: 14 Q. I'm going to get to those at some point, and 15 I'm trying to take this in order and just parsing 16 English words. 17 I'm trying to -- can you tell me, based on just 18 a matter of grammar, what needs to be based on specific 19 communication properties and at least one communication 20 service identification as recited in Element 6.pre.2. 21 MR. CHRISTOPHER: Objection. Form. 22 THE WITNESS: So you're saying -- those two 23 clauses, specific communication properties and at least 24 one communication service identification -- how are they 25 tied to the previous sentence?	Page 85 1 So there is -- there is a -- I want to refer 2 you to Column 4, Line 7. 3 "Moreover, said at least one network interface 4 comprises a mapping needs for mapping the requested at 5 least one communication service based on a specific 6 communication properties to a connection based on the 7 connection properties according to at least one 8 communication service identification." 9 So it is referring to the requester that is for 10 mapping the requested at least one communication service 11 based on the specific communication property. So it -- 12 it provides that capability on -- for the requesters. 13 Q. Okay. I appreciate that specification sense, 14 and there is a different part of the claim that talks 15 about mapping and I think uses that exact same language. 16 But I'm trying to understand 6.pre.2. Let's take a step 17 back. 18 You understand that claims need to inform the 19 public how to practice the claimed invention and how to 20 avoid the claimed invention; correct? 21 MR. CHRISTOPHER: Objection to form. 22 THE WITNESS: My understanding is that the 23 claims have to provide the -- the person who's using the 24 claims to understand what's going on, yes. 25 ///

22 (Pages 82 to 85)



1 BY MR. VANDENBURGH:

2 Q. And you also understand that to infringe a
3 claim, you need to practice every limitation of the
4 claims; correct?

5 MR. CHRISTOPHER: Objection to form and scope.

6 THE WITNESS: I did not -- I was not instructed
7 to look at infringement issues.

8 BY MR. VANDENBURGH:

9 Q. Do you have that understanding otherwise? Have
10 you ever been involved in -- strike that.

11 Have you ever been involved in infringement
12 analyses?

13 A. A long time ago, Counsel. I don't remember the
14 details of the legal --

15 Q. You understand that for a validity analysis,
16 you need to be able to understand each limitation of the
17 claim; correct?

18 MR. CHRISTOPHER: Objection to form.

19 THE WITNESS: Again, it's been a while since I
20 was to report on validity; but I would -- I'll be able
21 to for sure say that --

22 BY MR. VANDENBURGH:

23 Q. Do you not consider what you're doing in this
24 case is relating to validity?

25 MR. CHRISTOPHER: Objection to form.

1 THE WITNESS: I could see there could be a
2 intermediary step between what you have said and what's
3 starting that particular -- there could be another
4 entity between M and what you said the request is.
5 There could be some other entity. It doesn't mean that
6 it's -- I can see there would be another step in
7 between -- another --

8 BY MR. VANDENBURGH:

9 Q. So you don't agree, to be clear, that the
10 request by the module M needs to be based on specific
11 communication properties and at least one communication
12 service identification?

13 A. I am saying that that may be one way of doing
14 it, but there could be other ways of doing it. It's not
15 limiting the POSITA to just have that particular
16 approach.

17 Q. Okay. So what I've drafted there is at least
18 one way to understand that claim language and to
19 practice that portion of the claim?

20 A. That's one way of doing it, yeah.

21 Q. Okay. Now, let's go on to the rest, then,
22 which you wanted to talk about.

23 Do you agree with what I -- how I've broken out
24 the third paragraph such that the claim requires that
25 the -- at least one communication service identification

1 THE WITNESS: I have not looked at any
2 documentation for validity or the legal matters for
3 validity at this point. I have not done any work on
4 that.

5 BY MR. VANDENBURGH:

6 Q. Okay. All right. So let me go back to -- if
7 I'm a member of the public trying to understand whether
8 I am practicing 6.pre.2, can you tell me what I need to
9 do or what needs to be based on specific communication
10 properties and at least one communication service
11 identification when you read from column -- in Column 10
12 from Line 9 to 13 of Claim 6.

13 MR. CHRISTOPHER: Objection to form and scope.

14 THE WITNESS: You need to understand that the
15 request is being initiated by the processing module.
16 And based on specific communication properties and this
17 communication service identification, which we don't
18 want to talk about right now, you would be provided with
19 the resources to the network.

20 BY MR. VANDENBURGH:

21 Q. Okay. Going back to my Exhibit 1050, do you
22 disagree with how the -- the first two -- first two
23 paragraphs of what I've written there accurately
24 describe what's in the claims?

25 MR. CHRISTOPHER: Objection to form.

1 referred to in Paragraph 2 identifies -- I'm sorry --
2 comprises at least one communication thread or at least
3 one address range?

4 A. That's what it says.

5 Q. Okay. So we've got a communication service
6 identification that has to be one of those two things;
7 correct?

8 MR. CHRISTOPHER: Objection to form.

9 THE WITNESS: It's a "or" clause, so it could
10 be one and -- at least one address range.

11 BY MR. VANDENBURGH:

12 Q. And then the last paragraph correctly indicates
13 that in this claim limitation the -- at least one
14 address range identified in the third paragraph has to
15 identify one of two things, either one or more second
16 processing modules or a memory region within said one or
17 more second processing modules; correct?

18 A. That's what it says.

19 Q. I guess my question is, how I've parsed Element
20 6.pre.2 by adding paragraph breaks and adding bracketed
21 numbers and letters, that that accurately reflects the
22 requirement of that claim limitation?

23 MR. CHRISTOPHER: Objection to form.

24 THE WITNESS: As a POSITA, I did not need this
25 breakdown; but it certainly -- you did not add any extra

Page 90 1 words except for "the request is." 2 BY MR. VANDENBURGH: 3 Q. Well, I did add the 1 and the 2 in the second 4 paragraph; I added the (a) and the (b) in the third 5 paragraph; and I added the little i and second little ii 6 in the -- in the fourth paragraph. 7 Do you see -- you understand that; right? 8 A. My apologies. I wasn't looking that closely. 9 Yes, you've added those indications. But the meaning of 10 the -- whatever the preamble is saying for me. 11 Q. Okay. Do you have an opinion as to whether 12 this is a correct recitation of what's required by 13 6.pre.2? 14 MR. CHRISTOPHER: Objection to form and scope. 15 THE WITNESS: In my opinion, the way the 16 preamble is defined is sufficient; and you added this 17 added partitioning into indices and said that this 18 request is coming from the originator; but I said that 19 could be coming from somewhere in between, like between 20 M and -- and the rest of the network. So it's just one 21 example of that. 22 BY MR. VANDENBURGH: 23 Q. If the board were to find that this is the 24 correct way to parse Element 6.pre.2, would you disagree 25 with them?	Page 92 1 THE WITNESS: I can check that. Generally, 2 that's what the master processor will be doing, 3 requesting to the slave processor. 4 BY MR. VANDENBURGH: 5 Q. And let me turn your attention to Paragraph 83 6 of your declaration. 7 A. One second there. Did we just pass it? Okay. 8 School of operating -- can I read it, or do you want me 9 to -- 10 Q. I was going to direct your attention to the 11 second sentence because I think that will be most 12 helpful. It corresponds very much to, I believe, this 13 claim limitation. 14 A. Fine. Which sentence? 15 Q. Sentence in Paragraph 83, second sentence 16 reads, "For example, the '052 patent describes that a 17 master module M requests a communication service to a 18 slave module S." 19 Do you see that? 20 A. Correct. 21 Q. Okay. Is that what is being referred to in the 22 first paragraph of Exhibit 1050? 23 MR. CHRISTOPHER: Objection to form. 24 THE WITNESS: It's one example of that, but 25 could be others.
Page 91 1 MR. CHRISTOPHER: Objection to form and scope. 2 THE WITNESS: If I'm asking to review it based 3 on additional information, I would be able to reply to 4 that. 5 BY MR. VANDENBURGH: 6 Q. You can't answer my question right now? 7 MR. CHRISTOPHER: Objection to form. 8 THE WITNESS: No. I -- I believe that the way 9 you have partitioned it, it could be one way of doing it 10 but not more than that. 11 BY MR. VANDENBURGH: 12 Q. Now let's get into what these various words 13 refer to. 14 A. Okay. 15 Q. The first paragraph of Element 6.pre.2 -- let's 16 look at Exhibit 1050 -- refers to a request issued by 17 the module to the -- the initiator module to the target 18 module; correct? 19 MR. CHRISTOPHER: Objection to form. 20 THE WITNESS: It's a request from processing 21 module M to a second processing module S. 22 BY MR. VANDENBURGH: 23 Q. And in the patent this is described as simply a 24 request issued by a master to a slave; correct? 25 MR. CHRISTOPHER: Same objection.	Page 93 1 BY MR. VANDENBURGH: 2 Q. Give me an example of a communication service. 3 I'm sorry. Strike that. 4 Give me an example of a request for a 5 communication service. 6 MR. CHRISTOPHER: Objection to form. 7 THE WITNESS: Communication service refers to 8 the type of communication in need to accomplish the 9 request that was initiated. You want to have a 10 communication service for certain characteristics. 11 BY MR. VANDENBURGH: 12 Q. Does the patent tell you what a communication 13 service is? 14 MR. CHRISTOPHER: Objection to form. 15 THE WITNESS: I'm searching for that. I have a 16 lot of citations here. If you could bear with me, I 17 want to make sure that we get the wording right. 18 So it's a communication service based on said 19 specific communication properties. So communication 20 properties are a -- communication service points to a 21 communication property, and then you can decide what 22 kind of communication properties you have in your 23 system. 24 BY MR. VANDENBURGH: 25 Q. I'm going to come back to that.

24 (Pages 90 to 93)



Page 94 1 If you look at Paragraph 84 of your 2 declaration, you agree with me, don't you, that in the 3 '052 patent, the module requests the communication 4 service using an existing bus protocol? 5 MR. CHRISTOPHER: Objection to form. 6 THE WITNESS: Oh, okay. Let me understand. 7 You're saying the request will be talking OCP to the 8 adapter. Is that what -- is that -- did I understand 9 you correctly? 10 BY MR. VANDENBURGH: 11 Q. That isn't exactly what I asked, but that is a 12 flavor of what I asked. The -- what I'm -- what I'm 13 specifically asking is, is the request for a 14 communication service made in a bus protocol in the '052 15 patent? 16 MR. CHRISTOPHER: Objection to form. 17 THE WITNESS: If you stick with that sentence 18 in -- this request is sending first protocol example 19 OCP, so it's not too far from what I've said in that 20 paragraph. An OCP established as a bus protocol. So 21 that sentence there concurs that the -- the module would 22 be talking OCP to the adapter. 23 BY MR. VANDENBURGH: 24 Q. And it -- it would send the communication 25 service in a bus protocol like OCP; correct?	Page 96 1 of the Figure 1, the requested communication service is 2 issued in the AHB protocol? 3 A. It shows that way, yes. 4 Q. Okay. And you agree that if the module spoke 5 OCP, the requested communication service would be issued 6 in the OCP protocol? 7 A. That's the -- that's a fact too for you. 8 Basically, different, so to speak, languages of 9 communication are handled between the adapter and the 10 targeted module. 11 Q. Give me an example of a request by a first 12 module to a second module. Is that asking, you know, I 13 want to write some data? Is it as simple as that? Is 14 it, I want to read some data? Or is it more complicated 15 than that? 16 MR. CHRISTOPHER: Objection to form and scope. 17 THE WITNESS: It could be a variety of thing. 18 I want to read the sensor that is attached to the S 19 processor. I'm sorry. I use the word "S processor." 20 The word "slave" doesn't feel well. So the S processor. 21 And so that would be one application. You want to read 22 the registers of the S processor and so on and so forth. 23 So it's just not -- it's a variety of things that the M 24 processor wants to do. Okay? Just we're not limited to 25 reading or writing memory. It's all kinds of stuff.
Page 95 1 MR. CHRISTOPHER: Objection to form. 2 THE WITNESS: I haven't looked at the how the 3 interaction between the master and the OCP is for 4 communication service, but at some point it has to be 5 passed on. 6 BY MR. VANDENBURGH: 7 Q. Yeah. And -- and you are still looking at 8 Paragraph 83. I'd like you to look at Paragraph 84. 9 The second sentence says, "The requested 10 communication service is issued in the DTL protocol," 11 referring to Figure 1; is that correct? 12 A. You read that correctly, yes. 13 Q. Okay. So the module requests a communication 14 service using a bus protocol in the '052 patent; 15 correct? 16 MR. CHRISTOPHER: Objection to form. 17 THE WITNESS: Using a DTL protocol. 18 BY MR. VANDENBURGH: 19 Q. Okay. In Figure 1 it's specifically DTL; 20 right? 21 A. It is referring to DTL, but there is a AHB for 22 the other top portion. 23 Q. Yeah. 24 A. Yeah. That's -- 25 Q. Okay. So you'd agree that for the top portion	Page 97 1 BY MR. VANDENBURGH: 2 Q. Whatever those requests are, they are requests 3 that could be made through existing bus protocols, like 4 OCP; right? 5 A. If -- I have not looked at the details of these 6 bus protocols for what kind of requests you can pass on. 7 But it -- the functions I described -- there has to be a 8 way of doing that. There has to be a way of translating 9 your request in the language of the interface so it will 10 convey to the S processor to do that function and use 11 those services according to that. 12 Q. I want to ask next about what is meant by that 13 request being based on specific communication 14 properties. And let me start by this. Later in the 15 claim there is a reference to connection properties. 16 What is the difference between a communication 17 property and a connection property? 18 A. Yes. I've thought about that. I want to 19 read -- I'm going to give you example, Counsel. I want 20 to read the clock on the wall of your office. That 21 would be a communication request. Connection would be 22 how that's going to be done. It's going to be a camera 23 in front of it. It's going to be somebody looking at it 24 and calling me. So its communication is a little higher 25 level. Is that clear? Because I've thought about this.

25 (Pages 94 to 97)



1 I want to read the location of that S
2 processor. That's the communication. The connection
3 would be a little lower level to deal with the details.

4 Q. Now, I just -- because I think I understood
5 what you're saying, but you seem to refer to it in view
6 of the request. I'm asking what in the claim is the
7 difference between communication properties and
8 connection properties.

9 MR. CHRISTOPHER: Objection to form.

10 THE WITNESS: So communication properties I
11 would say, using the same example, I want you to be very
12 accurate in reading that information and make sure you
13 time stamp it so I know what time you read it.

14 The connection property means how you're going
15 to do this. Are you going to go over to counsel's
16 office to read it, or are you going to take a taxi or
17 whatever?

18 So that's the difference.

19 BY MR. VANDENBURGH:

20 Q. Okay. So a communication property is saying
21 something about how I want the information?

22 A. At the higher level.

23 Q. At a higher level.

24 And then the connection property is specific
25 properties that help to facilitate getting it at that

1 properties?

2 MR. CHRISTOPHER: Same objections.

3 THE WITNESS: So I think we established a
4 communication service. At least I gave you some
5 examples -- right? -- regarding requesting to read
6 something -- clock in your office.

7 The properties refers to some of more nuanced
8 aspect of that request. I want this to be done with
9 these kind of features. We can go with that example --
10 silly example I came up, but that's what it is. I want
11 to read something. But these are some of the properties
12 that I would like you to do in terms of that operation.

13 BY MR. VANDENBURGH:

14 Q. And I -- okay. I understand that. I'm also
15 trying to get a sense of what the words "based on" mean.
16 Are you saying -- are you interpreting "based on" to
17 mean "includes"? So the request needs to include
18 specific communication properties?

19 MR. CHRISTOPHER: Objection to form and scope.

20 THE WITNESS: I've -- I've not addressed the
21 word "based on," but I can imagine that you could
22 request a communication service and you're agnostic
23 about communication properties. You don't care about
24 something. So then you would not specify, and the
25 system will resolve it for you.

1 higher level?

2 A. Yes. That's -- that's the -- my understanding.

3 Q. Okay. So then -- and I'm still working off of
4 Exhibit 1050 because I find it helpful.

5 A. Okay.

6 Q. What does it mean to request at least one
7 communication service based on specific communication
8 properties? And I'll start by giving one possible
9 answer.

10 Does that mean that -- are you saying that the
11 request has to include communication properties?

12 MR. CHRISTOPHER: Objection to form and scope.

13 THE WITNESS: Well, I mean, at least one
14 communication service identification comprises at least
15 one -- right. So can I read the word "thread" and
16 address --

17 BY MR. VANDENBURGH:

18 Q. For what it's worth, I'm still in Paragraphs 1
19 and 2. I haven't gotten to -- Paragraph 3 tells us more
20 about what a communication service -- well, in fact, I'm
21 not even talking about communication services. I'm
22 talking about communication properties.

23 What does it mean to request at least one
24 communication service based on a specific
25 communication -- based on specific communication

1 If I want something to be done fast, then I
2 would add that extra request. So it is as you need it.
3 BY MR. VANDENBURGH:

4 Q. Yeah. I understand it might be optional; but
5 in order to be based on specific communication
6 properties, is it your testimony that the request needs
7 to include specific communication properties?

8 MR. CHRISTOPHER: Same objections.

9 THE WITNESS: As I said, if the requirement
10 does not include communication properties because it's
11 agnostic toward that, it would be just blank.

12 BY MR. VANDENBURGH:

13 Q. Okay. But would it, in that instance, still
14 be -- would the communication be based on specific
15 communication properties?

16 MR. CHRISTOPHER: Same objections.

17 THE WITNESS: If I tell you that you have to go
18 on this highway and you have no speed limit that you
19 have to satisfy or I say you have to go at 55 miles per
20 hour, if I give you no option, you can go anywhere you
21 want; right? So it's really -- it's up to the requester
22 to see what kind of communication properties want. I
23 don't think it's in any way limiting that. You can
24 ascribe no communication properties, if you wish. But
25 this one says you have to have the communication

Page 102 1 properties and then the rest -- the other paragraph that 2 we haven't started. 3 BY MR. VANDENBURGH: 4 Q. Okay. Is one way for a communication service 5 to be based on a specific communication property is if 6 the request includes a field that has a 2 in it and 7 within the adapter or the network interface, there is a 8 map that says, Well, 2 means I need this sort of 9 service? 10 Does that satisfy that language? 11 MR. CHRISTOPHER: Objection to form and scope. 12 THE WITNESS: I have not looked into that 13 implementation. You're asking me to design this based 14 on your expectations. I'm -- 15 BY MR. VANDENBURGH: 16 Q. Are you saying, though, that the actual -- you 17 know, it has to be, like, spelled out in words? "I need 18 fast communication" needs to be sent in the request? 19 MR. CHRISTOPHER: Objection to form. 20 THE WITNESS: I have not looked at the details 21 of implementation, but the request has to be conveyed to 22 that network somehow. 23 BY MR. VANDENBURGH: 24 Q. Okay. 25 A. And --	Page 104 1 MR. CHRISTOPHER: Counsel, he wasn't finished 2 with his answer. 3 THE WITNESS: Let me finish. 4 BY MR. VANDENBURGH: 5 Q. I got to slow down. 6 A. So I think that's one of the innovative parts 7 of this. I'm being biased because I work on -- the fact 8 that they're decoupling the standard protocol from the 9 rest. And I -- I applaud them for this. And it doesn't 10 have to be a bus. It could be anything. As long as 11 there is an adapter for it. 12 Q. Right. Right. Okay. So in the examples in 13 the patent, the request is sent via a bus protocol; 14 correct? 15 A. Examples. 16 Q. Yeah. 17 A. It didn't say it's limited to bus. 18 Q. Yeah. Understood. 19 Does that mean that OCP, prior to 2004, had the 20 ability to send messages that included specific 21 communication properties? 22 MR. CHRISTOPHER: Objection to form and scope. 23 THE WITNESS: Did not check that. 24 BY MR. VANDENBURGH: 25 Q. You don't know one way or the other?
Page 103 1 Q. That's what I'm trying to get at, is the 2 request needs to include a specific communication 3 property; right? 4 MR. CHRISTOPHER: Counsel, he wasn't finished 5 with his prior answer. Can we let the witness -- 6 please. 7 THE WITNESS: So as I said in my example, the 8 communication services expect certain response time, for 9 instance. So that information has to be passed on to 10 the communication -- specific communication properties. 11 And then -- then the rest goes on. 12 So in a way -- and it is a very important part 13 of this patent, is to be able to use the identification 14 of those requests and apply it to the properties. 15 That's really a very important part and that's why in 16 the preamble. 17 BY MR. VANDENBURGH: 18 Q. And the request is coming in a -- in a bus 19 protocol; right? We talked about that before. 20 MR. CHRISTOPHER: Objection to form. 21 THE WITNESS: I beg to differ because it could 22 be any protocol. Bus is just an example, so it's not 23 limited to bus. 24 MR. VANDENBURGH: Fair enough. Fair enough. 25 It certainly could be --	Page 105 1 A. It's easy to check. I did not do it for this. 2 Q. Okay. 3 A. Very easy, Counsel. 4 MR. VANDENBURGH: Why don't we go ahead and 5 take our -- take our lunch break here. 6 MR. CHRISTOPHER: Sounds good. 7 THE WITNESS: Thank you. 8 MR. CHRISTOPHER: Thank you. 9 (A lunch recess is taken.) 10 BY MR. VANDENBURGH: 11 Q. Before we took our break we were talking about 12 the first part of Element 6.pre.2 and specifically what 13 it means to issue a request that is based on specific 14 communication properties. I just want to follow this 15 up. 16 Does your report identify any instances in the 17 '052 patent where it indicates the request itself 18 includes a communication property? 19 MR. CHRISTOPHER: Objection to form. 20 THE WITNESS: I can check. A lot of requests 21 here. 22 So Page 33 it says -- Paragraph 58, "In other 23 words, the adapter units (A) translate the requested 24 communication service into messages (msg) which are 25 processed by the network" -- so -- so Unit A -- the

27 (Pages 102 to 105)



Page 106 1 requested communication service is coming to Unit A, and 2 what's on the other side of Unit A is the protocol -- 3 standard protocol, and it's just source M. 4 Your question was? 5 BY MR. VANDENBURGH: 6 Q. You've now directed me to this paragraph, so 7 I'll follow up because I think you might have misspoke. 8 You referred to Page 33, and I think you said 9 Paragraph 58. But I think you maybe meant Paragraph 83; 10 is that correct? Is that what you're looking at? 11 A. Sorry. Yes. Because it was a 58 there, I 12 misspoke, yes. Paragraph 83, yes. 13 Q. Okay. So my question is, does your report 14 identify any instances indicating that the request 15 issued by the module includes communication properties? 16 A. Yes. It -- let me read that again. 17 So requested communication service -- one 18 understanding would be the properties correspond to 19 those communication services. 20 Q. I mean, you told me before lunch that a request 21 might include communication properties and it might not; 22 right? 23 A. There is no -- yeah. It is possible to have 24 either way. It's -- 25 Q. You might not care how you get the data?	Page 108 1 in -- in the patent and in my document. 2 Q. Where in your declaration do you identify an 3 instance where the '052 patent indicates that the 4 request includes a communication property, or 5 properties? 6 MR. CHRISTOPHER: Objection to form. 7 THE WITNESS: In Paragraph 89 I refer to the 8 '052. And I do say -- I'm quoting '052, basically -- 9 "such a thread and the associated traffic class can be 10 mapped to A connection based on specific corresponding 11 communication properties." 12 Paragraph 89. 13 BY MR. VANDENBURGH: 14 Q. Okay. So that's indicating that the request 15 issued by the module includes both communication 16 properties and a communication service identification? 17 MR. CHRISTOPHER: Objection to form. 18 THE WITNESS: It's mapping into a connection 19 specific -- connection based on specific corresponding 20 communication properties. So it's just a process of 21 mapping those requested services into certain 22 properties. 23 BY MR. VANDENBURGH: 24 Q. And you interpret that as meaning that the 25 corresponding communication properties were issued by
Page 107 1 A. That's right, yeah. 2 Q. So this -- this paragraph is talking about 3 communication service; but it's not talking about 4 communication properties necessarily, is it? 5 MR. CHRISTOPHER: Objection to form. 6 THE WITNESS: I think it -- given the body of 7 the '052, it is referring to communication properties. 8 I gave you an example of that -- 9 BY MR. VANDENBURGH: 10 Q. Okay. 11 A. -- '052 holds. Even if -- 12 Q. Can you give me -- is there -- does your report 13 identify any instance where the '052 patent specifically 14 says that the request includes a communication property? 15 A. My report does not show communication property; 16 but the understanding of '052 is, in my opinion, 17 sufficient. But I did not address the word 18 "communication property" in my report. 19 Q. Does the word "communication property" or 20 "properties" appear in the '052 patent outside of the 21 claims? 22 A. Well, I take it back. I have communication 23 properties. So let me -- let me address what I just 24 said earlier. Okay? 25 Yeah. Communication properties are everywhere	Page 109 1 the module? 2 MR. CHRISTOPHER: Objection to form. 3 THE WITNESS: It's not limited to the module, 4 but one incident -- one incident -- instance could be 5 the module. It could be somewhere else down the pipe. 6 BY MR. VANDENBURGH: 7 Q. So it doesn't -- doesn't -- that paragraph 8 doesn't say that the request has to come from the 9 module? 10 A. It -- 11 Q. Strike that. That's a bad question. 12 That sentence that you quoted, Paragraph 89, 13 doesn't require that the identification of the specific 14 communication properties come from the request issued by 15 the module? 16 A. It doesn't require, but it could happen 17 anywhere from the requester to the receiving adapter. 18 There is no limitation on that. 19 Q. And -- and the claim would cover a system 20 regardless of whether the request came directly from the 21 requesting module or from some other component? 22 MR. CHRISTOPHER: Objection to form and scope. 23 THE WITNESS: Yeah. So I have not analyzed 24 that in my opinion for specifying that; but my 25 understanding is that, as I explained to you, one would

28 (Pages 106 to 109)



Page 110 1 get that by reading the description of the patent. 2 BY MR. VANDENBURGH: 3 Q. I'm not sure I understand your question [sic], 4 so I'll ask it again. 5 Does -- I'll ask a different question. 6 Does Element 6.pre.2 require that the specific 7 communication properties come from the request issued by 8 the module? 9 MR. CHRISTOPHER: Objection to form and scope. 10 THE WITNESS: As I said, it's -- the way the 11 patent is and the claims are is not limited to that 12 particular approach to providing the communication 13 property to the -- to the corresponding communication 14 services. So requester could do that. It could be 15 somewhere else. 16 BY MR. VANDENBURGH: 17 Q. Let's move on to the second thing that the 18 request from the module is based on in Element 6.pre.2. 19 Again, I'm looking at Exhibit 1050. 20 The request also is based on at least one 21 communication service identification; correct? 22 A. Yes. 23 Q. What is a -- strike that. 24 What does it mean for the request to be based 25 on a communication service identification?	Page 112 1 BY MR. VANDENBURGH: 2 Q. I'm asking for what your report identifies. 3 A. Well, I'm sure I've referred to this figure; 4 but your question was show me an example of request -- 5 which -- which one of those two? I lost track of it. 6 Q. The request from the module includes an address 7 range. 8 A. Yeah. The fastest way is to refer to Figure 4. 9 And I think it is some -- I must have a citation of 10 this. It's actually right there -- right above 11 Paragraph 89. Okay. 12 Q. And how does that figure indicate that what the 13 module is sending includes an address range? 14 A. Two ways. The module is setting it up, or NI 15 based on some priority scheme or some other ways is 16 setting it up. But it doesn't preclude from having the 17 flexibility to do it on either side of that connection 18 between M and NI. So POSITA would have -- that's 19 implemented. 20 Q. So if I understand what you're saying, you're 21 saying that Figure 4 shows an NI setting up three 22 different connections based on address ranges; correct? 23 MR. CHRISTOPHER: Objection to form. 24 THE WITNESS: One way would be that way. The 25 other way would be the master -- that the end processor
Page 111 1 MR. CHRISTOPHER: Objection to scope. 2 THE WITNESS: It is a service, in this case 3 communication service, that needs the ID and something 4 to designate it with. 5 BY MR. VANDENBURGH: 6 Q. Does -- does the request issued by the module 7 need to include a communication service identification? 8 MR. CHRISTOPHER: Objection. Scope. 9 THE WITNESS: It's one -- one way of doing it 10 would be the requester providing that. The other way 11 would be handled later on because you're trying to 12 coalesce a whole bunch of communication requests. So it 13 could be either way. 14 BY MR. VANDENBURGH: 15 Q. And if we go on to the next paragraph, it 16 identifies two different things that could be in the 17 communication service identification. One is a 18 communication thread, and the other is at least one 19 address range; right? 20 A. That's what it says, yes. 21 Q. Do you identify any instances in your report 22 where the '052 patent describes the module sending an 23 address range? 24 MR. CHRISTOPHER: Objection to form. 25 THE WITNESS: Can we refer to a figure?	Page 113 1 would be providing that information. You can do it two 2 ways. 3 BY MR. VANDENBURGH: 4 Q. But that option isn't actually shown in 5 Figure 4, is it? 6 A. Clearly, a POSITA would understand that that 7 could be one of the options. It's not limiting -- this 8 figure is not limiting to that. 9 Q. I understand that a POSITA may even say it's 10 not limiting. I'm asking a different question, which 11 is, is it shown in Figure 4 that the module sends an 12 address range? 13 A. It's showing the address range that NI is 14 looking at, but how it got there -- it could come from 15 the M processor or it could be already there. 16 Q. If we look at Figure 2A -- 17 A. 2A. 18 Q. -- that shows an example where the module is 19 simply sending an address to the adapter; correct? 20 A. This is coming from the protocol adapter, I 21 think, if I'm not mistaken. 22 Q. I think figure -- well, I think Figure 2 is 23 showing, on the left-hand side, signals coming from or 24 sent to the module and the right side is showing signals 25 being sent to or received from the network interface.

29 (Pages 110 to 113)



Page 114 1 But you should tell me. 2 A. Yeah. I'm trying, Counsel. 3 The message is, if you refer to Figure 1, 4 coming out of the adapter. That's my understanding, a 5 POSITA's understanding. And so -- 6 Q. And perhaps -- perhaps we should find the 7 portion of the specification talking about Figure 2A. 8 A. Okay. I was just getting to what you asked. 9 If you don't mind, let me continue with that. 10 So the -- give me one more minute. I think 11 you'll be okay with what I'm going to say. 12 So the signal is coming from the left side to 13 the adapter. Based on Figure 1, at least it has to come 14 from the M processor. 15 Q. Yeah. And so the signals coming from the M 16 processor are identified as rice [phonetic] data, 17 command and flags, and address; correct? 18 A. You're reading it correctly. There are no 19 other signals here. But the command could include a lot 20 of different things to do with services, with address 21 ranges, and so on. That's what the command is. 22 Q. Okay. So -- and to be clear, you're not saying 23 that the address input, ADDR, is referring to an address 24 range, are you? 25 A. I couldn't tell otherwise, but it could be	Page 116 1 THE WITNESS: Yes. I'm there. 2 BY MR. VANDENBURGH: 3 Q. So the second sentence of that paragraph says, 4 "The identification means in the existing protocols are 5 communication threads and addresses; i.e., the threads 6 or addresses are mapped to connections through the 7 interconnect based on specific connection properties." 8 Did I read that right? 9 A. I think you did. 10 Q. Does -- identification means there the same as 11 the -- what's called communication service 12 identification in Element 6.pre.2? 13 MR. CHRISTOPHER: Objection. Scope. 14 THE WITNESS: Two elements -- I'm sorry. Go 15 back. Identification means what? Could you please 16 repeat that. 17 BY MR. VANDENBURGH: 18 Q. I'm asking if identification means is the same 19 thing as communication service identification in Element 20 three -- 6.pre.2? 21 MR. CHRISTOPHER: Same objection. 22 THE WITNESS: Identification here in mapping -- 23 in a POSITA's opinion would mean the grouping of these 24 requests. Or -- or in a thread means a bunch of 25 communication requests or tasks within the request. So
Page 115 1 possible. Could be possible. 2 Q. Do you think a POSITA would interpret this 3 figure that way? 4 A. It could, sure. Yeah. 5 Q. And -- and by "could," do you think they would? 6 MR. CHRISTOPHER: Objection to form. 7 THE WITNESS: Yeah. Because the command could 8 be saying the first clock pulse, you're going to get the 9 beginning address; the next clock pulse you're going to 10 get the ending address. Of course you can do that. For 11 sure. 12 BY MR. VANDENBURGH: 13 Q. Okay. 14 A. Yeah. 15 Q. And -- and so one way of identifying an address 16 range would be a starting address followed by a command 17 followed by an ending address; is that right? 18 MR. CHRISTOPHER: Objection to form. 19 THE WITNESS: It's one way of doing it. There 20 could be other ways. But it certainly has address range 21 specified. 22 MR. VANDENBURGH: Let me direct your attention 23 to Column 4 of the '052 patent, the paragraph starting 24 on Line 15. 25 MR. CHRISTOPHER: Column 4, 15.	Page 117 1 that's the definition of thread, in general. So 2 identification is putting a label to -- to these two 3 categories. 4 BY MR. VANDENBURGH: 5 Q. Okay. 6 A. Right? 7 Q. Does -- does this sentence in Column 4 support 8 the requirement in Element 6.pre.2 that the request be 9 based on a communication service identification that is 10 either a thread or an address range? 11 MR. CHRISTOPHER: Objection to form and scope. 12 THE WITNESS: It -- it could. I mean, it's not 13 preventing that. But it could happen anywhere in that 14 sequence from the M processor towards the network. I 15 don't see any limitations on that. And one way would be 16 to do it that way with the -- with the M processor or -- 17 or somewhere between, so... 18 MR. VANDENBURGH: Can we go off the record for 19 just a moment. 20 (A recess is taken.) 21 MR. VANDENBURGH: Let's go back on the record. 22 BY MR. VANDENBURGH: 23 Q. Doctor, I just want to, then, direct your 24 attention to the bottom of Column 5 starting at Line 66 25 and then continuing on to Line 3 of Column 6. This is

30 (Pages 114 to 117)



Page 118 1 another instance where the patent says that the 2 identification means in the existing protocols are 3 communication threads and addresses; correct? 4 A. That's what it says. 5 Q. Okay. And then it goes on to say that these 6 threads or addresses are mapped to connections through 7 the interconnect based on specific connection 8 properties; correct? 9 A. Correct. 10 Q. So, again, is this an instance where you could 11 practice Element 6.pre.2 by having the request issued by 12 the module include a communication service 13 identification that is either a communication thread or 14 an address? 15 MR. CHRISTOPHER: Objection to form and scope. 16 THE WITNESS: I kind of lost track of exact 17 specification you provided in your sentence, but my 18 understanding is that -- but I can answer the question 19 this way. The identification is in a way some sort of a 20 grouping them together, addresses and threads. And 21 these are mapped to those connections based on specific 22 connection properties. That's my understanding. And 23 that's all I can offer you on that. 24 BY MR. VANDENBURGH: 25 Q. I'd like to actually talk a little bit about	Page 120 1 misunderstanding in terms of assuming this refers to the 2 same address range as '052. 3 Q. Okay. 4 A. So you can put it as hardwired for that 5 particular set of addresses in the address space. 6 Q. You agree, don't you, that Radulescu2004 7 discloses issuing request for service that include an 8 address? 9 A. I think it does mention having an address. 10 I -- I -- here it's at the end of the paragraph; right? 11 Q. Specifically, let's -- let's look at -- I'm 12 sorry. Were you done? I didn't want to interrupt. 13 A. Yeah. The last sentence says, "Understanding 14 Radulescu discloses an address and not an address 15 range." 16 That's what my point is. 17 Q. Okay. And if we look at Page 4 of Exhibit 1005 18 within Section 4.2 -- 19 A. 4.2. Okay. 20 Q. -- the fourth paragraph down -- 21 A. One second. This is -- fourth paragraph down. 22 Yes. 23 Q. -- talks about the -- in the second sentence, 24 "Within a narrowcast connection, the slave for which the 25 transaction is destined is selected based on the
Page 119 1 the Radulescu2004 reference. You should have that as 2 one of the exhibits I sent to you. It's Exhibit 1005. 3 (Whereupon the document referred to is marked 4 by the reporter as Exhibit 1005 for identification.) 5 A. I have it. 6 Q. And then if you'd also turn to Paragraph 156 of 7 your report. 8 A. 156. 9 Q. In that report you indicate, The same authors 10 of Radulescu2004 used to term "address, underscore, SPC" 11 to represent an address space, which a POSITA would 12 understand is analogous to an address range. 13 Do you see that? 14 A. Which sentence on 156? 15 Q. Oh, I'm about halfway through the paragraph. 16 It starts "Similarly." 17 A. Yes. I see it now. I thought I was looking at 18 the beginning of paragraph. Okay. Yes. Go ahead. 19 "Same authors." 20 Q. Okay. What -- what is your understanding of 21 what address space refers to in that sentence? 22 A. This is, like, a lookup table prearranged. To 23 this location address, you connect to this. It's 24 different from -- on '052 talks about the address range 25 vis-à-vis figure -- oh, I think -- so yes. It may be a	Page 121 1 address"; right? 2 A. That's correct. 3 Q. Okay. And then it goes on to say, "The address 4 range assigned to slave is configureable in the 5 narrowcast module"; correct? 6 A. That's the sentence, yes. 7 Q. Okay. So that second sentence you interpret as 8 indicating that the network is set up so that a range of 9 addresses are assigned to each slave? 10 And I'm sorry. I don't want to use that word 11 either, but that's what it's saying. 12 MR. CHRISTOPHER: Objection to form. 13 THE WITNESS: I think I've addressed that in 14 that previous paragraph that we're referring to. 15 If you read 158 -- actually, 159, 16 Radulescu2004 -- I'm reading 159 of my report. 17 "Radulescu2004 state that narrowcast 18 connections are connections between one master and one 19 slave" -- or "several slaves, where each transaction is 20 executed by a single slave selected based on the address 21 provided in the transaction." 22 So that lookup table, which mistakenly is 23 compared with the address range of '052, is basically 24 that. It's providing an address from that setup of 25 those -- those tables.

31 (Pages 118 to 121)



Page 122 1 BY MR. VANDENBURGH: 2 Q. Okay. So -- so, in other words, I think you're 3 saying that the address range in Radulescu2004 is 4 contained within the network interface so that when it 5 receives an address, it knows where to send the data? 6 MR. CHRISTOPHER: Objection to form. 7 THE WITNESS: I have not addressed where it's 8 happening. Did I say "network interface" here? I can 9 look it up. It's really not that critical. The point 10 is the map -- the lookup of the table is on address 11 spaces. It's like a -- it's like a dictionary with 12 sticks -- you know, marker sticks. You come out and you 13 say, I want this particular address or you assign the 14 S processors are the Pages 10, 11, 12, 13, and I go to 15 that address and grab the S processor. 16 So that's -- I think that's what it's -- what 17 I'm trying to say, if it's not coming across. 18 BY MR. VANDENBURGH: 19 Q. Well -- and I'm just -- I'm looking 20 specifically at Section 4.2 of Radulescu. 21 A. Sure. 22 Q. The sentence that says, "The address range to 23 assigned to a slave is configureable in the narrowcast 24 module." 25 Doesn't that mean that the lookup table you're	Page 124 1 narrowcast module, I can configure what address ranges 2 are assigned to a particular slave? 3 MR. CHRISTOPHER: Objection to form. 4 THE WITNESS: Let me give another example, if I 5 may. 6 BY MR. VANDENBURGH: 7 Q. If you could just answer my question instead of 8 giving me an example. 9 A. Because I think you don't seem to appreciate 10 what I'm trying to tell you. So I'm trying to use an 11 example to maybe be more clear of what I'm saying. Is 12 that okay if I continue -- 13 Q. No. No. It's actually not okay. First, tell 14 me that you can't answer my question yes or no. And I 15 can read the question back for you, if you'd like. 16 A. Is that a question, Counsel? 17 Q. I'm going to read the question back. And if 18 you -- you can say "yes," "no," or "I can't answer your 19 question yes or no." 20 The sentence in 4.2 that reads, "The address 21 range assigned to a slave is configureable in the 22 narrowcast module," means that within the narrowcast 23 module, I can configure what address ranges are assigned 24 to a particular slave? 25 MR. CHRISTOPHER: Same objection.
Page 123 1 talking about in Radulescu2004 is in the narrowcast 2 module? 3 A. It's assigning S processors to a particular 4 address in that space that it's allocating. So it could 5 be -- a processor S0 would be location 100. Some other 6 time, if you will, it could assign it to 102. I mean, 7 that's -- that's the point it's trying to make. It's 8 just an address. It's a narrowcast. It assigns entries 9 to that table, but it will select one based on the 10 address. 11 Q. Right. But what it's assigning is address 12 ranges to each slave within the narrowcast module; 13 correct? 14 A. It's assigning a table where these S processors 15 are located based on the address arriving. So I would 16 consider that a sequence of locations in a memory, if 17 you want to call it address range; but it's really 18 referring to it by an address, not an address -- so you 19 assign that table, then you request based on a map. 20 Q. Okay. Again, if you could pull up -- just look 21 at Radulescu at this point. Radulescu2004, 4.2. I'm 22 focusing on one sentence and one sentence only, the 23 sentence that says, "The address range assigned to a 24 slave is configureable in the narrowcast module." 25 You'd agree with me that means that within the	Page 125 1 THE WITNESS: What is your question? 2 BY MR. VANDENBURGH: 3 Q. That was my question. 4 You'd agree with me that what that sentence 5 means is that within the narrowcast module I can 6 configure what address ranges are assigned to a 7 particular slave? 8 A. I agree with you that you read it, but that's 9 not -- that's -- I agree with you -- you just read it 10 verbatim. That's all. If you want my understanding of 11 it or a POSITA's understanding, I can address that. 12 Q. No. I think you answered my question. Thank 13 you. I'm going to move on. 14 Do you have something to say, sir? 15 A. Can we take a break? I think he's getting 16 upset. 17 MR. CHRISTOPHER: Let's go off the record for a 18 couple minutes. 19 THE WITNESS: Asshole. 20 (A recess is taken.) 21 MR. VANDENBURGH: All right. Let's go back on 22 the record. 23 MR. CHRISTOPHER: And I just want to say before 24 we continue, we think that last line of questioning with 25 the tone, with the raised voice was completely

32 (Pages 122 to 125)



Page 126 1 unacceptable. It was border harassing the witness, and 2 we would ask that counsel ask the question more 3 respectably going forward. 4 With that, we can continue. 5 MR. VANDENBURGH: I do not believe that I was 6 being disrespectful. What I would ask is that the 7 witness would listen to my questions and answer my 8 question and not just go off on long tangents that do 9 not directly answer my question. 10 If I ask a yes-or-no question, I'm asking for a 11 yes-or-no answer. And if you can't, that's fine. But 12 just tell me you can't, and we can explore why you 13 can't. 14 MR. CHRISTOPHER: We disagree with the 15 characterization of that. I think he's doing his best, 16 but I think we all got to try to -- all of us. Let's 17 just try to be respectful, and let's move on. 18 BY MR. VANDENBURGH: 19 Q. All right. I will move on. And I want to ask 20 you a bit about the element of Claim 6 in the '052 21 patent that reads, "Enabling a connection-based 22 communication having a set of connection properties." 23 Do you have an understanding of what 24 "connection-based communication" means there? 25 THE WITNESS: Just one second. I lost my	Page 128 1 communication. So if the communication request is -- 2 can I use a example here to clarify what I'm trying to 3 say? It's not a yes-or-no question. Is that okay if 4 I -- 5 BY MR. VANDENBURGH: 6 Q. I think I asked you -- well, actually, I think 7 I did ask you a yes-or-no question. We can take it in 8 two steps. 9 My question was, do you understand what 10 connection-based communication is? 11 A. Yes, I do. 12 Q. And -- and what, in this art, is 13 connection-based communications? 14 A. So if -- if communication is at the higher 15 level coming from the M processor, the connection would 16 be more nuanced toward the connection properties. 17 Communication -- probably in most cases the connection 18 properties are hidden from the communication aspects of 19 the system because you won't have that coupling. That's 20 my understanding, a POSITA's understanding would be. So 21 you're trying to distinguish between connection and 22 communications. Connection would be referring to the 23 links in this case. 24 Q. Does every network interconnect employ 25 connections --
Page 127 1 mouse. Here it is. 2 Can you ask your question again. 3 BY MR. VANDENBURGH: 4 Q. Yes. Do you have an understanding of what is 5 meant by "connection-based communication" in Claim 6 of 6 the '052 patent? 7 A. "A connection-based communication having a set 8 of connection" -- so it's a connection that has a -- 9 certain connection properties and -- 10 Q. I'm just -- 11 A. -- the word "communication" as used there could 12 be misconstrued that it's something different, but I 13 think -- the way I read this and a POSITA would read 14 this -- I think -- we went through this regarding 15 relationship between communication and connection. 16 Connection is more closer to the -- those properties. 17 And that's my understanding and POSITA reading this 18 would have that. 19 Q. I'm looking just at the phrase 20 "connection-based communication." 21 Does that have a meaning to you as somebody 22 who's been in this field for a long time? 23 MR. CHRISTOPHER: Objection to form and scope. 24 THE WITNESS: So, again, communication is a 25 little higher level. Connection for those	Page 129 1 MR. CHRISTOPHER: Objection. Scope. 2 BY MR. VANDENBURGH: 3 Q. -- as that term is used in the claims of the 4 '052 patent? 5 MR. CHRISTOPHER: Same objection. 6 THE WITNESS: Every network uses the word 7 "connection"? That's the question? 8 BY MR. VANDENBURGH: 9 Q. Does it -- does it use -- does it employ 10 connections -- well, let me ask a better question. 11 A. All right. 12 Q. Is every interconnection -- every interconnect 13 connection-based? 14 MR. CHRISTOPHER: Objection. Form. Scope. 15 THE WITNESS: It's hard to say "every." I 16 don't -- I haven't checked every connection network in 17 the world, and there could be cases that that's not 18 defined that way. It's really hard for me to say every 19 interconnection network on this planet. No. I cannot 20 answer that. 21 BY MR. VANDENBURGH: 22 Q. The patent refers to connectionless protocols. 23 Do you remember that? 24 A. I believe so. Let me search to see what it's 25 talking about since it wasn't part of the crane --

33 (Pages 126 to 129)



Page 130 1 connectionless. Is it "dash less" or just "less" there? 2 I want to see the context. Is it "dash less"? Hold on. 3 Let me search for "less." 4 Q. I may have been thinking of a different 5 reference. I was thinking -- here it's talking about 6 notion of connection. Yeah. Okay. 7 So if you'll turn to Column 8, the paragraph 8 starting at Line 47. 9 A. Starting with "Summarizing"? 10 Q. Correct. 11 A. May I read that section? 12 Q. Please do. 13 A. So it uses internal Aethereal -- Aethereal 14 Network-on-Chip, which is their other publication, which 15 I refer to that one to see what exactly they mean. 16 Q. I'm -- I'm more asking just whether you have an 17 understanding of what it means to be an interconnected 18 supports connections versus theoretically there's an 19 interconnect that doesn't support connections. 20 MR. CHRISTOPHER: Objection to form. 21 BY MR. VANDENBURGH: 22 Q. Does that sound like -- does that sound 23 like something -- understand? 24 A. I have not offered an opinion on what the 25 connectionless protocols are, if that's what you're	Page 132 1 you don't know whether prior to 2004 you were aware of 2 connectionless protocols? 3 MR. CHRISTOPHER: Objection to form. 4 THE WITNESS: I have not done the work to find 5 out, and I have to find out what connectionless protocol 6 specifically they're referring to in that example. 7 BY MR. VANDENBURGH: 8 Q. Okay. Regardless of what is referred to in the 9 '052 patent, can you recall, prior to 2004, hearing 10 reference to something called a connectionless protocol? 11 MR. CHRISTOPHER: Objection to form and scope. 12 THE WITNESS: Yeah. I cannot offer you an 13 opinion on that, but I have to tell you that I've worked 14 a lot on NoC, and I know a lot of different variations 15 of NoC. 16 BY MR. VANDENBURGH: 17 Q. I don't understand why you're saying I'm -- I'm 18 asking for an opinion. I'm asking for the state of your 19 knowledge. 20 Prior to 2004 were you aware of something 21 called a connectionless protocol? 22 MR. CHRISTOPHER: Same objections. 23 THE WITNESS: I -- plain and ordinary meaning 24 of connectionless is something that I have to evaluate 25 and find out what exactly is meant. It is not that
Page 131 1 getting at. I did not offer an opinion on that. 2 Q. But you are aware that they exist? 3 MR. CHRISTOPHER: Same objections. 4 THE WITNESS: I have to evaluate that to see 5 what exactly is defined as connectionless. 6 BY MR. VANDENBURGH: 7 Q. So prior to 2004, as a POSITA in this art, you 8 were not aware of connectionless protocols; is that 9 correct? 10 MR. CHRISTOPHER: Objection to form and scope. 11 THE WITNESS: I have not looked into this; but 12 if I find out more about what exactly individuals are 13 referring to connectionless protocols, I would be able 14 to provide a better answer. It's not too difficult to 15 do if it's -- 16 BY MR. VANDENBURGH: 17 Q. I'm not asking for the explanation. Again, 18 we're back to a yes-or-no question. 19 Yes or no. Prior to 2004 were you aware... 20 A. I -- 21 MR. CHRISTOPHER: Objection to form and scope. 22 THE WITNESS: I have not done the work to be 23 aware or not. 24 BY MR. VANDENBURGH: 25 Q. Sounds like maybe the answer is "I don't" --	Page 133 1 complicated, but I did not include it in my report. 2 BY MR. VANDENBURGH: 3 Q. Again, I'm not ask -- I'm just asking for what 4 your brain contained in 2003, if you can recall. You 5 can say "I don't remember." That would be a fine answer 6 here. 7 A. No. I -- I cannot offer an opinion on that; 8 but, you know, communications can be done in the air. 9 It doesn't have to be on a -- on a physical level. So 10 there are many ways of communicating optically all kinds 11 of stuff. I have to look into that. 12 No. My brain works really well in that area. 13 That's my expertise. 14 Q. Well, based on that, it sounds like the answer 15 would be yes, you have heard about connectionless 16 protocols? 17 MR. CHRISTOPHER: Objection to form and scope. 18 THE WITNESS: No. I need to find out exactly 19 those communications that are not going to wires -- 20 connectionless or not, how they are construing that -- 21 that word. Because somebody could say electromagnetic 22 waves are connection -- so I don't know. 23 BY MR. VANDENBURGH: 24 Q. Can you turn to Paragraph 187 of your report. 25 Second sentence, under oath, you state, "I also

34 (Pages 130 to 133)



Page 134 1 note that OCP is a connectionless communication 2 protocol." 3 MR. CHRISTOPHER: Objection to form. 4 THE WITNESS: Yes. 5 BY MR. VANDENBURGH: 6 Q. What did you mean by that? 7 A. Because -- it's a protocol standard. That's 8 what it means. It doesn't include the connection 9 itself. It's a different explanation that we were 10 talking about. 11 Q. Okay. 12 A. The proto -- 13 Q. Explain to me what this means. 14 A. What we're talking about connection in terms of 15 a network -- that's multi-hop network. That's the 16 impression I had from your questioning because that's 17 what '052 was about. 18 This is a protocol. It's -- you could think of 19 it as a set of guidelines. So it doesn't tell you what 20 the connection is. It's most likely words -- a bus. 21 That's the bus that it's referring to. 22 Q. So your opinion is that a connectionless -- 23 well, no. Strike that. I don't even want to go there. 24 I think -- I would ask if you'd listen for my 25 questions because I think if we went back through the	Page 136 1 connections? 2 A. Would you identify the line on Column 8, 3 please. 4 Q. I was in the sentence starting on Line 47. 5 A. So your question, please. 6 Q. In that sentence, when it states that -- 7 "implemented with an interconnect supporting 8 connections," does that refer to an interconnect that 9 employs a protocol with connections? 10 MR. CHRISTOPHER: Objection to form and scope. 11 THE WITNESS: I think -- I cannot add anything 12 to -- more to that sentence. Means implementing an 13 interconnect with supporting connections. I mean, 14 what -- what else? 15 BY MR. VANDENBURGH: 16 Q. I was adding the idea of protocol. I think you 17 were telling me that connectionless communication 18 protocol means something to you. And I'm trying to get 19 an understanding, when it talks about Aethereal being an 20 example of an interconnect that supports connections, 21 that it employs a protocol that employs connections. 22 MR. CHRISTOPHER: Same objections. 23 THE WITNESS: So Aethereal we did not look at. 24 But OCP provides you with protocol -- for transaction 25 protocol on a bus-based system, but it doesn't tell you
Page 135 1 record, we would found I was asking about connection 2 proto -- connectionless protocols. 3 If you go back to Column 8 of the patent, it 4 talks about protocols which do not include the notion of 5 connection. 6 A. Give me a -- one second to get there. Where 7 again? I'm sorry. Please go ahead. 8 Q. Column 8, paragraph starting at 47. 9 A. Column 8, 47. Okay. 10 Q. The first sentence refers to communication 11 protocols which do not include the notion of connection. 12 A. Right. 13 Q. Is that the same thing that you mean in 14 Paragraph 187 where you say, "OCP is a connectionless 15 communication protocol"? 16 A. Yes. That's -- that's the -- 187. Let's see. 17 187. It's referring to OCP being a connectionless 18 protocol. 19 Q. Okay. 20 A. But it's a -- well, if you want me to qualify, 21 I can. 22 Q. Back to Column 8, in that first sentence, when 23 it goes on to say, "are implemented with an interconnect 24 supporting connections," does that refer to an 25 interconnect that employs a protocol with the notion of	Page 137 1 how many wires do you have for the bus. That's the 2 connectionless, in my opinion. It says, Follow these 3 standards. You decide how many wires you want. You -- 4 you want one wire? Use one wire. 5 So that's the connectionless. That's my 6 understanding. 7 BY MR. VANDENBURGH: 8 Q. Okay. 9 A. -- tell you that it has to be 64 bits. It's -- 10 it's orthogonal. That's the definition of 11 connectionless. 12 But in terms of connection, I was taken off on 13 another topic, which was connecting through some other 14 means but than an electronic wire. 15 Q. If you turn to Column 5 and the paragraph 16 starting at Line 40. 17 A. Okay. 18 Q. Do you agree with the second sentence there 19 that a connection is something that describes a 20 communication between one master and one or more slaves 21 with an associated service level, such as FIFO 22 transaction ordering and maximal latency? 23 MR. CHRISTOPHER: Objection to form and scope. 24 THE WITNESS: It states -- I -- I read that 25 sentence, and I understand it.



Page 138 1 BY MR. VANDENBURGH: 2 Q. And so when the claim requires connection-based 3 communication -- strike that. Let me start again. 4 When the claims recites as one of the steps 5 enabling a connection-based communication, it's 6 referring to enabling a system with connections that are 7 described as communication between a master and one or 8 more slaves with an associated service level, such as 9 FIFO transaction ordering and a maximal latency? 10 MR. CHRISTOPHER: Same objections. 11 THE WITNESS: So it's referring to connections, 12 which, as I tried to explain, was a lower level than 13 communication. So those details about the connection 14 properties are discussed at this level, like FIFO 15 transaction ordering maximal. It is possible that the 16 connection -- that communication could include those 17 levels as well. They communicate with each other -- 18 these two levels of communication and connection. So 19 it's consistent with my understanding. 20 BY MR. VANDENBURGH: 21 Q. Consistent with your understanding of what the 22 claim means when it says enabling a connection-based 23 communication? 24 MR. CHRISTOPHER: Objection to form and scope. 25 THE WITNESS: It's my understanding that the	Page 140 1 throughput. It could be error correction. Whatever 2 that is. 3 BY MR. VANDENBURGH: 4 Q. What does it mean to create a connection? 5 MR. CHRISTOPHER: Objection. Scope and form. 6 THE WITNESS: Establish that link between two 7 entities, whether it's a router or a network based on a 8 router. 9 BY MR. VANDENBURGH: 10 Q. And when you say "link," are you using that in 11 the networking sense? 12 A. That's an example of one. 13 Q. Okay. Does it happen when you physically 14 create the chip and you -- you put a wire in between the 15 two? Does that create a connection -- 16 MR. CHRISTOPHER: Objection to form. 17 BY MR. VANDENBURGH: 18 Q. -- as used in Column 5, Line 43? 19 MR. CHRISTOPHER: Sorry. 20 Objection. Form. Scope. 21 THE WITNESS: No. That -- this is mostly the 22 software aspects. Sits on top of the hardware. No. 23 You're not doing that. 24 BY MR. VANDENBURGH: 25 Q. Okay. So the connections are something that's
Page 139 1 connection provides those capabilities as stated here. 2 BY MR. VANDENBURGH: 3 Q. And as stated in Claim 6 of the patent; 4 correct? 5 MR. CHRISTOPHER: Same objections. 6 THE WITNESS: It's one way of doing it. Some 7 of those features could be done at the communication 8 services level. It is -- it is -- you know, some of the 9 FIFO activities could be done at the higher level. 10 BY MR. VANDENBURGH: 11 Q. The next sentence says, "Connections must be 12 created stating the requested service level." 13 A. It was -- Column 5? 14 Q. What does that mean to you? 15 A. Column 5? 16 Q. Column 5 at Line 44, "Connections must be 17 created stating the requested service level." 18 What does that mean to you? 19 MR. CHRISTOPHER: Objection. Scope. 20 THE WITNESS: Forty-four, "Connections must be 21 created stating the requested service level." 22 It means to me that those connections, when 23 they're established, have to satisfy what is the service 24 that is requested depending on what is that -- what that 25 service is. It could be latency. It could be	Page 141 1 created through software or... 2 MR. CHRISTOPHER: Objection to form and scope. 3 THE WITNESS: No. They have to be there -- 4 the -- the capabilities of how those connections are 5 used is the added layer of the software. But I have not 6 looked at the details of this, but that's the POSITA's 7 understanding. 8 BY MR. VANDENBURGH: 9 Q. Later in that sentence it says, "After use or 10 in that" -- strike that. 11 Later in the paragraph on Column 5, starting at 12 Line 40, it says, "After usage, the connection is closed 13 and these resources are freed." 14 What does it mean to close a connection? 15 MR. CHRISTOPHER: Objection. Scope. 16 THE WITNESS: So I -- I believe this is saying 17 that the connection is no longer available; and if there 18 was any buffering done, it basically empties the 19 buffers. That's just -- would be my understanding of 20 this. 21 BY MR. VANDENBURGH: 22 Q. Is it correct -- going back to the beginning, 23 where it says that a connection describes a 24 communication between one master and one or more slaves, 25 that connection here refers to an end-to-end connection?

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Page 142 1 MR. CHRISTOPHER: Objection to form and scope. 2 THE WITNESS: So as we talked about it earlier 3 today, these are indirect connections, not direct 4 connections through the routers. If you want to count 5 that as an end-to-end connection, that's your 6 understanding. But it's really indirect connections. 7 The master and slave are not directly connected. 8 They're connected through the nodes, the routers. 9 BY MR. VANDENBURGH: 10 Q. And this is -- this idea -- I think the word 11 "connection" is used in different ways when you start 12 talking about networking. There is physical connections 13 between nodes in a network. I get that. But you've -- 14 I think you told me that connection in this paragraph on 15 column -- on Column 5, starting at Line 40, is referring 16 more to a link-type connection, not to the -- just to 17 the physical connections; is that right? 18 A. That's one understanding of it, yes. 19 Q. Yeah. So when it's talking about a connection 20 being a communication between one master and one or more 21 slaves, it's talking about this -- this more abstract 22 link-type connection all the way from a master to one or 23 more slaves? 24 MR. CHRISTOPHER: Objection to form. 25 THE WITNESS: It could be a logical connection.	Page 144 1 logical point of view of connection. It's a difference 2 between these two. I no longer have a connection to the 3 other side; but, physically, that -- that avenue exists. 4 It would be very -- not sound engineering when you -- 5 when your communication is done, to just tear up the 6 whole thing. It just doesn't make sense. 7 Q. I agree. 8 The last sentence of that paragraph -- when it 9 says, "The configurations thereof and the computed at 10 compile time, i.e., offline or at run time." 11 So do you interpret that as meaning that the 12 connections -- the configurations of the connections can 13 be computed at compile time or run time? 14 MR. CHRISTOPHER: Objection. Scope. 15 THE WITNESS: That's what it says, yes. I 16 mean, I cannot add anything to what that says. 17 BY MR. VANDENBURGH: 18 Q. Okay. So -- and -- and do you agree that 19 configuring a connection at compile time would be 20 something that would be done just once and then would be 21 fixed thereafter? 22 MR. CHRISTOPHER: Objection to form and scope. 23 THE WITNESS: Respectfully, I disagree. 24 BY MR. VANDENBURGH: 25 Q. Okay. What does that mean to you, to configure
Page 143 1 You -- you -- you're signing a logical request of a 2 connection to a physical connection. 3 BY MR. VANDENBURGH: 4 Q. Okay. 5 A. So -- 6 Q. Those logical connections can be opened and 7 then closed after use? 8 MR. CHRISTOPHER: Objection to form and scope. 9 THE WITNESS: Well, we never established how 10 these connections are -- are they switched off. NoC I'm 11 familiar with -- these connections are -- are intact. 12 They were not breaking up the links between the routers. 13 That's -- but I cannot disregard somebody put a switch 14 between them and then turn them off for power 15 consumption issues. So as far as I know, no NoC breaks 16 up the physical links between the routers. 17 BY MR. VANDENBURGH: 18 Q. But this paragraph talks about closing 19 connections, and that's what I meant. In the sense that 20 this paragraph talks about opening and closing 21 connections, that is end-to-end connections between 22 modules; correct? 23 A. I cannot say correct, but I will answer it this 24 way. It is not disconnecting the link. It's maybe 25 talking about closing, meaning, closing it from the	Page 145 1 a connection at compile time? 2 MR. CHRISTOPHER: Same objections. 3 THE WITNESS: It's another topic of my class. 4 So compile time means before you initiate the 5 operation, you set up all the connections that you want. 6 And it's -- it has advantages and have disadvantages, 7 and we'll leave it to that. And run time you do it on 8 the fly. 9 BY MR. VANDENBURGH: 10 Q. Okay. So the -- the -- the patent is 11 indicating that your connections can be either at 12 compile time or at run time; correct? 13 MR. CHRISTOPHER: Form. 14 THE WITNESS: It's -- it's open-ended, yes. 15 BY MR. VANDENBURGH: 16 Q. Okay. 17 A. In a way it's not going to impact the '052. 18 Q. Okay. 19 A. It's not a relevant, in my opinion, topic. So 20 they just leave it to the implementation of this. 21 Q. Okay. If we then -- this has all been in the 22 context of the limitation in Column -- in Claim 6, 23 saying, "Enabling a connection-based communication." 24 Based on that sentence in Column 5, you 25 understand that that step could be -- of enabling a

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Page 146 1 connection-based communication could be performed at 2 compile time or at run time? 3 MR. CHRISTOPHER: Objection. Scope. 4 THE WITNESS: I have not looked into the issue 5 of compile time and run time for that particular claim 6 element. I've not evaluated it. But I'm very familiar 7 with the topic. 8 BY MR. VANDENBURGH: 9 Q. Okay. But you're not -- you think it might be 10 limited -- you might have to enable your connection only 11 at compile time or only at run time, and you can't tell 12 me one way or the other? 13 MR. CHRISTOPHER: Objection to form and scope. 14 THE WITNESS: Yeah. I need to look into this 15 more, but I'm very familiar with the subject. 16 BY MR. VANDENBURGH: 17 Q. Okay. If you go to the top of Column 6, Line 4 18 of the '052 patent reads, "Once a connection has been 19 created, the master initiates transactions," and then it 20 goes on. 21 Do you interpret that as meaning that a 22 connection needs to be opened before transactions are 23 initiated? 24 MR. CHRISTOPHER: Same objections. Form and 25 scope.	Page 148 1 communication reads, "Coupling said plurality of 2 processing modules (M, S) by an interconnect means, 3 (N)" -- what does it mean to couple the -- the modules 4 by an interconnect means? 5 MR. CHRISTOPHER: Objection. Scope. 6 BY MR. VANDENBURGH: 7 Q. Is that talking about a physical connection -- 8 physical coupling? 9 MR. CHRISTOPHER: Same objection. 10 THE WITNESS: No. It -- it -- it refers to 11 finding a way to make them communicate with each other. 12 So -- 13 MR. VANDENBURGH: Give me an example. 14 MR. CHRISTOPHER: Same objections. 15 THE WITNESS: If I have your cell phone number, 16 then I cannot couple with you but I can communicate with 17 you. If I don't have your cell phone number, I cannot 18 do that. So there are means of letting them communicate 19 with each other through all the rigamarole that we went 20 through with this. They are -- that's the coupling 21 we're talking about it. But if it was a master on one 22 network, another master on another network, they cannot 23 be coupled. 24 BY MR. VANDENBURGH: 25 Q. Okay. And I just want to be clear, though. It
Page 147 1 THE WITNESS: I have not looked at when the 2 connection would be turned on. That's a very -- 3 implementation details. It may or may not be important 4 to the designer. But that's a separate issue depending 5 on specifications that may want to do that. But, 6 generally, if it's physically connected, we don't want 7 to find a way to disconnect it. 8 BY MR. VANDENBURGH: 9 Q. Well -- and, again, you're slipping back into 10 physical connections. The connections that are being 11 talked about in Column 5 and 6 are these more logical 12 connections that you talked about earlier; right? 13 A. It's one interpretation of that. 14 Q. Okay. So in top of Column 6 at Line 4 and 5, 15 when it's talking about once a connection's created, 16 it's talking about the logical connection? 17 MR. CHRISTOPHER: Objection. Form. 18 THE WITNESS: It's one interpretation. It 19 could be the physical connection, if it's not broken 20 down, so to speak, turned off or closed. Because then 21 logical and physical will be the same. 22 BY MR. VANDENBURGH: 23 Q. Let's talk about the -- let's go back to 24 Claim 6 in the previous -- I'm sorry. 25 The step before the enabling a connection-based	Page 149 1 sounds like your opinion is if I simply build a NoC 2 where my NoC has modules that are physically connected 3 to a network, I have not performed that step? 4 MR. CHRISTOPHER: Objection. Scope. 5 THE WITNESS: Let me paraphrase what you said. 6 You have a NoC. You have the modules. But you 7 have not performed that step because? 8 BY MR. VANDENBURGH: 9 Q. Let me re-ask the question. That sounds like 10 you didn't understand it. 11 A. No. 12 Q. I'm manufacturing an integrated circuit. I 13 haven't turned it on, but I've manufactured an 14 integrated circuit that has processing modules and a 15 network. And they are physically coupled together. At 16 that point have I performed the step recited in Claim 6 17 of the '052 patent of coupling processing modules by an 18 interconnect means? 19 MR. CHRISTOPHER: Objection. Outside the 20 scope. 21 THE WITNESS: If -- so you gave me an example, 22 so let me go over that. Okay? 23 So you have a NoC; an NIC; and you have 24 multiple modules, the M and S. You're saying, Are they 25 coupled or not? Is that what you're saying?

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Page 150 1 BY MR. VANDENBURGH: 2 Q. I have a network. I built with a network. 3 A. Question. 4 Q. Have I coupled them together? 5 A. Yes. I explained to you why you are not 6 coupled -- because your question is not complete. 7 Because you have not given me the protocol of the 8 communication. It's like me living on the next street 9 but I don't have a car. Are we coupled to go see each 10 other? No. You didn't give me the car. So you -- 11 that's the bottom line. That's -- all the algorithms 12 and protocols provide us the means of communication and 13 coupling. 14 Q. Okay. Just wanted -- another way of confirming 15 it, you can't couple things just by putting wires 16 between them? 17 MR. CHRISTOPHER: Objection. Scope. 18 THE WITNESS: Well, all of this background says 19 that it's not just connecting by wires. It's basically 20 giving you multi-hop network, the protocols, and so on. 21 The network interface generates the packets. So it's 22 not -- if you look that the particular element, you're 23 not getting the picture of the '052. That's my 24 understanding. 25 MR. VANDENBURGH: Let's go off the record for	Page 152 1 design. 2 Q. Okay. Do you have an opinion as to whether 3 Radulescu2004 performs -- discloses performing the step 4 of enabling a connection-based communication as recited 5 in Claim 6 of the '052 patent? 6 MR. CHRISTOPHER: Objection. Scope. 7 THE WITNESS: Can you refer me to that 8 paragraph in my report. 9 MR. VANDENBURGH: I -- I don't think it's in 10 there, and that's why I'm asking. 11 MR. CHRISTOPHER: Same objection. 12 THE WITNESS: I probably did not address it if 13 it's not in there. 14 BY MR. VANDENBURGH: 15 Q. I'd like to turn to page -- or Paragraph 170 of 16 your report. 17 A. Okay. I'm there. 18 Q. You state in the first sentence that 19 "Radulescu2004 does not consider the 'connection data' 20 when selecting the connection for the narrowcast 21 transmission." 22 A. Okay. 23 Q. What do you mean by "connection data"? 24 A. It says in the next sentence, "In other words, 25 Radulescu2004 does not disclose mapping a communication
Page 151 1 30 seconds. 2 MR. CHRISTOPHER: Sure. 3 (A recess is taken.) 4 BY MR. VANDENBURGH: 5 Q. We've been talking about connections. If we 6 look to the Radulescu2004 article, it talks about 7 communication over connections using the same sort of 8 logical concept that's talked about in the '052 patent; 9 right? 10 A. Could you refer me to the what you're citing 11 just to make sure I agree with you on that, or I can 12 search for -- 13 Q. There's a lot of it. I'm trying to find a 14 specific example. 15 If we turn to the abstract -- 16 A. Abstract. Okay. 17 Q. Yeah. Halfway down there is a sentence that 18 reads, "It provides both guaranteed and best-effort 19 services via connections." 20 Do you understand that to be a reference to 21 this idea of logical connections between modules? 22 A. It doesn't call it a logical connection. It 23 could be physical connections. You know, it doesn't -- 24 it doesn't distinguish between the two types. Because 25 you can do some of this at any level depending on the	Page 153 1 service to a particular connection 'to assure that the 2 message is transmitted via a particular set of 3 transmission requirements.'" 4 Q. Okay. And what limitation of the claim is this 5 relevant to? 6 MR. CHRISTOPHER: Objection. Form. 7 THE WITNESS: I think mapping the requested at 8 least one communication service based on a set, which is 9 the last limitation of Claim 6. 10 BY MR. VANDENBURGH: 11 Q. So in order to perform the mapping stuff -- 12 strike that. 13 In order to perform the mapping step, you need 14 to consider connection data? 15 MR. CHRISTOPHER: Objection to form. 16 THE WITNESS: Connection data was something 17 they coin differently in their report. It's just -- 18 connection data, yeah. I don't see it in their report, 19 so -- refers to the fact that I just read. They don't 20 have the information to provide that mapping. 21 BY MR. VANDENBURGH: 22 Q. If you go back just above Paragraph 170 at the 23 end of Paragraph 169, you quote a sentence of the 24 specification referring to connection data. 25 Do you see that?

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Page 154 1 A. Yes. 2 Q. Okay. So your opinion that Radulescu2004 does 3 not consider connection data is a reference back to that 4 sentence specification of the '052 patent? 5 MR. CHRISTOPHER: Objection to form. 6 THE WITNESS: It's referring to this -- this 7 mapping issue. 8 BY MR. VANDENBURGH: 9 Q. Yeah. Specifically, the sentence in the -- in 10 the specification that says that "The system comprises a 11 mapping facility to map a range of addresses or a thread 12 information to connection data"; correct? 13 MR. CHRISTOPHER: Same objection. 14 THE WITNESS: I believe so. This was 169 -- 15 Paragraph 169? 16 BY MR. VANDENBURGH: 17 Q. Correct. 18 A. Why don't I see the word "data" anywhere? Am I 19 missing where the "data" is? Sorry. Oh, here it is. 20 Yes. I see it. Why is the entire -- so yeah. 21 Connection data, meaning what kind of 22 capabilities are available, best effort, guaranteed 23 throughput, so on and so forth. That's what it's 24 referring to. 25 Q. Now, Claim 6 of the patent does not talk about	Page 156 1 THE WITNESS: Can you refer me to exactly what 2 you're reading regarding that issue. 3 BY MR. VANDENBURGH: 4 Q. I actually wasn't reading anything. It came 5 out of my own head. 6 A. Oh, then I dispute it. 7 Q. Okay. Excellent. 8 Now, if we go to Paragraph 167, you do agree 9 that there is one connection property disclosed in 10 Radulescu2004; and that's ordering. Right? 11 A. Yes. I have stated it there, and it's -- it is 12 based on that document, yes. The only connection 13 property. 14 Q. Okay. And if we look at -- strike that. 15 If you look at Radulescu2004 -- 16 A. Yeah. 17 Q. -- second column, second full paragraph, last 18 sentence reads, "We provide transport layer services by 19 defining connections, e.g., point-to-point or multicast, 20 configured for specific properties, for example, 21 throughput and ordering." 22 Does -- you certainly agree I read that 23 correctly; right? 24 A. I -- I want to ask you what page because you 25 gave me everything except the page number. I didn't
Page 155 1 connection data, does it? 2 A. No. But it talks about connection properties. 3 Q. Well -- and -- and that's what my next question 4 is going to be, is do you equate connection data to a 5 term in the claims of the '052 patent? 6 A. There is that understanding. 7 Q. Okay. And what claim term do you equate to the 8 term "connection data" in the specification? Is it -- I 9 guess it -- you know, it could be a communication 10 service, could be a communication property. It could be 11 a connection property. 12 Can you tell me which one it is. 13 A. Properties. 14 Q. It's a -- so a connection data in the 15 specification you equate to a connection property in the 16 claim? 17 A. Yes. 18 Q. So your opinion ultimately, then, is that 19 Radulescu2004 does not take into account connection 20 properties when it performs mapping? 21 A. It lacks that particular important component of 22 Claim 6. 23 Q. Do you dispute that it does perform mapping of 24 requests to connections? 25 MR. CHRISTOPHER: Objection. Form.	Page 157 1 want to interrupt you, but I -- 2 Q. I appreciate that. Page 1. 3 A. Page 1. Thank you. So -- 4 Q. The right-hand column. 5 A. So -- 6 Q. Second full paragraph. 7 A. Column -- right column? 8 Q. Right column, second full paragraph, last 9 sentence. 10 A. Okay. "Provide transport" -- 11 Q. "We provide transport layer services by 12 defining connections (e.g., point-to-point or multicast) 13 configured for specific properties (e.g., throughput, 14 ordering)." 15 A. Your question, please? 16 Q. My question, first of all, is, Radulescu 17 describes both throughput and ordering as properties; 18 correct? 19 A. So my answer is Paragraph 167. So instead 20 of -- I can read it to you -- what I said. 21 Q. I -- I think you're -- I think you're heading 22 off on a different answer than my question. 23 A. Oh, okay. Fair enough. 24 Q. My question is, Radulescu describes both 25 throughput and ordering as properties; correct?

40 (Pages 154 to 157)



Page 158 1 A. Yes. But it's not a property of the 2 connection, but rather you have the network 3 implementation, and that's what's in my Paragraph 167. 4 So I was trying to refer to that. But anyway, there 5 is a -- there is a distinction here. 6 Q. All right. I know that's in your report, and 7 so we don't need to deal with that for right now. 8 You also do agree that in the '052 patent 9 ordering is considered to be a connection property? 10 A. It's one of the connection properties among 11 many. But it's not a network level, like Radulescu. 12 This happens at the connections -- properties of the 13 connections. There is a distinction here. Radulescu 14 has a -- well, anyway. I mentioned this before. 15 Q. You're going beyond my question. I appreciate 16 that. We'll get done faster. 17 A. I stopped, yes. 18 MR. VANDENBURGH: I'm sorry. I'm taking too 19 long. We should just take a break. 20 MR. CHRISTOPHER: Sounds good. 21 THE WITNESS: Sounds good. Thank you. 22 (A recess is taken.) 23 MR. VANDENBURGH: Back on the record. 24 BY MR. VANDENBURGH: 25 Q. I'm going to move on to Round 2, which, in your	Page 160 1 A. The reference to OCP. 2 It says -- I think you're referring to the -- 3 "We adopt this protocol to provide backward 4 compatibility to existing" -- the last sentence of that 5 paragraph; right? 6 Q. Correct. 7 A. It says -- yes, it says so. 8 Q. Okay. And then, of course, Exhibit 1006 that I 9 sent to you, you agree is the specification for 10 Release 1 of OCP? 11 (Whereupon the document referred to is marked 12 by the reporter as Exhibit 1006 for identification.) 13 MR. CHRISTOPHER: Objection. Scope. 14 THE WITNESS: The -- I have to look at the 15 first page to see what exactly -- this is Release 1.0. 16 Are they referring to this one in their citation? 17 OCP 18. Reference 18. 18 They're referring to Release 2.0. 19 BY MR. VANDENBURGH: 20 Q. Okay. So -- and -- and you raise an excellent 21 point. 22 So as you interpret Radulescu2005, it's 23 referring to a later version than what we have as 24 Exhibit 1006; correct? 25 MR. CHRISTOPHER: Objection to form and scope.
Page 159 1 declaration, you address starting in Paragraph 173, just 2 to orient yourself. 3 A. Okay. 4 Q. But I want to start with just some basic 5 questions. 6 I think we talked about one of the things that 7 the '052 patent provides is a Network-on-Chip to 8 facilitate communications between modules that speak 9 with any protocol, including known bus protocols; right? 10 A. In principle I agree with that. That's one of 11 the contributions, among others. 12 Q. And -- and can the same be said of 13 Radulescu2004? That it's disclosing a Network-on-Chip 14 that provides a way to communicate -- for modules to 15 communicate with any protocol, including existing bus 16 protocols? 17 A. Barring the fact that doesn't mean -- meet some 18 of the claimed elements, in general, yes. In general. 19 It doesn't meet the claim elements, as we went through 20 last time. 21 Q. And I'm looking at Radulescu2004, Exhibit 1005. 22 In Column 2 of the first page, it also 23 identifies OCP as a specific existing protocol that the 24 system of Radulescu is designed to be used with; 25 correct?	Page 161 1 THE WITNESS: It says Release 2.0. I think 2 Release 2.0 came after Release 1.0. 3 BY MR. VANDENBURGH: 4 Q. Sorry about that. I was confused. 5 Can you turn to Page 36 of Exhibit 1006. And 6 I'm talking about Page 36 at the bottom, not Page 36 at 7 the top, because there's two sets of numbers on there. 8 A. Yes. I'm there. 9 Q. So you've got a page that has -- it says 10 "Figure 2, OCP Signal Summary" at the top? 11 A. Yes. I see that. 12 Q. Okay. And the top -- one, two, three, four, 13 five, six, seven, eight -- nine signals are identified 14 as request signals; correct? 15 A. That -- they're -- yes. They're request 16 signals. 17 Q. Okay. So each of these signals in blue are 18 required signals within the OCP protocol; correct? 19 A. Yes. Selected as -- with the color blue to 20 indicate they are required, yes. 21 Q. Okay. And the -- and the ones that are 22 indicated in dotted lines are optional; correct? 23 A. Correct. 24 Q. So it's true that when you're using the 25 optional signals, you also still have to use the

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Page 162 1 required signals; right? 2 A. Required is required. Optional is optional, I 3 guess. You can't run the optional without the required. 4 Q. That was my question. 5 You agree that OCP provided functionality for 6 threading; correct? 7 MR. CHRISTOPHER: Objection to form. 8 THE WITNESS: It provides a thread ID and 9 consequently dealing with threads as an optional 10 feature. 11 BY MR. VANDENBURGH: 12 Q. And you agree that if you're using threading, 13 you do so by the master sending the thread ID with its 14 communication; right? 15 A. I have to check that. I -- if you have the 16 page for OCP, that will help. Let's see. Thread ID. 17 Q. Might be on Page 46 at the bottom. 18 A. So user thread IDs -- I'm reading from the 19 bottom of 46 -- allows two entities that are 20 communicating over an OCP bus, I guess, interface to 21 assign transfers to particular threads. If one of the 22 communicating entities itself is a bridge to another OCP 23 interface, the information will probably pass through. 24 I'm not going to read the rest of it. 25 But the actual assignment of thread IDs is done	Page 164 1 And the MthreadID is generated by the master, I 2 suppose. 3 Q. Go back to Page 36. I think you'll see that. 4 A. Okay. Thank you. Let's take a look. 5 Yes. Master thread ID is generated by the 6 master. Correct. 7 Q. And looking at Page 46, still, of Exhibit 106 8 [sic] -- 9 A. Forty-six. Okay. 10 Q. -- one of the benefits of using thread ID is -- 11 IDs is to maintain ordering; correct? 12 MR. CHRISTOPHER: Objection to form. 13 THE WITNESS: So there is a sentence here that 14 says, "All transfers within a given thread must remain 15 strictly ordered." 16 But there are no ordering rules for transfers 17 that are -- that are in different threads. So transfers 18 within the same thread will follow in order or order 19 strategy. That's my understanding. 20 BY MR. VANDENBURGH: 21 Q. It is -- is that one of the reasons you want to 22 use threading, is to maintain ordering of transactions? 23 MR. CHRISTOPHER: Objection to form. 24 THE WITNESS: I did not look at the why 25 in-order threading is useful. There are some
Page 163 1 on a per-OCP-interface basis. 2 So your question was? 3 Q. My question was that, does an OCP manage -- let 4 me strike that. 5 My question was, if you're using threading, you 6 do so by the master sending the thread ID with its 7 communication; right? 8 A. Do they use the word "master" here? I can 9 search for that. Maybe it's just -- 10 Q. I think they do, actually, if you go back to 11 Page 36. 12 A. Yes, they are. Wow. There is 389 citation. 13 So I'm trying to find exact sentence that talks 14 about the thread ID being attached to the master request 15 just to make sure that we're on the same page, 16 literally. It talks about the handshake, the master 17 data thread ID, I guess. M data thread ID. I guess 18 refers to the M -- master. Data thread ID. 19 Q. Are you done? 20 A. I'm trying to figure out the exact citation in 21 this document where it says master incorporates the 22 thread ID. 23 It says, "Mapping of individual request and 24 responses to threads is handled through the MthreadID 25 and SthreadID field respectively."	Page 165 1 applications that require that. I don't know if I 2 addressed what applications require in-order threading, 3 but it is possible certain applications require that. 4 BY MR. VANDENBURGH: 5 Q. Yeah. I mean -- and, again, I'm not trying to 6 get -- I'm not talking about the '052 patent 7 specifically. In fact, even if we step back prior to 8 2004, threading was a known feature of protocols like 9 OCP; right? 10 MR. CHRISTOPHER: Objection to form and scope. 11 THE WITNESS: I -- the publication date for -- 12 for this is prior to the -- to the '052. So it was 13 known. Threading was known. 14 BY MR. VANDENBURGH: 15 Q. Yeah. And -- and -- I mean, you're a POSITA; 16 and POSITAs would know about threading in 2004. 17 Correct? 18 A. A POSITA had looked at OCP 1.0 would have known 19 about it, yeah. 20 Q. And you knew about threading prior to 2004? 21 A. Yes. I've known about that for a long time but 22 not in the context of communication. There are other 23 reasons for threading. 24 Q. Okay. And -- and -- and that's -- and one of 25 the reasons for threading is to maintain ordering;

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Page 166 1 correct? 2 MR. CHRISTOPHER: Objection to form. 3 THE WITNESS: Among others. It's not -- it's 4 not necessary. 5 BY MR. VANDENBURGH: 6 Q. Yeah. And so what are the other benefits of 7 threading? 8 MR. CHRISTOPHER: Objection to form. 9 THE WITNESS: That is not to do with ordering? 10 BY MR. VANDENBURGH: 11 Q. Correct. 12 A. I haven't thought about it, but it is -- it's 13 not necessary for -- to use the threading for ordering. 14 It could be some other reasons. I have to think. 15 Yeah. I would not say it's just ordering. I 16 can't think off the top of my head, but it cannot be 17 just ordering. 18 Q. Okay. In 2003 threading was known to have 19 benefits; correct? 20 MR. CHRISTOPHER: Objection to form and scope. 21 THE WITNESS: It had benefits because it was 22 used for OCP for ordering here. They could have done 23 ordering some other ways as well. 24 BY MR. VANDENBURGH: 25 Q. Yeah.	Page 168 1 of OCP has other benefits beyond just maintaining order? 2 MR. CHRISTOPHER: Objection. Form. 3 THE WITNESS: If it does, I have not evaluated 4 it. I cannot tell you for certainty. 5 BY MR. VANDENBURGH: 6 Q. If you go back to Page 36 of Exhibit 1006 -- 7 A. Sure. 8 Q. -- one of the other optional single dish 9 signals is MAddressSpace. 10 Do you see that? 11 A. Sorry. I'm trying to catch up. I lost -- 12 okay. Now reloading it. Sorry. Page 36. Thirty-six. 13 Okay. Yes. Go ahead, please. 14 Q. So do you see that on Page 36 of Exhibit 1006, 15 of the optional signals that the master can send to a 16 slave is MAddressSpace? 17 A. Yes, I can see that. 18 Q. Okay. 19 A. That what this say. 20 Q. And if you go back in Exhibit 1006 to Page 26, 21 does that describe what the MAddressSpace field is used 22 for? 23 A. "The field is an extension of a MAddress field 24 and is used to indicate the address region of a 25 transfer."
Page 167 1 A. It doesn't have to be threading to order. 2 Q. And is it fair to say that OCP included a 3 threading functionality because it was useful? 4 MR. CHRISTOPHER: Objection to form. 5 THE WITNESS: I'm assuming that's how they 6 felt; but if you wanted to maintain ordering, there 7 could be other methods. 8 BY MR. VANDENBURGH: 9 Q. I -- I understand that. 10 A. And so -- 11 Q. In that sense, you agree that the threading 12 functionality of OCP has other benefits beyond just 13 maintaining order? 14 MR. CHRISTOPHER: Objection. Form. 15 THE WITNESS: What I meant to say is you can 16 maintain ordering and not use threading. I did not mean 17 that -- 18 BY MR. VANDENBURGH: 19 Q. I'm -- I'm not -- I'm not -- I'm starting a new 20 question. 21 A. Okay. I have not looked into what other 22 benefits threading would have for a bus-based protocol 23 other than ordering, but it is possible. 24 Q. Okay. And, again, new question. 25 Do you agree that the threading functionality	Page 169 1 It's an optional signal for providing that 2 information. 3 Q. Okay. And why does this functionality exist? 4 What is its purpose? 5 MR. CHRISTOPHER: Objection to form. 6 THE WITNESS: I think the next sentence 7 provides some information. 8 "Examples of the address regions are the 9 register space versus the regular memory space of a 10 target core." 11 So it provides you with the capability to 12 access some of the registers, some of the -- some of the 13 core target features, flags, controls, memory, so on. 14 BY MR. VANDENBURGH: 15 Q. So within OCP, prior to 2004, if I wanted to 16 have a master issue a request that targeted a particular 17 region of a slave, I would use the MAddressSpace signal; 18 correct? 19 MR. CHRISTOPHER: Objection. Form. 20 THE WITNESS: It would be one of the -- it 21 would be used for at least -- one purpose of that would 22 be to address the regions. 23 BY MR. VANDENBURGH: 24 Q. And, again, as a -- as a POSITA in 2003, why 25 would I want to do that? What's -- what's the

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Page 170 1 circumstance where you want that ability? 2 MR. CHRISTOPHER: Objection to form and scope. 3 THE WITNESS: If you're trying to read a 4 portion of the slave processor that is based on the 5 address region, you can access that particular piece of 6 information in the slave processor. Like I said, it's a 7 control register for something to do with the -- with 8 the slave processor memory. You're trying to access 9 those areas. 10 BY MR. VANDENBURGH: 11 Q. Now, OCP is designed to be used -- strike that. 12 OCP was designed to be used on -- with things 13 like buses; right? 14 A. It's a bus-based protocol. 15 Q. Okay. 16 A. It's not a -- for the sake of argument, it's 17 not Network-on-Chip. 18 Q. This benefit of -- we've lost your video. 19 A. Oh, just a minute. Thank you. I played around 20 with the cable. Sorry. 21 Q. The benefit provided by MAddressSpace of being 22 able to access a desired region in a target is a benefit 23 in any kind of communication between initiators and 24 targets; correct? 25 MR. CHRISTOPHER: Objection to form and scope.	Page 172 1 talks about OCP. 2 You see that paragraph? 3 A. Okay. Yes. Yes. It's the 4 second-from-the-bottom paragraph -- or maybe the third, 5 yeah. 6 Q. Yeah. It says that this is designed to provide 7 backward compatibility to existing protocols like OCP; 8 correct? 9 A. Correct. 10 Q. And do you agree that the way that is written 11 is it's intended to allow the system to be used with OCP 12 as is and without modification? 13 MR. CHRISTOPHER: Objection to form. 14 THE WITNESS: The fact no modifications are 15 needed, it's possible. But, I mean, I cannot gather 16 from this that -- maybe you need some modifications to 17 OCP. Maybe there was extensions of OCP that would 18 benefit them. I cannot say for certainty that no 19 modifications required -- it's -- it's just an 20 engineering decision. 21 BY MR. VANDENBURGH: 22 Q. Right. I guess I would have understood that 23 that's what's meant by the words "backward 24 compatibility," that you can use an old thing without 25 having to modify it.
Page 171 1 THE WITNESS: It depends on what features of 2 the target you're seeking. It's really not a -- it's 3 not a global understanding. Because you may not have 4 the features that you are exposing here, the OCP, 5 because the registers may not be available to a memory 6 route -- to a memory address. So I cannot say all the 7 systems would require that. 8 BY MR. VANDENBURGH: 9 Q. I'm not -- I'm not saying that all systems 10 would require it. I'm asking whether you know in any 11 system where a master -- I'm trying to quit using that 12 word. Strike that. 13 In any system where an initiator would like to 14 be able to access different regions of a target, it 15 would be useful to use an MAddressSpace identifier to 16 facilitate that; correct? 17 MR. CHRISTOPHER: Same objections. 18 THE WITNESS: It would be a feature to use, but 19 one could visualize a system that this is not useful for 20 that. It is possible. 21 BY MR. VANDENBURGH: 22 Q. Go back to Radulescu2004, Exhibit 1005. 23 A. Okay. 24 Q. And I want to direct you to that same 25 paragraph, Page 1, column right, in the paragraph that	Page 173 1 Do you have a different understanding of 2 "backward compatibility"? 3 A. You can be backward compatible, add new 4 features. 5 Q. Oh, I understand you can. 6 A. Yeah. 7 Q. But -- but my question is, is -- is one of the 8 features of the -- what's being described in 9 Radulescu2012 is a system that allows backward 10 compatibility such that you can use OCP as is? 11 MR. CHRISTOPHER: Form. 12 THE WITNESS: I think -- I'm not disputing 13 that. I think that's -- that is implied from that 14 sentence. So yes. It says so. Backward compatible. 15 And it lists a bunch of protocols; but whether they 16 added to the OCP when they acquired the compatibility, I 17 could not tell you that. OCP plus. 18 BY MR. VANDENBURGH: 19 Q. Now, it's -- it's correct, isn't it, that 20 Radulescu2004 doesn't disclose using threading; right? 21 A. Radulescu2004 lacks threading. 22 Q. Okay. Is the Radulescu2004 system incompatible 23 with threading? 24 MR. CHRISTOPHER: Objection to form. 25 THE WITNESS: Well, there is that adapter

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Page 174 1 interface; so whether they incorporate it through the 2 adapter, I'm not sure. But it doesn't provide enough 3 information how the threading would have been added to 4 that. Because it doesn't need the threading. It's 5 handling the ordering by its own mechanism. 6 BY MR. VANDENBURGH: 7 Q. I understand that. 8 My -- my question is, does it disclose anything 9 that makes it, you know, I guess, impossible to use 10 threading? 11 MR. CHRISTOPHER: Form and scope. 12 THE WITNESS: Well, if -- if they already offer 13 the ordering, why would they need to have threading to 14 provide ordering? That becomes a little bit obsolete in 15 terms of their original feature. If I already can 16 perform the ordering, as we went through it, I think 17 there is no reason to incorporate threading even if -- 18 even if it's available. 19 BY MR. VANDENBURGH: 20 Q. And I -- and I don't think we -- you know, I'm 21 not going to try to make you change your opinion on 22 this. I understand, I think, your opinion is that 23 threading is unnecessary to what's described in 24 Radulescu2004. Is that correct? 25 A. Yes. And I have a paragraph for that. I think	Page 176 1 to. 2 A. Okay. 3 Q. I tell you I want to add threading to 4 Radulescu2004. 5 You're not going to tell me that you can't do 6 it? 7 A. Being an honest engineer, I would walk away. 8 I'd say, This is not the place for me to work. 9 Q. All right. I'm going to give up on this line 10 of questioning. 11 MR. CHRISTOPHER: Good time for a break? 12 MR. VANDENBURGH: I feel like we haven't gone 13 that long. Have we? It is a good time because I 14 could -- I could figure out my next topic. 15 MR. CHRISTOPHER: All right. 16 MR. VANDENBURGH: All right. Let's go off the 17 record. 18 (A recess is taken.) 19 BY MR. VANDENBURGH: 20 Q. I'm going to talk next about Round 3 relating 21 to the Weber reference. To orient you and for what it's 22 worth, it starts on Paragraph 211 of your declaration. 23 A. Round 3, 211. 24 Q. Let me start with this. 25 Let's just look at Figure 1 of Weber.
Page 175 1 we -- we -- we covered it. 2 Q. I -- I understand. But I'm just trying to make 3 sure it's not your opinion that threading could not be 4 used in Radulescu2004. 5 A. If the feature already exists and the engineer 6 insists to use OCP threading, there has to be a 7 justifiable reason for adding this new feature because 8 you already have that. From an engineering point of 9 view, you got to come up with an explanation for your 10 manager why am I going to use the OCP threading, not 11 that it matters. So if they can convince that, then 12 more power to them. 13 Q. Okay. But, again, I'm just trying to get what 14 should be a simple point. 15 If I, as the engineer, said, "I want threading 16 in my Radulescu2004 system," you wouldn't say, "You just 17 can't have it because Radulescu2004 can't handle it"? 18 MR. CHRISTOPHER: Objection to form. 19 THE WITNESS: Counsel, I would reply to you, as 20 an engineer, is, Explain to me why you're adding these 21 additional layers. Otherwise, you would see the door. 22 Because you already have that feature. 23 BY MR. VANDENBURGH: 24 Q. Okay. I'll take it one step further. 25 I'm your boss. You have to do what I tell you	Page 177 1 A. Okay. Figure 1. 2 Q. Do you agree with me that the functional blocks 3 A, B, C, D, and E would qualify as modules as used in 4 the claims of the '052 patent? 5 A. There could be -- there could be those 6 processors, the M, yes. It's possible. 7 Q. In the modules in Figure 1 -- strike that. 8 Figure 1 also shows a plurality of buses; 9 correct? 10 A. So I believe, just to put a name to those 11 buses, if I'm not mistaken, 114 is a bus. And then so 12 is 112. And it also looks like the ASIC has a bus, but 13 it's not labeled. I just realized that. 14 Q. And I think we talked about this earlier. The 15 Bus 112 and 114 are connected via what would be a bridge 16 as Element F; is that correct? 17 A. I believe that's also consistent with my 18 report. 19 Q. Each of Buses 112 and 114 would be called a 20 shared communication bus; correct? 21 A. Yes. Assuming the bridge is the conduit 22 between these two bridges -- two buses. 23 Q. And -- 24 A. Yeah. 25 Q. -- also in between each module, such as A --

Page 178 1 Module A and the Interface 120, we have point-to-point 2 buses, such as 115; correct? 3 MR. CHRISTOPHER: Objection to form. 4 THE WITNESS: 115 is a point-to-point bus? 5 It's a bus. Did they call it one point-to-point bus? I 6 have to check on that. I -- 7 BY MR. VANDENBURGH: 8 Q. Let's look at Paragraph 39. 9 A. Okay. I don't know what -- 10 Q. I think they call it a point-to-point 11 interconnect. 12 A. Okay. So it's just a link. It's just 13 connecting one box to the other; and, you know, I think 14 it's -- 15 Q. And I don't want to get too caught up in the 16 terminology, but would you call a simple point-to-point 17 interconnect like that also -- can you call that a bus 18 between just two components? 19 A. It's an overkill for a bus. I would not -- I 20 would say it is extension of that Bus 124. 124. I have 21 to recall what 124 is. Is that the bridge we're talking 22 about? Let me search for that. I'm sorry. I don't 23 remember -- 124 -- oh, it's a module. It is one of the 24 modules; right? So I'm assuming it just came out of the 25 module. So -- so it's like A, B, C, D.	Page 180 1 A. Right. 2 Q. Right. As you look at Figure 1, you wouldn't 3 call A, B, C, or D a bridge, would you? 4 A. No. They're not -- they're not the bridge, no. 5 But -- but the 124 I think is the snooping block. Let 6 me just double-check that. Because it -- it is -- it's 7 interfacing the bridge. 8 Q. I -- if you give me time, I think we can -- if 9 you go up to 40 -- 10 A. Forty. Okay. 11 Q. -- it describes Interface Modules 120, 122, 12 123, and 124. So the box in front of the bridge is an 13 interface module. 14 A. Okay. 15 Q. Okay. 16 A. Yeah. I agree with that. And that explains 17 why it's sitting there. 18 Q. Right. It's serving as an interface between 19 the shared Bus 114 and the bridge? 20 A. Yes. I agree with that. 21 Q. Okay. And the other interfaces, 120, 121, 122, 22 123, are serving as interfaces between the Bus 114 and 23 the functional blocks, A, B, C, D -- or A, B, C, E? 24 A. I agree with that too. The Block D doesn't 25 have an interface. I just noticed that.
Page 179 1 Q. No. Well, let me -- let me clarify that. I 2 probably should have done that first. 3 So for A, B, C, and D, they call them 4 functional blocks in Weber; correct? 5 A. I believe so, yes. 6 Q. But if we were going to use the terminology of 7 the '052 patent, you agree that you -- you'd use -- 8 you'd call them modules? 9 MR. CHRISTOPHER: Objection to form. 10 THE WITNESS: They -- they're functional 11 blocks. And I can look in to see the details of the 12 modules for the specification of '052. A functional 13 block is different than a -- than a processor or a core. 14 And I want to see what '052 talked about those. 15 Why do I bring that up? Because if it's a 16 processor, it's programmable, it has a lot of features, 17 and so on. If it's a functional block, it's not that 18 flexible, so to speak. 19 BY MR. VANDENBURGH: 20 Q. So if we look at Paragraph 41 of Weber -- 21 A. Forty-one of Weber. Okay. 22 Q. -- it says, "In one embodiment there are four 23 fundamental types of functional blocks. The four 24 fundamental types are initiator, target, bridge, and 25 snooping blocks"?	Page 181 1 Q. So would that suggest that Block D doesn't need 2 an interface because it uses the same protocol as the 3 Bus 114? 4 A. I couldn't tell you. That's one scenario. And 5 I'm sure Weber describes this. If it's important to 6 you, I can search but... 7 Q. I don't think it is important to me, although 8 I'm not certain it does tell us that. But it's not 9 important right now. 10 A. Okay. 11 Q. Can I direct your attention to Paragraph 261 12 and 262 of your report. 13 A. Okay. Sixty-one -- 261. 14 Q. 261, 262. 15 A. Two more seconds, please. 16 Yes. I'm there. 17 Q. Okay. So starting with the first two 18 sentences, you state, in 261, "A POSITA would understand 19 that the Interfaces 120, 124, and 128 or the Bridge F 20 are not network nodes. This is because Weber discloses 21 that the interfaces, the bridge, i.e., a functional 22 block, and the shared bus all communicate in the same 23 protocol." 24 And so that -- I take it that is your opinion 25 that all of those components use the same protocol?

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Page 182 1 A. Yes. Otherwise, they would not communicate 2 with each other -- they would not be able to communicate 3 with each other. 4 Q. Okay. And then I -- just -- there was really a 5 lead-in to the first sentence of Paragraph 262 -- 6 A. 262. 7 Q. -- which reads, "Because each of Weber's 8 alleged network nodes, i.e., the Interfaces 120, 124, 9 and 128 and the Bridge F, run on the same protocol as 10 the initiator and target modules, a POSITA would 11 understand that Weber does not disclose protocol 12 conversion." 13 I just want to understand what you mean by 14 "protocol conversion." 15 A. They speak the same language. You don't have 16 the variety options that the adapter for using 17 Radulescu2004 or the '052, they provide the adapter to 18 be able to accommodate different protocol interfaces. 19 This is just an interface, and it's not advocating 20 having different protocols. Weber -- in my opinion, if 21 I -- if you find it that it talks about different 22 protocols, I'd be glad to go over that with you. 23 BY MR. VANDENBURGH: 24 Q. I just want to understand how -- what needs to 25 happen for there to be a protocol conversion.	Page 184 1 A. Figure 4. Okay. 2 Q. And I think if you -- to discuss what's shown 3 in Figure 4, it might be helpful to look at Paragraph 48 4 of Weber, which describes Figure 4. 5 A. Okay. Paragraph 48. 6 Q. It would be helpful if you've got it both on 7 your screen and the hard copy, perhaps one on the figure 8 and one on the paragraph. 9 A. An excellent idea. Thank you. It's the 10 dreaded afternoon hours. Okay. Let's do this. So let 11 me go to -- you said Paragraph 48? 12 Q. Correct. 13 A. Forty-eight. All right. 14 Q. Figure -- Figure 4 -- 15 A. Uh-huh. Yes. 16 Q. -- shows initiator Functional Block 102 17 communicating over 1010 to initiator interface Module 18 104, which then communicates over 1012 to a target 19 interface Module 1006, which then communicates over 1010 20 to a target functional Block 108. 21 That's a correct description of Figure 4; 22 correct? 23 A. That is my understanding as well. 24 Q. Okay. And Paragraph 48 indicates that the 25 middle Communication Bus 1012 is analogous to the shared
Page 183 1 I take it if you go from one bus protocol, OCP, 2 to another one, say, AXI, that would be a protocol 3 conversion? 4 A. That's one example of that. And '052 talks 5 about it. And it's one of their contributions, in my 6 opinion. 7 Q. Okay. What are -- what are some other examples 8 of a protocol conversion? 9 A. Just -- I mean, you can make it more abstract 10 from Protocol N to Protocol M; and you could put your 11 favorite protocol for N and M. It doesn't really 12 matter. The functionality is the same. 13 Q. What I'm struggling with is, what's "protocol"? 14 A. Oh, we just went through one. Connectionless 15 OCP. That's one of them. 16 Q. Okay. 17 A. We spent some time, and you pointed out that it 18 was connectionless. So yeah. I mean, it's one of the 19 important contributions of '052. Protocol conversions 20 IP -- IP independence. So you don't have to be focusing 21 on a specific protocol. 22 Q. Let's go back to Weber. 23 A. Weber. Okay. 24 Q. And I want to make sure we have the same 25 understanding of Figure 4.	Page 185 1 Buses 112 and 114 in Figure 1; right? 2 A. That's what it says, yes. 3 Q. Yeah. And so what it's showing, then, the two 4 inter -- initiator and target interface modules would be 5 analogous to one of the Interface Modules 120, 122, 123, 6 124 in Figure 1; right? 7 A. Yes. It's consistent with my understanding of 8 that interface. 9 Q. All right. And then the -- I'm sorry. What do 10 I want to call them? The Interconnect 1010 would be 11 analogous to the Interconnects 115 shown in Figure 1 12 that connect the Functional Blocks A B, C, D, E to an 13 Interface 120 or so on; correct? 14 A. I have to disagree with you because we don't 15 show the bridge here. So it's not a one-to-one 16 equivalence. The one you pointed out to -- I think you 17 were referring to 115 or Figure 1. Or am I -- 18 Q. Yeah. And there is a sentence right on this in 19 Paragraph 48. 20 It says, "Interconnects 110 are typically 21 analogous to Interconnect 115 of Figure 1." 22 A. Sure. 23 Q. -- "functional blocks to interface modules and 24 are point to point rather than shared interconnects." 25 Do you see that?

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Page 186 1 A. Yes. With some twists. Because we don't have 2 the bridge. We don't have -- I know what he says and 3 I -- I appreciate that, but it's just -- it will confuse 4 a little bit. Because that particular block is a bridge 5 that is interfacing, and these are functional blocks. 6 Q. Well, if I've -- in Figure 1, if I just look, 7 for example, of Functional Block A communicating to 8 Functional Block E over the single shared Bus 114, then 9 that would be analogous to what's shown in Figure 4; 10 correct? 11 A. I see it. So the same terminology is used for 12 interfacing the bridge and between the functional blocks 13 and the interfaces. Okay. Yes. Good point. 14 Q. And I'm just kind of working through it to 15 understand the figures. 16 If we go to Figure 5 -- 17 A. Figure 5. 18 Q. -- of Weber -- 19 A. Yes. 20 Q. -- and Paragraph 49 of Weber -- 21 A. Paragraph 49. 22 Q. -- this shows the shared communication Bus 23 1012; correct? 24 A. Yes. 25 Q. And it shows seven different communication	Page 188 1 the -- the interface -- sorry. It's also the 2 point-to-point connection between an initiator 3 functional block and its interface; correct? 4 A. Please give me a chance -- assuming the 5 interface is no longer there? 6 Q. Well, let's just start over. 7 If we go back to Figure 4, the number 1010 is 8 used to describe the interconnect between a functional 9 block and its interface? 10 A. Yes. 11 Q. And I think we already established this is 12 analogous -- sorry. Strike that -- this is analogous to 13 the point-to-point interconnects in 115 shown in 14 Figure 1? 15 A. Yes. I just can't circle back to one -- 1010 16 being between master and slave. We just established 17 it's between interface blocks. Am I -- 18 Q. I -- I think it might be true that in the 19 context of Figure 11, he's using slave to describe the 20 interface. You know, when you got a communication going 21 from a mod -- from a module to a interface, it's calling 22 the module the master and the interface the slave. 23 Do you agree with that? 24 A. Very confusing. Did he define 1104 as the 25 interface? Let me check on that, please. Really
Page 187 1 lines there -- correct? -- in Figure 5? 2 A. Yes. Just to be exact, when it's darker, it's 3 more than a wire. Just to clarify that. 4 Q. Yeah. It -- it's showing seven -- 5 A. Not lines. Some of them are multiple line. 6 Q. Okay. 7 A. Okay. 8 Q. So the categories of lines; right? Clock, 9 reset, command, connect, ID, address, data, and 10 response? 11 A. Or seven categories of connections, I would say 12 is better. 13 Q. And that's describing the shared communication 14 Bus 1012 of Figure 4; correct? 15 A. Yes. 16 Q. And then, finally, if we go to Figure 11, this 17 is showing the point-to-point Interconnect 1010 that 18 goes between the functional block and its interface; 19 correct? 20 A. Sorry. What was the 1010 before when you 21 showed it to me? I'm just -- 22 Q. I think I said Paragraph 74 of Weber. 23 A. Figure 4. So 1010 is the connection between 24 the target interface and the target functional block. 25 Q. And it's -- is it limited to that, or it's also	Page 189 1 confusing. 2 Q. Yes. I think it's the last line of -- I'm 3 sorry -- the last two lines of Paragraph 74 indicate 4 that. 5 A. Referring to Figure 5 master and may be example 6 initiator functional block as stated he may be on there. 7 Okay. Interface -- interface module. Okay. 8 Semantically, the same. Syntactically, they changed it. 9 Q. Yeah. But I think we're in agreement at this 10 point that Figure 11 of Weber is showing the 11 point-to-point interconnect that would be between a 12 functional block and its interface? 13 A. It is -- it is a connection between those two 14 entities. And if you want to call it point-to-point, 15 that's -- for the lack of better word, it is directly 16 connected. 17 Q. Do you have an understanding -- well, strike 18 that. Let me start with this. 19 You agree with me, don't you, that there are 20 more signals being shown in Figure 11 than in Figure 5? 21 A. Find Figure 5. 22 Well -- yes. I can count that that's more, 23 yes. 24 Q. So -- and you agree with me that what happens 25 in Weber's system is first the functional block, such as

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1 A, sends a signal to its interface module with all of
2 the different signal lines shown in Figure 11 and then
3 that interface outputs a signal across the shared bus
4 using the condensed set of signals shown in Figure 5?

5 A. Condensed set of signals, because those
6 darkened lines are not just single lines. It could be
7 more. We couldn't tell for sure. I know we count them
8 by -- by line, but those -- some of those thicker lines
9 are more than one wire. That's what I was trying to
10 do --

11 Q. Understood.

12 A. -- not for sure, yeah.

13 Q. Yep. Yep.

14 Let me just go through them one by one on
15 Figure 11. It looks like one line in Figure 11 is a
16 clock line?

17 A. Yes.

18 Q. The top. And then there is also a clock line
19 in Figure 5. So you would assume that if a signal was
20 sent over the clock line in Figure 11, it would go out
21 over the clock line in Figure 5?

22 A. Simple answer is yes. Complex answer, it's
23 multiple clocks.

24 Q. Okay.

25 A. But I think we just leave it to that. Okay?

1 Q. Yeah. And -- and for a number of these, I
2 think we're going to find one-to-one correspondence.
3 The next one on Figure 11 is command. So if the
4 functional block sends through its interface a signal
5 over the command line in Figure 11, you would agree it's
6 going to go out over the command line in Figure 5?

7 A. Yes. But we don't know how many wires. But
8 command matches command, yes. I think -- I would assume
9 so. They would not do a signal change for --

10 Q. Let's --

11 A. What's --

12 Q. Let's go to one that perhaps isn't in bold.

13 If we look in Figure 11, one of the signal
14 lines that the master can use to send to the slave --

15 A. Yes.

16 Q. Well, strike that.

17 In Figure 11, one of the signals that the
18 functional block can send to its interface is a width
19 signal?

20 A. Okay. I see that.

21 Q. How would the bus of Figure 5 send that width
22 signal out over the shared bus?

23 A. I don't know. I have not looked into that.

24 Q. Do you agree that there is some sort of
25 functionality within the interface that makes a decision

1 where to put that width signal in the shared bus shown
2 in Figure 5?

3 MR. CHRISTOPHER: Objection to form.

4 THE WITNESS: Counsel, to be honest with you, I
5 would not be able to give you a solid answer until I
6 look at the details of those signals. Any of those --
7 those ideas are possible, but would be guessing.

8 MR. VANDENBURGH: Go off the record for just a
9 minute -- less than a minute.

10 (A recess is taken.)

11 BY MR. VANDENBURGH:

12 Q. Just one last thing.

13 Understanding how the larger group of signals
14 shown in Figure 11 are condensed down into a smaller
15 grouping of signals in Figure 5 -- that doesn't change
16 your opinion, does it, that there is no protocol
17 conversion disclosed in Weber?

18 MR. CHRISTOPHER: Objection to form.

19 THE WITNESS: Counsel, I could not tell you for
20 sure because I don't know how much contraction there is.
21 These are fact signals, so to speak; and these refer to
22 bundles of these lines. So I could not tell you for
23 sure. It requires careful study. It is possible if one
24 does further analysis. It's not that complicated but
25 requires some work.

1 BY MR. VANDENBURGH:

2 Q. If you turn to Paragraph 50 of Weber.

3 A. Fifty, Weber.

4 Q. Yes.

5 A. Okay. I'm there.

6 Q. So the first sentence of that paragraph is
7 referring to that shared communication Bus 1012 that
8 we've been talking about and shown in Figure 5.

9 A. Figure 5?

10 Q. I believe that's true. Doesn't Figure 5 show
11 shared communication Bus 1012?

12 A. Correct.

13 Q. So Paragraph 50, first sentence, indicates that
14 that shared communication bus includes separate address
15 data and control lines?

16 A. Yes.

17 Q. The next sentence then says, "Other embodiments
18 may include multiplexed address data and control signals
19 that share a wire, or wires"?

20 A. Correct.

21 Q. Do you agree with me that that alternative
22 embodiment that I don't believe is shown in a figure
23 would involve taking the address data and control signal
24 lines shown in Figure 5 and essentially sending all that
25 data over a single line?

1 MR. CHRISTOPHER: Objection to form.
 2 THE WITNESS: I disagree all at the same time.
 3 Because it's -- it's not going to work out. They will
 4 be sent at different times. If you send them all at the
 5 same time, it won't work.
 6 BY MR. VANDENBURGH:
 7 Q. That was an excellent point.
 8 So in that second sentence of Paragraph 50,
 9 it's disclosing that you would take the three lines in
 10 Figure 5, combine them into one line, and then send the
 11 three categories of data sequentially?
 12 MR. CHRISTOPHER: Objection to form.
 13 THE WITNESS: Does it say "sequentially"?
 14 BY MR. VANDENBURGH:
 15 Q. I don't think it says "sequentially"; but I
 16 think that's what you were just telling me, is you can't
 17 send them at the same time.
 18 A. Yes. You cannot send them at the same time
 19 because you have limited highways. You just squeeze,
 20 for the lack of a better word, multiple cars through
 21 one-lane highway. So we go address first, so on. But
 22 the multiplexing -- it's -- you know, it means that you
 23 have a mechanism for doing that and --
 24 Q. I -- I agree.
 25 And -- so if you've got -- if you go back to

1 Figure 11, if your functional block is sending address
 2 data and control signals to its interface over separate
 3 lines and then you have an embodiment where Figure 5 is
 4 sending those signals out over the same line, that means
 5 that the interface is what then performs the condensing
 6 of the data so that it can be sent sequentially over the
 7 same line; correct?
 8 MR. CHRISTOPHER: Objection to form.
 9 THE WITNESS: Condensing the data -- I will
 10 qualify that another way. It's using the same highways
 11 to send different types of information. That's what
 12 it's doing.
 13 BY MR. VANDENBURGH:
 14 Q. At different times so they're kind of one after
 15 another?
 16 A. Cannot be at the same time. It has to be
 17 separated by time.
 18 Q. Okay. But the -- I guess to confirm, based on
 19 our understanding of Figures 11 and Figure 5, that
 20 functionality would occur in the interface to the
 21 functional block?
 22 MR. CHRISTOPHER: Objection to form.
 23 THE WITNESS: Are you basing that assertion on
 24 the fact that the wires coming out of the interface
 25 block is fewer than the ones on the other side? Is that

1 what you're referring to?
 2 BY MR. VANDENBURGH:
 3 Q. I'm basing it on the fact that Figure 11 shows
 4 separate address, data, and control lines. And then
 5 Paragraph 50 of Weber suggests, as an alternative
 6 embodiment, you can take the lines of Figure 5 and
 7 condense the address, data, and control signal lines
 8 into a single line.
 9 MR. CHRISTOPHER: Form.
 10 THE WITNESS: Okay. Yeah.
 11 BY MR. VANDENBURGH:
 12 Q. Are you still thinking of an answer? I did not
 13 hear an answer to my question.
 14 A. I said, "Hold on." I'm waiting for counsel.
 15 MR. CHRISTOPHER: I just said, "Form" --
 16 Objection to form.
 17 You can go ahead and answer the question.
 18 THE WITNESS: I'm sorry. I misunderstood.
 19 MR. CHRISTOPHER: I should have said the word
 20 "Objection."
 21 THE WITNESS: Okay. Yes.
 22 So I think we went through this, Counsel. So
 23 you're saying, if I understand you correctly, you have
 24 all these signals for Figure 11 and then Slave 1004 is
 25 the A box in the -- in Figure 5, basically. So there is

1 a contraction of signals from Figure 11 back to
 2 Figure 5.
 3 Am I -- did I understand you correctly?
 4 BY MR. VANDENBURGH:
 5 Q. I -- I state it somewhat differently.
 6 Where Figure 11 is showing the point-to-point
 7 Interconnect 1010 between a functional block and its
 8 interface; correct?
 9 A. Got that.
 10 Q. And then Figure 5 is showing the shared
 11 communication Bus 1012; correct? I mean, just to
 12 reorient ourselves.
 13 A. Yes. I -- I understand that too.
 14 Q. So my question ultimately is, if I'm sending
 15 data from a functional block to its interface using the
 16 signals of Figure 11 and then the interface sends that
 17 data out over the shared bus of Figure 5 with the
 18 embodiment described in Paragraph 50 where I'm
 19 multiplexing address data and control signals over
 20 shared wires, you agree that it's then the interface
 21 that has to handle that condensing of the separate
 22 signals into a signal sent over the single line at
 23 different times?
 24 MR. CHRISTOPHER: Objection to form.
 25 THE WITNESS: I -- okay. I -- I don't know

Page 198 1 what the details of those signals are in Figure 5 and 2 how much contraction was done between the signals that 3 the processor Functional Block 102 gave to the 4 interface, which is Slave 10 -- 1104. I don't know how 5 much contraction there is. The number of lines are more 6 for sure in Figure 11. I cannot deny that. But, again, 7 there are fat lines in Figure 5. And it could include 8 some of these lines. I cannot tell you for sure. 9 That's my answer. 10 BY MR. VANDENBURGH: 11 Q. I think you've maybe lost -- one of us has lost 12 track of where we started. 13 A. Okay. 14 Q. Go back to Paragraph 50 -- 15 A. Okay. 16 Q. -- of Weber. 17 A. Yes. 18 Q. In the first sentence it says, "Shared 19 communication Bus 1012 includes separate address, data, 20 and control wires." 21 A. Right. 22 Q. And that's exactly what's shown in Figure 5 for 23 shared communication Bus 1012; right? 24 A. It shows that, yeah. 25 Q. Okay. Then the next sentence says, "Other	Page 200 1 depends, what are you multiplexing? If you're 2 sequentializing the address of data, you could be 3 sending some of these signals as well. What stops you 4 from doing that? You're using time pulses based on 5 clock pulses. So let's -- if I continue with this 6 answer, clock pulse 0, I'm going to send the address. 7 Clock pulse 20, I'm going to send the data. Clock pulse 8 30, I'm going to send all the control signals that I 9 need. So -- so it is contracting into one-lane highway, 10 but it's sending everything. I could not tell you for 11 certain on that. 12 Q. Look at Paragraph 272 of your declaration. 13 A. Yes. 272. Just one second. Yes. 14 Q. You say that "With respect to the mapping 15 process, Weber describes that for each component in a 16 path for initiator target, e.g., through several 17 interfaces and one or more communications substep 1710, 18 an available channel is chosen, and one could choose the 19 channel that closely matches the performance 20 requirements of the initiator's data flow." 21 And then the next sentence reads, "Based on 22 this disclosure, a POSITA would understand that Weber's 23 communication subsystems do not choose an available 24 channel." 25 So, first of all, I just want to understand
Page 199 1 embodiments may include multiplexed address data and 2 control signals that share a wire, or wires." 3 So that sentence would effectively say, Take 4 Figure 5 and instead of having separate address, data, 5 and control lines, you would send that data over a 6 single line at different times. 7 A. So it's -- it's -- 8 MR. CHRISTOPHER: I'd say objection to form. 9 THE WITNESS: So it's a different embodiment 10 than Figure 5, you're talking about? 11 BY MR. VANDENBURGH: 12 Q. Correct. 13 A. Because address and data -- separate. It is 14 not multiplexed here. 15 Q. I agree. Figure 5 is described in the first 16 sentence where they're separate. Paragraph 50. The 17 next sentence describes a different embodiment where I 18 have, to use your terminology, I think, gone from a 19 three-lane highway to a one-lane highway. 20 A. So we don't have a figure for this new 21 contraction. 22 Q. Correct. 23 A. So you're asking me, based on that paragraph, 24 make the analysis. I -- I don't know if I can answer 25 that -- a fair answer on that. But -- because it	Page 201 1 what you mean by choosing an available channel. 2 A. So it's decided a priority to the initiation or 3 commencement of the communication using compile time, if 4 we want to use that terminology. It was already 5 established. 6 NoC is different. You do it at the run time 7 most of the time. You can do at the compile time as 8 well. But this one is set in place. You have no other 9 option. 10 Q. Okay. So are -- are -- are you -- and this is, 11 I believe, tied to the mapping limitation in the claims 12 of the '052 patent; is that right? 13 A. Yes. It's -- it's referring to that. It says 14 Weber fails to provide an explanation as to which 15 component of the system -- correct. 16 Q. Okay. And -- are you saying, then, that in 17 order to meet the mapping limitation, you need to have 18 multiple paths through the network to choose from? 19 MR. CHRISTOPHER: Objection to form. 20 THE WITNESS: Well, multi-hop network is based 21 on the fact that you have the ability to go to different 22 routers. This is not implementing the multi-hop 23 network. So it's really comparing apples and oranges, 24 in my opinion. It's really not relevant. 25 ///

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1 BY MR. VANDENBURGH:

2 Q. Okay. Well -- and maybe your question's --
3 that suggests a more basic question.

4 Does a multi-hop network mean that you have to
5 have more than one path to get from a master to a slave?

6 A. Not required. You can if -- based on the
7 design of the NoC, you have that option because you have
8 these short links to other routers. And that's the
9 beauty of NoC compared to a bus or, in this case, the
10 way that he handles the communication between entities.

11 So you have that option. If you don't want to
12 use it, you don't use it. That's the routing algorithm
13 that we worked on, basically. You can have a very
14 deterministic routing, or you can have an adaptive
15 routing. Weber doesn't have that because it's not based
16 on that.

17 Q. I think we talked about this earlier; and I
18 believe you indicated that if I had a very simple system
19 that had two modules and a single router, that that
20 could still practice the method of, say, Claim 6 of the
21 '052 patent?

22 MR. CHRISTOPHER: Object to form.

23 THE WITNESS: One or more nodes. It's in the
24 description. And I had explained to you that the link
25 to the router is one hop; the other one is the other

1 right? So -- so it would be a knob that I may not be
2 using. But as you increase the size of the network, it
3 makes sense.

4 BY MR. VANDENBURGH:

5 Q. I understand that it may be impractical; but,
6 again, the public is entitled to know what the claim
7 covers. And you have a very specific understanding of
8 the mapping. And I think you're distinguishing Weber
9 because it's only -- it doesn't choose an available
10 channel. And I think that means you would have to agree
11 with me, that if I had only two modules and a single
12 router, that I can't perform the mapping step in
13 Claim 6.

14 MR. CHRISTOPHER: Objection to form and scope.

15 THE WITNESS: I disagree with that. I said you
16 can still apply the mapping if there -- if it makes
17 sense because of implementation.

18 For instance, one of the properties that we
19 talk about is latency -- correct? -- or throughput. If
20 you can justify that those parameters are important and
21 you have the option, then yeah, you can. Assume the
22 router in the middle, that one hop -- one of the links
23 is connected to something else, then you won't
24 include -- include throughput and latency because you
25 have other options. Although it's not another entity,

1 one.

2 BY MR. VANDENBURGH:

3 Q. Okay.

4 A. It -- it -- it clearly says one or more.

5 Q. But you agree with me in that circumstance
6 there would be only one path for the data to take from
7 the initiator module to the target module?

8 A. Yes. But comparing that to a bus I think to me
9 misses the point that the scalability of NoC --
10 everybody talks about scalability. If you want improve
11 the scalability with one router, then it's really not a
12 fair game. Because bus is limited. But the NoC can
13 expand. Most of the NoCs I've seen have -- but the hops
14 count matches the one node. That's the most -- you
15 don't an OC11 router, usually. But hops count.

16 Q. Here's my question. In that -- in that
17 hypothetical where I've got only two modules connected
18 by a single router, can I perform the mapping step
19 recited in Claim 6 of the '052 patent?

20 MR. CHRISTOPHER: Object to form.

21 THE WITNESS: I have not evaluated that; but if
22 you have the properties that you want, it becomes
23 frivolous for one router to -- to look into --
24 throughput the latency. Because where do they come up?
25 Because you have other routers that are interfering;

1 but it could be another object, like an ASIC or some
2 other device.

3 So it does make sense. It's just as the
4 network gets larger, it becomes more important. That's
5 why Weber cannot catch up with that. And also the fact
6 that you have flow control.

7 BY MR. VANDENBURGH:

8 Q. I thought I had an answer to my question for
9 about the first half, but then you started bringing in a
10 more complicated NoC. I'm -- I'm asking you a
11 hypothetical system that has only two modules and a
12 single router.

13 Can I perform the mapping step of Claim 6 in
14 that hypothetical network?

15 A. Yes, you can.

16 Q. Okay. Thank you.

17 MR. CHRISTOPHER: We've been going about an
18 hour. Is it a good time for a break or --

19 MR. VANDENBURGH: I think it is, actually.

20 MR. CHRISTOPHER: All right. Let's go off the
21 record.

22 MR. VANDENBURGH: Ten minutes again? Five to
23 ten?

24 MR. CHRISTOPHER: Sounds good.

25 (A recess is taken.)

1 BY MR. VANDENBURGH:

2 Q. I've saved the best for last. I just want to
3 talk a little bit about your qualifications and history.

4 Can you turn to Paragraph 10 of your
5 declaration.

6 A. Okay.

7 Q. You indicate in the second sentence that you --

8 A. Give me a chance to catch up.

9 Q. Yeah. Yeah.

10 A. Got it. Paragraph. Qualifications. Yes. I'm
11 with you.

12 Q. Okay. The second sentence of Paragraph 10 of
13 your declaration states, "I also received another Best
14 Student Paper award co-authored with my doctoral
15 students in the proceedings of Asia and South Pacific
16 Design Automation Conference (ASPDAC) 2002."

17 A. Yes.

18 Q. What is the Asia and South Pacific Design
19 Automation Conference?

20 A. Design automation conference in that part of
21 the world. I can't add any more than what the title.

22 Q. What is -- what is -- what's your understanding
23 what's intended by design automation?

24 A. Design automation refers to using tools to
25 design the next-generation chips: Circuits, functional

1 to pick it up?

2 A. I don't like long trips unless it's Paris, so I
3 didn't go there. Unless it was in Paris. I'm not sure.

4 Q. Okay. Are you familiar with the Design
5 Automation and Test in Europe conference?

6 A. DATE conference?

7 Q. Correct.

8 A. I've heard of it, yes.

9 Q. Okay. And have you attended that one?

10 A. I may have in the past. I don't recall which
11 year.

12 Q. Okay. Would you be surprised if the Asia
13 Pacific Design Automation Conference described DATE as a
14 sister conference?

15 A. Or brother conference? I don't -- I don't -- I
16 have no clue, Counsel. I -- I really mean it from the
17 bottom of my heart that these two are tightly coupled,
18 using the terminology of this patent. I don't know. I
19 don't really know. Usually, they have program committee
20 members and so on. And if they are overlapping, sure,
21 it could be possible. But I don't know.

22 Q. Okay. You also, in Paragraph 11, say that you
23 became an IEEE fellow.

24 A. Yes.

25 MR. VANDENBURGH: And perhaps, for the court

1 blocks we talked about, all kinds of stuff. It's just
2 focused on the tools for the development of these
3 technology. At least primarily. They have some
4 sessions that do other things, but that's the basic
5 focus.

6 Q. And is that conference one that is attended by
7 POSITAs, as we've defined that term for this case?

8 MR. CHRISTOPHER: Objection to scope.

9 THE WITNESS: If they have the money, it could
10 be. Far away for POSITAs in the United States. So I
11 would say it would be a long haul to go wherever that
12 was.

13 BY MR. VANDENBURGH:

14 Q. But, of course, there is POSITAs all over the
15 world; right? I mean, they're not just in the United
16 States?

17 A. Sure. I mean, it's possible.

18 I don't know who attended. I don't even know
19 doctoral student attended, for that matter.

20 Q. How many times have you attended that
21 conference?

22 A. Never.

23 Q. Never?

24 A. Never.

25 Q. You were given an award, but you did not attend

1 reporter, I think we do I triple E as IEEE.

2 THE WITNESS: Yeah.

3 BY MR. VANDENBURGH:

4 Q. What is IEEE?

5 A. It's our institute -- professional institute.
6 Now you're asking me about initials. Institute of
7 Electrical -- or Electronic and Electrical Engineers.
8 It could be either -- the first E is electronic or
9 electric. It's our professional society, and it's quite
10 an honor to be a fellow of that.

11 Q. Again, are POSITAs going to be familiar with
12 IEEE?

13 MR. CHRISTOPHER: Objection to scope.

14 THE WITNESS: Because they could have
15 memberships, student memberships, senior members, so
16 there are ranks. Student member would be an IEEE
17 member. For different benefits they have some
18 fellowship sometimes. And senior members -- junior
19 faculty tend to be senior members because maybe helps
20 them to become fellows because you have to be a senior
21 member before you become a fellow.

22 BY MR. VANDENBURGH:

23 Q. Okay. If we go back -- well, let me start with
24 this.

25 IEEE existed prior to 2004; correct?

Page 210 1 A. Yes. It's been there for many decades. 2 Q. All right. What is the role of IEEE in, say, 3 the year 2000? 4 MR. CHRISTOPHER: Objection to form. 5 THE WITNESS: Oh, they have -- they have a 6 charter, and they have board of governors. I mean, from 7 the top of my head, they have standards committee. I 8 mentioned about the bus standards committee in my 9 background, if you recall. Many different things. 10 Publications, organizing events. All kinds of stuff. I 11 mean, I would be not truthful to say that's the list. 12 It's just a lot more. They have more -- board of 13 governors. They meet regularly. I have very good 14 friend of mine -- colleague of mine is a member of that 15 committee -- one of those committees. It's encompassing 16 our field in many ways. Standards and so on. 17 BY MR. VANDENBURGH: 18 Q. Yeah. Okay. I guess my -- my last question 19 before I hand it over is, you know, we've taken a number 20 of breaks today. Have you discussed the substance of 21 your testimony with the NST lawyers at any of our breaks 22 today? 23 A. Absolutely not. 24 MR. VANDENBURGH: Thank you. I have no further 25 questions.	Page 212 1 we're talking about. I think I closed it down. What -- 2 what exhibit is my declaration? Twenty-seven? 3 BY MR. CHRISTOPHER: 4 Q. 2007. 5 A. 2007. Yes. 6 Q. Okay. Do you see above Paragraph 31 the 7 section heading, Roman IV., "Understanding of Legal 8 Principles"? 9 A. Yes, I see that. 10 Q. And then in Paragraph 31 you state, "I have a 11 general understanding of the validity based on my 12 experience with patent, my career experience, and my 13 discussions with counsel." 14 Do you see that? 15 A. Yes. 16 Q. And then if you can turn to Paragraph 34 on the 17 next page. 18 A. Yes. 19 Q. Do you see the subheading B., "Anticipation"? 20 A. Correct. 21 Q. And then if you scroll two pages down to 22 Paragraph 38 -- 23 A. Yes. 24 Q. -- do you see, above Paragraph 38, the 25 subheading "Obviousness"?
Page 211 1 MR. CHRISTOPHER: We'll have some short 2 redirect, if we can go off the record -- 3 MR. VANDENBURGH: Yeah. 4 MR. CHRISTOPHER: -- get situated. 5 (A recess is taken.) 6 MR. CHRISTOPHER: Let's go back on the record. 7 8 EXAMINATION 9 10 BY MR. CHRISTOPHER: 11 Q. Just a few short questions for you, 12 Dr. Bagherzadeh. I just butchered the pronunciation. 13 Do you recall being asked by Mr. Vandenburg 14 about something called the validity analysis? 15 A. I do. 16 Q. And do you recall stating that you did not look 17 at any documentation for validity or the legal matters? 18 A. I recall that. 19 Q. What did you mean by that? 20 A. I meant the district court case that I've been 21 recruited, but I haven't done anything. 22 Q. Okay. Could you turn to Paragraph 31 of your 23 declaration. 24 (Discussion held off the record.) 25 THE WITNESS: Let me find the document that	Page 213 1 A. I see that. 2 Q. Did you apply the legal principles in 3 Section IV of your declaration in forming your opinions? 4 A. Yes, I did. 5 MR. CHRISTOPHER: No further questions. 6 MR. VANDENBURGH: I have no further questions. 7 DEPOSITION OFFICER: Mr. Christopher, you're 8 ordering a copy; right? 9 MR. CHRISTOPHER: I think we'll like a rough, 10 yes. 11 DEPOSITION OFFICER: Would you like a rough as 12 well, Mr. Vandenburg? 13 MR. VANDENBURGH: Yeah. I think we would. 14 Thank you. 15 (Deposition session concluded at 4:57 p.m. Pacific Time) 16 -oOo- 17 18 19 20 21 22 23 24 25

54 (Pages 210 to 213)



Page 214 1 I have read the foregoing and by signing hereafter, 2 approve same. 3 4 Dated _____. 5 6 _____ 7 (Signature of Deponent) 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25	Page 216 1 of the testimony given by the witness. (Fed. R. Civ. P. 2 30(f)(1)). 3 Before Completion of the deposition, review of 4 the transcript { } was { } was not requested. If 5 requested, any changes made by the deponent (and 6 provided to the reporter) during the period allowed, are 7 appended hereto. (Fed. R. Civ. P. 30(e)). 8 9 Dated: _____, 2024 10 11 _____ 12 13 14 15 16 17 18 19 20 21 22 23 24 25
Page 215 1 DEPOSITION OFFICER'S CERTIFICATE 2 3 STATE OF CALIFORNIA } 4 } ss. 5 COUNTY OF LOS ANGELES } 6 7 I, THERESA JOANN PHILLIPS-BLACKWELL, hereby 8 certify: 9 I am a duly qualified Certified Shorthand 10 Reporter in the State of California, holder of 11 Certificate Number CSR 12700 issued by the Court 12 Reporters Board of California and which is in full force 13 and effect. (Fed. R Civ. P. 28(a)). 14 I am authorized to administer oaths or 15 affirmations pursuant to California Code of Civil 16 Procedure, Section 2093(b) and prior to being examined, 17 the witness was first duly sworn by me. (Fed. R. Civ. 18 P. 28(a), 30(f)(1)). 19 I am not a relative or employee or attorney or 20 counsel of any of the parties, nor am I a relative or of 21 such attorney or counsel, nor am I financially 22 interested in this action. (Fed. R. Civ. P. 28). 23 I am the deposition officer that 24 stenographically recorded the testimony in the foregoing 25 deposition and the foregoing transcript is a true record ///	



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