

Deposition of
Todd C. Mowry, Ph.D.
November 04, 2024

Qualcomm
vs.
Network System Technologies



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1 UNITED STATES PATENT AND TRADEMARK OFFICE 2 3 BEFORE THE PATENT TRIAL AND APPEAL BOARD 4 QUALCOMM INCORPORATED 5 Petitioner 6 v. 7 NETWORK SYSTEM TECHNOLOGIES, LLC 8 Patent Owner 9 10 U.S. Patent No. 7,373,449 11 12 Inter Partes Review No. IPR204-00338 13 14 15 16 17 Deposition of 18 TODD C. MOWRY, Ph.D. 19 Monday, November 4, 2024 20 21 22 23 REPORTED BY: JOHN WISSENBACH, RDR, CRR, CSR 6862 24 JOB NO. 10152347 25	Page 1 1 BE IT REMEMBERED that, pursuant to the laws 2 governing the taking and use of depositions, on Monday, 3 November 4, 2024, commencing at 9:32 a.m. EST, before 4 me, JOHN WISSENBACH, CSR 6862, of San Francisco, 5 California, appeared through videoconference TODD C. 6 MOWRY, Ph.D., at Philadelphia, Pennsylvania, called as a 7 witness by the Patent Owner, who, being by me first duly 8 sworn, was thereupon examined as a witness in said 9 action. 10 APPEARANCES OF COUNSEL VIA VIDEOCONFERENCE 11 For the Petitioner: 12 CARLSON CASPERS VANDENBURGH & LINDQUIST, PA 13 BY: PETER M. KOHLHEPP, Attorney at Law 14 AARON W. PEDERSON, Attorney at Law 15 Capella Tower, Suite 4200 16 225 South Sixth Street 17 Minneapolis, Minnesota 55402 18 (612) 436-9659 pkohlhepp@carlsoncaspers.com 19 (612) 436-9609 apederson@carlsoncaspers.com 20 21 For the Patent Owner: 22 NIXON PEABODY LLP 23 BY: ANGELO CHRISTOPHER, Attorney at Law 24 PETER KRUSIEWICZ, Attorney at Law 25 70 West Madison St., Suite 5200 Chicago, Illinois 60602 (312) 977-4391 achristopher@nixonpeabody.com (312) 977-4473 pkrusiewicz@nixonpeabody.com NIXON PEABODY LLP BY: BENJAMIN R. HOLT, Attorney at Law 799 9th Street NW, Suite 500 Washington, DC 20001-5327 (202) 585-8048 bholt@nixonpeabody.com ---
Page 2 1 INDEX OF EXAMINATIONS 2 3 WITNESS: 4 TODD C. MOWRY, Ph.D. 5 Examination by Mr. Christopher 4 6 Examination by Mr. Kohlhepp 230 7 Examination by Mr. Christopher 236 8 9 10 EXHIBITS REFERENCED 11 12 Samsung Exhibit 1001 13 Samsung Exhibit 1003 14 Samsung Exhibit 1005 15 Samsung Exhibit 1006 16 Qualcomm Exhibit 1007 17 Qualcomm Exhibit 1032 18 Network System Technologies Exhibit 2022 19 20 (Exhibits not attached) 21 22 ---000--- 23 24 25	Page 4 1 EXAMINATION BY MR. CHRISTOPHER 2 Q. Good morning. Can you please state your name 3 for the record. 4 A. It's Todd Carl Mowry. 5 Q. Thank you. Is there any reason why you cannot 6 give complete, truthful, and accurate testimony today, 7 Dr. Mowry? 8 A. No. 9 Q. Great. Based on your CV, I understand you've 10 been deposed before. Is that correct? 11 A. Yes, that's correct. 12 Q. Approximately how many times have you been 13 deposed? 14 A. Roughly 20. 15 Q. Okay. So you're likely familiar with the 16 ground rules. Just as a reminder, from time to time 17 your counsel may object to my questions, but you should 18 answer the question, if you can, unless counsel 19 instructs you not to answer. Understood? 20 A. Yes. 21 Q. And as a reminder for our court reporter, 22 please remember to verbalize your answers rather than 23 nodding or shaking your head. Makes sense? 24 A. Yes. 25 Q. And if you don't ask me to clarify a question,

Page 5 1 I'm going to assume that you understood the question and 2 that you can answer it. Is that fair? 3 A. Yes, I understand that. 4 Q. Okay. Dr. Mowry, where are you physically 5 located for today's deposition? 6 A. I'm in Pittsburgh, Pennsylvania. 7 Q. Anyone else in the room with you? 8 A. No. It's just me. 9 Q. Great. Did you do anything to prepare for 10 today's deposition? 11 A. Yes. I went back and reviewed my declaration 12 and the '449 patent and the references that I cited in 13 my declaration. 14 Q. Did you do anything else to prepare for today's 15 deposition? 16 A. I also had discussions with the -- with 17 attorneys. 18 Q. Okay. And I don't want to ask you about any 19 communications you had with counsel, but which attorneys 20 did you have discussions with; just their names? 21 A. Peter Kohlhepp and Aaron Pederson. 22 Q. And how long did you discuss with counsel? 23 A. On the order of 12 hours or so; something like 24 that. 25 Q. And you understand you're here today to testify	Page 7 1 A. Yes. 2 Q. And is that your signature on the middle 3 right-hand side of page 116? 4 A. Yes, it is. 5 Q. Great. How long did you spend preparing your 6 declaration? 7 A. I don't -- I don't remember exactly off the top 8 of my head. I would say on the ballpark of maybe 50 9 hours, something like that. 10 Q. Okay. In the course of preparing your 11 declaration, did you speak to anyone other than 12 attorneys regarding your declaration? 13 A. No. 14 Q. Okay. And did you have -- again, I'm not 15 asking you for the substance of any communications; it's 16 just a yes or no. 17 Did you discuss your declaration with counsel 18 in the course of preparing the declaration? 19 A. Yes. 20 Q. And at that time, was that counsel for Samsung? 21 A. Yes, that's correct. 22 Q. And did you -- again, I'm not looking for any 23 substance or anything like that. Did you have any 24 discussions with counsel for Qualcomm at that time? 25 A. No.
Page 6 1 regarding a declaration that you prepared in connection 2 with an inter partes review, IPR, proceeding, correct? 3 A. Yes. 4 Q. Great. My colleague is going to introduce a 5 copy of Exhibit 1003 into the Zoom chat. If you'd like 6 to open that up and review, that's fine. If you have 7 your own clean copy printed out, I'm fine with you 8 reviewing that. Do you have a copy, or would you prefer 9 to use the version through the Zoom chat? 10 A. I do have a clean paper copy, but I -- I 11 will -- I will make use of both of them, potentially. 12 Q. Okay. And you don't have any notes or anything 13 like that on the paper copy, right? 14 A. No, it's unmarked. 15 Q. Okay. And I'm fine with you referring to 16 either version. 17 You recognize Exhibit 1003 as a copy of your 18 declaration? 19 A. Yes. 20 Q. And then if you could turn for me to page 116, 21 which is the very last page. Let me know when you're 22 there. 23 A. Yes. 24 Q. The declaration is dated December 18th, 2023, 25 correct?	Page 8 1 Q. Okay. All right. In your declaration, you are 2 offering opinions on U.S. Patent Number 7,373,449, 3 correct? 4 A. Yes. 5 Q. And let's get this out of the way. If my 6 colleague can put a copy of Exhibit 1001 in the chat so 7 you'll have that to refer to. Let me know when you have 8 a copy of Exhibit 1001 open. 9 A. I am opening it. Yes, I have it. 10 Q. Great. And is it okay with you if we refer to 11 this patent as the '449 patent? 12 A. Yes. 13 Q. Great. All right. I want to go over some 14 background on the parties in this IPR proceeding. 15 You were originally retained by Samsung 16 Electronics to prepare your declaration, correct? 17 A. Yes. 18 Q. Great. And you understand that Samsung has 19 been terminated from this IPR proceeding, correct? 20 A. Yes. 21 Q. Okay. 22 A. I don't know all the, like, legal details, but 23 I -- that's my understanding, yes. 24 Q. Sure. And do you understand that Qualcomm 25 filed its own petition challenging the '449 patent?

Page 9 1 A. Yes. 2 Q. Okay. Given that counsel for Qualcomm is here 3 with us today, am I correct that you were retained by 4 Qualcomm at some point subsequent to preparing your 5 declaration? 6 A. Yes. 7 Q. When were you first contacted by Qualcomm? 8 A. I don't remember the exact date. It was 9 sometime, I mean, earlier this year. But I don't 10 remember exactly. It may have been roughly in the 11 summer, but I -- I don't remember. I don't remember 12 exactly. 13 Q. Just a few more background questions to 14 orientate us later. 15 Are you aware that the '449 patent has been 16 asserted against Qualcomm in a district court 17 proceeding? 18 A. I've heard that, yes. 19 Q. And are you aware that the '449 patent was 20 previously asserted against Samsung in a district court 21 proceeding? 22 A. Yes, I had heard that also. 23 Q. All right. One more. And are you also aware 24 that the '449 patent was previously asserted against 25 Texas Instruments in a different district court	Page 11 1 in the question has a special meaning. I did look at 2 these exhibits. I didn't necessarily refer to each of 3 them in my -- in my obviousness arguments, but I did 4 review all of those exhibits. So if -- if that's what 5 "consider" means, then the answer would be yes. 6 Q. Yeah. And let me just -- maybe we could just 7 make this clear. You at least reviewed the documents 8 listed in the exhibit list of the petition; is that 9 fair? 10 A. Yes. Uh-huh. 11 Q. And when you referred to "the Petition" here in 12 paragraph 17, that referred to Samsung's IPR petition, 13 correct? 14 A. Well, it's referring to this document, which 15 was the petition -- which was my declaration for what 16 was originally the Samsung IPR, yes. 17 Q. Have you reviewed Qualcomm's IPR petition 18 challenging the '449 patent? 19 A. Yes. 20 Q. Have you reviewed the Board's institution 21 decision with respect to Samsung's IPR petition? 22 A. Yes, I have. 23 Q. Okay. Have you reviewed NST's preliminary 24 patent owner response to Samsung's IPR petition? 25 A. Yes, I have.
Page 10 1 proceeding? 2 A. Yes, I had heard that. 3 Q. All right. If you could turn to paragraph 17 4 of your declaration, please. Let me know when you're 5 there. 6 A. Okay. 7 Q. All right. In paragraph 17, you provide a list 8 of materials that you considered in forming your 9 opinions, correct? 10 A. Yes, that's correct. 11 Q. Is that a complete list of the materials that 12 you considered in forming the opinions in your 13 declaration? 14 A. These are the references that I cite in my 15 obviousness combinations. But I refer to other 16 materials, for example, in the technical background 17 section of my declaration, and I also relied upon my 18 expertise in the field. 19 Q. Do you see where it says, in paragraph 17, 20 "other documents listed in the Exhibit List of the 21 Petition"? 22 A. I see that, yes. 23 Q. Did you consider all of the exhibits that were 24 included with the petition? 25 A. Let's see. I'm not sure if the word "consider"	Page 12 1 Q. Same questions now for Qualcomm. Have you 2 reviewed the Board's institution decision for Qualcomm's 3 IPR petition? 4 A. Yes, I have. 5 Q. And have you reviewed NST's preliminary patent 6 owner response to Qualcomm's petition? 7 A. Yes, I have. 8 Q. Let's turn now to paragraph 30 of your 9 declaration. Excuse me, 32. 10 A. Okay. 11 Q. In the first sentence of paragraph 32, you 12 wrote, "To enable the various system components within a 13 chip for an SoC design to communicate with each other, 14 an on-chip interconnect is needed. One such on-chip 15 interconnect is often referred to as a 'Network on Chip' 16 (NoC)" Do you see that? 17 A. Yes. 18 Q. I just want to go over some background with 19 you. What is an SoC? 20 A. I think I introduced that -- that abbreviation 21 back in paragraph 31. It is a system on chip. 22 Q. And could you describe for me at a high level 23 what a system on chip is? 24 A. Well, I also described that in paragraph 31. 25 But in -- in the early days of VLSI, a chip usually just

Page 13 1 contained one major component, like a -- a single 2 processor, for example. But as the capacity of 3 integrated circuits increased, it became possible to 4 integrate multiple interesting IP blocks onto a chip, 5 such as multiple processors or processors and 6 accelerators or other things like that. So 7 "system on chip" generally refers to a chip that 8 contains multiple of these things, such as what I 9 describe in paragraph 31. 10 Q. All right. And you referred to a NoC in 11 paragraph 32. Could you similarly describe for me at a 12 high level what a network on chip is? 13 A. So this -- the term "network on chip," what it 14 generally refers to in the research community is that -- 15 so in the -- again, in the early days, if you just had a 16 very small number of components on a chip and you wanted 17 to connect them together, what you might do is just wire 18 them directly together and have dedicated communication 19 paths between pairs of things that were talking to each 20 other. But as the systems start to become larger and 21 larger, that becomes more and more problematic, for 22 various technical reasons. So the idea of a 23 network on chip is to implement something like a -- a 24 on- -- an interconnect that was commonly used, for 25 example, in parallel machines, where you would have	Page 15 1 quite a bit. So that just becomes difficult, both in 2 terms of just put -- physically putting down all the 3 wires, and then it also starts to -- long wires are 4 generally slower on an interconnect within a chip. So 5 it's better to have shorter wires, in terms of the 6 latency of the communication. 7 Q. Would one example of the direct wiring you 8 described be a bus? 9 MR. KOHLHEPP: Object to form. 10 THE WITNESS: No. 11 BY MR. CHRISTOPHER: 12 Q. So your view is that a bus is not -- let me -- 13 let me withdraw that and back up. 14 You would agree that on a system on a chip, two 15 different modules could be connected via a bus so that 16 they could communicate with one another, right? 17 A. A bus is one type of an interconnect. Yes, 18 that would be a possibility. 19 Q. And in the example I gave where two modules are 20 connected via a bus, that would be a direct connection, 21 right? 22 MR. KOHLHEPP: Object to form. 23 THE WITNESS: Well, a minute ago, when I was 24 discussing a scenario where things were wired directly 25 together, I wasn't trying to add any special meaning to
Page 14 1 multiple hops, where you'd be routing packets through 2 the interconnect. And that would be the way that 3 different IP components would -- would communicate with 4 each other. 5 And as I reference at -- in the end of 6 paragraph 32, there was a very famous paper by Bill 7 Dally and Brian Towles that referred to this approach. 8 That was not the first paper on this topic, but that was 9 a paper that many people -- many computer architects and 10 network designers were -- are quite familiar with. 11 Q. You mentioned that when the systems start to 12 become larger, that becomes problematic for various 13 technical reasons. Could you explain a little bit more 14 what you meant by "problematic"? 15 A. Well, if I'm just trying to wire two things 16 together, for example, then I just have a single set of 17 wires running between them. If I start trying to wire, 18 say, dozens or hundreds of different things together 19 with pairs of wires between each thing, the number of 20 connections starts to grow quadratically. So, for 21 example, every -- every IP block would need to be 22 directly wired to every other IP block. And so the 23 number of wires would grow, like, with the square of the 24 number of things, and also just the number of wires 25 coming in and out of each block would be increasing	Page 16 1 the term "direct," just as an aside. 2 But what I meant is a dedicated -- dedicated 3 pair of wires specifically between two modules. So a 4 bus is different, because on a bus each module is 5 connected to the bus, but that's not what I was -- the 6 bus would be a common set of wires. They'd have to take 7 turns communicating across it. But I was -- in my -- 8 just as background, and not to define any terminology 9 here, but when I referred to wiring things directly 10 together, I meant literally having a dedicated set of 11 wires running between them, so if unit A wanted to talk 12 to unit B, it would just send whatever it was 13 communicating directly on those specific wires, and they 14 could be used only for communicating between A and B, 15 for example. 16 BY MR. CHRISTOPHER: 17 Q. Just to go back to my example where there's two 18 modules, and there's only two modules, on the chip and 19 they're connected by a bus, that would be a direct 20 connection, correct? 21 MR. KOHLHEPP: Object to form. 22 THE WITNESS: Well, I'm not sure, from your 23 question, if you're referring to what I was mentioning 24 earlier when I was discussing the state of the art prior 25 to network on chips or if you're discussing some

Page 17 1 specific meaning attached to "direct connection." So 2 could you clarify that? Were you referring back to my 3 earlier discussion of the state of the art prior to 4 networks on chips? 5 BY MR. CHRISTOPHER: 6 Q. Well, in your declaration, you described two 7 modules that are directly wired together, right? 8 A. Can you point me to the part of my declaration 9 you're referring to? Is there a particular sentence 10 that you're -- you're referring to? 11 Q. Well, in paragraph 32, the third sentence, you 12 wrote, "Rather than directly wiring together each pair 13 of" on-pair -- "on-chip components via dedicated 14 hardware FIFO buffers and wires." Do you see that? 15 A. Okay. Yes, I see that. 16 Q. And so my question was, if each pair of on-chip 17 interconnects were directly connect -- were connected 18 via a bus, that would be another example of a direct 19 connection, correct? 20 A. Well, in your question, you seem to be asking 21 me to define what "direct connection" is. In this 22 sentence, I was not assigning any special meaning to -- 23 I'm not trying to do claim construction on that term, 24 but, rather, in -- the point I was making in this 25 sentence is, I'm discussing specifically having a FIFO	Page 19 1 THE WITNESS: Well, I was not asked, in my 2 declaration, to provide opinions on a definition of the 3 term "network on chip." I'm -- in this paragraph 32, 4 when I'm referring to the term, I'm referencing the 5 concept that was discussed in the paper by Bill Dally 6 and Brian Towles. 7 BY MR. CHRISTOPHER: 8 Q. Yeah. My question's not limited to the paper. 9 I'm just asking as a general matter. One of skill in 10 the art would understand that a network on chip 11 transmits packets, correct? 12 MR. KOHLHEPP: Same objection: form and scope. 13 THE WITNESS: Well, I was not asked to provide 14 an opinion on the claim construction of the term 15 "network on chip." When I -- when I referenced it here 16 in this section, I'm referring to it specifically as it 17 was discussed by Bill Dally and Brian Towles. This -- 18 this paper was -- was -- as I said, was well known at 19 the time. But that's -- that's how they were using -- 20 that's -- that's how -- what they were referring to in 21 this paper. 22 BY MR. CHRISTOPHER: 23 Q. In your declaration, you've offered opinions 24 from the perspective of a person of ordinary skill in 25 the art, right?
Page 18 1 where you wire from component A wires that go directly 2 into component B and then communication is point to 3 point directly across those wires. And I was raising 4 this point as the -- to discuss the state of the art 5 prior to the concept of a network on chip. 6 Q. So you mentioned in paragraph 32 transmitting 7 packets. Would you agree that all networks on a chip 8 transmit packets? 9 MR. KOHLHEPP: Object to form. 10 I'm also going to object to scope. 11 THE WITNESS: Well, it would -- I would have to 12 see the specific details of a specific network on chip. 13 But when the term was introduced, it -- for example, in 14 Bill Dally's paper, the paper with Bill Dally and Brian 15 Towles, the title of the paper was "Route Packets, Not 16 Wires," and that -- the -- the whole idea of that is 17 that it would be an interconnect that's routing packets 18 having -- so the -- the term, quote-unquote, 19 "network on chip" as -- as used -- as introduced by that 20 paper, was advocating for routing packets. 21 BY MR. CHRISTOPHER: 22 Q. Is the use of the term "network on chip" from 23 that paper consistent with how a person of ordinary 24 skill in the art would define "network on chip"? 25 MR. KOHLHEPP: Object to form, scope.	Page 20 1 A. Yes, that's correct. 2 Q. And you are a person of ordinary skill in the 3 art, correct? 4 A. Yes, that's correct. 5 Q. And my question is, as a person of ordinary 6 skill in the art, a network on chip -- you would -- 7 strike that. Try that again. 8 As a person of ordinary skill in the art, you 9 would understand that a network on chip transmits 10 packets, correct? 11 MR. KOHLHEPP: Object to form, scope. 12 THE WITNESS: Well, I was not asked to provide 13 an opinion on claim construction for a term "network on 14 chip." I was referring here to the term as it was used 15 in this paper by Bill Dally and Brian Towles. And the 16 idea in that paper is that the on-chip interconnect 17 would route packets. 18 MR. CHRISTOPHER: Move to strike as 19 nonresponsive. 20 Q. My question was, a person of ordinary skill in 21 the art would understand that networks on chip transmit 22 packets, correct? 23 MR. KOHLHEPP: Same objection: form, scope; 24 also asked and answered. 25 THE WITNESS: Well, I was not asked to provide

Page 21 1 claim construction for the term "network on chip." But 2 the -- the paper by Bill Dally and Brian Towles, which 3 was describing this concept of network on chip, that was 4 referring to a -- an on-chip routing -- an on-chip 5 interconnect that used routing switches to send packets 6 between sources and destinations rather than sending -- 7 rather than just having things be directly wired 8 together. And the paper discussed various trade-offs 9 with that. So the -- the -- that term, when people use 10 the term "network on chip" and they're referring to the 11 concept from that paper, then that's -- that is -- 12 that's referring to packet routing interconnects. But 13 the term "network" is a somewhat generic term. So as I 14 said, I was not asked to provide claim construction on 15 that term, "network on chip." 16 BY MR. CHRISTOPHER: 17 Q. My question's not about the Dally paper. Do 18 you understand that? 19 A. I'm having some difficulty following the 20 question. 21 Q. I'm asking, from the perspective of a person of 22 skill in the art, they would understand that a network 23 on a chip transmits packets, correct? 24 MR. KOHLHEPP: Same objection: form, scope. 25 THE WITNESS: So in the section here of my	Page 23 1 implemented many different ways. As I mentioned 2 earlier, one possibility is just to directly wire things 3 together, for example. 4 So that's -- that's why I'm not able to answer 5 your question, because it's -- it's unclear whether 6 you're referring specifically to the concept introduced 7 by Bill Dally and Brian Towles and others at that time 8 or if you're using the term more generically to mean 9 something else. Broadly speaking, there have been -- 10 there are other options. There are a variety of options 11 for implementing networking or some type of interconnect 12 on a chip. 13 BY MR. CHRISTOPHER: 14 Q. Could you go to the second sentence of 15 paragraph 32 in your declaration. 16 A. Yes. 17 Q. There you wrote, "One such on-chip interconnect 18 is often referred to as a 'Network on chip' (NoC)." Do 19 you see that? 20 A. Yes. 21 Q. In your experience in the field, are you aware 22 of any network on chip, as you use that term in 23 paragraph 32 of your declaration, that does not route 24 packets? 25 MR. KOHLHEPP: Object to form, scope, also
Page 22 1 report that begins in paragraph 32 through paragraph 34, 2 I'm referring to a type of on-chip interconnect where 3 it -- it routes packets. And the term "network on chip" 4 was often used in this time frame to refer to 5 interconnects that route packets. And that was 6 certainly the concept introduced in papers like the 7 Dally and Towles paper and others at the time. So that 8 was a common understanding of what "network on chip" 9 meant. But the term "network" and "chip," those are 10 very common terms, and I -- I was not asked to provide 11 claim construction on that term. But in this -- in 12 section -- in that section of my report, paragraphs 32 13 through 34, I am referring to an interconnect that 14 routes packets, and persons of ordinary skill in the art 15 in that time frame were -- were aware of this -- would 16 have been aware of this, this work. 17 BY MR. CHRISTOPHER: 18 Q. Okay. In your years of experience in this 19 field, are you aware of any network on chip that does 20 not route packets? 21 MR. KOHLHEPP: Object to form, scope. 22 THE WITNESS: Well, the problem with the 23 question you're posing is the term "network" can be a 24 generic term. So if "network" is meant to mean some 25 type of interconnect on a chip, such things have been	Page 24 1 asked and answered. 2 THE WITNESS: In the second sentence in 3 paragraph 32, I put "Network on Chip" in quotes because 4 an NoC referred to a specific type of on-chip 5 interconnect. And it was one where, similar to what was 6 introduced in the Dally and Towles paper, packets are 7 routed through a more general type of on-chip 8 interconnect, as opposed to directly communicating 9 through dedicated point-to-point wires between units. 10 So as I'm using the phrase here, I am referring 11 to an interconnect that routes packets. However, I 12 would want to point out that the terms "network" and 13 "chip" are generic terms. But when I specifically refer 14 to it here as, quote, "'Network on Chip,'" end quote, 15 "(NoC)," I was referring specifically to this concept 16 from the Dally and Towles paper where you route packets. 17 And I was not asked, for example, to provide claim 18 construction on the term "network on chip" in general. 19 BY MR. CHRISTOPHER: 20 Q. In paragraph 32, you also mentioned "traversing 21 multiple hops." Do you see that? 22 A. Yes. 23 Q. What does it mean to traverse multiple hops? 24 A. One example of this type of on-chip 25 interconnect would be a mesh, or a ring would be another

Page 25 1 example. And in those cases -- let's take the example 2 of a mesh interconnect. There the -- to get from a 3 source to a destination, the path typically involves 4 going across a set of links through a set of routers, 5 because there's not a direct connection from the source 6 to the destination. So those hops refer to going across 7 links and through routers. And when there are multiple 8 hops, that means you're traversing multiple links 9 through multiple routers to get somewhere; from the 10 source to the destination, that is. 11 Q. Can you turn to paragraph 34 of your 12 declaration. 13 A. Okay. 14 Q. In the first sentence, you wrote, "Because 15 NoCs...have more diverse types of communicating 16 components beyond traditional parallel machines." Do 17 you see that? 18 A. Yes. 19 Q. What is an example of a traditional parallel 20 machine? 21 A. Well, there were -- there's a long history of 22 parallel machines. That's one of the topics that I do 23 research on. So starting in the 1970s, there were 24 machines that used either message passing or shared 25 address space to communicate. And, for example, Silicon	Page 27 1 effort. With -- "best effort" means there's no 2 guarantee. You're just communicating and hoping to get 3 the best possible performance, but there's no specific 4 guarantee on what that performance will be. 5 Q. And in paragraph 34, you use the word 6 "extended." Why would NoCs need to be extended to 7 support quality of service? 8 A. Well, quality of service involves having -- 9 managing end-to-end properties, and it's a concept 10 that's built on top of a base level of interconnect. So 11 you can take a basic mesh or ring or something like 12 that, and then you can do management on top of it if you 13 want to provide quality of service mechanisms. 14 Something similar happens in wide area networks, for 15 example. If you want to set up a connection and have -- 16 if you -- there are various examples of that in 17 different types of interconnects. So the idea of 18 quality of service is a concept that's been around for 19 quite a while in networking. 20 Q. If you'd turn to paragraph 35. 21 A. Okay. 22 Q. In paragraph -- I'll direct you to -- it's 23 about the middle of the paragraph. You see the sentence 24 that starts with "The transport layer can operate"? 25 A. Yes.
Page 26 1 Graphics, where I worked as a consultant, sold many 2 parallel machines back in the nineties. Sun 3 Microsystems, which was later bought by Oracle, also 4 sold many such machines -- or many supercomputers built 5 that way. So they involve processors breaking down a 6 computational task and cooperating with each other, 7 which involves communicating data between processors and 8 memory, between multiple processors, sometimes directly 9 from processor to processor, or sometimes they're 10 communicating through shared memory. 11 Q. And then at the end of paragraph 34, you wrote 12 "they are often extended to also support 13 quality-of-service (QoS) across different communication 14 streams." Do you see that? 15 A. Yes. 16 Q. What is quality of service? 17 A. Quality of service refers to certain 18 performance guarantees. For example, when you're 19 streaming video, you don't want to have the bandwidth 20 drop below a certain amount or the video quality will be 21 unacceptable. The same is true for, say, a phone 22 conversation. So bandwidth is -- a minimum bandwidth is 23 one example of a quality of service. Another example 24 would be end-to-end latency. There are other examples 25 of this. But it -- it's -- it's in contrast with best	Page 28 1 Q. And you state here that the OSI "transport 2 layer can operate in one of two modes: 3 connection-oriented or connectionless." Do you see 4 that? 5 A. Yes. 6 Q. What does it mean to be connection-oriented? 7 A. Well, connection-oriented means that you're 8 going to -- you maintain end-to-end state to manage a 9 stream of communication. And for -- one example is if 10 you want to have in-order delivery of packets across a 11 stream or if you want to make sure that you don't drop 12 any packets in a stream, that involves maintaining state 13 on both ends of the connection. 14 So with a connection-oriented protocol, before 15 you start communicating you first establish a connection 16 between the source and a destination, and that allows 17 the transport layer to set up a state that's necessary 18 to manage that communication. For example, if you don't 19 want to lose packets, what it typically involves is 20 assigning sequence numbers to packets and -- on the 21 sender side, and then on the receiver side you pay 22 attention to whether you've received the packets in 23 order. And if you fail to receive any within a certain 24 window of time, you request retransmission, for example. 25 So TCP/IP is a very common example of this kind

Page 29 1 of protocol which is used for much of the traffic on -- 2 on the Web. 3 Q. Going back again to paragraph 35, what does it 4 mean to be connectionless? 5 A. With connectionless communication, you don't 6 establish a connection; you simply start -- you -- if 7 you want to communicate from a source to a destination, 8 you simply go ahead and send your packet and hope for 9 the best. So UDP is one example of this type of 10 protocol. And hopefully your packet arrives, although 11 it's not uncommon to see packet loss in this case, and 12 it's not really practical to have any end-to-end 13 quality-of-service guarantees, because you're just 14 sending it packet by packet. 15 Q. Okay. What's the difference between 16 connection-oriented and connectionless? 17 A. I think that's exactly what I describe in 18 paragraph 36. So if it's a connection-oriented 19 protocol, you begin by establishing this logical 20 connection from the source to the destination so that 21 you can set up the state that's necessary to manage the 22 stream of communication. And then when you're finished, 23 you free up or terminate that -- that connection. If 24 its connectionless, you don't need to preestablish this 25 logical connection. You just -- the sender just goes	Page 31 1 might be. It depends on what properties you're managing 2 with that, that -- that stream. One example would be if 3 you want to make sure that you get -- you don't -- that 4 the packets arrive in order -- let's say you're shipping 5 a video and you want it to arrive in order and you don't 6 want to lose any packets. Then what that state might 7 involve is keeping track of a sequence number. That 8 would be something that the -- that the connection 9 would -- would add to each packet on the sender side. 10 It would wrap that as additional information into a 11 packet and send it. And then the receiver would look at 12 these sequence numbers and reassemble it in order. 13 And then there's a window where, if it has 14 failed -- after a certain period of time if it has 15 failed to receive a packet, it would send a message back 16 to the sender and request that it be sent again. That 17 would be one example of that type of state. It -- that 18 type of state is sometimes also called metadata. So 19 it's -- it's not data that's being communicated, and -- 20 it's not data that the user is trying to communicate; 21 it's additional information that's being used to manage 22 the communication. 23 Q. Let me see if I understand this. 24 So the state refers to certain contextual 25 information about the connection; is that fair?
Page 30 1 ahead and sends its message directly into the -- into 2 the network or interconnect. 3 Q. All right. Let's turn to paragraph 36. 4 A. Okay. 5 Q. In the first sentence you wrote, "For 6 connection-oriented protocols such as TCP/IP, 7 communication begins by first establishing a logical 8 connection between the endpoints." You see that? 9 A. Yes. 10 Q. Is it correct that connection-oriented 11 protocols require establishing a logical connection 12 between endpoints? 13 A. Yeah. Yes. That's -- that's -- that's 14 correct. Yes. 15 Q. Okay. And then in the next sentence you wrote, 16 "The state that is associated with this logical 17 connection is then used to manage the stream of 18 communication: e.g. to provide guarantees on 19 reliability, delivery order, quality of service, 20 et cetera." Do you see that? 21 A. Yes. 22 Q. What is a state? 23 A. Well, in this sentence what I'm referring to is 24 information related to the communication stream. And 25 the -- there are many different examples of what that	Page 32 1 MR. KOHLHEPP: Object to form. 2 THE WITNESS: Well, I think I just gave a 3 fairly detailed answer about what that state was. And 4 I'm not exactly sure what you mean by "contextual 5 information." One example of what it would be, as I 6 said, would be sequence numbers. There can be other 7 examples of things, like, for example, if you cared 8 about jitter, for example, then it may pay attention to 9 things like end-to-end latency and use that to 10 dynamically try to adjust the latency to manage jitter, 11 for example. But it -- what it -- what it is, it 12 depends on the properties that you're trying to manage. 13 BY MR. CHRISTOPHER: 14 Q. Is "state" a term of art that would be used by 15 people of skill in the art? 16 MR. KOHLHEPP: Object to form. 17 THE WITNESS: Well, that question was very 18 broad. If I -- did you want to add more context to 19 that, or if you're referring to the second sentence in 20 paragraph 36, I think that a person -- you know, a 21 person familiar with networking would -- would 22 understand what I'm referring to here, which is in any 23 type of connection-oriented protocol there's some state 24 that is maintained to manage the -- the connection. And 25 I gave an example of that, such as ordering packets if

Page 33 1 you're trying to have reliable delivery of data in a 2 particular -- in the same order in which it was sent. 3 BY MR. CHRISTOPHER: 4 Q. In the last paragraph of 36, you state that 5 connectionless protocol simply sends data from sender to 6 receiver, right? 7 A. So you -- in your question you said last 8 paragraph. I think you meant last sentence in paragraph 9 36. 10 Q. I did. Last -- so "paragraph" is -- 11 A. Okay. Can you repeat the question again? 12 Q. Sure. In the last sentence of paragraph 36, 13 you state that connectionless protocol simply sends data 14 from sender to receiver; is that right? 15 A. I said "the sender simply goes ahead and sends 16 its message to the receiver" without first 17 preestablishing this logical connection. Yes, that's 18 what happens with a connectionless protocol. 19 Q. And based on what we just talked about 20 regarding the term "state," is it correct that 21 connectionless protocols do not establish a state? 22 MR. KOHLHEPP: Object to form, scope. 23 THE WITNESS: Well, I think that that -- the 24 framing of that question is not quite correct, in that 25 what I -- when I'm referring to "state," I was referring	Page 35 1 examples, like, for example, assigning packet sequence 2 numbers would be one example of that type of state. 3 BY MR. CHRISTOPHER: 4 Q. Let's go to paragraph 37 of your declaration. 5 A. Okay. 6 Q. Excuse me. Paragraph 38. I was off in my 7 notes. 8 And I want to direct your attention. It's 9 toward the bottom of page 21. There's a sentence that 10 starts with "For an SoC." Let me know when you see 11 that. 12 A. Okay. I see that. 13 Q. All right. And in that sentence you wrote, 14 "For an SoC that includes other forms of communication 15 (e.g., multimedia streams for audio or video), however, 16 the quality-of-service benefits of connection-oriented 17 communication may be quite compelling." Did I read that 18 correctly? 19 A. Yes, that's what it says. 20 Q. Okay. And just to put a more concrete example 21 on this, for multimedia streams, would an example of a 22 multimedia stream be something like streaming Netflix? 23 A. That would be one example of a multimedia 24 stream, sure. I mean, but that's across a wide area. 25 But, you know, an audio or video stream is one example
Page 34 1 specifically to the state of a connection-oriented 2 protocol. But the term "state," if it's not in that 3 context, could refer to other things, and any type of 4 interconnect involves making, for example, routing 5 decisions. So without the appropriate context, the term 6 "state" could be -- refer to something generic. But 7 what I'm referring to in this paragraph when I talk 8 about "state" is the state associated with a 9 connection-oriented protocol. 10 BY MR. CHRISTOPHER: 11 Q. Okay. So "state" as you've used it in 12 paragraph 36 of your declaration would not pertain to 13 connectionless protocols; is that fair? 14 MR. KOHLHEPP: Object to form. 15 THE WITNESS: Well, what I say here is -- in 16 the second sentence in paragraph 36, or in paragraph 36 17 more broadly, is I say, "The state that is associated 18 with this logical connection." So if I just use the 19 term "state" without that context, it could refer to a 20 number of things. But what I'm referring to is just 21 specifically if you create a connection, for a 22 connection-oriented protocol, that involves establishing 23 state, that then -- that -- if the -- the state that 24 would be created with that connection would be used to 25 manage the -- the stream of communication. And I gave	Page 36 1 of this type of stream. 2 But -- but this is referring to it within -- 3 within the chip. So if we're referring to communicating 4 Netflix video within the chip, then yes. But I'm not 5 referring to the -- the issues of streaming it from 6 Netflix's server to get it to your -- through this 7 device. 8 Q. Okay. Would you agree that for SoCs that 9 provide multimedia communication streams, 10 connection-oriented communication is preferred? 11 MR. KOHLHEPP: Object to form, scope. 12 THE WITNESS: Well, in this paragraph 38, I 13 explain that if you are doing, say, for example, 14 traditional parallel processing where you have 15 processors communicating through a shared address space, 16 then all that they are communicating is -- which is a 17 common thing that happens on system on chip. You often 18 have multiple processors that are working together. And 19 when they are communicating, they're typically 20 transferring cache blocks, which are roughly 64 bytes 21 long. And for these, the goal is just to make the 22 communication as fast as possible, but there's not any 23 particular quality of service requirement. You simply 24 want it to be fast. 25 And for that, as I explained in paragraph 38,

Page 37 1 the latency of setting up a connection -- for example, 2 if you had to do that every time you wanted to 3 communicate a cache block, that that would have too much 4 overhead. But if you have a longer-running multimedia 5 stream -- for example, if the -- you have a camera on a 6 device that is streaming video into memory in another 7 part of the chip, then -- or to a display, for example, 8 then the -- the -- the stream runs for a longer period 9 of time, and having those quality of service properties 10 would be attractive. 11 So a common thing is to have a combination, 12 where you would have some connections for the streams 13 where quality of service matters but also best-effort 14 communication for things where it doesn't matter. 15 BY MR. CHRISTOPHER: 16 Q. In paragraph 38 -- I just want to focus on what 17 you wrote at the very end. You said "the 18 quality-of-service benefits of connection-oriented 19 communication may be quite compelling." Do you see 20 that? 21 A. I see that, yes. 22 Q. When you wrote "compelling," that meant that 23 connection-oriented communication would be preferred in 24 this instance, correct? 25 MR. KOHLHEPP: Object to form.	Page 39 1 A. Yes. 2 Q. The channels you're referring to here would be 3 part of a connection, right? 4 A. Yes, this would be a part of a connection; 5 that's correct. 6 Q. Can a physical channel exist in a 7 connectionless protocol? 8 A. Yes, definitely. As I -- as I described in 9 the -- say the second sentence of paragraph 40, the term 10 "physical channel" essentially refers to wires. And so 11 there are different -- depending on the medium, if 12 it's -- usually for an on-chip interconnect, it's just 13 metal wires. If they -- there could be other mediums, 14 like electromagnetic waves or optical. But if we just 15 stick to wires, the physical channel refers to a set of 16 wires, or sometimes this is referred to as a link. It's 17 something that's connecting routing switches together. 18 Q. And maybe you could predict my next question. 19 Can virtual channels exist in a connectionless 20 protocol? 21 A. Yes. So a virtual channel is a logical -- as I 22 explain here, a common type of virtual channel -- 23 there's a well-known problem in a parallel machine or a 24 machine that uses request-response transactions, which 25 is you can have something called fetch deadlock, where
Page 38 1 THE WITNESS: What I was referring to is that 2 supporting quality of service could be advantageous, 3 would have some compelling benefits, potentially, for 4 the situations where you are streaming where you have, 5 for example, a multimedia stream that has a 6 quality-of-service requirement. So if there -- it says 7 "an SoC that includes." It includes some of this. 8 Not everything that communicates involves a 9 quality-of-service requirement. For the things that do 10 not have a quality-of-service requirement, as I 11 mentioned earlier in this in quite a few sentences, here 12 in paragraph 38, for example, having parallel processors 13 just communicating data, there is no quality-of-service 14 metric there, so simply communicating best effort is the 15 best strategy for that type of communication. So 16 overall having a mixture of some things that are best 17 effort and some things that involve quality of service 18 is an approach that makes sense. 19 BY MR. CHRISTOPHER: 20 Q. All right. Let's go to paragraph 40 of your 21 declaration, moving right along. 22 A. Okay. 23 Q. In the first sentence you wrote, "There are two 24 different types of channels in NoCs: physical channels 25 and virtual channels." Do you see that?	Page 40 1 the machine will freeze up permanently because you -- 2 you have requests that have clogged up all of the buffer 3 space but there's no way for the replies to get back to 4 the requestors because there's no -- because the 5 interconnect is completely clogged up with requests. 6 So a typical way to deal with this is to create 7 separate virtual channels for requests versus responses. 8 And that way you can always make forward progress, 9 because the replies -- the responses can -- can move 10 forward. And this is used -- this concept has been used 11 for many decades in parallel machines, even predating 12 systems on chips. This is a common way to avoid fetch 13 deadlock on interconnects for parallel machines. And 14 those were connectionless. 15 Well, specifically the -- the normal 16 communication between parallel processors communicating 17 data was connectionless. So, yes, to answer your 18 question, you can have virtual channels on something 19 that's doing connectionless communication. 20 MR. CHRISTOPHER: All right. We've been going 21 about an hour. Why don't we take a short five, 22 ten-minute break. 23 THE WITNESS: Okay. 24 MR. CHRISTOPHER: Let's go off the record. 25 (Recess taken.)

Page 41 1 BY MR. CHRISTOPHER: 2 Q. Welcome back, Dr. Mowry. Did you discuss your 3 testimony with anyone during our break? 4 A. No. I did not have a conversation with anyone 5 at all during the break. 6 Q. Okay. If you can turn now for me to paragraph 7 61 of your declaration. 8 A. Yes. 9 Q. All right. In paragraph 61 you wrote, "It is 10 my opinion that a POSITA at the time of the '449 patent 11 would have had at least a Bachelor's degree in computer 12 science, electrical engineering, computer engineering, 13 or an equivalent technical degree, and two or more years 14 of experience with system-on-chip, interconnect, or 15 networking technologies." Did I read that correctly? 16 A. Yes. 17 Q. What is the time of the '449 patent that you 18 refer to here in paragraph 61? 19 A. Well, it's the priority date, which is in 2003, 20 I believe, the filing date of the patent. 21 Q. So for purposes of paragraph 61 of your 22 declaration, the time of the '449 patent would have been 23 2003; is that correct? 24 A. Right. The patent was filed in, I think, 25 October 2003. That's the -- that's the time frame I'm	Page 43 1 talking about paragraph 61 and the definition of a 2 POSITA. And those differences wouldn't affect anything 3 about definition of a POSITA in my opinion. 4 BY MR. CHRISTOPHER: 5 Q. Okay. If we could turn back to paragraph 61. 6 I want to focus specifically on the experience aspect of 7 your definition. You refer to "experience with 8 system-on-chip, interconnect, or networking 9 technologies." Do you see that? 10 A. Yes. 11 Q. Based on your use of the word "or" here, is it 12 your opinion that a person of skill in the art would not 13 need to have any experience with system on chip? 14 A. Well, yes, a person with a bachelor's degree in 15 computer science or electrical engineering or computer 16 engineering or equivalent degree would have taken 17 courses on hardware design and VLSI, so they would be 18 aware of what's involved with integrating hardware onto 19 a chip. So they wouldn't necessarily have to have had 20 experience with designing system-on-chip products if 21 they had -- given that they had that educational 22 background, and if they have experience in the other 23 things on my list, then, yes, they wouldn't necessarily 24 have to have experience specifically in system-on-chip. 25 Q. When you referred to "networking technologies"
Page 42 1 referring to. 2 Q. Can you open a copy of the '449 patent, Exhibit 3 1001. 4 A. Okay. 5 Q. And on the first page, the cover, about halfway 6 down on the left-hand side, do you see where it says 7 "PCT Filed: October 7, 2003"? 8 A. Yes. 9 Q. Is that the date you used for the time of the 10 '449 patent in your declaration? 11 A. Yes, that's correct. 12 Q. Okay. And then do you see, several lines down, 13 where it says "Foreign Application Priority Data"? 14 A. Yes. 15 Q. And then do you see underneath that it says 16 October 8th, 2002? 17 A. Yes, I see that. 18 Q. So you didn't (audio dropout) the October 2002 19 date as the time of the '449 patent in your declaration, 20 correct? 21 MR. KOHLHEPP: Object to form. 22 THE WITNESS: Well, just to clarify, in -- for 23 paragraph 61, there's not any substantial difference 24 between 2002, 2003, or really 2001, for that matter. 25 That's -- so if we're talking about -- I believe we're	Page 44 1 here in paragraph 61, are you referring to off-chip 2 networks? 3 A. Well, I was referring to networking 4 technologies broadly. So for people who take 5 networking -- so, again, someone who's completed this 6 type of degree would have taken a networking course, and 7 that covers, typically, the full system stack from the 8 physical layer all the way up to the -- you know, the 9 high -- transport layer, the layers above that. So they 10 would be aware of what's involved with routing packets 11 and all those things. So that's -- that's what I'm 12 referring to with network -- "networking technologies." 13 Those things apply both on and off chip. 14 Q. Are you familiar with a -- something called a 15 local area network, or a LAN, L-A-N? 16 A. Yes, I know what that is. 17 Q. If someone had two years of experience 18 designing LANs and a computer science degree, would they 19 be a person of ordinary skill in the art for the '449 20 patent under your definition? 21 MR. KOHLHEPP: Object to form. 22 THE WITNESS: Can you repeat the question? 23 I -- I'm not sure that I caught every piece of what -- 24 of the scenario you were describing. 25 BY MR. CHRISTOPHER:

Page 45 1 Q. Sure. Would a person who has a bachelor's 2 degree in computer science and two years of experience 3 designing LANs be a person of ordinary skill in the art 4 for the '449 patent? 5 MR. KOHLHEPP: Same objection; form. 6 THE WITNESS: Well, somebody who satisfied my 7 definition here would be a person of ordinary skill in 8 the art, and that -- the list of degrees includes 9 computer science, and the list of technologies that they 10 would have experience in is network technologies, 11 interconnect, or system-on-chip. I didn't put LAN on 12 this list, but -- I was talking about interconnect, 13 networking technologies, or system-on-chip here. So the 14 definition is -- my definition is what's -- what's shown 15 here in this paragraph 61. 16 MR. CHRISTOPHER: I'm going to move to strike 17 as nonresponsive. 18 Q. Let's take this in pieces. Would you agree 19 that a LAN is an example of networking technologies as 20 you've used that term in paragraph 61 of your 21 declaration? 22 MR. KOHLHEPP: Same objection; form. 23 THE WITNESS: Well, a LAN is a -- an example of 24 a network, yes. But what I'm -- what I'm discussing 25 here is somebody who has education and experience in	Page 47 1 A. Yes, that's correct. 2 Q. Okay. I'll try my question again. 3 If somebody has a bachelor's degree in computer 4 science and they have two years of experience in 5 networking technologies but no experience whatsoever 6 with networks on a chip, that person would be a person 7 of ordinary skill in the art for the '449 patent; yes or 8 no? 9 MR. KOHLHEPP: Object to form. 10 THE WITNESS: So a person who had a bachelor's 11 degree in computer science and had two years of 12 experience with networking technologies, such a person 13 would have taken courses in, for example, VLSI design 14 and networking as part of their training, and so their 15 understanding of networking, for example off-chip 16 interconnects and networking technologies, those things 17 would apply very directly to an interconnect for a 18 system-on-chip. So such a person with the appropriate 19 experience would qualify as a person of ordinary skill 20 in the art in my definition. The definition is -- yeah, 21 it's what I've -- what I've written here in paragraph 22 61. 23 BY MR. CHRISTOPHER: 24 Q. Based on that very long answer, the answer to 25 my prior question was "yes," right?
Page 46 1 interconnect and -- or networking technologies 2 generally. So what I'm not referring to is simply a 3 person who's done something extremely narrow. So 4 that's -- your -- your question is -- or narrowing my 5 definition. But -- or I'm not sure if that's the right 6 lawyer word for it or not. 7 But, like, you know, for example, if I said 8 somebody had -- a degree is -- was -- someone was a 9 qualified veterinarian and part of that is, you know, 10 treating a specific animal scenario, that doesn't 11 necessarily mean that knowing something about a specific 12 treatment for a specific animal makes you a 13 veterinarian. 14 So what I'm referring to here is that a person 15 would be broadly aware of networking technologies. So 16 that would include, for example, the types of things 17 that you would learn about in a course on networking. 18 So if they had that as background and they were working 19 on a LAN, that may qualify. But -- but what I'm 20 referring to is networking technologies broadly. 21 MR. CHRISTOPHER: Move to strike as 22 nonresponsive. 23 Q. The term "networking technologies" in your 24 declaration is not necessarily limited to on-chip 25 networks. Would you agree with that?	Page 48 1 MR. KOHLHEPP: Object to form; asked and 2 answered. 3 THE WITNESS: I just answered your question and 4 provided the context to understand my answer. So I can 5 repeat that answer again if you'd like. 6 BY MR. CHRISTOPHER: 7 Q. Well, no. My question was, yes or no; a person 8 with a bachelor's degree in computer science and two 9 years of work experience in networking technologies but 10 no work experience on networks on a chip would be a 11 person of ordinary skill in the art for the '449 patent; 12 yes or no? 13 MR. KOHLHEPP: Same objections: form, asked 14 and answered. 15 THE WITNESS: I -- I just answered that 16 question two questions ago. I can provide the same 17 answer again, which is a person with -- who had 18 completed that educational training would have taken 19 courses in networking and VLSI technology, so if they 20 had experience in off-chip networking and -- or 21 interconnect design, then those things would be directly 22 applicable to interconnects on a chip, and such a person 23 would -- would meet my definition of a person of 24 ordinary skill in the art. 25 MR. CHRISTOPHER: I'm going to move to strike

Page 49 1 as nonresponsive. 2 Q. You understand I'm asking you a yes-or-no 3 question, right? 4 A. I am giving you -- and I am attempting to 5 answer your question, and I'm providing the context 6 necessary to understand my answer. 7 Q. And is it your testimony that you can't give me 8 a yes-or-no answer as to whether somebody with a 9 computer science degree and two years of experience in 10 network technology is a person of skill in the art? You 11 can't answer that yes or no? 12 MR. KOHLHEPP: Object to form. 13 THE WITNESS: I believe I've already answered 14 this question twice, which is, a person who has 15 completed that educational training would have taken 16 classes in networking and VLSI design, so, given that 17 they have had two years of experience in networking 18 technologies or interconnect design for off-chip 19 scenarios, they would understand how to apply that to an 20 on-chip interconnect, and such a person would, yes, meet 21 my definition of a person of ordinary skill in the art. 22 BY MR. CHRISTOPHER: 23 Q. Okay. So the answer's "yes," right? 24 MR. KOHLHEPP: Object to form. 25 THE WITNESS: Well, I've answered this three	Page 51 1 of page 34 -- do you see it says "2-3 years of work 2 experience in very large-scale integrated ('VLSI') 3 systems, such as application-specific integrated 4 circuits ('ASICs'), application-specific standard parts, 5 ('ASSPs'), system-on-chip ('SoC'), or field-programmable 6 gate arrays ('FPGAs')." You see that? 7 A. Yes. 8 Q. And then at the very last part, the definition 9 says "and has an understanding of on-chip interconnect 10 networks." Do you see that? 11 A. I see that. 12 Q. At the time of the '449 patent, which is 13 October 2003, would you have met NST's definitions for a 14 person of ordinary skill in the art for the '449 patent? 15 A. Yes. 16 Q. So as of October 2003, you had two to three 17 work -- two to three years of work experience in SoCs; 18 is that correct? 19 A. I had several -- I had more than three years of 20 experience in VLSI systems and ASICs. And I was 21 familiar with systems on chip. I had been doing 22 research on systems-on-chip issues, so -- for -- for 23 many years at that point; actually, you know, well over 24 three years. In fact, I'm an ACM Fellow, and my ACM 25 Fellow status was awarded for two things, and one of
Page 50 1 times now. But if you want, I can answer it a fourth 2 time. 3 BY MR. CHRISTOPHER: 4 Q. Let's move on. The transcript will speak for 5 itself. 6 Let's go to paragraph 62 of your declaration. 7 A. Okay. 8 Q. Scroll there myself. 9 In paragraph 62 you have quoted a different 10 definition from -- for a person of skill in the art, 11 that NST had proposed in district court proceedings. Do 12 you see that? 13 A. Yes. 14 Q. Okay. Am I correct that you disagree with 15 NST's proposed definition? 16 A. Well, it's different from my definition. But 17 even using NST's definition, it doesn't change any of 18 the analysis in my declaration. 19 Q. That's not my question. My question is, do you 20 disagree with NST's proposal? 21 A. It is not the definition of a POSITA that I 22 provided. 23 Q. Okay. Under NST's proposal, the -- the -- 24 strike that. 25 Under NST's proposal -- and this is at the top	Page 52 1 them was my work related to things on -- in -- related 2 to system-on-chip technologies. 3 Q. Just to be clear, when you refer to two to 4 three years of experience on SoCs, was that work 5 experience or experience in academia? 6 A. I -- I worked as a consultant at both Silicon 7 Graphics and at a company called SandCraft. Those were 8 both processor companies, and they were both building 9 CPUs using VLSI technology and ASICs. And I was also 10 doing research on and collaborating with industry, 11 including Intel, the CPU maker, on system-on-chip 12 research. 13 Q. And all of that was prior to October 2003? 14 A. That's correct. 15 Q. All right. Let's turn now for a while to the 16 '449 patent. If you can open up your copy of Exhibit 17 1001. 18 A. Okay. 19 Q. All right. You reviewed the '449 patent in its 20 entirety when you prepared your declaration, correct? 21 A. Yes. 22 Q. You reviewed the specification, drawings, and 23 claims, right? 24 A. Yes. 25 Q. And one of the things you would have reviewed

Page 53 1 would have been the background section, "Background of 2 the Invention" section, of the '449 patent, correct? 3 A. Yes. 4 Q. And did you consider the entirety of the '449 5 patent's background section in forming the opinions in 6 your declaration? 7 A. Yes. 8 Q. And you wouldn't just ignore parts of the 9 background section that are contrary to your opinions, 10 right? 11 A. I reviewed the entire patent, including the 12 entire Background of the Invention section. 13 Q. And you considered all of that when you formed 14 your opinions, right? 15 A. Yes. 16 Q. All right. Let's go to paragraph -- well, 17 we're going to go back to your declaration, paragraph 82 18 to your declaration. And I want to focus. It's a 19 sentence at the very bottom of page 44. It starts with 20 the word "indeed." Let me know when you're there. 21 A. Okay. 22 Q. All right. In that last sentence here in 23 paragraph 82, you wrote, "Indeed the '449 patent itself 24 acknowledges that many of the issues faced by networks 25 on chip had been studied in the context of off-chip	Page 55 1 They don't affect higher-level concepts such as quality 2 of service or the issues raised by the claims or the 3 patent specification in the '449 patent. 4 BY MR. CHRISTOPHER: 5 Q. But it does say here that the premises of 6 off-chip and on-chip networks are different; true? 7 A. It says, "However, NoC's premises are different 8 from off-chip networks." There are -- I mean, one -- 9 one is on-chip and one is off-chip. That's a 10 difference, although those differences only really 11 affect lower-level design choices, things like the 12 number of wires that you can put on individual links. 13 It affects things like latency. So this does have an 14 impact with some lower-level design choices, but it does 15 not affect higher-level concepts like guaranteeing 16 quality of service and the types of issues discussed in 17 the claims of the '449 patent. 18 Q. And then it also says "most of the...design 19 choices must be reevaluated," right? 20 A. It says that. And what's -- what -- what is 21 different between on-chip and off-chip, as I mentioned, 22 are some lower-level trade-offs. For example, it's 23 easier to have more wires on links. And those things 24 affect some -- some design parameters, but it does not 25 affect higher-level concepts like providing quality of
Page 54 1 networks and that results of those studies are 2 applicable to on-chip networks as well." Do you see 3 that? 4 A. Yes. 5 Q. And then you cited the '449 patent at column 1, 6 lines 50 to 66, correct? 7 A. Yes, that's correct. 8 Q. All right. Let's go back to the '449 patent. 9 I want to turn your attention to column 1, starting at 10 line 66. 11 A. Okay. 12 Q. And this bridges on to the column page -- 13 column 2, at the top, if you read along with me. 14 Starting at column 1, line 66, the '449 patent 15 states, "However, NoC's premises are different from 16 off-chip networks, and, therefore, most of the network 17 design choices must be reevaluated." Do you see that? 18 A. I see that. 19 Q. Here the '449 patent is teaching that on-chip 20 networks and off-chip networks have different premises, 21 right? 22 MR. KOHLHEPP: Object to form. 23 THE WITNESS: Well, it is mentioning that there 24 are some differences, which is true, although these 25 differences affect essentially low-level design choices.	Page 56 1 service or any of the issues that are discussed in the 2 claims of the '449 patent. 3 Q. If I'm understanding you correctly, are you 4 saying that you disagree with the '449 patent's 5 statement that most of the design choices must be 6 reevaluated? 7 MR. KOHLHEPP: Object to form. 8 THE WITNESS: The design choices that they're 9 referring to here are low-level trade-offs that affect, 10 as I said, lower-level issues related to the network: 11 the interconnect, for example; the width of connections. 12 And that could affect something like bandwidth, although 13 those same types of issues also change from generation 14 to generation of VLSI technology. And the patent's 15 claims are about things like providing 16 quality-of-service guarantees, and at that higher-level 17 of abstraction that we see in the patent claims, these 18 lower-level design choices have no bearing -- have no 19 significance in terms of what's discussed in the patent 20 claims. 21 MR. CHRISTOPHER: Move to strike as 22 nonresponsive. 23 Q. My question was, do you disagree with this 24 statement in the '449 patent: "most of the...design 25 choices must be reevaluated"?

Page 57 1 MR. KOHLHEPP: Object to form. 2 THE WITNESS: I believe I just gave you a 3 fairly detailed answer to that question. I'm happy to 4 give the answer again, which is the -- the -- it does 5 mention that design choices must be reevaluated, but the 6 design choices that they're referring to are low-level 7 design choices closer to the physical layer of the 8 networking stack. But when you get up to higher levels 9 of the networking stack, such as where quality of 10 service matters, those design choices are simply 11 differences in parameters, and it doesn't affect any of 12 the concepts related to guaranteeing a quality of 13 service. Those differences are on the same order as 14 differences when there's a change from generation to 15 generation of VLSI technology. So it does affect 16 low-level design choices but not things that have any 17 bearing on the claims of '449 patent. 18 BY MR. CHRISTOPHER: 19 Q. That explanation you just gave is nowhere in 20 your declaration, correct? 21 MR. KOHLHEPP: Object to form. 22 THE WITNESS: Well, I don't recall. I'd have 23 to look through my declaration. I don't think I just 24 said -- I don't remember -- I wasn't reading from my 25 declaration there. So I'm not sure whether -- I	Page 59 1 that sentence from the specification in your 2 declaration, you didn't address it in your declaration? 3 MR. KOHLHEPP: Object to form. 4 THE WITNESS: Well, I would need to go back and 5 look through my declaration. I'm happy to do that. I 6 feel like I have discussed these issues somewhere in my 7 declaration. I can go back and -- and look for that, 8 though, if you'd like. It will take me a little -- some 9 time to do that. 10 BY MR. CHRISTOPHER: 11 Q. The premise is self-evident. If you didn't 12 specifically cite this sentence in your declaration, 13 then you didn't specifically address the sentence, 14 correct? 15 A. I disagree with that. I believe I -- 16 MR. KOHLHEPP: Object -- object to form. 17 Go ahead, Dr. Mowry. 18 THE WITNESS: I discussed in the technical 19 background section the fact that existing technologies 20 for interconnect design for off-chip interconnects, that 21 these things are directly applicable to network-on-chip. 22 So I have addressed this issue in the sentence. 23 BY MR. CHRISTOPHER: 24 Q. Even though you didn't cite it. That's your 25 testimony? You've addressed this sentence even though
Page 58 1 don't -- what I just said, I was -- as I said, I wasn't 2 reading from my declaration, so I'm not sure whether I 3 just said that somewhere in my declaration or not. I 4 could spend some time looking for that if you'd like. 5 BY MR. CHRISTOPHER: 6 Q. Well, could we at least agree on this: The 7 sentence here starting at column 1, line 66 of the '449 8 patent, spanning to column 2, that says, "However, NoC's 9 premises are different from off-chip networks, and, 10 therefore, most of the...design choices must be 11 reevaluated," you didn't expressly address that sentence 12 anywhere in your declaration, correct? 13 MR. KOHLHEPP: Object to form. 14 THE WITNESS: I don't recall whether I 15 addressed that specific sentence in my declaration. But 16 what it's referring to are -- when it's talking about 17 reevaluating design choices, is it's referring to 18 low-level design choices that would affect things closer 19 to the physical layer. It does not affect issues at, 20 say, the transport layer, where you're trying to 21 guarantee quality-of-service properties. So it doesn't 22 actually have any technical bearing on the claims of the 23 '449 patent. 24 BY MR. CHRISTOPHER: 25 Q. Would you agree with me that if you didn't cite	Page 60 1 you didn't cite or quote it anywhere in your 2 declaration? 3 A. I am not -- 4 MR. KOHLHEPP: Object to form. 5 THE WITNESS: I don't recall -- sorry. 6 I don't recall whether I specifically cited 7 this sentence. But this is exactly the issue that I'm 8 discussing in my technical background section when I'm 9 describing why it is that existing technology for -- in 10 the paragraph -- if you can remind me. The paragraph 11 where we just were was discussing exactly this, the fact 12 that existing interconnect technology is directly 13 applicable. This is -- so I have addressed this, this 14 issue, in my declaration. 15 BY MR. CHRISTOPHER: 16 Q. All right. Let's turn to column 2, line 16. 17 A. Before we do that, can you remind me where we 18 were just -- which paragraph we were just discussing in 19 my declaration? I've been searching a bit, and I lost 20 track of that. 21 Q. I wasn't asking you about a paragraph in your 22 declaration. I was asking you about a sentence in the 23 background section of the '449 patent. 24 But let's move on to column 2, line 16, if you 25 can, please. Let me know when you're there.

Page 61 1 A. Okay. 2 Q. All right. The second sentence in that 3 paragraph -- it starts on line 17 -- reads, "An off-chip 4 network interface usually contains a dedicated processor 5 to implement the protocol stack up to network layer or 6 even higher, to relieve the host processor from the 7 communication processing." Do you see that? 8 A. Yes, I see that. 9 Q. Okay. So this is saying that in an off-chip 10 network, the protocol stack -- let me -- strike that. 11 Let me back up, talk a little bit about an off-chip 12 network generally. 13 I want to give you an example. One example of 14 an off-chip network would be a LAN, right? 15 MR. KOHLHEPP: Objection. 16 THE WITNESS: You said a LAN? 17 BY MR. CHRISTOPHER: 18 Q. Yeah, local area network. 19 A. Well, strictly speaking a LAN is a network, and 20 it's not integrated onto a chip, but the types of 21 interconnects that are most relevant to a 22 network-on-chip, as discussed here, are the types of 23 interconnects that are used in parallel machines, not 24 Ethernet switches. Ethernet switches, similar to 25 wide-area networking switches, are far less concerned	Page 63 1 be the type of interconnect that would naturally -- like 2 I said, the -- for a parallel machine, which is the type 3 of interconnect -- the interconnect for a parallel 4 machine is the type of interconnect that was more 5 typically used for a network on chip, because it's far 6 more streamlined and has lower latencies, so it's more 7 directly applicable. In that case, you -- you're very 8 concerned about latency, so you don't usually go through 9 a number of different layers like that, in terms of 10 going through lots of networking chips and things. 11 Networking -- network interface chips, that is. 12 Q. All right. Let's focus on the next sentence. 13 It says, "Including a dedicated processor in a network 14 interface is not feasible on chip." Do you see that? 15 A. Yes, I see that. 16 Q. The '449 patent is teaching to one of skill in 17 the art that including a dedicated processor to 18 implement the protocol stack would not be feasible in a 19 network on chip, right? 20 MR. KOHLHEPP: Object to form. 21 THE WITNESS: Well, the type of scenario that 22 they're discussing here is more like the wide-area 23 network or Ethernet type of communication. But as I 24 said, the type of interconnect that was referenced in 25 the Bill Dally and Brian Towles paper is the type of
Page 62 1 about minimizing latency. So that's quite a -- quite a 2 stretch, in my opinion. 3 Q. Let's do it this way: In an off-chip network, 4 similar to an on-chip network, the network is connecting 5 two modules. Do you agree with that? 6 A. Well, two or more. Usually more than two. 7 But, yes, at least two. 8 Q. And so what the '449 patent is saying here in 9 column 2, starting at line 17, is that in such an 10 off-chip network, the protocol stack would be on one of 11 those modules, correct? 12 MR. KOHLHEPP: Object to form. 13 THE WITNESS: Can you please repeat the 14 question? 15 BY MR. CHRISTOPHER: 16 Q. Sure. In that -- in an off-chip network, where 17 we have two or more modules connected by a network, 18 according to this teaching in the '449 patent where is 19 the dedicated processor to implement the protocol stack? 20 A. Well, this -- this -- there are different 21 possibilities. This is not really discussing detail 22 about that. I mean, one possibility is that on, say, a 23 personal computer, if you stick a network interface card 24 onto the system bus, that's one possibility for having 25 an -- an off-chip network interface. But that would not	Page 64 1 interconnect typically used in a parallel machine, and 2 you do not use a dedicated processor in those cases to 3 implement a protocol stack. You simply use it to do 4 basic low-latency communication. 5 The protocol stack can be implemented in a 6 number of different ways. And on a system-on-chip, you 7 can -- you can integrate IP blocks or other hardware to 8 assist with networking if the designer decides that 9 that's a good trade-off to make. 10 BY MR. CHRISTOPHER: 11 Q. So if I -- if I understand your answer, you're 12 saying that the network on chip described in the Dally 13 paper would not have a dedicated processor to implement 14 the protocol stack, correct? 15 MR. KOHLHEPP: Object to form. 16 THE WITNESS: Well, what I said was there -- 17 there are a variety of different ways to implement a 18 network interface. In the case of Ethernet over a LAN 19 or wide-area communication, sometimes people use network 20 interface cards, which can have a dedicated processor in 21 them, but that increases the communication latency. 22 On the interconnect for a parallel machine, 23 which is more relevant to system-on-chip, you don't have 24 a -- you don't typically dedicate that amount of 25 hardware to the network interface. There's a whole

Page 65 1 spectrum of different possibilities in terms of how much 2 hardware you dedicate to the network interface and where 3 it's located. So I'm not -- 4 BY MR. CHRISTOPHER: 5 Q. Do you -- 6 A. Go ahead. 7 Q. Sorry. Were you finished with your answer? 8 A. Yes. 9 MR. CHRISTOPHER: Okay. Move to strike as 10 nonresponsive. 11 Q. I need you to focus on the specific question 12 I'm asking you. The question was, the network on a chip 13 that was described in the Dally paper that you keep 14 referencing, that would not have a dedicated processor 15 to implement the protocol stack, right? 16 MR. KOHLHEPP: Object to form. 17 THE WITNESS: Well, I'd have to go back and 18 look at the Dally paper more care -- to remind my -- 19 refresh my memory on what's discussed in it exactly. 20 But when you say "the protocol stack," that can mean 21 many different things. There's -- there's basic 22 communication, just routing messages. That's a 23 lower-level concept, as opposed to trying to implement 24 all the layers of the ISO stack, which is a very 25 different story. So there is hardware support for the	Page 67 1 MR. KOHLHEPP: Object to form. 2 THE WITNESS: No. I disagree with that. I -- 3 what you asked about, I thought, was what a person 4 generally would understand that decoupling computation 5 from communication would mean. It can mean a few 6 different things. It can mean just dedicating separate 7 hardware. That's probably what this is -- this is most 8 likely what it's referring to. But there's also a 9 performance aspect of decoupling communication from 10 computation, and sometimes people are referring to that. 11 BY MR. CHRISTOPHER: 12 Q. In the context of the '449 patent, what does 13 "decouple computation from communication" mean? 14 MR. KOHLHEPP: Object to form. 15 THE WITNESS: Well, the way you phrased the 16 question, it sounds like you're asking for me to offer 17 an opinion on claim construction of the term, which I 18 have not contemplated. But what they're describing here 19 is that they don't want the -- essentially the IP block, 20 or the -- the computational element, to be tailored to a 21 specific type of communication. They want to leave that 22 flexible. 23 BY MR. CHRISTOPHER: 24 Q. Let's go to column 17. I'll direct your 25 attention to line 60. It's towards the bottom. Let me
Page 66 1 communication in the network interface in some form. 2 But I believe that what's being discussed here is 3 more -- more like a typical CPU, and that might be a 4 reasonable thing to put into the network interface card 5 on a LAN, but that's not the type of interconnect that's 6 used, typically, for a system-on-chip. 7 BY MR. CHRISTOPHER: 8 Q. Let's back up to column 1, line 44, of the '449 9 patent. 10 A. Okay. 11 Q. All right. So here -- actually, it starts on 12 line 43. 13 "Second, NoCs also decouple computation from 14 communication, which is essential in managing the design 15 of billion-transistor chips." You see that? 16 A. I see that, yes. 17 Q. Yeah. What does it mean to a person of 18 ordinary skill in the art to decouple computation from 19 communication? 20 A. It can mean a variety of different things. 21 It's not entire -- it's not completely clear what it 22 means specifically in this case. 23 Q. So you're not clear what the '449 patent means 24 with respect to "decouple computation from 25 communication"? Is that your testimony?	Page 68 1 know when you're there. 2 A. Yes, I'm there. 3 Q. All right. So at line 60, specification reads, 4 "First, the services should abstract from the network 5 internals as much as possible. This is a key ingredient 6 in tackling the challenge of decoupling the computation 7 from communication, which allows IPs," parentheses, 8 "(the computation part), and the interconnect," 9 parentheses, "(the communication part), to be designed 10 independently from each other." You see that? 11 A. Yes, I see that. 12 Q. So the '449 patent teaches that decoupling 13 computation from communication allows the IP blocks and 14 interconnect in an NoC to be designed independent. 15 Would you agree with that? 16 A. That's what this paragraph is -- 17 MR. KOHLHEPP: Sorry. Object to form. 18 Go ahead. 19 THE WITNESS: I believe you're -- you're 20 accurately quoting this sentence here in the paragraph. 21 BY MR. CHRISTOPHER: 22 Q. Okay. In a traditional off-chip network -- and 23 we can use the example of the parallel machines that 24 you've referred to -- can the IP be designed 25 independently from the interconnect?

Page 69 1 A. Yes. 2 Q. Okay. In an off-chip network, the computer 3 would need to know that a network exists to be able to 4 connect to it, right? 5 A. Well, for any type of network, if you -- you 6 need to be -- the -- the -- the computation needs to 7 initiate communication. So if what you're asking is -- 8 I mean, if I understand your question correctly, the -- 9 in any event, if a -- an IP needs to communicate, it 10 needs to be aware of the possibility of communicating. 11 It doesn't necessarily need to know the details of how 12 that communication will be implemented, but it needs to 13 realize that it can communicate. 14 Q. Would the computer also need to know what type 15 of network it is connecting to, to be able to connect to 16 it, in an off-chip implementation? 17 A. It wouldn't need to necessarily. The -- it's 18 usually a design goal to abstract that so that the lower 19 layers of the stack could be implemented in a variety of 20 different ways. 21 Q. Okay. Just one more question on this topic. 22 Would you agree that the computer in an 23 off-chip network would need to have hardware and 24 software for connecting to the network? 25 MR. KOHLHEPP: I'm going to object to form.	Page 71 1 there's a specific legal meaning for -- for "means," as 2 I recall. 3 BY MR. CHRISTOPHER: 4 Q. Yeah. My question's not using any legal 5 definition. So I'll restate it this way. 6 The computer would need to have some sort of 7 mechanism to be able to connect to the network, right? 8 MR. KOHLHEPP: Object to form. 9 THE WITNESS: For a computer to communicate on 10 a network, it has to be able to communicate on the 11 network. It has to have -- I don't -- I don't -- I 12 don't think I follow the question. But the -- a 13 computer, if it's going to communicate, that has to be 14 possible, yes. That would have to be possible somehow. 15 BY MR. CHRISTOPHER: 16 Q. Let's turn now back to the '449 patent. I want 17 to go over some of the figures with you, just to 18 orientate ourself for the rest of the discussion. 19 If you could turn first to figure 1. Let me 20 know when you're there. 21 A. Okay. Yes, I'm -- I'm there. 22 Q. All right. I want to talk about what each of 23 these things are in figure 1. Starting with the far 24 left-hand side, you see the box "M"? 25 A. "M," yes.
Page 70 1 THE WITNESS: I can't follow that question, for 2 the following -- I mean, I can't understand the scenario 3 exactly. And I can explain why, which is the computer 4 itself has hardware and software, and I'm not sure if 5 you're talking about additional hardware or software 6 beyond that. For example, it's possible to have that 7 functionality be performed mostly by software, which, of 8 course, runs on hardware, or it could be running on 9 dedicated hardware. If you hard-wire everything about 10 the stack, it's possible to do it without software. But 11 generally complicated things on computers involve 12 hardware and software. But I'm not sure where you're 13 drawing the line in terms of where they're located 14 exactly in your scenario. 15 BY MR. CHRISTOPHER: 16 Q. So let me ask it just a little bit differently. 17 Would you agree that the computer would need to 18 have some sort of means for connecting to the network? 19 MR. KOHLHEPP: Object to form. 20 THE WITNESS: Well, my understanding is that 21 the word "means" actually has a legal meaning, so -- and 22 that was not something that I was considering here. So 23 maybe you can restate the question, or if -- for me 24 to -- if I go ahead and answer this. So, you know, I'm 25 not -- I'm not sure how to think about that, given that	Page 72 1 Q. Okay. That's the master processing module, 2 correct? 3 A. Well, let me -- I have to go see where it's 4 discussed to confirm that. But that sounds -- sounds 5 correct. But let me look here. 6 Yes, that's correct. It's discussed in column 7 9. It's the master, correct. Yes. 8 Q. And the master module can be implemented as a 9 CPU, right? 10 A. That seems -- seems like a reasonable 11 possibility, yes. 12 Q. Okay. And then on the right-hand side of 13 figure 1, there are two boxes, "S1" and "S2." Do you 14 see those? 15 A. Yes. 16 Q. And those are slave modules, correct? 17 A. That's how column 9 describes them, yes. 18 Q. And the slave modules can be implemented as 19 memory, correct? 20 A. Well, they're -- they're modules. That seems 21 like a reasonable possibility. I don't remember whether 22 that's discussed specifically somewhere. But that -- 23 that seems like a reasonable possibility. 24 Q. And then towards the middle, do you see there's 25 three boxes that say "N1"? See those?

Page 73 1 A. Yes. 2 Q. All right. Those are network interfaces, 3 right? 4 A. Yes. 5 Q. And then you see there's kind of this 6 irregularly shaped, almost circular element in the 7 middle that's labeled with an "N"? Do you see that? 8 A. Uh-huh. Yes. 9 Q. That's the network, right? 10 A. Yes. 11 Q. And then within the network, we have "rd," 12 comma, rw, with some arrows. Do you see those? 13 A. Yes. 14 Q. All right. Those are read/write transactions, 15 right? 16 A. That's what I would think they would be, yes. 17 Q. Let's look at figure 3 now. We're going to do 18 the same thing. 19 A. Okay. 20 Q. All right. On the far left-hand side, you see 21 there's a -- there's a box with an "I" in it? 22 A. Yes. 23 Q. All right. That's the initiator, right? 24 A. Yes, I believe so. 25 Q. And that corresponds to the master module "M"	Page 75 1 A. That's right. 2 Q. And then I'm sure you can guess where my next 3 question's coming. Do you see the box "PNIP"? 4 A. Yes. 5 Q. All right. That's the passive network 6 interface port, right? 7 A. That's how it's described, yes. 8 Q. And it's passive because it's associated with 9 the target module, correct? 10 A. That's how it's described in the spec, yes. 11 Q. All right. And then in the middle, we've got 12 our somewhat oval-shaped "RN." Do you see that? 13 A. Yes. 14 Q. All right. That is a router network, correct? 15 A. I believe so, yes. 16 Q. All right. Two more. "CM." That is the 17 communication manager, right? 18 A. Yes, that's how it's described. 19 Q. And then "RM" is the resource manager, correct? 20 A. Yes, that's how it's described. 21 Q. And in figure 3, both the communication manager 22 and the resource manager are inside the router network, 23 right? 24 A. That's how they are drawn in figure 3, yes. 25 Q. And then the specification teaches that
Page 74 1 we just talked about in figure 1, right? 2 A. It's -- yeah, it's the moral equivalent of 3 that. It's something that's initiating a request. So a 4 master could be an initiator, yes. 5 Q. All right. You probably know where I'm going 6 with this. Far right-hand side, do you see the box with 7 the "T"? 8 A. Yes. 9 Q. All right. That's the target, correct? 10 A. Yes. 11 Q. And the target is equivalent to the slave 12 module "S" we talked about in figure 1, right? 13 A. Well, I think it's more general than that. It 14 could -- it could be that. It's something that it's 15 communicating with. It could be another CPU or an I/O 16 device. 17 Q. All right. And then in the middle, more 18 towards the left, there's a box "ANIP." Do you see 19 that? 20 A. Yes. 21 Q. And that represents an active network interface 22 port, correct? 23 A. Yes, that's how it's described. 24 Q. All right. And it's described as active 25 because it's associated with the initiator block, right?	Page 76 1 alternatively the communication manager and the resource 2 source manager could be arranged in the network 3 interfaces, correct? 4 A. I believe it says that, yes. The top of column 5 10, yes, it says that. 6 Q. And the specification teaches that the 7 communication manager and resource manager have to be 8 arranged together, correct? 9 MR. KOHLHEPP: Object to form. 10 THE WITNESS: Sorry. Is there a -- you're 11 pointing to a particular part in the patent spec. Can 12 you point me to what you're referring to, please? 13 BY MR. CHRISTOPHER: 14 Q. Well, let me ask it this way: The 15 specification teaches that both the communication 16 manager and the resource manager could be inside one of 17 the network interfaces, right? 18 A. It says that "they can be arranged in one or 19 some of the network interfaces." 20 Q. Okay. The specification doesn't teach, for 21 example, that the communication manager could be inside 22 the network interface while the resource manager is 23 inside the router network, correct? 24 MR. KOHLHEPP: Object to form. 25 THE WITNESS: I don't believe it has any

Page 77 1 constraint on this. I think it's laying -- in column 2 10, lines 3 through 6, I think it's just saying that 3 there are a variety of possibilities in terms of how you 4 arrange these things. I don't see any constraint there 5 that says they have to be organized in a specific way. 6 BY MR. CHRISTOPHER: 7 Q. Would you at least agree that the '449 patent 8 does not expressly disclose an embodiment in which one 9 of the managers is inside the network interface and the 10 other is inside the router network? 11 A. I believe the point of that sentence in column 12 10, starting from lines 3 through 6, is to say that -- 13 that both of them can be arranged in a variety of ways. 14 They could -- they could be in the router network. They 15 could be in network interfaces. It's just expressing 16 flexibility regarding where they're located. That's 17 essentially the universe of possibilities. So it's, I 18 think, expressly saying that these variety of options 19 are all possible. 20 Q. So it's your testimony that the specification 21 teaches an embodiment in which one of the managers is 22 inside a network interface and the other manager is 23 inside the router network? Is that right? 24 A. I didn't say that it expressly or explicitly 25 enumerates all the possibilities. What I said is that	Page 79 1 But I think you said "module." Sometimes "module" just 2 refers to a node on a network. And the node on the 3 network may or may not include the network interface. 4 In many cases it -- the network interface is considered 5 to be part of the module, because it's a separate hop on 6 the interconnect, or a separate source or destination 7 address. 8 Q. The '449 patent doesn't disclose that the 9 network interface can be in the initiator block, 10 correct? 11 MR. KOHLHEPP: Object to form. 12 THE WITNESS: When you say "initiator block," 13 do you mean the square in figure 2 or 3? Is that what 14 you're referring to specifically? 15 BY MR. CHRISTOPHER: 16 Q. Let's look at figure 3. Do you have it in 17 front of you? 18 A. Yes. 19 Q. Okay. Do you see "ANIP"? 20 A. Yes. 21 Q. '449 patent does not teach that ANIP can be 22 placed inside the initiator block on the left, correct? 23 MR. KOHLHEPP: Object to form. 24 THE WITNESS: I don't think it prohibits that 25 possibility. It's referring to the network interface.
Page 78 1 my reading of that sentence in column 10 from lines 3 to 2 6 is to say that there's not a particular constraint on 3 where the communication manager or resource manager are 4 located; it's saying that they could be in the router 5 network. They might be in one or more of the network 6 interfaces. And that's essentially all the obvious 7 possibilities that come to mind. So my understanding of 8 this is it's leaving open the design choices. 9 Q. All right. I want to talk through the 10 communication between those two managers. If you can 11 scroll down in column 10, starting at line -- actually, 12 let's -- before we do that, let's back up, going back to 13 figure 3. 14 The '449 patent doesn't disclose that either 15 the resource manager or the communication manager could 16 be arranged inside the initiator module, correct? 17 A. It says that they could be arranged in the 18 network interfaces. And if the network interface is 19 distinct from the initiator -- initiator module, then it 20 would be in the network interface. If there was some 21 integration of the network interface into the initiator, 22 then in that case they could be integrated. But as 23 it's -- as the example is shown here, the network 24 interface is distinct, so it would not be part of the 25 initiator. It would not be part of the initiator block.	Page 80 1 And with more and more integration, the -- these things 2 may or may not be integrated together. It doesn't -- I 3 don't think it expressly prohibits that. 4 BY MR. CHRISTOPHER: 5 Q. I mean, would you agree in figure 3 that the 6 initiator block and the active network interface port 7 are separate components? 8 A. They are shown as separate boxes here. I 9 believe that that's referring to the functionality of 10 the network interface. I mean, they are shown as 11 separate blocks, boxes, in this example in figure 3; 12 yes, that's correct. 13 Q. All right. And earlier we talked about 14 decoupling computation from communication. Do you 15 recall that? 16 A. Yes. 17 Q. All right. Would you agree that the initiator 18 block would be involved in computation? 19 A. Yes. 20 Q. Would you agree that the active network 21 interface port would be involved in communication? 22 A. Yes. 23 Q. And in figure 3 the computation and 24 communication are decoupled because the initiator block 25 and the active network interface port are shown

Page 81 1 separately, correct? 2 MR. KOHLHEPP: Object to form. 3 THE WITNESS: Well, they are distinct because 4 the -- the point is that the designer of the system 5 doesn't have to think about integrating the network 6 interface into their design of the IP block or the 7 initiator logic. They can just design it focusing on 8 the communication. 9 BY MR. CHRISTOPHER: 10 Q. Understood. So if ANIP were placed inside the 11 initiator block, computation and communication would not 12 be decoupled in that example, right? 13 THE WITNESS: No, that's -- 14 MR. KOHLHEPP: Object to form. 15 THE WITNESS: -- not -- that's not what I just 16 said. I said the point is that from the point of view 17 of the designer, they don't have to modify their design 18 of -- they can -- they can design the computation block 19 without having to worry about low-level, like, specific 20 details of the exact type of interconnect or network 21 interface that they have. Well, I mean, they have to 22 talk to that interface. But the -- the point is that 23 you don't have to keep redesigning the computation block 24 if you change details of the interconnect. 25 BY MR. CHRISTOPHER:	Page 83 1 A. Okay. 2 MR. CHRISTOPHER: Go off the record. 3 (Recess taken.) 4 MR. CHRISTOPHER: Back on the record. 5 Q. All right. Dr. Mowry, welcome back. Did you 6 discuss your testimony with anyone during our break? 7 A. No. 8 Q. Great. All right. I want to change gears, 9 cover a different topic now. I know you've used this 10 term today. Are you familiar with the concept of claim 11 construction? 12 A. Somewhat, yes. 13 Q. Okay. You do not offer any opinions on any 14 claim constructions for the '449 patent in your 15 declaration, correct? 16 A. Well, I don't provide claim constructions. I 17 don't. But I think there might be a part where I 18 discuss claim constructions. I'm not -- so I don't -- I 19 don't -- I do not provide my own claim constructions. 20 But I use the claim constructions that were provided to 21 me. 22 Q. All right. 23 A. I was not asked to provide an opinion on claim 24 construction. 25 Q. Okay. And we'll go through that. If you could
Page 82 1 Q. That design flexibility you're mentioning is 2 possible because the initiator block and the network 3 interface are separate, right? 4 MR. KOHLHEPP: Object to form. 5 THE WITNESS: Well, you keep using the term 6 "initiator block," and I don't know what you mean by 7 that exactly. The -- in figure 3, the -- there's a 8 square, which -- or rectangle, for "I," and there's a -- 9 and that's the initiator. And then there's a square for 10 "ANIP," the network interface in this case. And it's 11 referencing the functionality of these two things. But 12 I don't see the word "block" in here. 13 But in terms of decoupling, as I said earlier, 14 this has to do with being able to design the 15 computational element without having to worry about 16 changing the design when details of the interconnect 17 change. 18 BY MR. CHRISTOPHER: 19 Q. All right. Let's go to column 10 of the '449 20 patent, starting at line 19. 21 A. Just one procedural question. We've been 22 going, I think, for more than an hour and ten minutes or 23 so. I just was curious what -- how long you thought it 24 would be till the next break. 25 Q. We could break here. That's fine.	Page 84 1 turn to paragraph 90 of your declaration. And I'll -- 2 once you're there, I'll direct your attention to the 3 very bottom of page 49, starting with the sentence that 4 says "I understand." 5 A. Yes, I see that. 6 Q. All right. So here in paragraph 90 of your 7 declaration, you referred to "Patent Owner has proposed" 8 claim construction for "'resource manager,'" which was 9 "circuit that manages network resources." Do you see 10 that? 11 A. I see that, yes. 12 Q. Okay. Your declaration did not offer any 13 opinions regarding NST's claim construction for 14 "resource manager," correct? 15 MR. KOHLHEPP: Object to form. 16 THE WITNESS: So I didn't go to law school, and 17 I'm not exactly sure whether you're -- the way you're 18 phrasing the question has some special significance. 19 When you say I'm not offering any opinions, I did not 20 provide my own alternate claim construction. I did my 21 analysis adopting the claim constructions that I was 22 given. 23 As I said here at the bottom of paragraph 90, 24 using the proposed claim construction from the patent 25 owner -- as I said here, that "In my opinion,

Page 85 1 Goossens2002 discloses...a resource manager" under that 2 proposed claim construction. 3 BY MR. CHRISTOPHER: 4 Q. Let me -- let me try -- and I appreciate that 5 you're not an attorney, and I don't mean to trick you 6 with legal terms. So let me ask it in plain English. 7 Have you offered -- you haven't offered any 8 analysis in your declaration with respect to whether you 9 agree or disagree with patent owner's "resource manager" 10 claim construction; is that fair? 11 A. I don't recall having a discussion of that 12 issue in my declaration. I may be forgetting something. 13 But I don't recall off the top of my head having a 14 discussion of that. 15 Q. And you applied patent owner's proposed claim 16 construction for "resource manager" in forming your 17 opinions; is that right? 18 A. Well, for example -- I mean, yes. For example, 19 I did that here at the end of paragraph 90, as we were 20 just discussing. 21 Q. All right. And if you could turn now to 22 paragraph 122 of your declaration. 23 And I actually want to draw your attention. 24 It's at the top of -- well, it's near the top of page 25 69. It's the last sentence of paragraph 122. Let me	Page 87 1 you have that opened up. 2 A. Okay. I have it open. 3 Q. And then if you could turn to page 60. 4 A. Okay. 5 Q. All right. First of all, I'll represent to you 6 that Exhibit 2022 is a copy of the claim construction 7 order from the district court case involving patent 8 owner and Texas Instruments. Are you with me? 9 A. Okay. 10 Q. Okay. On page 6, do you see "Term/Phrase," and 11 one of them listed there is "'communication manager,"' 12 '449 Patent: Claims 10-16'?" 13 A. I see that. 14 Q. All right. And then on the right column, I'll 15 represent to you that this is the Court's claim 16 construction for "communication manager," which is 17 "Subject to Section 112, paragraph 6." Do you see that? 18 A. Yes. 19 Q. All right. And then it lists: "Function: 20 forwarding a request to a resource manager. Structure: 21 portion of the circuit configured to implement the 22 scheme disclosed in the '449 Patent at" column 10, lines 23 19 to 24, column 10, lines 41 to 54. Do you see that? 24 A. Yes. Uh-huh. 25 Q. You did not apply the Texas Instruments court's
Page 86 1 know when you're there. 2 A. Okay. I'm -- I'm at that paragraph. 3 Q. All right. So in the last sentence of 4 paragraph 122, on page 69, you wrote, "As such, in my 5 opinion, Goossens2002 in view of Drake renders obvious a 6 'circuit that manages communication between modules,' 7 which I understand is the construction of 'communication 8 manager' that patent owner has proposed." See that? 9 A. Yes, I see that. 10 Q. Okay. I'll try asking it again in plain 11 English. 12 You haven't offered any analysis as to whether 13 you agree or disagree with patent owner's proposed 14 construction for "communication manager," right? 15 A. Yes, I believe that that's correct. 16 Q. Okay. And so is it fair to say that you 17 applied patent owner's proposed claim construction for 18 "communication manager" in rendering the opinions in 19 your declaration? 20 A. Yes, I did -- I did apply those, as -- as we 21 see an example. It's the end of paragraph 122, as we 22 were just discussing. 23 Q. All right. I'm going to introduce in the Zoom 24 chat a copy of Exhibit 2022, which was previously 25 submitted in this proceeding. Please let me know when	Page 88 1 claim construction for "communication manager" in the 2 analysis in your declaration, correct? 3 MR. KOHLHEPP: Object to form. 4 THE WITNESS: Well, I did apply the 5 understanding of "communication manager" as described in 6 column 10, lines 41 to 54; I did -- I did, and lines -- 7 column 10, lines 19 through 24. And I believe I discuss 8 that in my -- my report. So my analysis does cover this 9 construction. 10 BY MR. CHRISTOPHER: 11 Q. Well, can we agree that your declaration does 12 not expressly address the Texas Instruments claim 13 construction for "communication manager"? 14 MR. KOHLHEPP: Object to form. 15 THE WITNESS: Well, I don't recall whether I 16 explicitly used the terms "Texas Instruments," you know, 17 "claim construction order" exactly in here, but reading 18 the construction, as I just said, I did apply the 19 description of -- of the structure from column 10, lines 20 19 through 24, and column 10, lines 41 to 54 in my 21 analysis of what the communication manager is. And I do 22 explicitly discuss that. I -- I cite that, those 23 sections, in my analysis. 24 BY MR. CHRISTOPHER: 25 Q. Understood. But you don't specifically cite

Page 89 1 this claim construction from the Court in the Texas 2 Instruments case. We agree on that? 3 MR. KOHLHEPP: Object to form. 4 THE WITNESS: I'm just trying to figure out if 5 there was anything different between that question and 6 the question I just answered. Did -- did something 7 change between the two questions? I think -- I think I 8 just answered that, didn't I? 9 BY MR. CHRISTOPHER: 10 Q. Well, I'm just trying to get a yes-or-no 11 question -- yes-or-no answer to a simple question. 12 Your declaration does not expressly address the 13 claim construction issue -- the claim construction that 14 was issued by the Court in the Texas Instruments case, 15 correct? 16 A. And as -- 17 MR. KOHLHEPP: Same objection. 18 THE WITNESS: Sorry. 19 As I said a minute ago, the -- I do expressly 20 address the description of "communication manager" from 21 lines -- from column 10, lines 19 through 24, and column 22 10, lines 41 through 54. I do expressly discuss that in 23 my analysis of "communication manager." 24 BY MR. CHRISTOPHER: 25 Q. All right. You -- you haven't offered any	Page 91 1 A. I don't recall offering an opinion on that 2 specific issue. I don't -- I believe I was not asked 3 to -- I don't believe I offer an opinion on that. Maybe 4 I'm forgetting something, but I -- as far as I recall, I 5 don't -- I don't think that I offer an opinion on that 6 topic. 7 Q. All right. And you mention in your declaration 8 you considered column 10, lines 19 to 24 and column 10, 9 lines 41 to 54 in your analysis of the communication 10 manager. Did you consider any other portions of the 11 specification in your analysis of the communication 12 manager? 13 A. Well, I considered the entire '449 patent in my 14 analysis of "communication manager." I -- and those are 15 sections that talk specifically about it. But I read -- 16 I reviewed the entire '449 patent before I did my 17 analysis. 18 Q. Okay. Column 10, lines 19 through 24 are 19 describing the structure associated with the claimed 20 communication manager, right? 21 MR. KOHLHEPP: Object to form, also scope. 22 THE WITNESS: Well, my understanding is that 23 the term "structure" has a specific meaning, legal 24 meaning, and so I did not provide an opinion on that 25 specific phrase, on it in that context. I did
Page 90 1 opinions in your declaration with respect to whether the 2 term "communication manager" is subject to Section 112, 3 paragraph 6, correct? 4 A. Sorry. Can you remind me, what is -- what is 5 Section 112, paragraph 6, again? Is that -- I don't -- 6 off the top of my head, I don't recall what that -- what 7 that is. 8 Q. I'm just asking, did your declaration address 9 whether or not the term "communication manager" is 10 subject to Section 112, paragraph 6? 11 A. Well, I don't know how to answer that without 12 getting clarification, again, as -- I don't remember. 13 Is Section 112, paragraph 6 -- that's -- is that legal 14 code? I don't remember -- I think I've probably heard 15 of that. I just don't remember off the top of my head 16 what that's referring to. Is that means plus function, 17 or what -- what is that referring to exactly? I 18 don't -- I don't know how to answer that question 19 without getting clarification on what that -- that 20 means. I think -- I mean, I discuss "communication 21 manager" in my declaration. 22 Q. I'll ask it this way: Your declaration does 23 not offer any opinions as to whether the term 24 "communication manager" is a means-plus-function term, 25 correct?	Page 92 1 analyze -- as I said, I did take into account column 10, 2 lines 19 through 24, and column 10, lines 41 through 54 3 when I was analyzing the claims of the '449 patent, and 4 specifically where it refers to "communication manager." 5 BY MR. CHRISTOPHER: 6 Q. Is it your understanding that for a 7 means-plus-function term, one must identify the 8 corresponding structure in the specification for the 9 claim term? 10 MR. KOHLHEPP: Object to form. 11 THE WITNESS: Sorry. Can you point me to a 12 part of my declaration where I discuss means plus 13 function? I don't recall -- as we discussed a minute 14 ago, I don't recall discussing that. Is there -- can 15 you point me to the part of my declaration you're 16 referring to? 17 BY MR. CHRISTOPHER: 18 Q. Well, I'll represent to you that your 19 declaration does not address means plus function. 20 I'll ask this question: Sitting here today, do 21 you have any opinions with respect to what the 22 corresponding structure is for the claim term 23 "communication manager" in the specification? 24 A. I was not asked to provide opinions on means 25 plus function. As I mentioned a minute ago, I did -- I

Page 93 1 did do analysis that took into account the -- as -- the 2 document that you're showing me, my analysis is 3 consistent with the -- the -- the part that says that 4 this is referring to section -- column 10, lines 19 5 through 24, column 10, lines 41 through 54. I did 6 review those sections -- those parts of the spec, and I 7 used that in my analysis of "communication manager." 8 But I was not asked to provide analysis related to means 9 plus function. 10 Q. If the Board were to adopt the Texas 11 Instruments case means-plus-function claim construction 12 for "communication manager," you would need to update 13 your opinions, correct? 14 A. No, I -- 15 MR. KOHLHEPP: Object to form. 16 BY MR. CHRISTOPHER: 17 Q. I'm sorry. The -- what was -- is the answer 18 no? 19 A. Sorry. No, I would not. As I said already, 20 I -- I did refer -- I cited that those passages of 21 the -- that -- that claim construction does not change 22 my opinions. 23 Q. Okay. And your testimony is that you cited 24 those passages of the specification referenced in the 25 claim construction in connection with your analysis of	Page 95 1 "network"? 2 MR. KOHLHEPP: Object to form, also scope. 3 THE WITNESS: Well, I was not asked to provide 4 opinions on whether that's the correct claim 5 construction of "network." I adopted that claim 6 construction in my analysis. 7 BY MR. CHRISTOPHER: 8 Q. So am I correct that sitting here today, you 9 don't have an opinion one way or the other as to whether 10 patent owner's proposed construction for "network" is 11 correct? 12 A. That's correct. I did not -- 13 MR. KOHLHEPP: Object to form. 14 THE WITNESS: I did not -- I did not analyze 15 that issue. I adopted the claim constructions that I 16 was given. And that's -- that's what I did. 17 BY MR. CHRISTOPHER: 18 Q. All right. Let's go to claim 10 of the '449 19 patent. Let me know when you're there. 20 A. Okay. 21 Q. Now, I want to focus your attention on line 32. 22 A. Okay. 23 Q. The claim reads "the first module issuing a 24 request for a connection with the second module to a 25 communication manager." Do you see that?
Page 94 1 the communication manager? 2 A. Well, yes, when I -- when I -- when I analyzed 3 "communication manager," these reference sections here 4 are things that I was referring to. And I explicitly 5 reference those things in my declaration. So this -- 6 this claim construction does not change my analysis. My 7 analysis would be the same with this claim construction. 8 Q. Just so I'm clear, if the Board were to adopt 9 the claim construction from the Texas Instruments case 10 for "communication manager," your view is that you 11 wouldn't have to change any of the opinions expressed in 12 your declaration; is that right? 13 A. Yes, that's correct. 14 Q. Okay. You could turn now to paragraph 172 of 15 your declaration. 16 A. Okay. 17 Q. In the very first sentence, you wrote, "I 18 understand that Patent Owner has advocated in parallel 19 district court proceedings for a construction of 20 'network' as 'a multi-hop interconnection between 21 modules separated by one or more network nodes.'" Do 22 you see that? 23 A. Yes, I see that. 24 Q. Sitting here today, do you have any reason to 25 disagree with that proposed claim construction for	Page 96 1 A. Yes, I see that. 2 Q. Would you agree that the first module and the 3 second module are different modules? 4 MR. KOHLHEPP: Object to form. 5 THE WITNESS: Can you please repeat the 6 question? 7 BY MR. CHRISTOPHER: 8 Q. Sure. The claim recites a "first module" and a 9 "second module," correct? 10 A. Those -- those things do appear in claim 10. 11 Yes, there's a first module and a second module. Yes. 12 Q. Okay. The first module and the second module 13 are different modules, correct? 14 MR. KOHLHEPP: Object to form. 15 THE WITNESS: Here I'm not sure whether you 16 mean that they are distinct places on the interconnect 17 or if you mean that they're designed differently. 18 What -- can you clarify what you mean by "different"? 19 BY MR. CHRISTOPHER: 20 Q. The first module and the second module are 21 distinct structures on the interconnect, correct? 22 MR. KOHLHEPP: Object to form. 23 THE WITNESS: The claims recite a first module 24 that's trying to communicate with a second module. 25 BY MR. CHRISTOPHER:

Page 97 1 Q. Yes. And the first module and the second 2 module are distinct structures, right? 3 MR. KOHLHEPP: Object to form. 4 THE WITNESS: Well, my understanding is that 5 the term "structure" has legal significance, and I 6 wasn't analyzing that. But a first module is a module 7 that is different from the second module. 8 BY MR. CHRISTOPHER: 9 Q. Okay. So you agree that the first module is a 10 different module than the second module, correct? 11 A. They are discussed as two separate -- as two 12 modules in the claims. I'm trying to think about the 13 possibility of an interconnect sending a message to 14 itself. But that's not typically done. I believe 15 these -- these are described as two modules. 16 Q. Let me ask it this way: Claim 10 of the '449 17 patent requires two different modules, one being the 18 first module and one being the second module, true? 19 A. The term -- 20 MR. KOHLHEPP: Object to form. 21 THE WITNESS: The term "different," I'm not 22 clear on what you mean by "different." It -- it does 23 discuss two modules. There's a first module and there's 24 a second module, where the first module is trying to 25 communicate with the second module.	Page 99 1 "structure" to describe a component of a network on a 2 chip? 3 A. Not necessarily. 4 Q. Let me ask it this way: You would agree that 5 an example of a first module would be a CPU, right? 6 A. It -- it could be a CPU. That would be one 7 possibility, yes. 8 Q. And you agree that a CPU is a physical 9 structure, right? 10 A. A CPU is a piece of hardware. You keep wanting 11 to use the term "structure," which, as I've mentioned, 12 is a -- my understanding, although, again, I didn't go 13 to law school, but I understand it has special 14 significance. So I would characterize it as a piece of 15 hardware. And it could potentially be the first module. 16 Q. What's your understanding of the special 17 significance of the term "structure"? 18 A. Well, as I recall, I was not asked to form 19 an -- to provide an opinion on that term in -- in my 20 declaration. I don't think I have a discussion of that 21 here in my report. But I'm happy to answer questions 22 about my report. 23 Q. Okay. Let's do it this way. 24 Would you agree that the first module includes 25 hardware?
Page 98 1 BY MR. CHRISTOPHER: 2 Q. Do you agree that the first module is a 3 structure? 4 MR. KOHLHEPP: Object to form. 5 THE WITNESS: The first module is described as 6 a module. As I said before, my understanding is the 7 term "structure" has special legal significance. I was 8 not asked to analyze that. But it is described as a 9 module. 10 BY MR. CHRISTOPHER: 11 Q. So you don't have any opinions with respect to 12 whether the first module in the claim is a structure? 13 Is that your testimony? 14 MR. KOHLHEPP: Object to form. 15 THE WITNESS: I don't recall being asked to 16 form an opinion on -- well, for that matter, there's -- 17 as I said, I believe that the term "structure" has 18 special significance in legal terms, and I was not asked 19 to evaluate that. But the first module is described as 20 a module. I don't recall having a section of my 21 declaration where I talk about it -- whether it's a -- a 22 legal structure or not, but I may be forgetting 23 something, possibly. I don't -- don't recall that. 24 BY MR. CHRISTOPHER: 25 Q. Would a person of skill in the art use the term	Page 100 1 A. A CPU includes hardware, and the first module 2 would include hardware, presumably, yes. 3 Q. Likewise, the second module would include 4 hardware, correct? 5 A. Yes. 6 Q. And the hardware for the first module would be 7 different than the hardware for the second module, 8 correct? 9 MR. KOHLHEPP: Object to form. 10 THE WITNESS: As I mentioned before, the term 11 "different" can mean different things, not to overuse 12 that term. So, like, it's possible that these are two 13 CPUs. They could be identical designs. That's a 14 possibility. So in that sense they're not different. 15 They -- they are -- you do have a first module that is 16 sending messages to a second module. So they're 17 identified as the initiator and target of communication. 18 So that -- that makes them distinct in that sense. 19 BY MR. CHRISTOPHER: 20 Q. Would you -- would you agree that the hardware 21 for the first module would be physically distinct from 22 the hardware associated with the second module? 23 MR. KOHLHEPP: Object to form. 24 THE WITNESS: Well, that question has the same 25 issue that I addressed with the word "different" before.

Page 101 1 So are they different designs? Are they designed 2 differently? No, not necessarily. Possibly, but not 3 necessarily. All that this is saying is that the first 4 module is able to communicate with a second module. 5 That's -- that's all that the claim is saying. 6 BY MR. CHRISTOPHER: 7 Q. My question didn't use the word "differently." 8 I used the word "physically distinct." 9 Would you agree that the hardware for the first 10 module would be physically distinct from the hardware 11 associated with the second module? 12 MR. KOHLHEPP: Object to form. 13 THE WITNESS: The term "physically distinct" 14 could mean multiple things. As I said, the -- the first 15 node does not need to be -- to the extent that 16 "physically distinct" means different designs, it does 17 not imply that. They might be the same design. It may 18 be two copies of identical hardware. That would be one 19 possibility for the first module communicating to the 20 second module. 21 BY MR. CHRISTOPHER: 22 Q. Okay. The first and second modules in the 23 claim are on an integrated circuit, right? 24 A. Yes, that's correct. 25 Q. And the integrated circuit would have multiple	Page 103 1 correct? 2 A. Yes, that's correct. 3 Q. Okay. And earlier today we talked about how 4 the '449 patent discusses decoupling computation from 5 communication. Do you recall that? 6 A. Yes. 7 Q. Okay. Now, for my next few questions, I'm 8 asking about "decoupling...computation from 9 communication" as that phrase is used in the '449 10 patent. Do you understand? 11 A. It's -- yes. It's discussed a little bit in 12 the spec but not in the claims; but yes. 13 Q. Right. And my next series -- just so we 14 understand each other, my next series of questions, to 15 the extent I refer to decoupling computation from 16 communication, I'm talking about that in terms of how it 17 is described in the '449 patent. You with me? 18 A. Okay. 19 Q. Okay. Would you agree that in the claim, the 20 first and second modules would be associated with 21 computation? 22 A. Not necessarily. 23 Q. Would the first module and second module be 24 associated with communication? 25 A. So it's not clear what you mean by "associated
Page 102 1 elements on the same substrate, right? 2 A. Yes. 3 Q. And on the integrated circuit in claim 10, one 4 of those elements would be the first module, and a 5 different one of those elements on the substrate would 6 be the second module, right? 7 A. Yes, that's how it's described. Yes. 8 MR. CHRISTOPHER: Okay. Why don't we go off 9 the record and take our lunch break. 10 (Whereupon, a lunch recess was taken.) 11 12 AFTERNOON PROCEEDINGS 13 MR. CHRISTOPHER: All right. Back on the 14 record. 15 Q. Hope you had a nice lunch, Dr. Mowry. Did you 16 discuss your testimony with anyone during our lunch 17 break? 18 A. No, I did not. 19 Q. All right. So before the break, we were 20 discussing independent claim 10 of the '449 patent, and 21 we were discussing how claim 10 recites a "first module" 22 and a "second module." Do you recall that? 23 A. Yes. 24 Q. Okay. Claim 10 of the '449 patent also recites 25 a "resource manager" and a "communication manager,"	Page 104 1 with." 2 Q. Okay. The '449 patent talks about decoupling 3 computation from communication, right? 4 A. As I said, the claims don't discuss that. The 5 spec has a little part where it mentions that in the 6 background. 7 Q. And when the spec mentions "computation," it's 8 referring to the IP blocks, correct? 9 A. That would be a natural thing to connect that 10 with, yes. 11 Q. And the first and second modules in claim 10 12 correspond to the IP block that is described in the 13 specification, right? 14 A. The first and second modules would correspond 15 to IP blocks. That would be a natural -- yes, that 16 would -- that would make sense, yes. 17 Q. And the specification of the '449 patent 18 describes the "communication" part as the interconnect, 19 correct? 20 A. Well, communication involves a number of 21 things. There's the network interface. There's the 22 interconnect where you're transporting data across the 23 links. There are a number of pieces to that. I believe 24 when the '449 is talking about decoupling communication 25 and -- communication as a design goal to help minimize

Page 105 1 work on the part of the designers, it's discussing all 2 of the communication that would affect the IP block, 3 although, again, this is just described as a design goal 4 in the background. It doesn't expressly appear, in my 5 opinion, in the claims. 6 Q. Okay. The communication manager and the 7 resource manager in the claims would be associated with 8 the "communication" part described in the specification 9 with respect to decoupling computation and 10 communication, correct? 11 MR. KOHLHEPP: Object to form. 12 THE WITNESS: The communication manager and the 13 resource manager are involved with the communication 14 that occurs. 15 BY MR. CHRISTOPHER: 16 Q. Let's take a look -- well, let me back up 17 before we change gears. 18 Would you agree that the communication manager 19 and the resource manager are not part of the 20 computation? 21 MR. KOHLHEPP: Object to form. 22 THE WITNESS: That's worded a little vaguely. 23 I mean, computation -- if I'm running a parallel 24 program, I think of everything that's taking place as 25 being part of the computation. If you're asking whether	Page 107 1 Q. Would a person of ordinary skill in the art 2 understand that the communication manager and the 3 resource manager in the claims are associated with the 4 communication part that is described here in the 5 specification? 6 MR. KOHLHEPP: Object to form. 7 THE WITNESS: Well, this section of the spec is 8 talking about high-level objectives. For example, it 9 says "the services should abstract from the network 10 internals as much as possible." This is not an 11 absolute. And this is also a goal. This section is 12 just laying out design goals. This is not defining the 13 boundaries of the claims. 14 So this -- to get back to your question, the 15 communication manager and the resource manager are 16 things that are involved with communication, but as you 17 phrased your question, this -- we don't -- it's not -- I 18 don't think it's -- the -- the communication -- this -- 19 this high-level goal of decoupling communication and 20 computation does not get inserted into the -- the claim 21 language somehow. The -- the claim language is what it 22 is. This is just simply describing design goals, but 23 they're not hard and fast. This is simply an objective. 24 I mean, this is simply a desirable thing. 25 MR. CHRISTOPHER: Move to strike as
Page 106 1 they're part of the IP block, the -- I mean, the 2 specs -- the claims, rather, talk about -- have specific 3 details in them. But I don't think it characterizes 4 "computation" somewhere in the claim language. 5 BY MR. CHRISTOPHER: 6 Q. Okay. Can you turn to column 17, line 61 of 7 the '449 patent. 8 A. Yes, I see that. 9 Q. Right. It says, "This is a key ingredient in 10 tackling the challenge of decoupling the computation 11 from communication, which allows IPs," parentheses, 12 "(the computation part) and the interconnect" -- 13 (Discussion off the record.) 14 MR. CHRISTOPHER: Sorry. Let's try that a 15 little slower. 16 Q. I'm reading at line 61 in column 17 of the '449 17 patent. 18 "This is a key ingredient in tackling the 19 challenge of decoupling the computation from 20 communication, which allows IPs," parentheses, "(the 21 computation part), and the interconnect," parentheses, 22 "(the communication part) to be designed independently 23 from each other." 24 You see that? 25 A. I see that, yes.	Page 108 1 nonresponsive. 2 Q. I need you to focus on the question I'm asking. 3 Try a different question. 4 Would you agree that the communication manager 5 and the resource manager in the claim are part of the 6 interconnect? 7 A. They are part of what is used to manage the 8 interconnect. It depends on whether -- sometimes when 9 people use the term "interconnect," they're talking 10 specifically about the links and routers. But if you 11 consider it to include not only that but the -- the 12 interface to that interconnect, then, yes, they are 13 definitely part of that communication -- the -- part of 14 that interconnect subsystem. 15 Q. All right. Let's change gears a little bit and 16 go to column 10 of the '449 patent. And I am going to 17 direct you to paragraph starting at line 41. 18 A. Okay. 19 Q. And I believe you testified earlier that you 20 considered the portion of the specification starting at 21 line 41 in column 10 with respect to your opinions on 22 the communication manager. Do you recall that? 23 A. Yes. 24 Q. Okay. And then I want to focus on the sentence 25 that starts at line 46. It reads, "Optionally, the

Page 109 1 communication manager CM can accept the connection with 2 the available properties, but on the other hand the 3 communication manager CM may also refuse the offered 4 connection if the available properties or the resources 5 thereof are not acceptable." Do you see that? 6 A. Yes. 7 Q. The specification is teaching that the 8 communication manager can accept the connection or 9 refuse the offered connection, correct? 10 A. Well, the word "optionally" begins at the 11 beginning of that sentence. So these are some options, 12 yes. 13 I forget. Can you repeat the question, please? 14 I missed the very beginning of your question. 15 Q. Sure. Would a person of ordinary skill in the 16 art understand that the communication manager accepts 17 the connection or refuses the offered connection? 18 MR. KOHLHEPP: Object to form. 19 THE WITNESS: Well, as I said before, the 20 beginning of this sentence says "optionally." So it's 21 describing that this is an option. And there are, I 22 think, some dependent claims that actually talk about 23 this. But I believe that claim 10, for example, does 24 not explicitly discuss this. I think it's some later 25 dependent claims that discuss these possibilities.	Page 111 1 rejects the connection, correct? 2 MR. KOHLHEPP: Object to form. 3 THE WITNESS: As I just said, I disagree with 4 that, for the reasons I just explained. One of them is 5 this sentence begins with the word "optionally," so I 6 believe this sentence is saying in some designs it's a 7 possibility that it would decide whether to accept 8 versus reject the connection. And also, claim 17 says 9 that the connection manager could reject the connection. 10 And since this is dependent on claim 10 by way of claim 11 15, that means that claim 10 includes a possibility that 12 the communication manager does not reject the 13 connection. So this is -- that -- that -- the teaching 14 of that sentence is just related to some possibilities 15 of some designs but not necessarily all the options for 16 claim 10. 17 BY MR. CHRISTOPHER: 18 Q. Let's go to claim 10 in the '449 patent. 19 A. Okay. 20 Q. I'll direct you to a line once I find it. 21 All right. Line 26, column 19. Let me know 22 when you're there. 23 A. So like 19:26? 24 Q. Correct. Column 19, line 26. 25 A. Okay.
Page 110 1 BY MR. CHRISTOPHER: 2 Q. So is it your testimony that a person of skill 3 in the art would understand that the communication 4 manager does not have to either accept or reject the 5 connection? 6 MR. KOHLHEPP: Object to form. 7 THE WITNESS: Well, for example, claim 17 8 discusses the possibility of the communication manager 9 rejecting a -- a connection based on the available 10 connection properties, so claim 17 is definitely 11 discussing that an option is that the connection -- the 12 communication manager could reject a connection. But -- 13 claim 10, for example, does not have -- does not 14 explicitly discuss this, so that -- I believe that means 15 that claim 10 would involve designs that don't 16 necessarily have this feature, so there might be ones 17 where the connection manager does not reject a 18 connection based on the connection property -- available 19 connection properties. 20 BY MR. CHRISTOPHER: 21 Q. Understood. My question is not about the 22 claims. I'm just asking about the teaching that starts 23 at column 10, line 46 in the specification. This 24 portion of the specification is teaching that the 25 communication manager either accepts the connection or	Page 112 1 Q. All right. So here claim 10 recites "any 2 communication channel being independently configurable." 3 Do you see that? 4 A. Yes. 5 Q. How would a person of ordinary skill in the art 6 understand "independently configurable" as used in claim 7 10 of the '449 patent? 8 A. Well, I believe I discuss this in paragraph 103 9 of my declaration. And "independently configurable" 10 means that the different channels can have different 11 properties. 12 Q. All right. I want to ask you about a couple of 13 examples. I'm going to abstract this a little bit, so 14 bear with me. 15 If you had channel 1 with property A and 16 channel 2 with property B, would those two channels be 17 independently configurable? 18 MR. KOHLHEPP: Object to form. 19 THE WITNESS: It's -- it's unclear from your 20 example. You've just stated that there are properties, 21 but I don't have enough information to answer that 22 question. 23 BY MR. CHRISTOPHER: 24 Q. All right. Well, let's look at paragraph 103 25 of your declaration. You state in the first sentence,

Page 113 1 "In my opinion, a POSITA would have understood that each 2 of the different channels described by Goossens...can 3 have different connection properties, i.e., that they 4 are 'adjustable independently.'" Do you see that? 5 A. I see that. 6 Q. Okay. Is it your opinion that the channels in 7 Goossens2002 are independently adjustable because each 8 channel can have different connection properties? 9 A. Right. Well, yes, it is -- yes. And I go on 10 and describe this in some detail here in paragraph 103. 11 Q. Okay. So I'll try to give you a different 12 example so we can understand this. 13 Let's -- let's call a first channel "channel 1" 14 and a second channel "channel 2." With me so far? 15 A. Okay. 16 Q. Channel 1 has a first set of connection 17 properties. Channel 2 has a second set of connection 18 properties, that is different than the first set of 19 connection properties. With me so far? 20 A. Yes. 21 Q. Okay. In that example, would the first channel 22 and the second channel be independently configurable? 23 A. It would depend on whether they are 24 configurable. In the scenario you've described, I could 25 just have channels with static properties, that can't be	Page 115 1 then -- then it would be. 2 Q. What do you mean by adjustable independently? 3 A. Okay. I think I may have lost the thread of 4 this question. Can you repeat where -- the context of 5 this? I mean -- 6 Q. Sure. 7 A. -- what I -- 8 Q. I'll reask it. And I'll -- I'll take it in 9 pieces with you again, to make sure we're on the same 10 page. 11 We have a first channel, that has a first set 12 of connection properties. We have a second channel, 13 that has a second set of connection properties, that are 14 different than the first set of connection properties. 15 With me so far? 16 A. So, for example, channel A could have different 17 bandwidths, but it's been set up to have a 10 gigabits 18 per second of bandwidth, and channel B could also have 19 similar sets of bandwidth, but we've set it to a 20 different value, like 5 gigabits; something like that? 21 Q. Yes. Why don't we use that. 22 A. Okay. 23 Q. And with that assumption added on to my 24 hypothetical, would you agree that those two channels 25 would be independently adjustable?
Page 114 1 configured. For example, the bandwidth of a Wi-Fi 2 connection is much lower than the bandwidth of a wired 3 connection. So they have different bandwidths. That 4 doesn't necessarily mean that they're configurable. In 5 this -- this paragraph 103, I describe that the -- the 6 channel properties described in Goossens2002 can be 7 independently configured. 8 Q. So -- so I'm understanding you correctly, two 9 channels that have different sets of connection 10 properties are not necessarily independently 11 configurable. Is that fair? 12 A. It depends on whether they can be configured or 13 adjusted. If it's -- if it's just permanently static, 14 then there's no -- then there's no adjusting that can 15 happen. But in Goossens2002, for example, they are 16 independently configurable. 17 Q. So in the example I've been giving you about 18 channel 1 and channel 2, I want you to assume that the 19 connection properties for each channel could be adjusted 20 and they're not static. With that assumption, are those 21 two channels independently configurable? 22 A. Potentially. Depends on the details. 23 Q. What details would you need to know to answer 24 that hypothetical? 25 A. As long as they can be adjusted independently,	Page 116 1 A. Yes, provided that I could adjust channel A's 2 bandwidth independently of adjusting channel B's 3 bandwidth, then they would be independently adjustable. 4 Q. Okay. And so just so we're clear, just because 5 two different channels have different sets of 6 communication properties doesn't necessarily mean that 7 the two channels are independently configurable. Would 8 you agree with that? 9 MR. KOHLHEPP: Object to form. 10 THE WITNESS: Can you please repeat the 11 question? 12 BY MR. CHRISTOPHER: 13 Q. Sure. 14 "Independently configurable," as that term is 15 used in the '449 patent, requires something more than 16 just two different channels with two different sets of 17 connection properties. Would you agree with that? 18 MR. KOHLHEPP: Object to form. 19 THE WITNESS: Well, if -- assuming that they 20 are independently configurable, then they would be -- we 21 could adjust them independently. 22 BY MR. CHRISTOPHER: 23 Q. I'll move on. 24 Actually, if you can go to claim 1 of the '449 25 patent. I'll direct you -- this is column 18. I'll

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1 start at line 40. Let me know when you're there.

2 A. Okay. I'm there.

3 Q. So line 40 reads "the connection properties of

4 the different communication channels of said connection

5 being adjustable independently." Do you see that?

6 A. Yes, I see that.

7 Q. Would you agree that "independently

8 configurable" and "independently adjustable" are

9 synonymous?

10 A. Yes, I -- I believe that they're synonymous.

11 Q. Okay. Are you aware that in the related

12 district court proceedings, petitioner and patent owner

13 have agreed to a claim construction for "independently

14 configurable"?

15 A. I may have heard that. I don't recall off the

16 top of my head. But I -- I forget whether I just -- I

17 forget whether that's something I discuss in my

18 declaration or not.

19 Q. Okay. I'm going to introduce what has been

20 previously marked in the Qualcomm IPR proceeding as

21 Exhibit 1032. Let me know when you have that open.

22 A. I don't see it in the chat yet.

23 Okay. I have it.

24 Q. See it? All right.

25 And I'll represent to you, Dr. Mowry, this is a

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1 joint claim construction statement from the district

2 court case involving petitioner and patent owner. Have

3 you seen Exhibit 1032 before?

4 A. I don't recall whether I've seen it. It's not

5 one of the documents that I have in my list of exhibits.

6 So I don't -- I don't recall off the top of my head

7 where -- whether I've seen it or not.

8 Q. If you could turn to the second page. It

9 actually says page 1 at the bottom, but it's the second

10 page. Let me know when you're there.

11 A. Okay. Yes.

12 Q. At the very top, do you see where it says

13 "Agreed Constructions"?

14 A. Uh-huh. Yes.

15 Q. All right. And then in the second row from the

16 bottom on the left-hand column, do you see

17 "'independently configurable'"?

18 A. Yes.

19 Q. Next column says "'449," right?

20 A. Uh-huh.

21 Q. And then in the right-hand column, the agreed

22 construction is "'Able to be configured with connection

23 properties that do not depend on those of another

24 configuration.'" You see that?

25 A. Yes.

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1 Q. Okay. You didn't expressly mention this claim

2 construction for "independently configurable" in your

3 declaration, correct?

4 MR. KOHLHEPP: Object to form.

5 THE WITNESS: Well, this -- I believe this

6 document was not on the list of exhibits that I

7 referenced in my declaration. But as I read this, this

8 claim construction is consistent with my understanding

9 of the term, and it -- and this would -- adopting this

10 construction would not change any of my opinions in my

11 declaration.

12 MR. CHRISTOPHER: Move to strike as

13 nonresponsive.

14 Q. My -- my question was, you didn't expressly

15 mention this claim construction, which is "'Able to be

16 configured with connection properties that do not depend

17 on those of another configuration,'" correct?

18 MR. KOHLHEPP: Object to form.

19 THE WITNESS: I believe I just answered exactly

20 that question. Did -- was there something different in

21 the second question?

22 BY MR. CHRISTOPHER:

23 Q. Do the words "able to be configured with

24 connection properties that do not depend on those of

25 another configuration" appear anywhere in your

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1 declaration; yes or no?

2 A. Well, I'd have to search through my declaration

3 to answer that. I don't recall writing that. But

4 that's synonymous with "independently adjustable," in my

5 opinion, so that claim construction would not alter any

6 of my opinions in my declaration.

7 MR. CHRISTOPHER: Move to strike as

8 nonresponsive. It's a yes-or-no question.

9 Q. Let's move on to paragraph 18 of your

10 declaration.

11 A. Okay.

12 Q. All right. In paragraph 18 you wrote, "The

13 references listed above are prior art to the '449

14 patent." Do you see that?

15 A. Yes, I see that.

16 Q. Are you rendering an opinion that the

17 references are prior art, or are you just stating your

18 understanding here at paragraph 18?

19 A. Well, my understanding is that it's up to the

20 Court to decide whether something qualifies definitively

21 as prior art or not. But this is my understanding,

22 which is that these are prior art.

23 Q. All right. You're not rendering an opinion

24 that these references qualify as prior art to the '449

25 patent, correct?

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1 A. Well, my understanding is that -- my
2 declaration -- things written in my declaration are my
3 opinions, and given the information that I have, I
4 believe that these are all -- assuming that the priority
5 date is October 2003, then these -- these are all prior
6 art of the '449 patent.

7 **Q. Okay. Let's start with the first reference, at**
8 **the top, Exhibit 1005, Goossens2002. Do you see that?**

9 A. Yes.

10 **Q. You just testified that Goossens2002 is prior**
11 **art to the '449 patent, correct?**

12 A. Yes.

13 **Q. Okay. Under what section of the Patent Act is**
14 **Goossens2002 prior art?**

15 A. I'm sorry. Are you asking me if I've gone to
16 law school and I've memorized the -- the patent law? Is
17 that -- is that actually the question?

18 **Q. Well, you just testified that it's prior art.**
19 **And I'm trying to understand the basis for your**
20 **testimony. So can you explain to me why it's prior art**
21 **to the '449 patent?**

22 A. Assuming that the correct priority date of the
23 '449 patent is -- let's see, what is it, just to be
24 precise here? The filing date, which was October 7,
25 2003. The -- the Goossens2002 paper appeared in early

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1 2002, at the -- at the DATE conference. And that was
2 more than 12 months before the filing date. So my
3 understanding is that that would make it prior art.

4 **Q. Okay. And, again, I'm -- I'm giving you an**
5 **opportunity to tell me whether it's an opinion or your**
6 **understanding. In paragraph 18, are you providing your**
7 **understanding, or are you rendering a legal opinion**
8 **about whether these references are prior art?**

9 A. I mean, I believe it's the Court that makes --
10 renders legal opinions on whether things are prior art.
11 I know that Goossens was available to the public in
12 early 2002, and my -- my understanding is that if
13 something was available that far in advance of October
14 7, 2003, that that would make it prior art. That's my
15 understanding.

16 **Q. But you'd agree you're not qualified to offer a**
17 **legal opinion on whether any of these references are**
18 **prior art, right?**

19 A. I'm not an attorney, if that's what you're
20 asking, no.

21 **Q. And you testified that Goossens2002 was**
22 **published in 2002 -- 2002, right?**

23 A. Yeah, at the -- the -- the DAT -- the DATE
24 conference in Europe, yes, in early 2002.

25 **Q. How do you know that Goossens2002 was published**

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1 **in 2002 at the DATE conference?**

2 A. Sorry. Can you please repeat the question?

3 **Q. Sure. You testified a few moments ago that**
4 **Goossens2002 was published in 2002 at the DATE**
5 **conference. Do you recall that?**

6 A. Was that the question? I mean, I recall
7 discussing that it was published in early 2002. That's
8 according to the conference proceedings and IEEE Digital
9 Library. And I actually have -- Professor De Micheli,
10 who taught me my first VLSI course at Stanford, was the
11 session chair of the -- the session at the conference
12 where the paper was presented. And he's -- one of his
13 papers was also presented in the same session. He also
14 has written papers on networks on chip.

15 **Q. Okay. So your understanding is based on**
16 **materials you reviewed in the course of preparing your**
17 **declaration, right?**

18 A. Yes.

19 **Q. Have you done anything as of today to**
20 **independently verify any of that information?**

21 A. I'm not sure what you mean by that. I
22 independently -- I verified it as I wrote my
23 declaration. The -- I went on to the conference --
24 it's -- it's in the conference proceedings. It's in the
25 official proceedings. Like I said, I -- I know the

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1 professor who was the session chair at the conference.
2 It is a major design automation conference, which design
3 automation is the -- the term for basically integrated
4 circuit design. That -- the DATE conference is the
5 major design automation conference that's held in
6 Europe. Another one is DAC, the Design -- Design
7 Automation Conference, which is in the U.S. So these
8 things are always handed out during -- to the
9 participants who go to the conference. And that's also
10 how it appears on, like, IEEE Explorer, for example.

11 MR. CHRISTOPHER: Move to strike as
12 nonresponsive.

13 **Q. My question was simply, in the course of**
14 **preparing your declaration, did you personally do any**
15 **investigation to verify the date discussed in your**
16 **declaration for Goossens2002?**

17 A. Yes.

18 **Q. Okay. What did you do to independently verify**
19 **the date discussed in your declaration?**

20 A. I looked at the official conference proceedings
21 and saw that it appeared in the conference, and it is
22 also available on IEEE digital libraries like Xplore.
23 Also, like I said, I have a friend who was the session
24 chair of the conference, and having attended those types
25 of conferences, conferences that are sponsored by ACM

Page 125 1 and IEEE, they make their proceedings available to the 2 participants when you attend the conference, and then 3 they get mailed out to all the people who belong to the 4 special interest group, in this case SIGDA -- SIGDA, 5 which is Special Interest Group on Design Automation. 6 All of the members of that special interest group would 7 be mailed physical copies of the proceedings in the 8 weeks following the actual conference. So I think those 9 are the things that I did. 10 MR. CHRISTOPHER: Move to strike as 11 nonresponsive. 12 Q. I didn't ask about how the conferences operate. 13 I asked what you did. 14 Did you talk to this friend about the 15 Goossens2002 paper in the course of preparing your 16 declaration? 17 A. I did not call Professor De Micheli to ask 18 specifically about this. I know that his paper also 19 appeared in the same session, and I've been a session 20 chair for conferences like this myself, so I know how 21 they work. 22 Q. All right. Let's open up a copy of 23 Goossens2002, Exhibit 1005, which you should find in the 24 Zoom chat. 25 Let me know when you have that open.	Page 127 1 information to travel in one direction, correct? 2 A. Yes, simplex is a one-directional channel. 3 Yes, that's right. 4 Q. All right. So a connection to send information 5 in two directions would need at least two simplex 6 channels, right? 7 MR. KOHLHEPP: Object to form. 8 BY MR. CHRISTOPHER: 9 Q. Let me withdraw and reask that a little bit 10 better. 11 For a connection to be able to send information 12 in two directions, assuming that it only has simplex 13 channels, the connection would need at least two simplex 14 channels, correct? 15 MR. KOHLHEPP: Object to form. 16 THE WITNESS: Well, you're using the word 17 "connection" there, and "connection" is used in 18 different ways. So sometimes we talk about connection 19 properties, but if you wanted to establish a connection 20 or communication in two directions and each channel that 21 you're using only is simplex, then you would have 22 multiple simplex channels to communicate in both 23 directions, presumably. 24 BY MR. CHRISTOPHER: 25 Q. Are you familiar with the term "duplex"?
Page 126 1 A. Okay. It's open now. 2 Q. Let's start on page 3. I'm going to ask you 3 about the paragraph under -- do you see, on the 4 left-hand side, "4. The AEthereal Network-on-Silicon," 5 roughly halfway down? 6 A. Yes, I see that. 7 Q. All right. And the second paragraph starts 8 with "We use." Do you see that? 9 A. Yes. 10 Q. All right. Second sentence reads, "A channel 11 implements a simplex point-to-point communication 12 between two network interfaces (possibly with multiple 13 paths)." Do you see that? 14 A. I see that. 15 Q. All right. Earlier today we talked about 16 virtual and physical channels. Do you recall that? 17 A. Yes. 18 Q. All right. The channel that's being described 19 here on page 3 of Goossens, is that a virtual channel or 20 a physical channel? 21 A. This would be a virtual channel. 22 Q. Okay. Goossens2002 states that the channel is 23 a simplex channel, correct? 24 A. Yes, it says that. 25 Q. Simplex means that the channel only allows	Page 128 1 A. Yes. It's often used in the terms of half 2 duplex and full duplex, where half duplex means usually 3 one way and full duplex means you can communicate in 4 both directions. 5 Q. Is it correct that half duplex would 6 communicate in one direction at one point in time, and 7 then it could communicate in a different direction at a 8 different point in time? 9 MR. KOHLHEPP: Object to form, scope. 10 THE WITNESS: Can you repeat the question, 11 please? 12 BY MR. CHRISTOPHER: 13 Q. Sure. Well, let's start with full duplex. 14 Full duplex, the channel could send information in both 15 directions simultaneously, correct? 16 MR. KOHLHEPP: Same objection. 17 THE WITNESS: So I don't recall discussing this 18 issue in my declaration. Is this -- is there part of my 19 declaration that we're talking about now? 20 BY MR. CHRISTOPHER: 21 Q. No, I'm asking you as a person of ordinary 22 skill in the art and as an expert, in full duplex the 23 channel sends information in both directions 24 simultaneously, right? 25 MR. KOHLHEPP: Same objection: form, scope.

Page 129 1 THE WITNESS: Well, I mean, I'm happy to answer 2 questions related to my expert report, but I don't see 3 how -- I didn't discuss this in my -- in my declaration, 4 and I'm not sure how this is relevant to it, to be 5 honest. 6 BY MR. CHRISTOPHER: 7 Q. Can you answer the question? 8 A. Well, it sounds like you're asking me to define 9 terms that are outside the scope of the '449 patent. So 10 I -- I was not asked to give an opinion on the meaning 11 of "full duplex," and so I'm not prepared to do that as 12 I sit here. 13 Q. So you're refusing to -- withdraw that. 14 You're declining to testify as to what a person 15 of ordinary skill in the art would understand "full 16 duplex" to entail? 17 A. Well, I'm not here to provide opinions on claim 18 construction. As I said, I was -- I applied claim 19 construction terms that I was given in my declaration. 20 I was not asked to provide any opinions upon correct 21 claim construction in my declaration. As you're 22 phrasing your question, you're asking me to provide an 23 opinion on claim construction for a term that I think 24 does not appear anywhere in my report. 25 Q. Okay. "Full duplex" is not a claim term,	Page 131 1 report at this point. I didn't bring a computer 2 dictionary with me or -- to kind of answer these types 3 of questions. I'm happy to discuss things that are 4 related to my report and the '449 claims. 5 Q. So the way this works is, in a deposition I ask 6 questions, and if you can answer you have to answer. If 7 you can't answer, that's okay. You could tell me that. 8 But you have to answer the question. 9 Can you define for me how half duplex is 10 different than simplex? 11 A. I believe that they are essentially synonyms. 12 I'm not aware of a concrete difference between them. 13 Q. Okay. Let's go to your declaration, paragraph 14 128. 15 Let me know when you're there. 16 A. I am there. 17 Q. Okay. In the second sentence, you wrote, "For 18 example, Goossens2002 describes that its IPs (i.e., 19 processing modules) 'can set up and remove 20 connections.'" Do you see that? 21 A. Yes. 22 Q. So in Goossens2002, the IPs make a service 23 request that includes information regarding the 24 connection, correct? 25 A. Yes.
Page 130 1 right? 2 A. I don't think it's a claim term in the '449 3 patent. 4 Q. Okay. And when I asked you about "duplex," you 5 used the word "full duplex." Do you recall that? 6 A. Well, "duplex" also is not a claim term, as I 7 recall. 8 Q. That's not my question. My question is, when I 9 asked you if you were familiar with the term "duplex," 10 in your answer you used the word "full duplex." Do you 11 recall that? 12 A. Yes, I recall that. 13 Q. All right. So I'm going to give you one more 14 opportunity to tell me. What would a person of ordinary 15 skill in the art understand "full duplex" to mean? 16 A. Well, as I said earlier, full duplex is a type 17 of communication that is -- that -- between, say, node A 18 and node B. With full duplex, you can communicate in 19 both directions. It supports communication in both 20 directions, whereas half duplex is communicating in just 21 one direction. 22 Q. If half duplex is only communicating in one 23 direction, how is half duplex any different than 24 simplex? 25 A. I think we've wandered beyond the scope of my	Page 132 1 Q. And then on paragraph 29 -- 129, excuse me, the 2 very last sentence -- it bridges from the bottom of page 3 71 on to the top of page 72 -- you wrote, "In my 4 opinion, a POSITA would have understood from these 5 disclosures that the requests described by Goossens2002 6 and Drake include desired connection properties." Do 7 you see that? 8 A. Yes. 9 Q. So the request in Goossens2002 that comes from 10 the IP block would include desired connection 11 properties, correct? 12 A. Yes. 13 Q. And Goossens2002 describes something called a 14 quality-of-service manager, correct? 15 A. I believe so. I'm just trying to look to see 16 whether it uses exactly those terms. But I believe so, 17 yes. 18 Q. And you've offered an opinion that 19 Goossens2002's quality-of-service manager corresponds to 20 the claimed resource manager in the '449 patent, 21 correct? 22 A. Yes, that's correct. 23 Q. Okay. Goossens2002 describes IP blocks, right? 24 A. Yes. 25 Q. All right. And those IP blocks correspond to

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1 the first and second module, for example, in claim 10 of
2 the '449 patent, right?

3 A. Yes, that's right.

4 Q. And Goossens2002 also explains that there's an
5 interconnect that connects the IP blocks on the chip,
6 right?

7 A. Yes.

8 Q. Okay. Goossens2002 does not state where the
9 quality-of-service manager would be located, correct?

10 A. Yes, I believe that that's correct.

11 Q. Where would one of ordinary skill in the art
12 understand the quality-of-service manager described in
13 Goossens2002 to be located?

14 A. Well, there are a few different design options.
15 It could be distributed or centralized. It could be in
16 the network interface, or it could be somewhere in the
17 interconnect itself.

18 Q. Are there any other design options that a
19 POSITA would envision?

20 A. Those are the ones that come to mind.

21 Q. Would a POSITA understand that the
22 quality-of-service manager in Goossens2002 could be
23 implemented in one of the IP blocks?

24 A. Well, assuming that we're -- by "IP block"
25 we're referring to one of the original IP blocks that

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1 wants to initiate communication, then it would not be
2 inside that IP block.

3 The one thing that I would say is that "IP
4 block" is a somewhat generic term, so if we meant
5 something broader than that to just mean a piece of
6 hardware on the chip, then it would get a little bit
7 more complicated. But sticking with the assumption that
8 an IP block is a compute element that wants to
9 commute -- communicate with something else on the chip,
10 then, yes, that's correct, that it would not be inside
11 that.

12 Q. In your declaration, you have not opined that
13 Goossens2002 discloses the communication manager claimed
14 in the '449 patent, correct?

15 A. My opinions are based on a combination of -- of
16 Goossens2002 and Drake, and my opinions are based on
17 that -- on that -- in that combination where there's an
18 obvious -- or there's a clear communication manager in
19 Drake, the teachings of Drake, when applied to
20 Goossens2002.

21 Q. Understood. Goossens2002, standing alone, does
22 not disclose the claimed resource manager, correct?

23 MR. KOHLHEPP: Object to form.

24 THE WITNESS: I thought in the previous
25 question you were asking about resource manager. And

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1 the current question is about communication manager; is
2 that correct?

3 BY MR. CHRISTOPHER:

4 Q. I'll reask it so the record is clear.

5 Goossens2002, standing alone, does not disclose
6 a communication manager as claimed in the '449 patent,
7 correct?

8 MR. KOHLHEPP: Object to form, scope.

9 THE WITNESS: I did not give an opinion on
10 anticipation of -- of Goossens2002 on its own with
11 respect to the communication manager. My -- my analysis
12 is just based on a combination of Goossens2002 and
13 Drake. So I did not form an opinion on the question you
14 just posed.

15 BY MR. CHRISTOPHER:

16 Q. So you have no opinion, sitting here today, as
17 to whether Goossens2002 discloses a communication
18 manager, correct?

19 A. That's correct.

20 MR. CHRISTOPHER: We've been going about an
21 hour, and this might be a good stopping point if you all
22 want to take a short break.

23 (Recess taken.)

24 MR. CHRISTOPHER: All right. Let's go back on
25 the record.

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1 Q. All right. Welcome back, Dr. Mowry. Did you
2 discuss your testimony with anyone during our break?

3 A. No.

4 Q. All right. My colleague, sitting across from
5 me, is about to put a copy of Exhibit 1006 into the Zoom
6 chat. Let me know when you have that downloaded and
7 open.

8 And he's giving me a look because I didn't tell
9 him to do it during the break.

10 A. Okay. I have it.

11 Q. Great. All right. Do you recognize Exhibit
12 1006 as a copy of the Drake reference discussed in your
13 declaration?

14 A. Yes.

15 Q. All right. I want to start on the first page,
16 so you don't have to flip anywhere, with the abstract.
17 In the first sentence, Drake states, "A management
18 system for local area networks ensures selected levels
19 of quality of service to all transmission requests
20 submitted to the management system." Do you see that?

21 A. I see that.

22 Q. All right. Drake relates to a management
23 system for local area networks, correct?

24 MR. KOHLHEPP: Object to form.

25 THE WITNESS: Well, it -- the abstract mentions

Page 137 1 local area networks, but the teachings of Drake are 2 applicable to a broad set of networks, including 3 networks on chip. 4 BY MR. CHRISTOPHER: 5 Q. Okay. But Drake, according to the abstract, is 6 directed to "a management system for local area 7 networks." It literally says that, right? 8 A. The abstract mentions local area networks. But 9 as I said, it would also be -- the teaching from this 10 are also applicable to networks on chip. 11 Q. Well, sticking with the abstract, abstract 12 doesn't mention any other type of network other than a 13 local area network. Would you agree with that? 14 A. Well, in the rest of the abstract, it just 15 refers to "the network." It's not specific about that. 16 And in -- in this time frame, the level of integration 17 within VLSI chips had not reached the point where we had 18 systems on chip or networks on chip. But the -- the 19 concepts here apply in that case also. The teachings 20 are relevant to a network on chip. 21 Q. My question was just simply whether any other 22 type of network is mentioned in the abstract. And it 23 sounds like the answer to that question is no, correct? 24 MR. KOHLHEPP: Object to form. 25 THE WITNESS: It mentions "local area networks"	Page 139 1 nonresponsive. 2 Q. My question was simply, Drake's local area 3 network is an example of an off-chip network; yes or no? 4 MR. KOHLHEPP: Object to form. 5 THE WITNESS: Well, as I just said, in 1995 6 on-chip networks did not exist yet, because VLSI 7 technology had not yet progressed to the point where we 8 could integrate entire systems on a chip. So the local 9 area network -- local area networks in 1995 were, 10 indeed, examples of off-chip interconnects or networks. 11 But the teachings of Drake are relevant to a broad set 12 of networks, anything where quality of service is a 13 concern, and that would include networks on chip. 14 MR. CHRISTOPHER: Okay. Again, move to strike 15 as nonresponsive. 16 Q. My last question was a yes-or-no question. Do 17 you understand that? 18 A. And I was providing the context to understand 19 my answer. 20 Q. Okay. But you didn't say yes or no, did you? 21 A. I believe I answered your question. 22 Q. Okay. Well, the Board can read the transcript, 23 and we'll see if they agree. 24 Let's go to column 2, line 65. 25 A. Okay.
Page 138 1 once, but after that it just refers to "the network" 2 generically, and the techniques here would be relevant 3 to a variety of networks, including network on chip. 4 BY MR. CHRISTOPHER: 5 Q. Second sentence in the abstract reads, "This 6 management system is attached to the network." You see 7 that? 8 A. Yes. 9 Q. Drake's management system is described as being 10 "attached" to the network here in the abstract, right? 11 A. It uses that word there in the abstract, yes. 12 Q. Great. And you recall earlier today we were 13 talking about the background of the '449 patent. We 14 discussed on-chip and off-chip networks. Do you recall 15 that? 16 A. Yes. 17 Q. Drake's local area network would be an example 18 of an off-chip network, correct? 19 A. Well, in 1995 we did not yet have, as I said, 20 enough capacity within VLSI chips to have a system 21 completely on a chip or a network completely on a chip. 22 So this technology predates that possibility. But the 23 concepts here -- the teachings of Drake apply equally 24 well to a network on chip. 25 MR. CHRISTOPHER: Move to strike as	Page 140 1 Q. All right. Line 65, it reads, "In accordance 2 with another feature of the present invention, the 3 quality of service management of a local area network is 4 almost entirely concentrated in a single QoS management 5 station on the LAN, thereby significantly reducing the 6 complexity of introducing QoS management into existing 7 LAN networks." You see that? 8 A. I see that, yes. 9 Q. So here, Drake is saying that the quality of 10 service management is performed by a single station that 11 is connected to the LAN, correct? 12 A. They're discussing a centralized approach to 13 implementing the quality-of-service management, yes. 14 Q. Okay. And Drake explains here that performing 15 quality-of-service management in the network itself is 16 complex, correct? 17 A. Well, I believe all that they're saying here is 18 that by encapsulating everything into one centralized 19 component, then you don't need to change other -- you 20 don't need to make substantial changes throughout 21 existing components. 22 Q. And the implication of encapsulating everything 23 into one centralized component is that doing so is 24 less -- less complex, correct? 25 A. Well, yes, that's what it's saying here. And

Page 141 1 the reason for that is, back when -- in this time frame, 2 if you needed to introduce more pieces of hardware, like 3 because this new QoS management art was something else 4 that would attach as a -- as an endpoint on the 5 interconnect, then you would only need to buy or design 6 one new thing, as opposed to having to go redesign other 7 parts of your network interfaces. 8 Q. All right. Let's go to figure 1 of Drake. 9 A. Okay. 10 Q. All right. And we're going to go through a 11 similar exercise that we went through the '449 patent, 12 get on the same page on what all of these things are. 13 You see in the top left there's a "Source 14 Station," labeled with reference number 10? 15 A. Yes, I see that. 16 Q. All right. And inside the Source Station 10, 17 we have "Application Requesting QoS" 11, "QoS Requestor 18 Manager" 12, "QoS Protocol Machine" 13, "Transport 19 Protocol Stack" 15, and "MAC" 16, correct? 20 A. Uh-huh. Yes. 21 Q. All right. Source Station 10 is a computer, 22 correct? 23 MR. KOHLHEPP: Object to form. 24 THE WITNESS: I believe it's just described as 25 a node. It's -- it's an endpoint on the -- the	Page 143 1 correct? 2 A. Probably. I mean, if you could point me to a 3 specific part of it. But I -- I believe so. They're 4 not -- they're not attempting to modify block 17 5 relative to existing interconnects, so -- I don't know 6 if it literally used those words, but the gist of it is 7 that's correct, definitely. 8 Q. All right. QoS Allocator 20, on the bottom, 9 you see that; figure 1? 10 A. Yes. 11 Q. All right. Is that also a computer? 12 MR. KOHLHEPP: Object to form. 13 THE WITNESS: Well, as I said before for box 14 10, this is a node on -- from the perspective of the 15 interconnect, which is box 17, this is one of the 16 endpoints on the interconnect. So that typically 17 involves, you know, a network interface, among other 18 things. 19 BY MR. CHRISTOPHER: 20 Q. All right. I want to walk through Drake's 21 process for QoS. I'm going to start with column 4, line 22 26. Let me know when you're there. 23 A. I am. I note -- I mean, I don't know if this 24 is an issue. I just noticed that part of the Exhibit 25 1006 has highlighting in it in column 10. I'm not sure
Page 142 1 interconnect. It includes the thing that's trying to 2 communicate, which is box 11, along with the network 3 interface, which is the other components, 12, 13, 15, 4 and 16, within box 10. 5 BY MR. CHRISTOPHER: 6 Q. Would you agree that the Source Station 10 7 would require hardware to perform the functionality 8 described in Drake? 9 A. Well, computers always involve hardware, even 10 regardless of whether it's -- if it's a fully 11 hardware-implemented piece of functionality, then it's 12 just hardware; or if it's software, then it's running on 13 hardware. So, yes, it would include -- it would -- this 14 would involve hardware. 15 Q. All right. And in figure 1, we have a box in 16 the middle, "LAN," labeled with reference number 17. Do 17 you see that? 18 A. Yes. 19 Q. And that is the local area network, correct? 20 A. Yes. 21 Q. And in figure 1, we have the Source Station 10, 22 the QoS Allocator 20, and the Target Station 29. All 23 three of those are attached to the LAN 17, correct? 24 A. Yes, that's correct. 25 Q. Drake characterizes the LAN 17 as prior art,	Page 144 1 if that was intentional or not. 2 Q. It likely was not. 3 Why don't we go off the record for a second. 4 Let's clean that up. And we'll come back to this. 5 A. Okay. 6 (Recess taken.) 7 MR. CHRISTOPHER: All right. Back on the 8 record. 9 Q. All right. Dr. Mowry, before our break, we 10 were about to discuss Drake. And my colleague has 11 introduced a clean version of two thousand -- Exhibit 12 1006 in the Zoom chat. I would ask that you open that 13 up. Let me know when you have it open, starting at 14 column 4, line 26. 15 A. Yes, I have it open. 16 Q. Perfect. All right. Starting at line 26, in 17 column 4, Drake states, "More particularly, station 10 18 is the source of a desired multimedia transmission and 19 comprises an application 11 which requests a QoS 20 connection to the destination or target station 29." 21 You see that? 22 A. Yes, I see that. 23 Q. Okay. And I just want to walk through with you 24 how Drake works. 25 The application 11 in the Source Station 10

Page 145 1 requests a QoS connection to the target station, 2 correct? 3 A. Yes. Well, in particular, when it wants to 4 communicate with 11, box 11, application requesting QoS 5 is trying to communicate with box 26, the application 6 receiving the data stream, which is in with -- which is 7 within the target station. 8 Q. Okay. And then moving down a few lines here in 9 column 4, do you see the sentence that starts with 10 "Together"? 11 A. Yes, around line 34 or so. 12 Q. And there Drake states, "Together, components 13 12 and 13 assemble a request to reserve a QoS connection 14 for a multi-media data stream on that path through the 15 LAN 17 between source station 10 and target station 29." 16 You see that? 17 A. Yes. 18 Q. So components 12 and 13 in the source station 19 assemble a request before that request is sent from the 20 source station into the LAN, correct? 21 MR. KOHLHEPP: Object to form. 22 THE WITNESS: Well, components 12 and 13, the 23 QoS requestor manager and the QoS protocol machine, 24 those things assemble the request. They put together 25 the request to reserve the QoS connection.	Page 147 1 protocol 15 to format a request packet, the packet is 2 launched on LAN 17 through a medium access control," 3 parentheses, "(MAC) entity 16." You see that? 4 A. Yes, I see that. 5 Q. Right. After components 12 and 13 assemble a 6 request, the LAN transport protocol 15 forms a request 7 packet for sending the requests from source station 10 8 to the LAN 17, correct? 9 A. Yes, that's correct. 10 Q. All right. Let's turn now to line 62, column 11 4, of Drake. Let me know when you're there. 12 A. Okay. 13 Q. All right. Starting on line 62, very 14 right-hand side, Drake reads, "The QoS requestor manager 15 12 interacts with application 11 using internal messages 16 as is well known in the art and" uses "QoS protocol 17 machine 13 to format the QoS request." You see that? 18 A. Yes. 19 Q. What would a person of ordinary skill in the 20 art understand those internal messages described in 21 Drake to be? 22 MR. KOHLHEPP: Object to form. 23 THE WITNESS: There's a very broad set of 24 possibilities. This means that in some form the 25 application is communicating the fact that it wants to
Page 146 1 BY MR. CHRISTOPHER: 2 Q. And the request we're talking about is a QoS 3 connection between the source station 10 and the target 4 station 29, correct? 5 A. Well, 10 and 29, the Source Station and the 6 Target Station, those are the nodes on the LAN. Those 7 are the endpoints as far as the LAN interconnect is 8 concerned. But it's actually -- within that, it's box 9 11, Application Requesting QoS, that is communicating -- 10 wants to communicate with box, let's see, 26, 11 Application Receiving Data Stream. 12 Q. All right. So, continuing on in the same 13 paragraph in the specification, you see the sentence 14 that starts with the word "using"? 15 A. Okay. Right. Around line 37? 16 Q. Yeah, thereabout. You see -- 17 A. Okay. 18 Q. All right. Do you see where Drake says, "Using 19 a standard LAN transport protocol 15 to format a request 20 packet...packet is launched on LAN 17 through a 21 medium" -- 22 (Discussion off the record.) 23 MR. CHRISTOPHER: I'll restart. Sorry about 24 that. 25 Q. Drake reads, "Using a standard LAN transport	Page 148 1 establish a new connection, and -- and it -- then 2 somehow there are desired connection properties 3 associated with it. That could be implemented in a very 4 wide set of different possibilities. It could be just 5 through shared memory. It could be through I/O, I mean, 6 mechanisms. There are many possible designs for how 7 that information would be passed between box 11 and box 8 12. 9 BY MR. CHRISTOPHER: 10 Q. All right. Well, sticking with the same 11 passage, according to Drake the QoS requestor manager 12 12 interacts with the QoS protocol machine 13 to format the 13 QoS request before the request is sent from the source 14 station to the LAN 17, correct? 15 A. Sorry. I was trying to follow along in the 16 column with what your -- with your question. Can you 17 please repeat that? I lost track of where -- how the 18 question lined up with the text. 19 Q. Sure. We were looking starting at line 62 to 20 65. And my question was, according to this passage in 21 Drake, the QoS requestor manager 12 will interact with 22 the QoS protocol machine 13 to format the QoS request 23 before the request is sent out from the source station 24 to the LAN 17, correct? 25 A. Yes, that's correct.

Page 149 1 Q. All right. And if we could go back now to 2 figure 1 of Drake. I'll direct your attention to the 3 Source Station 10 box. 4 A. Okay. 5 Q. All right. The Application Requesting QoS 11 6 is software, correct? 7 A. Well, this would be an IP block. This is 8 some -- some piece of hardware, presumably running 9 software, although it could just be an I/O device, that 10 wants to communicate. 11 Q. Is the application 11 -- strike that. 12 Would it be fair to say that Application 13 Requesting QoS 11 is software running on hardware within 14 the Source Station 10? 15 A. Well, box 10, the Application Requesting QoS, 16 there's definitely hardware there. It might be a CPU. 17 It could be an I/O device. It's something that wants 18 to -- it could be a DMA engine. It's something that 19 wants to initiate communication. There would definitely 20 be hardware there. There -- there may or may not be 21 software. Well, there's probably software running on 22 top of the hardware. That would definitely be the case 23 if it was a CPU, for example. 24 Q. What about the QoS Requestor Manager 12? Would 25 one of skill in the art understand QoS Requestor Manager	Page 151 1 Q. All right. So the QoS Requestor Manager 12, 2 that requestor manager is associated with the Source -- 3 the Source Station 10, right? 4 A. Yes. 5 Q. And if the QoS Requestor Manager 12 is 6 associated with the Source Station 10, it has to be 7 inside the Source Station 10, correct? 8 MR. KOHLHEPP: Object to form. 9 THE WITNESS: Well, I don't know whether the 10 Drake patent says that -- I mean, this is an 11 illustration of a -- a design. I don't know that it's 12 saying that it necessarily needs to be only here. 13 It's -- there might be other potential designs. In 14 figure 1, it is showing box 12 inside of box 10. 15 BY MR. CHRISTOPHER: 16 Q. Well, sitting here today, are you aware of 17 whether Drake expressly discloses whether the QoS 18 Requestor Manager 12 can be positioned outside of the 19 Source Station 10? 20 A. I don't recall Drake discussing an alternate 21 design off the top of my head. 22 Q. All right. Let's go back to Drake's 23 specification. Now I'll turn your attention to column 24 4, starting at line 50. Let me know when you're there. 25 A. Okay. I'm there.
Page 150 1 12 to be software running on hardware within Source 2 Station 10? 3 A. Not necessarily. It could be simply hardware. 4 Q. So one of skill in the art would recognize that 5 the Requestor Manager 12 could be hardware? 6 A. It -- it could be. Even if it's software, the 7 software would be running on hardware. 8 Q. All right. And you agree that the QoS 9 Requestor Manager 12 is shown here in figure 1 as being 10 inside the Source Station 10, correct? 11 A. Yes, the -- box 12 is inside box 11 in 12 figure 1. 13 Q. And Drake never discloses that the QoS 14 Requestor Manager 12 could be positioned outside of the 15 Source Station 10, correct? 16 A. Well, there's a distributed design here. 17 Each -- each node that can initiate communication would 18 presumably have a QoS requestor manager. When you're 19 trying to initiate communication with a 20 quality-of-service requirement, the initiator of it 21 would need to have a quality-of-service requestor 22 manager. 23 Q. All right. Well, there's also a QoS Requestor 24 Manager 23 within the QoS Allocator box 20, right? 25 A. Yes. I see that, yes.	Page 152 1 Q. All right. Starting at line 50, there's a 2 sentence that reads -- I'll try to go slow -- "The 3 overall function of allocator 20 is to receive the QoS 4 request from station 10, examine the resources of LAN 5 17, and determine if a path exists in LAN 17 between 6 station 10 and station 29 which satisfies the requested 7 level of QoS." Do you see that? 8 A. Yes, I see that. 9 Q. All right. Drake discloses that the request 10 sent from the Source Station 10 is received by the QoS 11 Allocator 20, right? 12 A. Yes. 13 Q. Then the QoS Allocator 20 determines whether 14 the requested level of QoS is available, right? 15 A. Yes, based on the availability of resources in 16 the LAN, which is box 17. Yes, that's correct. 17 Q. And then let's go now to column 8, starting at 18 line 20. Let me know when you're there. 19 A. Okay. I'm there. 20 Q. All right. Starting at line 20, Drake's 21 specification reads, "Before proceeding to a description 22 of the flowcharts of Figs. 4 through 11, the contents of 23 the various messages exchanged between...stations of the 24 local area network of Fig. 1 necessary to implement 25 quality of service multimedia path management will be

Page 153 1 discussed." Do you see that? 2 A. Yes. 3 Q. All right. And then the next sentence reads, 4 "These messages include: the QoS allocation allocation 5 request, QoS allocation reply." Do you see that? 6 A. Yes. 7 Q. All right. And -- and we just talked about, a 8 moment ago, how the QoS Allocator 20 determines whether 9 the requested level of QoS is available, right? 10 A. Yes. 11 Q. After determining whether the requested level 12 of QoS is available, the QoS Allocator 20 will send a 13 message to the Source Station 10, right? 14 A. That's correct. 15 Q. And one example of a message sent by the QoS 16 Allocator 20 to the Source Station 10 is a QoS 17 allocation reply, correct? 18 A. Yes. 19 Q. All right. Let's go to column 10, line 18 of 20 Drake. Let me know when you're there. 21 A. Okay. I'm there. 22 Q. All right. Here Drake states, "Starting in 23 Fig. 4 at...box 60, box 61 is entered where a source, 24 such as source station 10 of Fig. 1, formats," 25 parentheses, "(in QoS protocol machine 13) a request to	Page 155 1 identification of the data source station to be 2 registered in QoS allocator 20 prior-to the actual 3 transmission of the data." You see that? 4 A. Yes. 5 Q. And so Drake is describing here a process by 6 which the Source Station preregisters with the QoS 7 Allocator 20 prior to the actual transmission of data 8 between the Source Station 10 and the Target Station 29, 9 right? 10 MR. KOHLHEPP: Object to form. 11 THE WITNESS: Well, what it's describing here 12 is establishing a connection with the desired connection 13 properties. 14 BY MR. CHRISTOPHER: 15 Q. So in the prior sentence, Drake states -- well, 16 Drake explains that the source station 10 formats a 17 request to be registered in the QoS allocator 20. You 18 see that? 19 A. Yes. 20 Q. And then in the next sentence, Drake calls that 21 "pre-registration," right? 22 A. Yes. 23 Q. And that preregistration process happens before 24 there's a transmission of data between the Source 25 Station 10 and the Target Station 29, right?
Page 154 1 be registered in QoS allocator station 20 for the 2 transmission of a multimedia file supplied by 3 application 11." You see that? 4 A. Yes. 5 Q. So Drake states that the QoS Protocol Machine 6 13 in the Source Station 10 formats the request for the 7 QoS connection, correct? 8 A. Yes. 9 Q. The request for the QoS connection is different 10 than the actual request that is sent to the target 11 station, correct? 12 MR. KOHLHEPP: Object to form. 13 THE WITNESS: Well, the allocation request, the 14 contents of which are described in column 8, could very 15 well be a completely separate message, although it would 16 be possible to bundle the -- together this. It's not -- 17 not impossible that this would be combined into what 18 would appear to be a single request. But the connection 19 would have to be established first before the actual 20 message would be sent. A natural design would be for 21 these to be separate messages, though. 22 BY MR. CHRISTOPHER: 23 Q. In -- in the next sentence in Drake, starting, 24 it looks like, at line 23, it reads, "Such 25 pre-registration is important in that it allows the	Page 156 1 A. I believe it's described that way in the 2 specification, yes. 3 Q. All right. Let's go to column 10, line 33. 4 Excuse me, line 35. 5 A. Okay. 6 Q. So in the first sentence, Drake states, "At 7 some later time, in box 66, the target station 29 8 (Fig. 1) requests a list of the multimedia data files 9 available from source station 10." You see that? 10 A. I see that. 11 Q. All right. So before Drake would allocate any 12 quality of service, the target station requests a list 13 of files that it could receive from the source station, 14 right? 15 MR. KOHLHEPP: Object to form. 16 THE WITNESS: Well, I think that this is simply 17 describing one scenario, where someone is pulling a set 18 of multimedia files. I don't think this is describing 19 how things necessarily work. I mean, this is one use 20 case that would involve quality of service. So if you 21 want to -- yeah, if you want to pull a set of media 22 files, you would want to know what the options are. 23 BY MR. CHRISTOPHER: 24 Q. I think that alluded to my next question, which 25 is, the source station wouldn't know what level of

Page 157 1 quality of service to request without knowing what data 2 file the target station is requesting, right? 3 MR. KOHLHEPP: Object to form. 4 THE WITNESS: Not necessarily. 5 BY MR. CHRISTOPHER: 6 Q. How could the source station know what quality 7 of service to request if it doesn't know what multimedia 8 file the target station is requesting? 9 A. Well, if the source station was sourcing video, 10 it could realize that for video to have a sufficient 11 quality, then it would want a certain level of quality 12 of service in the interconnect, in which case it would, 13 in that case, potentially always request the same level 14 of quality of service. 15 I mean, these quality-of-service messages are 16 mixed together with ones that don't require quality of 17 service. Not everything requires it. But if this -- if 18 everything was the same type of multimedia file, they 19 could potentially always want the same quality of 20 service. They could also be different. But that might 21 be based on the -- the type of media file. For example, 22 depending on the compression ratio, how -- how 23 aggressively compressed the file is, you -- it could 24 calculate how much bandwidth it needs per unit time, for 25 example.	Page 159 1 (Recess taken.) 2 MR. CHRISTOPHER: All right. Back on the 3 record. Welcome back. 4 Q. Dr. Mowry, did you discuss your testimony with 5 anyone during our break? 6 A. No. 7 Q. All right. So before the break, we were 8 talking about Drake. And I'll turn your attention back 9 to column 10 at Drake, at line 39. Let me know when 10 you're there. 11 A. Okay. Yes. 12 Q. All right. Starting at line 39, "In box 69, 13 the user at target station 29 selects a multimedia file 14 to be transmitted and transmits this selection back to 15 the source station 10." Do you see that? 16 A. Yes. 17 Q. All right. So Drake teaches that a user at the 18 target station selects which file is going to be 19 transmitted by the source station to the target station, 20 correct? 21 MR. KOHLHEPP: Object to form. 22 THE WITNESS: Well, as I said, this is one 23 illustrating example of why there might be a 24 quality-of-service-based transfer between a source and a 25 target. And in this example that they're illustrating,
Page 158 1 Q. Well, wouldn't the source station need to know 2 that the target station might request a video to be able 3 to allocate quality of service for a video? 4 A. Sorry. So this -- this scenario on line 35, 5 where it's discussing one possibility, this is just one 6 way to illustrate that one -- one way that this could be 7 used is that you're pulling video. You could also be 8 proactively pushing things. So, for example, if box 11 9 was, say, a camera and the idea is just to stream input 10 data to storage somewhere, then you -- it wouldn't be a 11 pull -- pull-based request, P-U-L-L. It would be 12 push-based. So you wouldn't need to have a target 13 station communicate first to figure that out. 14 But as I said, in this specific scenario, where 15 you're downloading -- or you're pulling across a 16 multimedia file based on a request, it may be that it 17 needs to know which specific file, possibly. That's one 18 possibility. But it may also be that if it realizes 19 that you'll always need that same quality of service 20 level for these types of file that it stores, then it 21 may know it without -- just it may know that, realize it 22 ahead of time. 23 MR. CHRISTOPHER: All right. We've been going 24 close to an hour. If you guys don't mind, I'd like to 25 take a short break. Can we go off the record?	Page 160 1 the media file is being -- it's -- it's downloading a 2 media file that the user is selecting. So, yes, in that 3 section that we just read, the user is selecting it in 4 this case, although in general, as I mentioned, there 5 can also be push-based scenarios also, such as a camera 6 that's just capturing video. 7 BY MR. CHRISTOPHER: 8 Q. Well, this example that we're talking about in 9 Drake is a pull scenario, as you've put it, correct? 10 A. That's what's being described here in line 39 11 of column 10, yes. 12 Q. And Drake does not expressly disclose the push 13 scenario you referred to, correct? 14 MR. KOHLHEPP: Object to form. 15 THE WITNESS: Well, for example, in the 16 Background of the Invention, it's discussing multimedia 17 and situations where the quality of service is needed. 18 More broadly, it talks about generating multimedia 19 content. It's not simply saying that this is limited to 20 this illustrative scenario where you're pulling a -- a 21 file across. So I think that it does explicitly mention 22 that -- that given the breadth of these situations, a 23 person of ordinary skill in the art would realize 24 that -- that there could either be push-based or 25 pull-based scenarios for this type of communication.

Page 161 1 I think that they're showing the pull-based 2 case because it's just a little more complicated than 3 the push-based case. The push-based case is essentially 4 a subset of this. You don't have to first have the user 5 select something. You can just go ahead and start 6 transferring it. 7 BY MR. CHRISTOPHER: 8 Q. Would you agree that all of the embodiments 9 disclosed in Drake are the pull scenario? 10 MR. KOHLHEPP: Object to form. 11 THE WITNESS: No, I disagree with that. Drake 12 is describing a general mechanism for managing quality 13 of service. There's -- the only -- like I said, I think 14 that they probably -- I'm guessing. They probably chose 15 the case where you're pulling data just because it adds 16 some additional steps into figure 4. But everything 17 that's described, for example figures 5, I mean, through 18 11, everything else here, is just equally applicable to 19 the push-based case. There's nothing here that limits 20 it to the pull-based case. That's a more complicated 21 case. So they're just showing that it can handle push 22 and pull by showing the more complicated case. 23 BY MR. CHRISTOPHER: 24 Q. Show me where Drake expressly discloses the 25 push scenario you've been describing. Where is it?	Page 163 1 conferencing and Client/Client collaborative work." In 2 those cases you are just pushing video streams or other 3 multimedia streams like audio and video. So those -- 4 those are -- it's -- only the first of these is the 5 pull-based case in figure 4. It is explicitly 6 discussing push-based cases also. And, in addition, 7 the -- as I said, the push-based case is just a subset 8 of figure 4. You simply don't have to have the 9 additional step of having the user request the list of 10 files. You can just skip over that part. 11 BY MR. CHRISTOPHER: 12 Q. All right. So focusing on what you just 13 directed me to in the background, starting around line 14 32, is it your testimony that the client/client video 15 conferencing example would only be a push scenario? 16 MR. KOHLHEPP: Object to form. 17 THE WITNESS: Well, I didn't say only push, 18 because in a client/client video conference you might 19 also -- I mean, often you push things, like you're 20 probably just pushing the video and the audio, but you 21 might also share files, similar to how we've been 22 sharing files in the chat. If you download something 23 that's been shared with you in a chat screen, then when 24 you click on it, you are downloading that. That could 25 be part of client/client video conferencing. But
Page 162 1 A. Well, in the first paragraph of the Background 2 of the Invention, it says -- starting in line -- column 3 1, line, say, 17, it says, "In many multimedia 4 applications, information is generated or stored at 5 devices that are remote." Okay. So if something is 6 generated at a device, that's the push-based scenario. 7 That's where you have, for example, a camera that is 8 streaming data. It's -- it's the same scenario, except 9 that you -- you just have the camera pushing the data 10 across the connection. It's not looking up a media 11 file. So it's talking about -- generically about a 12 number of different media applications here. Those 13 would definitely include push-based cases. 14 Q. I understand that that's your interpretation. 15 But it doesn't explicitly describe the push-based 16 scenario anywhere here in the Background of the 17 Invention section, does it? 18 MR. KOHLHEPP: Object to form. 19 THE WITNESS: Well, at the end of that 20 paragraph, it also mentions -- for example, it says, 21 "Examples of multimedia" applications "that put an 22 emphasis on the network are Client/Server playback." 23 So that's the first of three things. That 24 would be pulling video, as shown in figure 4. But it 25 then says -- goes on to talk about "Client/Client video	Page 164 1 sending the video is push-based, so it could be a 2 combination of both things. The -- the Drake patent can 3 cover -- handle both push and pull scenarios. 4 BY MR. CHRISTOPHER: 5 Q. So would you agree that the client/client video 6 conferencing example described here could be push or 7 pull? 8 A. I think the most likely scenario is that it's 9 push-based, and it might be augmented with some 10 additional pull-based things, like -- as I said, sending 11 the audio and video, that would be push-based. The 12 things that I mentioned -- when you asked if it was only 13 push-based, I mentioned that in addition to pushing the 14 audio and video for the conversation, you could, in -- 15 in addition to that, also share files within the same 16 application, and that might be more like a pull-based. 17 So it could be both at the same time. But the -- the 18 natural thing that comes to mind is that it would be -- 19 have this push-based component, which would be the audio 20 and video of the conversation. 21 Q. Does -- this discussion we've been having about 22 push versus pull, that's not anywhere in your 23 declaration, is it? 24 A. I don't recall discussing this specific issue 25 in the declaration.

Page 165 1 Q. Okay. Let's turn now to column 11, line 22. 2 A. Okay. 3 Q. Let's start with the beginning of the 4 paragraph. It reads, "Box 96 is then entered to send an 5 allocation acceptance message to the source of the 6 multimedia file. In box 97 this acceptance is received 7 at the source station 10 and, in decision box 98, it is 8 determined whether this message is an acceptance message 9 or a denial message." You see that? 10 A. Yes. 11 Q. Based on this teaching in Drake, if the 12 allocator determines that sufficient QoS exists for the 13 request, it will send an allocation acceptance, correct? 14 MR. KOHLHEPP: Object to form. 15 THE WITNESS: Can you repeat the question, 16 please? 17 BY MR. CHRISTOPHER: 18 Q. Sure. If the allocator determines that 19 sufficient QoS exists for the request, it will send an 20 allocation acceptance to the source station 10, correct? 21 MR. KOHLHEPP: Object to form. 22 THE WITNESS: You said "allocator." Do you 23 mean QoS allocator? Are you -- is that what you're 24 referring to? 25 BY MR. CHRISTOPHER:	Page 167 1 MR. KOHLHEPP: Object to form. 2 THE WITNESS: Well, Source -- as we discussed 3 before, Source Station 10 is the node in the -- from the 4 perspective of the LAN, box 17, box 10, the Source 5 Station, that's the endpoint on the interconnect. But 6 when this -- so, yes, the -- while it's true that the -- 7 what's it called? -- the -- the allocation acceptance 8 message, it does go to the source -- it goes -- from the 9 LAN's perspective, it's routing it to box 10, but it 10 actually gets sent back all the way to the QoS Requestor 11 Manager, box 12. That's actually where it goes. 12 BY MR. CHRISTOPHER: 13 Q. Understood. And the QoS Requestor Manager 12 14 would be inside the Source Station, correct? 15 MR. KOHLHEPP: Object to form. 16 THE WITNESS: In figure 1, the drawing has box 17 12 -- sorry, box 12 is shown inside box 10. 18 BY MR. CHRISTOPHER: 19 Q. All right. And if you can go back to column 11 20 of Drake, line thirty -- sorry, line 22. 23, actually. 21 Start at line 23. 22 A. Okay. 23 Q. All right. Again, it says, "In box 97 this 24 acceptance is received at the source station 10." See 25 that?
Page 166 1 Q. Yes. 2 A. Well -- 3 Q. Do you -- 4 A. -- in figure 5 -- sorry. Go ahead. 5 Q. Do you need me to reask the question? 6 A. Yes, please. 7 Q. Sure. If the QoS allocator 20 in Drake 8 determines that sufficient level of QoS exists for the 9 request, it will send an allocation acceptance to the 10 source station 10, correct? 11 MR. KOHLHEPP: Object to form. 12 THE WITNESS: Well, in figure 5, there's a 13 flowchart here showing the algorithm for -- this is 14 showing the process of determining whether the -- the 15 desired connection property can be achieved or not, and 16 if -- in box 96, it reaches a point of sending an 17 allocation acceptance message. 18 BY MR. CHRISTOPHER: 19 Q. All right. Let's focus on box 97. Do you see 20 where it says, in figure 5, "Receive Allocation 21 Message"? 22 A. Yes, I see box 97. 23 Q. All right. That allocation message would be 24 received by the Source Station 10, correct? 25 A. Well, it's --	Page 168 1 A. Yes. Uh-huh. 2 Q. It doesn't say that the acceptance is received 3 at the QoS requestor manager 12, correct? 4 A. Well, both things are true, because the QoS 5 requestor manager is inside box 10, so it does go to -- 6 it does go to the source station in order to get back to 7 the requestor manager. But simply delivering it to the 8 boundary of box 10 is essentially the same as dropping 9 it on the floor, because if you don't actually process 10 the message, nothing -- nothing interesting happens. 11 And the originator of the message was actually box 12. 12 It was the QoS requestor manager. And that's the thing 13 that gets the response ultimately. So this -- this text 14 is not wrong, in that it does get received at source 15 station 10, because box 12, the QoS requestor manager, 16 is inside box 10. So it goes all the way to box 12. 17 Q. I understand that. But that's not my question. 18 My question is, Drake does not expressly state that the 19 message is received by the QoS requestor manager 12, 20 right? 21 MR. KOHLHEPP: Objection; form. 22 THE WITNESS: Well, I don't know whether it 23 says it anywhere else, but certainly a person of 24 ordinary skill in the art would -- it would be very 25 clear, abundantly clear, that that's where the message

Page 169 1 goes. It doesn't make any sense, as I mentioned before, 2 to just deliver it to -- simply to box 10 and not all 3 the way back to box 12, since the message would just be 4 lost. Nothing would happen with it if you just only 5 delivered it to box 10 and not to box 12. 6 MR. CHRISTOPHER: I'm going to move to strike 7 as nonresponsive. 8 Q. I need you to focus on my question. If your 9 counsel wants to ask follow-up questions about it, he's 10 certainly able to do so. But my -- my specific question 11 for you is, Drake does not expressly disclose that the 12 message is received by the QoS requestor manager 12, 13 right? 14 A. I just answered that question, and I'm happy to 15 answer it again, which is the QoS requestor manager 16 is -- a person of ordinary skill in the art would 17 realize that this is clearly the -- the -- the recipient 18 of this message. It is within -- it is inside -- box 12 19 is inside box 10. But simply delivering the response to 20 box 10 and not to box 12 would make no sense at all, 21 because nothing would happen to the message, and the 22 data transfer would not happen. So, again, for a person 23 of ordinary skill in the art, it's very clear that it 24 gets sent to box 12. 25 MR. CHRISTOPHER: I again move to strike as	Page 171 1 Otherwise, simply delivering it to the boundary of box 2 12 would be nonfunctional. There would -- the message 3 would essentially be dropped on the floor if it stopped 4 at the boundary of box 10. It clearly needs to go to 5 box 12. They mention box 10 because box 10 is the -- is 6 the endpoint on the LAN where the message is sent. But 7 it needs to go back to box 12. So a person of ordinary 8 skill in the art would -- would realize that this was 9 abundantly clear. 10 MR. CHRISTOPHER: I'm going to again move to 11 strike as nonresponsive. 12 Q. Dr. Mowry, do you understand that the Board is 13 going to read the transcript of today's deposition? 14 A. Yes, that's my understanding. 15 Q. Do you think that they will believe you've been 16 forthright in answering my questions here? 17 A. I believe so. 18 Q. Okay. Well, then we'll move on. 19 Let's go back to Drake figure 1. 20 A. Okay. 21 Q. Your opinion in your declaration is that Drake 22 source station 10 corresponds to the claimed first 23 module in the '449 patent, correct? 24 A. Yes, Drake is describing the connections 25 between the quality -- sorry, the quality-of-service
Page 170 1 nonresponsive. 2 Q. I'm asking you about what Drake expressly 3 discloses. Do you know what I mean by "expressly 4 discloses"? 5 A. Yeah. I think I just answered your question 6 taking that into account. 7 Q. So we'll try it again. 8 Drake does not literally say anywhere that the 9 message is received by the requestor manager 12, does 10 it? It's a yes-or-no question. 11 MR. KOHLHEPP: I mean, Counsel, he answered 12 your question. I'm not sure -- 13 MR. CHRISTOPHER: No speaking objections. Let 14 the witness answer. 15 MR. KOHLHEPP: I'm going to object again. Same 16 objection. 17 THE WITNESS: I think I've just answered that 18 several times. So I'm happy to repeat my answer. But I 19 think I've very clearly answered that question. If you 20 would like, I can answer it again. 21 BY MR. CHRISTOPHER: 22 Q. Can you answer the question "yes" or "no"? 23 A. Yes, I just answered the question, which is it 24 does disclose that it goes back to box 12, because 25 that's the only logical place where it can go.	Page 172 1 connection between the source station and the 2 destination station in order to let Application 3 Requesting QoS box 11 communicate with Application 4 Receiving Data Stream box 26. 5 MR. CHRISTOPHER: Let the record show that the 6 witness took over two minutes to answer that question. 7 We're going to keep this deposition open if it continues 8 like this. 9 Q. So to speed this along, let's go to paragraph 10 97 of your declaration. 11 MR. KOHLHEPP: Counsel, you're asking him very 12 broad questions, and you're not directing him to what 13 part of his declaration you're talking about. He has 14 been very patient and polite here. 15 MR. CHRISTOPHER: Speaking objections. 16 MR. KOHLHEPP: I don't -- I don't think your -- 17 your last comment was at all merited in that. We've 18 been polite today, and I think we can remain that way. 19 I'm just not sure why that last comment was made. 20 THE WITNESS: It took me two minutes because I 21 didn't know exactly where in my report I discuss that, 22 and it took me time to locate that. So I apologize that 23 it took that amount of time. 24 If you can point me to where in my report 25 you're referencing, that would help speed things along.

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1 BY MR. CHRISTOPHER:

2 **Q. All right. Let's actually go to paragraph 129.**

3 A. Okay.

4 **Q. Paragraph 129, you wrote, "Similarly, Drake**

5 **describes that an application in a source station (i.e.,**

6 **first module)." Do you see that?**

7 A. Yes.

8 **Q. So in your declaration, you've mapped Drake's**

9 **source station to the first module in the claims,**

10 **correct?**

11 A. Yes.

12 **Q. All right. And you also mapped Drake's target**

13 **station to the claimed second module, correct?**

14 A. Yes.

15 **Q. All right. And when you wrote here in**

16 **paragraph 129 "Drake describes that an application in a**

17 **source station" -- do you see that?**

18 A. Yes.

19 **Q. Does "an application" refer to the application**

20 **11 in figure 1 of Drake?**

21 A. It corresponds to box 11 in figure 1, yes.

22 **Q. Is it your opinion that the entirety of the**

23 **source station 10 corresponds to the claimed first**

24 **module, or is it just the application 11 that**

25 **corresponds to the "first module" in the claims?**

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1 MR. KOHLHEPP: Object to form.

2 THE WITNESS: Sorry. Can you repeat the

3 question one more time?

4 BY MR. CHRISTOPHER:

5 **Q. Yes. Again, you referred here in paragraph 129**

6 **to -- and I quote -- "an application in a source**

7 **station," parentheses, "(i.e., first module." Do you**

8 **see that?**

9 A. Yes.

10 **Q. And my question is, are you saying that the**

11 **application 11 corresponds to the first module or are**

12 **you saying that the entire source station corresponds to**

13 **the first module?**

14 A. Well, I'm saying that the application in a

15 source station -- so the application is box 11. The

16 other parts of -- the other things within box 10 -- that

17 is, boxes 12, 13, 15, and 16 -- these are the network

18 interface. So, for example, in figures 1, 2, and 3,

19 this would be the NI or ANIP.

20 **Q. All right. Why don't about we go back to Drake**

21 **figure 1.**

22 A. Okay.

23 **Q. Can you tell me which of the components in**

24 **figure 1 of Drake correspond to the claimed first**

25 **module?**

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1 A. Well, in this scenario it's box 11, which is

2 inside the source station.

3 **Q. Is there --**

4 A. The --

5 **Q. -- anything else?**

6 **I'm sorry. I didn't realize you weren't**

7 **finished with your answer. Please continue.**

8 A. When the communication occurs, it's -- from the

9 LAN's perspective the communication is between boxes 10

10 and 29. But it is really between box 11 and box 26.

11 But to answer your question, which I -- which

12 is the same answer I said -- gave before, which is it's

13 box 11.

14 **Q. Are there any other components in figure 1 that**

15 **correspond to the "first module" in the claim?**

16 MR. KOHLHEPP: Object to form.

17 THE WITNESS: Like I said, I think the other --

18 the other boxes -- 12, 13, 15, and 16 -- that are shown

19 in the figure are the network interface.

20 BY MR. CHRISTOPHER:

21 **Q. So boxes 12, 13, 15, 16 would not correspond to**

22 **the "first module" in the claims of the '449 patent,**

23 **correct?**

24 MR. KOHLHEPP: Object to form.

25 THE WITNESS: I'll have to go back and spend a

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1 minute looking at the patent claims again for a second.

2 I apologize.

3 Yeah, it's box -- box 11 is the first module.

4 BY MR. CHRISTOPHER:

5 **Q. All right. Let's go to paragraph 93 of your**

6 **declaration. And actually, I'll direct you. It's on**

7 **page 52, the portion I'd like to ask you about. Let me**

8 **know when you're there.**

9 A. Okay. I'm there.

10 **Q. All right. Do you see in paragraph 93 of your**

11 **declaration there's an annotated version of Drake's**

12 **figure 1?**

13 A. Yes, I see that.

14 **Q. All right. Did you create those annotations?**

15 A. Well, I discussed the annotations with the

16 attorneys when we -- and asked them to do that. I did

17 not, like, physically modify the figure myself. Someone

18 else did that for me on my behalf.

19 **Q. Totally understood. So you directed the**

20 **creation of the annotations we see here in paragraph 93;**

21 **is that correct?**

22 A. Yes, that's correct.

23 **Q. And so you have -- here in paragraph 93 the QoS**

24 **Allocator 20 in Drake is highlighted, I'll call it**

25 **purple. Correct?**

Page 177 1 A. Okay. Yes. 2 Q. And you've labeled it "Resource Manager," 3 correct? 4 A. Yes. 5 Q. All right. Now let's turn to paragraph 121 of 6 your declaration, please. And it's actually on the next 7 page, once you get there. Let me know when you're 8 there. 9 A. I'm there. 10 Q. All right. I -- same question. Did you direct 11 the creation of the annotations we see here in figure 1 12 of Drake and paragraph 121 of your declaration? 13 A. Yes. 14 Q. All right. And so here we have -- in the 15 Source Station 10 the QoS Requestor Manager 12 is 16 annotated in red. Do you see that? 17 A. Yes. 18 Q. And you've also written -- caused to be written 19 the words "Communication Manager," and there's an arrow 20 between the words and the QoS Requestor Manager 12, 21 right? 22 A. That's right. 23 Q. And so in your opinion, the QoS Requestor 24 Manager 12 in Drake corresponds to the claimed 25 communication manager, correct?	Page 179 1 Q. But you literally labeled the QoS Requestor 2 Manager 23 as "Communication Manager," right? 3 MR. KOHLHEPP: Object to form. 4 THE WITNESS: Well, I literally labeled box 12 5 as the communication manager, and then what box 23 is 6 supposed to be showing -- again, I could have probably 7 used some more labeling to make this more clear -- is 8 box 23 is the receiving side of the communication. It's 9 receiving the -- the request that comes from box 12. 10 BY MR. CHRISTOPHER: 11 Q. Why would you label the requestor manager 23 12 "Communication Manager" if you're not opining that it's 13 the communication manager in the claims? 14 A. I was -- well, in computer hardware, when 15 you -- when one component communicates with something 16 else, there's both a sending and receiving side of the 17 communication. So I was illustrating how it -- where 18 that communication arrived in the resource manager. But 19 the -- in terms of aligning things with the claims, it's 20 box 12 that's the communication manager. 21 As I said, I could have labeled this more 22 clearly. 23 Q. So if you were to go back and redo these 24 annotations, would you remove the arrow and red 25 highlighting for the QoS Requestor Manager 23? Is that
Page 178 1 A. That's correct. 2 Q. Now, you've also annotated in red here in 3 paragraph 121 the QoS Requestor Manager 23. Do you see 4 that? 5 A. Yes. 6 Q. And you've also labeled the QoS Requestor 7 Manager 23 in red and labeled it "Communication 8 Manager," correct? 9 A. Yes, that's correct. And what that is meant to 10 show is that in the hardware the -- the -- the -- in 11 terms of -- so box 12 is the communication manager, and 12 box 23 is the receiving part of the communication when 13 it's communicating with the resource manager. 14 Q. So is it your testimony that the QoS Requestor 15 Manager 23 is not part of the communication manager? 16 A. Well, in terms of aligning things with the 17 claim language, box 12 is the communication manager. I 18 admit that this figure might be a little confusing with 19 how I had it highlighted, but what I meant to show is 20 the communication manager, box 12, it has -- when it 21 communicates with the resource manager, the receiving 22 end of that communication is the -- is box 23. 23 I perhaps could have been more explicit in how 24 I labeled things. But that's -- that's what I was 25 attempting to show here.	Page 180 1 what you're saying? 2 A. What I would have done, to make it more clear, 3 is that I would have probably used a different color for 4 box 23, and -- and a different label, and to make it 5 clear that this is how -- this is where the 6 communication from the communication manager is received 7 inside of the resource manager. 8 Q. All right. But you didn't do that in your 9 declaration, right? 10 MR. KOHLHEPP: Object to form. 11 THE WITNESS: Well, I believe I describe -- I 12 describe that -- that fact in the text, as I recall. 13 BY MR. CHRISTOPHER: 14 Q. Did you expressly state anywhere in your 15 declaration that the QoS Requestor Manager 23, that you 16 labeled as "Communication Manager," was not in fact the 17 communication manager, in your analysis? 18 MR. KOHLHEPP: Object to form. 19 THE WITNESS: So I know you were concerned 20 about how long it took me to answer a question before. 21 But that question, as you posed, is going to take me a 22 while to answer, because I'm going to have to go search 23 and see whether I do that. So if you're okay with me 24 taking some time, I can do that. 25 BY MR. CHRISTOPHER:

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1 Q. Well, why don't we do it this way: Sitting
2 here right now, can you identify for me, without going
3 through the declaration, anywhere in which you
4 explicitly said that the QoS Requestor Manager 23, that
5 you labeled as "Communication Manager," was not in fact
6 the communication manager you were relying on with
7 respect to the claims?
8 MR. KOHLHEPP: Object to form. And as you
9 know, Counsel, this is not a memory test.
10 MR. CHRISTOPHER: No speaking objections,
11 please.
12 THE WITNESS: I believe that I explicitly
13 mention that box 12 is the -- is the communication
14 manager in terms of aligning things with the claims.
15 But it would take me time to go search through here to
16 find the details of where that happens in my --
17 BY MR. CHRISTOPHER:
18 Q. Sure.
19 A. -- declaration.
20 Q. If you knew where you specifically addressed
21 whether the QoS Requestor Manager 23 was the
22 communication manager, you'd tell me, right?
23 MR. KOHLHEPP: Object to form.
24 THE WITNESS: I'm sorry. I don't understand
25 that question. You mean if my memory was better, I

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1 would have better memory? I don't -- I don't know how
2 to answer that question. I'm sorry.
3 BY MR. CHRISTOPHER:
4 Q. Well, just to wrap it up, sitting here right
5 now, without having gone top to bottom through your
6 declaration again during the deposition, you can't
7 specifically point to me where you expressly addressed
8 this issue we've been discussing about the annotations
9 on requestor manager 23; is that fair?
10 A. My memory is that I do explicitly say,
11 somewhere in my declaration, that box 12 is the
12 communication manager. But I, off the top of my head,
13 am not sure what to point to exactly. It would take me
14 some time to search for that.
15 Q. All right. Can we actually go to paragraph 118
16 of your declaration.
17 Let me know when you're there.
18 A. Okay.
19 Q. And in the first sentence, you wrote, "For
20 example, Drake discloses a 'communication manager' in
21 the form of a 'QoS requestor manager.'" Do you see
22 that?
23 A. Yes.
24 Q. And you didn't specify here in paragraph 118
25 whether you were referring to QoS Requestor Manager 12

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1 or QoS Requestor Manager 23, right?
2 MR. KOHLHEPP: Object to form.
3 THE WITNESS: Well, continuing on in paragraph
4 118, the QoS requestor managers that I'm discussing are
5 the ones in the source stations. So the ones that I'm
6 mentioning in this paragraph are box 12.
7 BY MR. CHRISTOPHER:
8 Q. All right. Do you see in the -- you have a
9 citation to Drake, actually a series of citations to
10 Drake, after the first sentence. You see those?
11 A. Yes.
12 Q. And do you see -- it's the third line in the
13 paragraph -- one of your citations is to Drake at column
14 5, lines 5 through 8. Do you see that?
15 A. Yes.
16 Q. All right. And you probably know where I'm
17 going with this.
18 Let's go to Drake, column 5, line 5. Let me
19 know when you're there.
20 A. Okay.
21 Q. So starting at line 5 in Drake, it reads,
22 "Allocator station 20 also includes a QoS requestor
23 manager 23." You see that?
24 A. Yes.
25 Q. Okay. So your declaration in paragraph 116

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1 cited to a portion of Drake that discusses the QoS
2 requestor manager 23, right?
3 A. Right. And that's because in order for the
4 communication manager 12 to perform its work, it has to
5 communicate with the resource manager, and there has to
6 be a receiving side of that communication. And the
7 receiving side is box 23. Box 23 is also necessary. If
8 it didn't exist, then there wouldn't be successful
9 communication from the communication manager to the
10 resource manager.
11 Q. Let's go now -- go to paragraph 106 of your
12 declaration.
13 Let me know when you're there.
14 A. Okay.
15 Q. And I want to focus on the second sentence. It
16 reads, "Just like Goossens2002, Drake also describes two
17 different channels: one in the 'forward direction,' for
18 communications 'from source station 10 to target station
19 29,' and a second in the" backwards "'direction,' for
20 communications 'from the target station 29 to the source
21 station 10.'" Do you see that?
22 A. Yes, I see that.
23 Q. And you cite Drake at column 5, lines 30 to 50,
24 right?
25 A. Yes.

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1 Q. Let's go back to Drake. And we'll go to column
2 5, starting at line 30.
3 So are you there?
4 A. Yes.
5 Q. All right. So at line 30, Drake states, "While
6 quality-of-service parameters that describe the service
7 expected from the network can be specified in many
8 different ways, for the purposes of this application,
9 the following parameters are used." Do you see that?
10 A. Yes. Uh-huh.
11 Q. The list that extends all the way from line 34
12 all the way to column 6, maybe line 28, do you see that?
13 A. Yes.
14 Q. And these parameters that are listed in the
15 specification are labeled either "Forward Direction" or
16 "Backward Direction," right?
17 A. Yes.
18 Q. So is it your opinion that Drake necessarily
19 discloses two channels because it is describing forward
20 direction and backwards direction parameters here at
21 column 5, lines 30 to 50?
22 A. Yes. The forward and backward communication
23 would be on separate channels.
24 Q. Would those be simplex channels, like we
25 discussed earlier?

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1 A. I mean, you could think of them as each being
2 simplex channels going in opposite directions; yes,
3 that's right.
4 Q. All right. And if you can go to Drake column
5 4, line 22, please.
6 A. Okay.
7 Q. Here it states, "LAN 17 may, for example, be a
8 Token Ring network." Do you see that?
9 A. Yes.
10 Q. Do you have an understanding as to what a Token
11 Ring network is?
12 A. Yes, I do.
13 Q. Could you describe what your understanding of a
14 Token Ring network is?
15 A. Sure. It may take a little time. But the --
16 I'll try to make it brief.
17 A ring -- first of all, a ring network is a
18 configuration of the wiring where you -- it resembles a
19 ring. So there are some number of nodes that are
20 communicating, and each one is wired to two neighbors,
21 and they form a circle going all the way around a ring.
22 And the routing is either, say, in one direction, say
23 clockwise, or -- around the ring or possibly
24 bidirectional, maybe both clockwise and
25 counterclockwise.

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1 And then you can have virtual channels on the
2 ring to divide up the -- so that the wiring between
3 neighbors is a physical link or channel, and then you
4 can have virtual channels on top of that where you
5 time-multiplex the bandwidth. And the token part is --
6 essentially a token is a form of synchronization that
7 allows you to start routing messages around the ring.
8 So this is one type of interconnect, as opposed to a
9 mesh or -- there are a number of other configurations
10 for interconnects.
11 Q. Isn't it true that a Token Ring network can use
12 duplex channels?
13 MR. KOHLHEPP: Object to form.
14 THE WITNESS: Well, you can build duplex
15 channels on top of any type of physical interconnect.
16 That's a construct at -- at a -- at a higher level,
17 potentially. So that's -- it's -- yes, a Token Ring
18 could have duplex channels.
19 BY MR. CHRISTOPHER:
20 Q. Okay. My colleague should be putting a copy of
21 Goossens2003 in the Zoom chat. Let me know when you
22 have that open.
23 This is Exhibit -- for the record, Exhibit
24 1007.
25 A. Okay. I have it.

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1 Q. All right. Goossens2003 is directed to a
2 network on a chip, right?
3 A. Yes, that's correct.
4 Q. All right. We'll start on page 65, which, if
5 you're using a PDF, it would be page 5.
6 A. Okay. I'm there.
7 Q. All right. In the third sentence, you see
8 where it starts with the word "second"?
9 A. I'm not sure if I'm looking in the right place.
10 Q. The header reads, "2," period. "NOCs and QoS,"
11 colon, "a synthesis."
12 A. Okay. I see it. I'm seeing it as the fourth
13 sentence. Yeah, "Second, IP re-use and platform-based."
14 Is that what you mean?
15 Q. Yeah, I could totally be wrong on how many
16 sentences I counted. I think you're actually right
17 about that.
18 So the sentence that starts with the word
19 "second," do you see that one?
20 A. Yes.
21 Q. All right. And that sentence reads, "Second,
22 IP re-use and platform-based design aim to re-use
23 applications and architectures by decoupling them."
24 You see that?
25 A. Yes.

Page 189 1 Q. Would you agree that one of Goossens2003's 2 goals is to decouple applications and architectures? 3 MR. KOHLHEPP: Object to form. 4 THE WITNESS: I just -- I just need a second to 5 read here for the context of what they mean specifically 6 by architectures, because that means a number of 7 different things in different contexts. 8 Assuming they mean the network architecture, 9 which is probably what they mean, then -- okay, then I 10 think I'm following you. 11 I mean, if there was a question, can you please 12 repeat the question? 13 BY MR. CHRISTOPHER: 14 Q. Sure. Would you agree that one of 15 Goossens2003's goals is to decouple applications and 16 architectures? 17 A. Well, it's -- it's stating that here as a -- 18 one of their goals, yes. 19 Q. And in the same sentence, Goossens2003 refers 20 to "IP re-use." Do you see that? 21 A. Yes. 22 Q. "IP" refers to an intellectual property block, 23 such as a processing module, right? 24 A. Yes. 25 Q. And one of Goossens2003's goals is to reuse IP	Page 191 1 you see that? 2 A. Yes, I see that. 3 Q. So in Goossens2003, when the initiator IP makes 4 a request, that request is for a connection with certain 5 properties, correct? 6 A. Assuming that you want to have a connection 7 with quality of service, it's possible to -- it also 8 supports best-effort communication, and in that case you 9 don't need to explicitly state communication properties. 10 You can just go ahead and communicate. 11 But if you have a scenario where you do want 12 quality of service guarantees or specific communication 13 properties, then you do need to state what they are 14 explicitly. 15 Q. All right. Let's go to paragraph -- you could 16 scroll up -- paragraph 173 of your declaration. 17 A. Okay. 18 Q. All right. In the second sentence you wrote, 19 "As I discussed above, Goossens2003 explains that the 20 implementation of connections in a NoC requires 21 'resource manager,' but does not describe a component or 22 mechanism for tracking resource usage within the NoC or 23 for determining the availability of the resources 24 required for a requested connection." Do you see that? 25 A. Yes, I see that.
Page 190 1 blocks by connecting them using a network on a chip, 2 right? 3 A. Yes. 4 MR. KOHLHEPP: Object to form. 5 BY MR. CHRISTOPHER: 6 Q. Okay. Let's go back -- 7 A. With the -- can you repeat the question, 8 please? 9 Q. One of the goals in Goossens2003 is to reuse 10 the IP blocks by connecting them via a network on a 11 chip, right? 12 A. Well, it mentions IP reuse. And that means 13 that you don't have to change the IP based on how you're 14 connecting it to other things. So that is -- IP reuse 15 is a goal. Another goal here is that they want to 16 connect things with a network on chip. One could debate 17 whether a network on chip directly leads to IP reuse. 18 But they're -- they're making that argument, I believe. 19 Q. All right. Let's go to paragraph 194 of your 20 declaration. 21 A. Okay. 22 Q. In the second sentence, you wrote, 23 "Goossens2003 also explains that when IPs make a request 24 for a connection, the desired communication properties 25 and level of service 'must be explicitly stated.'" Do	Page 192 1 Q. Okay. You are not opining in your declaration 2 that Goossens2003 discloses the claimed resource manager 3 in the '449 patent, correct? 4 A. That's right. It's my opinion that Goossens -- 5 Goossens2003 is not disclosing the resource manager; 6 that's correct. 7 Q. All right. Let's go to paragraph 186 of your 8 declaration. 9 A. Okay. 10 Q. In the second sentence you wrote, 11 "Additionally, in my opinion, Goossens2003's interface 12 discloses the communication manager under Patent Owner's 13 proposed construction." Do you see that? 14 A. I see that, yes. 15 Q. All right. So your opinion that Goossens2003 16 discloses a communication manager is predicated on 17 applying patent owner's construction for "communication 18 manager" from the district court, right? 19 A. Yes. 20 Q. And let's go back to claim 10 of the '449 21 patent. Column 19, line 36. Let me know when you're 22 there. 23 A. Okay. 24 Q. All right. So here, line 36, the claim reads 25 "the communication manager forwarding the request to a

Page 193 1 resource manager." Did I read that correctly? 2 A. Yes, that's what it says. 3 Q. Right. So the communication manager -- strike 4 that. 5 The claims require that the communication 6 manager forwards the request to the resource manager, 7 right? 8 A. That's what -- that's what claim 10 says there 9 at the line we're looking at, yes. 10 Q. If Goossens2003 does not disclose a resource 11 manager, then it necessarily does not disclose a 12 communication manager that forwards a request to the 13 resource manager, correct? 14 MR. KOHLHEPP: Object to form. 15 THE WITNESS: Well, I believe my analysis here 16 is done -- I'm not doing anticipation; I'm doing an 17 obviousness combination with Goossens2003 and Drake. 18 Drake discloses a resource manager. So if we combine 19 the teachings of Drake with Goossens2003, then there is 20 a resource manager. Goossens2003 describes that 21 something does resource management, but it doesn't go 22 into any detail about how that happens exactly. But it 23 does describe that the -- this interface -- let's see. 24 The interface that I'm mentioning here in 25 paragraph two thousand -- sorry, paragraph 186 would be	Page 195 1 Q. We'll try it one more time. 2 You understand my question is just about 3 Goossens2003. It's not about a combination with Drake. 4 Do you understand that? 5 A. But as I just said, I didn't do an anticipation 6 analysis of Goossens2003. I did an obviousness 7 analysis. 8 Q. But you opined in your declaration, did you 9 not, that Goossens2003 discloses a communication manager 10 under patent owner's proposed construction to the 11 district court? 12 A. Yes, I see that in paragraph 186. 13 Q. And so I'm asking you, focusing just on 14 Goossens2003, if Goossens2003 doesn't have a resource 15 manager as that term is used in the claims, then it 16 necessarily doesn't have a communication manager, does 17 it? 18 MR. KOHLHEPP: Object to form, scope. 19 THE WITNESS: As I understand your question, 20 the -- your question would make sense if I was doing 21 anticipation analysis, where I was considering only 22 Goossens2003 on its own. But my analysis was an 23 obviousness combination, where the resource manager is 24 provided by the teachings of Drake in combination with 25 Goossens2003. There are a number of things in this
Page 194 1 forwarding a request to Drake's resource manager. 2 BY MR. CHRISTOPHER: 3 Q. Were you finished with your answer? 4 A. Yes. 5 Q. Okay. I'll go back to my question, which was, 6 if Goossens2003 doesn't disclose the resource manager, 7 then it necessarily does not disclose the communication 8 manager, correct? 9 MR. KOHLHEPP: Object to form. 10 THE WITNESS: What was -- okay. I thought I -- 11 just -- thought I just addressed that. 12 My -- my analysis is for a combination. And so 13 in the combination, there are certain things that 14 Goossens provides and certain things that I combine it 15 with, where I combine it with the teachings of Drake. 16 So Drake teaches a resource manager. And I -- 17 it would be obvious to combine Drake with Goossens. And 18 given that, there is a resource manager. It's the one 19 taught by Drake. And then the network interfaces from 20 the -- and then the discussion in paragraph 186, where I 21 say that Goossens2003's interface discloses the 22 communication manager, then that's -- it's communicating 23 with the resource manager taught by Drake. 24 MR. CHRISTOPHER: I'm going to move to strike 25 as nonresponsive.	Page 196 1 combination that are taught by Goossens, and when 2 combined with Drake's resource manager, then Goossens' 3 network interface would teach a communications manager. 4 MR. CHRISTOPHER: Move to strike as 5 nonresponsive. 6 Q. I'll put it to you this way: Does Goossens2003 7 disclose the communication manager in claim 10 of the 8 '449 patent; yes or no? 9 A. In my combination with Drake, as I described in 10 my report, it does, because the teachings of Drake 11 provide the resource manager, and therefore Goossens 12 does provide the communication manager in that 13 combination. 14 MR. CHRISTOPHER: And move to strike as 15 nonresponsive. 16 Q. My question isn't about Drake; it's not about 17 the combination. It's just about Goossens2003. 18 Goossens2003, on its own, does not disclose the 19 communication manager in claim 10 of the '449 patent; 20 yes or no? 21 MR. KOHLHEPP: Objection. That's (audio 22 dropout) -- 23 THE WITNESS: I apologize -- all right. Sorry. 24 Go ahead. 25 I know you keep asking the same question, and

Page 197 1 I'm doing my best to answer your question. But I 2 don't -- as you keep restating the same question the 3 same way, it's not becoming more clear to me. The 4 question's not becoming more clear. I think I've 5 answered as clearly as possible, which is, my analysis 6 is not anticipation. You're asking me to do 7 anticipation analysis, and that's not what I did. I 8 provided opinions on obviousness. And I'm trying to 9 describe that as clearly as possible. The resource 10 manager is taught by Drake in combination with Goossens. 11 There are certain elements in the combination that are 12 taught by Goossens alone, and then there are certain 13 elements where you need to include Drake. And the 14 resource manager is -- comes from Drake. So the 15 communication manager described in Goossens is 16 communicating with the resource manager as taught by 17 Drake. 18 MR. CHRISTOPHER: I'll move to strike as 19 nonresponsive. 20 You didn't answer the question. 21 Why don't we take a break, go off the record. 22 (Recess taken.) 23 MR. CHRISTOPHER: All right. Let's go back on 24 the record. 25 Q. I'm sure you know this question's coming. Did	Page 199 1 going to take me like five seconds, and I'll be right 2 back, if that's okay, or -- okay. I'm back. Sorry 3 about that. 4 Q. Go to paragraph 128 of your declaration. 5 A. Okay. 6 Q. All right. Here in the second sentence you 7 wrote "Goossens2002 describes that its IPs (i.e., 8 processing modules) 'can set up and remove 9 connections.'" Do you see that? 10 A. Yes. 11 Q. And here the IPs you're referring to, those are 12 the IP blocks in the Goossens2002 network on a chip, 13 right? 14 A. Yes, that's right. 15 Q. And in your view, the initiator IP block in 16 Goossens2002 corresponds with the "first module" in 17 claim 10 of the '449 patent, correct? 18 A. That's correct, yes. 19 Q. All right. And then in paragraph 129, lower on 20 the page, in the first sentence you wrote, "Similarly, 21 Drake describes that an application in a source station 22 (i.e., first module) 'requests a QoS connection.'" Do 23 you see that? 24 A. Yes. 25 Q. And so here you are opining that the
Page 198 1 you discuss your testimony with anyone during our break? 2 A. I did not. 3 Q. All right. Very good. 4 Let's go to paragraph 94 of your declaration, 5 please. 6 A. Okay. 7 Q. All right. In paragraph 94, starting towards 8 the end of the first line, you wrote "a POSITA would 9 have found it obvious to look to Drake's disclosures 10 regarding a QoS allocator for details regarding the 11 implementation of Goossens2002's quality-of-service 12 manager." Do you see that? 13 A. Yes. 14 Q. And earlier we talked about how you've opined 15 that Goossens2002's quality-of-service manager 16 corresponds to the claimed resource manager. Do you 17 recall that? 18 A. Yes. 19 Q. All right. And so here in paragraph 94 of your 20 declaration, you have associated Drake's QoS allocator 21 with Goossens2002's quality-of-service manager, correct? 22 A. Yes. 23 Q. Great. Let's go -- 24 A. Can you hang on for one second? It's gotten 25 dark here. I just need to turn the light up. It's	Page 200 1 application in the source station in Drake corresponds 2 to the claimed first module, correct? 3 A. Yes. Box -- yes, box 11. Yes. 4 Q. All right. And so putting these two references 5 together, you have associated the initiator IP block in 6 Goossens2002 with the application 11 in Drake for 7 purposes of your obviousness combination, correct? 8 A. Yes, that's correct. 9 Q. Okay. And you stated here in paragraphs 128 10 and paragraphs 129 that Goossens initiator IP block and 11 Drake's application in the source station send requests, 12 correct? 13 A. Yes. That's right. 14 Q. All right. Now let's go to paragraph 193 of 15 your declaration. 16 A. Okay. 17 Q. I want to focus on the last sentence, starting 18 where it says "a POSITA would have understood that 19 Goossens2003's master IPs (i.e., first module) issue 20 requests for connections to the network interfaces 21 (i.e., communication managers)." You see that? 22 (Discussion off the record.) 23 MR. CHRISTOPHER: "Communication managers." 24 THE WITNESS: I see that, yes. 25 BY MR. CHRISTOPHER:

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1 Q. All right. So for purposes of your obviousness
2 opinions, you have associated the master IP block in
3 Goossens2003 with the "first module" in claim 10 of the
4 '449 patent, correct?
5 A. Yes.
6 Q. All right. And then in paragraph 195 -- let me
7 know when you're there. It's just on the next page.
8 A. I'm there, yes.
9 Q. All right. The middle of the first sentence,
10 you wrote "Drake similarly describes that an application
11 in a source station (i.e., first module)." Do you see
12 that?
13 A. Yes.
14 Q. So, again, you've associated Drake's
15 application in the source station with the claimed first
16 module in claim 10 of the '449 patent, right?
17 A. Yes.
18 Q. So putting these two references together for
19 purposes of your obviousness combination, you have
20 associated Goossens2003's master IP with the application
21 11 in the source station in Drake; is that correct?
22 A. Yes, that's correct.
23 MR. KOHLHEPP: Object to form.
24 THE WITNESS: So -- you said have I associated
25 the IP modules from Goossens2003 with the application

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1 requesting QoS in Drake. Yes, the -- those are the
2 things that I'm associating, the IPs from Goossens2003.
3 BY MR. CHRISTOPHER:
4 Q. All right. Let's go to paragraph 76 of your
5 declaration.
6 A. Okay.
7 Q. All right. And it's the last sentence at the
8 bottom of page 40, bridging onto the next page.
9 "A POSITA would have been particularly
10 interested in Drake's disclosure of a 'QoS requestor
11 manager' to formulate requests for guaranteeing services
12 with particular properties and a 'QoS allocator' to
13 determine whether the network resources required for the
14 requested services are available." Do you see that?
15 A. Yes, I see that.
16 Q. And so here in paragraph 76 of your
17 declaration, you are opining that it would have been
18 obvious to a person of skill in the art to use the Drake
19 QoS requestor manager in Goossens2002; is that right?
20 MR. KOHLHEPP: Object to form.
21 THE WITNESS: Well, it would have been obvious
22 to use the teachings of Drake with respect to the
23 teachings of its QoS requestor manager and QoS
24 allocator, that when combined with Goossens2002, that
25 that -- that would have been an obvious combination,

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1 yes.
2 BY MR. CHRISTOPHER:
3 Q. All right. Well, let's -- let's jump ahead,
4 actually, to paragraph 122 of your declaration.
5 A. Okay.
6 Q. And I want to focus on the -- the second
7 sentence, that starts with the word "additionally." Do
8 you see that?
9 A. Okay. Yes.
10 Q. So here you wrote, "Additionally, in my
11 opinion, a POSITA would have been motivated to do so by
12 implementing the functionality of Drake's QoS requestor
13 manager as a circuit on the same integrated circuit chip
14 as Goossens2002's IP blocks and NOS." Do you see that?
15 A. Yes.
16 Q. You haven't defined here in paragraph 122
17 specifically where the requestor manager -- QoS
18 requestor manager from Drake would be implemented on the
19 Goossens2002 integrated circuit chip; true?
20 MR. KOHLHEPP: Object to form.
21 THE WITNESS: Can you repeat the question,
22 please?
23 BY MR. CHRISTOPHER:
24 Q. You have not explicitly defined in paragraph
25 122 where Drake's QoS requestor manager would be

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1 implemented as a circuit on the integrated circuit chip
2 in Goossens2002?
3 MR. KOHLHEPP: Object to form.
4 THE WITNESS: Well, there are -- I'm referring
5 to the teachings of Drake, and there would be several --
6 I mean, there would be several options for where this
7 might be implemented. It's shown here in the network
8 interface. That would be a natural place to put it. I
9 believe that the '449 patent mentions that the -- that
10 this could be either -- well, sorry. Sorry. Resource
11 manager.
12 This could be either -- I believe the '449
13 patent discusses that this could either be distributed
14 or centralized. And those are -- are all options. You
15 just need the -- the concepts here, that are described
16 in Drake. So there's some flexibility in terms of how
17 this is implemented. But a POSITA would understand
18 this.
19 BY MR. CHRISTOPHER:
20 Q. Okay. We'll get into the options, because I do
21 want to ask you about those options. But I need you to
22 focus on my question, which is, in paragraph 122 of your
23 declaration you haven't explicitly defined for us where
24 you would implement the QoS requestor manager from Drake
25 when combined with Goossens2002, correct?

Page 205 1 MR. KOHLHEPP: Object to form. 2 THE WITNESS: I mean, I said it would be on 3 the -- on the system on chip. When you say "where," 4 presumably you don't mean literally where on the chip in 5 terms of -- I mean, I'm having trouble understanding 6 your question. It's -- it's some functionality that 7 would be implemented on the -- on the system on chip 8 somewhere. It just needs to be something that the 9 communication manager can interact with. But I did say 10 that it goes on the chip. So I don't understand how 11 much more specific you -- you're hoping for me to be 12 exactly. I don't quite follow your question, I guess. 13 BY MR. CHRISTOPHER: 14 Q. Okay. Would one option be to implement Drake's 15 QoS requestor manager in Goossens2002's IP block? 16 A. Well, that's not the most natural choice. It 17 would probably be separate from the IP blocks. I don't 18 think that putting it in the IP block would be the most 19 natural choice. 20 Q. Can you think of any reason why a person of 21 skill in the art would put the QoS requestor manager 22 from Drake in the Goossens2002 IP block? 23 A. I mean, as I mentioned, I believe the '449 24 patent says that the resource manager could be 25 implemented either in a centralized or distributed	Page 207 1 centralized manager, because it needs to have a -- a 2 global view of what's happening with the resources. 3 It's easier to implement that if you don't need 4 distributed communication. 5 Q. All right. Just so I get a clear answer to 6 this, somebody skilled in the art could implement the 7 Drake QoS requestor manager in the Goossens network 8 interface. That's possible, right? 9 MR. KOHLHEPP: Object to form. 10 THE WITNESS: There are -- I mean, the resource 11 manager is -- there are requirements for what the 12 resource manager does, as described in the '449 patent. 13 And the functionality for that could be distributed or 14 it could be centralized. 15 It -- it doesn't make sense for it to exist -- 16 I mean, if it's distributed, then it introduces some 17 more complications. You would need to coordinate across 18 the different distributed nodes. It's -- it's easier to 19 think of it if it's centralized, because it eliminates 20 the communication problem of just understanding the 21 global allocation of all the resources. But there -- 22 but there are multiple ways to implement this. 23 BY MR. CHRISTOPHER: 24 Q. Okay. Can you list for me in your obviousness 25 combination all of the potential places that the Drake
Page 206 1 manner. If it's centralized, then it wouldn't be in a 2 particular IP block unless you count being your own IP 3 block as an option. I mean, effectively that's what it 4 would be. But in terms of the existing IP blocks, if it 5 was distributed, the natural place for it to be is in 6 the network interface, or near the network interface. 7 So there are always trade-offs with whether you put 8 things in IP blocks or not. It -- it's -- like I said, 9 I don't think it's the most natural choice. But I don't 10 remember shaping a specific opinion on that. If I did 11 in my report, I'm happy to talk about that. But I don't 12 remember discussing that exact issue. 13 Q. So I think you've testified that one option 14 would be to implement Drake's QoS requestor manager in 15 the network interface of Goossens2002. Is that right? 16 A. Well, I believe that the -- I believe that the 17 '449 patent mentioned that it could be -- the resource 18 manager could be implemented either centralized or 19 distributed. If it was distributed, then it could be 20 done in the -- you could -- it could be that there are 21 parts of that, at least, that are in the network 22 interface, although, you know, it would have to be 23 coordinating somehow with the other distributed 24 components of the resource manager. 25 It's easy to think about doing it as a	Page 208 1 QoS requestor manager could be implemented in 2 Goossens2002? 3 MR. KOHLHEPP: Object to form. 4 THE WITNESS: Well, my understanding is that 5 when doing obvious analysis, I don't need to show the 6 universe of possibilities, but, rather, just show that 7 there is a possibility that matches the patent claims. 8 And one option that would, would be to have a 9 centralized implementation of the resource manager, 10 similar -- very much like what is shown in figure 1 from 11 Drake. And that would be a straightforward thing for an 12 engineer to implement. And the -- the teachings of 13 Drake would show that as an option. As I said, I 14 believe that you could -- rather than having just a 15 simply centralized version of it, you could 16 decentralize -- you could distribute it. But it's 17 easiest to think of it as just a centralized piece of 18 hardware. 19 BY MR. CHRISTOPHER: 20 Q. In the centralized implementation that you just 21 described, tell me specifically where in Goossens2002 22 that the QoS requestor manager would be implemented. 23 A. On the chip somewhere. It doesn't really 24 matter where it is. You just need to be able to 25 communicate with it.

Page 209 1 I mean, you seem to be suggesting that I want 2 to draw a picture and show you where -- where it is on 3 the picture? I'm not understanding what kind of answer 4 you're hoping to get exactly. 5 But as I said, I think that what matters is 6 that when I combine the teachings of Drake, it -- there 7 is -- there's -- it suggests a -- you know, a very 8 clear, obvious possibility, which is you could just 9 implement it the way that Drake suggests, which is 10 there's -- it's a centralized -- it's a centralized 11 piece of hardware. And the different nodes would 12 communicate with it to -- to allocate these connections 13 with their desired connection properties. 14 Q. Is there anything else you want to tell me 15 today about specifically where the QoS requestor manager 16 in Drake would be implemented in Goossens2002? 17 MR. KOHLHEPP: Object to form. 18 THE WITNESS: I think I've already answered 19 this. So, no, I don't have anything additional that I 20 want to add. 21 BY MR. CHRISTOPHER: 22 Q. All right. I'm going to ask you a similar 23 question with respect to Goossens2003. 24 In your obviousness combination of Goossens2003 25 and Drake, can you tell me specifically where the Drake	Page 211 1 components in Goossens2003. Is that right? 2 A. Yes, that's what I -- I say that, for example, 3 in the middle of paragraph 173 in my report. 4 Q. All right. So I'm going to ask you the same 5 question we walked through with Goossens2002. 6 You don't explicitly state anywhere here 7 between paragraphs 155 and paragraph 166 where Drake's 8 QoS requestor manager would be implemented on the 9 Goossens2003 chip, correct? 10 A. Okay. I think maybe -- maybe I'm possibly 11 understanding your question, or how to answer your 12 question, rather. 13 So the answer is, it can go anywhere on the 14 chip as long as it has access to the -- as long as it's 15 attached to the NOC, because the only requirement is 16 that the source -- the IP block that's the source of 17 communication just has to be able to talk to it. So 18 physically it can go anywhere on the chip provided that 19 it has a connection to the NOC. And that would be true 20 of essentially the whole chip. So you have flexibility, 21 really, to put it anywhere. You just have to attach it 22 to the NOC. And the same is true for Goossens2002 as 23 well. It can go anywhere on the chip. The only 24 requirement is it just has to be connected to the 25 network on chip.
Page 210 1 QoS requestor manager would be implemented within the 2 chip in Goossens2003? 3 A. Can -- can you point me to that section in my 4 report, please? 5 Q. Paragraph 160. 160. 6 In the middle of paragraph 160, there's a 7 sentence that starts with "A POSITA." Let me know when 8 you are there. 9 A. Okay. I see that. 10 Q. All right. So here you wrote in paragraph 160, 11 "A POSITA would have been particularly interested in 12 Drake's disclosure of a 'QoS requestor manager.'" You 13 see that? 14 A. Yes. 15 Q. And you're discussing this in the context of 16 Ground II, which is Goossens2003, right? 17 A. Yes. 18 Q. And so here in Ground II, you have offered an 19 opinion that it would have been obvious to combine 20 Drake's QoS requestor manager into Goossens2003, 21 correct? 22 A. Yes. 23 Q. Right. And I assume, like Goossens2002, your 24 opinion is that Drake's requestor manager would be 25 implemented on the same chip as the rest of the	Page 212 1 Q. All right. I think we discussed this today. 2 You have opined that the Drake QoS requestor manager 20 3 corresponds to the claimed resource manager, correct? 4 Excuse me. I'll withdraw and reask that. I 5 misspoke. 6 You have opined that the QoS allocator 20 in 7 Drake corresponds to the claimed resource manager, 8 correct? 9 A. Yes, that's right. Yeah. When combined with 10 Goossens2002 or Goossens2003, yes, the -- that the 11 teachings of the QoS allocator correspond to the 12 resource manager, yes. 13 Q. In the combination of Goossens2002 and Drake, 14 is it your opinion that the Drake QoS requestor 15 manager -- strike that. I said it wrong again. 16 In the Goossens2002 and Drake combination, is 17 it your opinion that the QoS allocator 20 from Drake can 18 be implemented anywhere on the integrated circuit in 19 Goossens2002? 20 A. There's flexibility to put it anywhere as long 21 as it can connect to the network on chip. So as -- for 22 example, as shown in figure 1 in Drake, that QoS 23 allocator has a connection to the interconnect. In that 24 case it's box 17. So it's exactly the same idea. It 25 just needs to have a connection some -- somewhere to

Page 213 1 the -- in this case it would be the on-chip 2 interconnect. That's -- that's the only requirement. 3 Otherwise it can go anywhere. 4 Q. All right. Same question with respect to the 5 Drake and Goossens2003 combination. When you combine 6 Goossens2003 and Drake, in your view the QoS allocator 7 20 from Drake could be implemented anywhere on the 8 integrated circuit in Goossens2003 so long as it can 9 connect to the network on a chip; is that right? 10 A. Yes, that's correct. 11 MR. CHRISTOPHER: I think I'm getting close. 12 If you indulge me a few minutes with my colleagues off 13 the record, I think I can get organized for one last 14 short segment. 15 THE WITNESS: Okay. 16 MR. CHRISTOPHER: All right. Let's go off for 17 about five minutes. 18 THE WITNESS: Okay. 19 (Recess taken.) 20 MR. CHRISTOPHER: All right. Back on the 21 record. 22 Q. Dr. Mowry, did you discuss your testimony with 23 anybody during our break? 24 A. No, I did not. 25 Q. If you could turn for me to claim 10 of the	Page 215 1 did my analysis including that, that possibility. 2 BY MR. CHRISTOPHER: 3 Q. Okay. So for purposes of rendering your 4 opinions in this case, you have assumed that the 5 preamble of claim 10 is limiting; is that correct? 6 A. Well, I did my -- yes. I did my analysis 7 starting in paragraph one thirty -- 138 under the 8 assumption that it was limiting, but I didn't provide an 9 opinion on whether that's the correct assumption or not. 10 Q. Okay. And sitting here today, do you have any 11 opinion with respect to whether the preamble of claim 10 12 is limiting? 13 A. No. I'm not providing an opinion on that. 14 Q. Okay. Now I want to walk through the steps 15 recited in claim 10, starting around line 32. Do you 16 see where it says "the first module issuing a request 17 for a connection with the second module to a 18 communication manager"? 19 A. Yes. 20 Q. All right. And just for shorthand, because 21 we're going to come back to this, is it okay with you if 22 we refer to that as the "request" step? 23 A. Okay. That's fine. Sure. 24 Q. And then the next step, down at line 36: "the 25 communication manager forwarding the request to a
Page 214 1 '449 patent. It starts in column 19. Let me know when 2 you're there. 3 A. Yes. Yes. 4 Q. Okay. You see, starting at line 21, where it 5 says "Method for exchanging messages in an integrated 6 circuit"? You see that? 7 A. Yes. 8 Q. And then you see at line 31 it says "further 9 comprising the steps of"? 10 A. Yes. 11 Q. Okay. You understand that the portion of the 12 claim between line 21 and line 31 is referred to as the 13 preamble, correct? 14 A. Yes, that's my understanding. 15 Q. All right. And are you familiar with the 16 concept of whether or not a preamble is a claim 17 limitation? 18 A. Yes, I've heard -- I've heard about that. Yes. 19 Q. Okay. Do you agree that the preamble of 20 independent claim 10 of the '449 patent is limiting? 21 MR. KOHLHEPP: Object to form, scope. 22 THE WITNESS: Well, I did not render an opinion 23 on whether it's limiting or not. And -- but I did my 24 analysis. As I said -- like starting in paragraph 138, 25 I said -- I included assuming that it is limiting. I	Page 216 1 resource manager." Do you see that? 2 A. Yes, I see that. 3 Q. And sticking with our shorthand, okay with you 4 if we refer back to this step as the forwarding step? 5 A. Okay. 6 Q. All right. And then the next step, starting at 7 line 38: "the resource manager determining whether a 8 target connection with the desired connection properties 9 is available." You see that? 10 A. Yes. 11 Q. And okay if we refer to that as the 12 "determining" step? 13 A. Sure. That's fine. 14 Q. All right. Now back up at the top of column 15 20, the next step: "the resource manager responding 16 with the availability of the target connection to the 17 communication manager." Do you see that? 18 A. Yes, I see that. 19 Q. And we'll refer to that as the "responding" 20 step. Is that understandable to you? 21 A. Yes. 22 Q. All right. And then the last one, at line 4, 23 column 20: "the target connection between the first and 24 second module being established." You see that? 25 A. Yes.

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1 Q. All right. And understandable to you if we
2 refer to this as the "establishing" step?
3 A. That's fine.
4 Q. Would a person of ordinary skill in the art
5 reviewing claim 10 of the '449 patent understand that
6 each of the steps that we just walked through, the
7 request, the forwarding, the determining, the
8 responding, and the establishing, have to be performed
9 in the order they're written in the claim?
10 MR. KOHLHEPP: Object to form.
11 THE WITNESS: So you're asking -- sorry. I --
12 I was thinking through the question. At the beginning,
13 did you say -- who did you say? Did you say do I think
14 that, or what -- who -- who was the -- from what
15 perspective did you ask that question?
16 BY MR. CHRISTOPHER:
17 Q. From the perspective of a person of ordinary
18 skill in the art at the time of the invention.
19 A. Well, there are some dependencies. So, for
20 example, you can't -- the forwarding step can't forward
21 something until you get a request. So one -- one thing
22 I would say is I'm -- I didn't -- I don't believe I
23 offered an opinion on this in my report. So I would
24 need to think about this. But I can say that in some
25 cases there are clear dependencies, where, for example,

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1 the resource manager can't -- a determining step clearly
2 can't happen until it gets the request in the forwarding
3 step, and then the resource manager can't respond until
4 it determines.
5 Regarding the last steps, last two steps,
6 though, the "establishing" and the "responding," and for
7 that matter even the "determining" part, I think it's --
8 I would need to think about this some more, but I think
9 that there's -- it appears that there's flexibility in
10 the ordering there. For example, the establishment of
11 the connection could potentially happen simultaneously
12 with responding, depending on how it was implemented.
13 Q. Understood.
14 Let's change topics. Let's go to paragraph 92
15 of your declaration.
16 A. Okay.
17 Q. All right. So here in the first sentence of
18 paragraph 92 you wrote "Drake's QoS allocator provides
19 the same functionality as the 'resource manager' that is
20 described in the specification of the '449 patent." You
21 see that?
22 A. Yes.
23 Q. Would it be fair to say that Drake's QoS
24 allocator allocates quality of service?
25 MR. KOHLHEPP: Object to form.

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1 THE WITNESS: I don't think I would phrase it
2 that way exactly, because I think if you look at, for
3 example, figure 1 in Drake, many things have the word
4 "QoS" attached to them. So quality of service is a
5 property, and -- like there's the QoS requestor, the QoS
6 allocator. "QoS" appears in many places.
7 So if you call it a QoS, does it allocate
8 quality of service? I wouldn't -- I mean, quality of
9 service is a more abstract concept. That's a -- that's
10 not -- it would be, I think, more accurate to say that
11 what it does is the -- like, for example, in figure 5,
12 in box 94, when you are, for example, updating
13 components in the database, where the database is box 25
14 in figure 1, I mean, that is -- in my mind that's when
15 it's really doing allocation, because it is -- it keeps
16 track of the resources that it has reserved for
17 different quality-of-service requests. So that's --
18 that aligns better with the concept of allocating. It
19 is -- so at a high level, it's doing allocating in
20 response to a quality-of-service request. But I
21 wouldn't quite describe it as -- I think the phrase
22 "allocating quality of service" is a bit vague, possibly
23 misleading, but not -- not necessarily the most precise
24 way to talk about it.
25 BY MR. CHRISTOPHER:

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1 Q. All right. Now, I'll direct you back again to
2 that first sentence in paragraph 92, where you state the
3 "QoS allocator provides the same functionality as the
4 'resource manager.'" Do you see that?
5 A. Yes.
6 Q. Would it be fair to say that allocating quality
7 of service is the same as managing resources?
8 MR. KOHLHEPP: Object to form, also scope.
9 THE WITNESS: Managing resources" is a very
10 broad term. So what I'm saying here is -- you know,
11 "resource manager" has a very specific meaning in the
12 context of the '449 patent. And I'm saying that that
13 QoS Allocator box in figure 1, box 20, that that
14 corresponds to the, quote-unquote, "resource manager,"
15 which has a specific meaning in the context of the '449
16 patent.
17 BY MR. CHRISTOPHER:
18 Q. Using the specific meaning of "resource
19 manager" in the '449 patent, would you agree that one of
20 the functions of the resource manager is to allocate
21 quality of service?
22 MR. KOHLHEPP: Same objection: form, scope.
23 THE WITNESS: I mean, the -- the
24 quality-of-service allocator box 20, its functionality
25 is the same as the resource manager as described in the

Page 221 1 '449 patent. And that -- that functionality is -- 2 include -- I mean, as -- well, that's -- that -- that's 3 described in the '449 patent. 4 I'm not -- I may be -- I mean, I'm not 5 necessarily following. It seems like you're targeting 6 some subtlety in your question that I must be missing. 7 But as I said in this first sentence in paragraph 92, 8 the -- that QoS Allocator box 20, that serves the role 9 of the resource manager from the '449 patent. 10 BY MR. CHRISTOPHER: 11 Q. Let's go to paragraph 107. 12 A. Okay. 13 Q. All right. So in the first sentence you wrote, 14 "Drake also describes 'AllocationRequest' messages, 15 which are used '[t]o request an allocation of a QoS path 16 for a particular data stream.'" Do you see that? 17 A. Yes. 18 Q. The allocation request in Drake is a request 19 for resources, correct? 20 MR. KOHLHEPP: Object to form. 21 THE WITNESS: Well, the allocation request is a 22 message that's requesting a connection with certain 23 quality-of-service properties. 24 BY MR. CHRISTOPHER: 25 Q. Can the allocation request also be	Page 223 1 like, for example, maximum packet size in a forward or 2 backward direction, committed burst size, excess burst 3 size. There are quite a few of these. And they have 4 separate fields for forward and backward directions. So 5 you're separately describing things in both directions. 6 Q. All right. And then going back to paragraph 7 109 of your declaration, there's a sentence about 8 halfway through that starts with "For example." Do you 9 see that? 10 A. Yes. 11 Q. All right. And here you wrote, "For example, 12 Drake's 'access class' field." You see that? 13 A. Yes. 14 Q. What is an access class? 15 A. Well, it's described in column 6, starting at 16 line 24. It says, you know, like synchronous, 17 asynchronous, priority. That's -- I mean, synchronous 18 and asynchronous, these are just different properties 19 of -- of communication for multimedia streams. 20 Q. Okay. Access priority, synchronous, and 21 asynchronous are examples of access classes that can be 22 provided in Drake, right? 23 A. Yes. Uh-huh. 24 Q. Okay. And earlier today, throughout the 25 deposition, we talked about quality-of-service
Page 222 1 characterized as a request for a resource? 2 MR. KOHLHEPP: Object to form, scope. 3 THE WITNESS: I wouldn't -- I wouldn't put it 4 that way. 5 BY MR. CHRISTOPHER: 6 Q. Can the allocation request be characterized as 7 a request for a reservation of resources? 8 MR. KOHLHEPP: Object to form. 9 THE WITNESS: I wouldn't describe it that way. 10 BY MR. CHRISTOPHER: 11 Q. Okay. Let's go to paragraph 109 in your 12 declaration. Are you there? 13 A. Okay. Yes, I'm there. 14 Q. All right. In the first sentence you wrote, 15 "These separately configurable channels are consistent 16 with Drake's description of 'traffic descriptors.'" Do 17 you see that? 18 A. Yes. 19 Q. What is a traffic descriptor? 20 A. I'm searching here. It's going to take me a 21 second. 22 Okay. So -- sorry. You said what is a traffic 23 descriptor? Well, the -- the -- they -- that is -- I 24 mean, it's these various things that are described here 25 between 5:54 and 6:28. There are quite a few of them,	Page 224 1 parameters. You recall discussing that term? 2 A. Yes, I think so. Yes. 3 Q. Would you agree that quality-of-service 4 parameters can be adjusted after their initial 5 allocation? 6 MR. KOHLHEPP: Object to form. 7 THE WITNESS: Well, they're kind of combining 8 two separate things. There are parameters, such as 9 minimum bandwidth, maximum end-to-end latency. So 10 that's what the parameters are. You said can they be 11 adjusted later? Well, that depends on the design. 12 That's a separate issue. 13 BY MR. CHRISTOPHER: 14 Q. Okay. And you gave a couple examples there. 15 Would priority be an example of a QoS parameter? 16 A. Sorry. Can you point me to where we're talking 17 about here in the -- in the -- are we still in paragraph 18 109, or -- 19 Q. Yeah, I'm just asking you in general from the 20 perspective of a person of skill in the art. Would a 21 person of skill in the art understand that one example 22 of a QoS parameter would be a priority connection? 23 MR. KOHLHEPP: Object to form. 24 THE WITNESS: Well, the term "priority" is a 25 somewhat generic term. So possibly. Maybe, maybe not.

Page 225 1 The '449 patent spells out a list of examples of 2 quality-of-service parameters, and the two Goossens 3 references and Drake all discuss things like, for 4 example, bandwidth and latency. Those are examples of 5 quality-of-service parameters. 6 Priority, some concept of priority may or may 7 not be, and could potentially -- it may or may not be a 8 quality-of-service parameter. Like I said, the term is 9 somewhat generic. 10 BY MR. CHRISTOPHER: 11 Q. All right. Let's go to figure -- sorry, 12 paragraph 116 of your declaration. 13 A. Okay. 14 Q. All right. And in paragraph 116, you refer to 15 "The QoS allocation database used by Drake's QoS 16 allocator to determine the availability of requested 17 connection properties." You see that? 18 A. Yes, I see that. 19 Q. And then you go on to say -- just for 20 completeness I'll read the rest. 21 In the rest of the sentence, you wrote "is 22 exactly like the 'property table' used by the resource 23 manager of the '449 patent to determine the availability 24 of resources." Do you see that? 25 A. Yes.	Page 227 1 THE WITNESS: Well, the QoS allocation database 2 number 25 is information. So it's data. So I wouldn't 3 characterize it as software. There may or may not be -- 4 there could potentially be software that's used for 5 managing it, but it could also be done in hardware. The 6 flowchart that we see in figure 5 could potentially be 7 implemented directly in -- in hardware. 8 BY MR. CHRISTOPHER: 9 Q. Can you give me an example of a type of 10 database that would be used for the QoS allocation 11 database? 12 A. One second. I'm just looking for something. 13 So in your question, you said an example of a 14 type of database. So just to be clear, this is not -- 15 this is not a database in the sense of, like, Oracle 16 database or IBM Db2 or SQL Server. This is just a table 17 that is updated and queried by this algorithm. And 18 that's the same in the '449 patent. We're just talking 19 about tables that would keep track of resources that 20 were allocated for different channels. 21 Q. If Drake's QoS allocator 20, which includes the 22 QoS allocation database 25, were implemented in a system 23 on a chip, how would one of skill in the art implement 24 the functionality of the database described in Drake? 25 A. It's a table, and that just requires some type
Page 226 1 Q. All right. And then if you could turn to 2 Drake. Go to figure 5. 3 A. Yes. 4 Q. And on the left-hand side in figure 5, in about 5 the middle, you'll see a box labeled with the number 94: 6 "Update Components in Data Base." Do you see that? 7 A. Yes. 8 Q. And that's referring to the database that you 9 referred to in paragraph 116 of your declaration, right? 10 A. Right. And it's also labeled as box 25 in 11 figure 1. 12 Q. Correct. The QoS allocation database is 13 updated to reflect the quality of service that is 14 allocated for a connection, correct? 15 (Whereupon the stenographer was momentarily 16 disconnected from the videoconference.) 17 (Discussion off the record.) 18 (The record was read by the reporter.) 19 THE WITNESS: My response was: Yes, that's 20 correct. 21 MR. CHRISTOPHER: And my -- my next question 22 was -- I could just repeat it so it's all on the record. 23 Q. The QoS allocation database in Drake would be 24 implemented in software, correct? 25 MR. KOHLHEPP: Object to form.	Page 228 1 of memory. So that could be either SRAM or DRAM, 2 possibly, or -- I don't think there'd be any compelling 3 reason to make it nonvolatile storage. SRAM would be 4 the most likely way to do this, because if the system 5 powered off, you're going to lose everything anyway, 6 probably. So the likely implementation is it's just a 7 little, small chunk of SRAM that -- and there are many 8 examples of those in -- across systems on chips. And 9 then the -- however you implement the algorithm in 10 figure 5, it would just read and write this -- this 11 SRAM. So that's a very common type of thing that -- 12 common type of design that people would create for any 13 component for a system on chip having a combination of 14 computation and a little bit of SRAM storage. 15 Q. All right. Let's go to -- and I promise we're 16 almost done -- paragraph 128 of your declaration. 17 A. Okay. 18 Q. All right. And in paragraph 128, in the second 19 sentence, you wrote, "For example, Goossens2002 20 describes that its IPs," parentheses, "(i.e., processing 21 modules) 'can set up and remove connections.'" Do you 22 see that? 23 A. Yes. 24 Q. And then in the next sentence you wrote, 25 "Goossens2002 explains that the IPs do so by making a

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1 'service request' that includes information regarding
2 the performance requirements of the connection."
3 Do you see that?
4 A. Yes.
5 Q. So would you agree that the IP block in
6 Goossens2002 is able to send requests for connections
7 with certain properties?
8 A. Yes.
9 MR. CHRISTOPHER: If we could go off for a
10 couple minutes. I'm going to check with my team here,
11 and I think we could wrap up.
12 THE WITNESS: Okay.
13 (Recess taken.)
14 BY MR. CHRISTOPHER:
15 Q. All right. Dr. Mowry, did you discuss your
16 testimony with anyone during our last break?
17 A. No.
18 MR. CHRISTOPHER: All right. Well, I know it
19 was a long day. I want thank you for your time.
20 And with that I will pass the witness.
21 MR. KOHLHEPP: Thank you. Let's just take
22 another quick break, probably about 15 minutes.
23 MR. CHRISTOPHER: All right. We'll be here.
24 THE WITNESS: Okay.
25 MR. KOHLHEPP: Thank you.

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1 (Recess taken.)
2 EXAMINATION BY MR. KOHLHEPP
3 Q. Okay. Good afternoon, Dr. Mowry.
4 A. Good afternoon.
5 Q. Just a few additional questions for you. So if
6 you could turn to paragraph 17 in your declaration.
7 A. Okay.
8 Q. And let me know when you're there.
9 A. Yes, I'm there.
10 Q. Okay. So there you identify several documents
11 that you considered for your declaration, including
12 Goossens2002 and Goossens2003, right?
13 A. Yes.
14 MR. CHRISTOPHER: Leading.
15 BY MR. KOHLHEPP:
16 Q. Okay. And do you provide multiple grounds
17 under which, in your view, the claims are obvious in
18 your declaration?
19 MR. CHRISTOPHER: Objection; form.
20 THE WITNESS: There -- yes, I provide two
21 grounds, one which is Goossens2002 in view of Drake, and
22 the second is Goossens2003 in view of Drake.
23 BY MR. KOHLHEPP:
24 Q. Okay. And if it were found that the relevant
25 priority date for the '449 patent claims that are at

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1 issue was October 2002, would that change your opinions
2 at all regarding Ground I?
3 A. No, it would not.
4 Q. Okay. And if you go to paragraph 62.
5 A. Okay.
6 Q. And if you recall, you were asked several
7 questions about a definition of a POSA provided by the
8 patent owner's expert. Do you recall that?
9 A. Yes, I recall that.
10 Q. As of October 2002, did you meet the definition
11 provided at paragraph 62 by the patent owner's expert?
12 A. Yes, I did.
13 Q. Okay. You were also asked whether your
14 declaration referenced a construction from another
15 proceeding for the term "independently configurable"
16 that read, quote, "'Able to be configured with
17 connection properties that do not depend on those of
18 another configuration.'" Do you recall that?
19 A. Yes.
20 Q. Okay. And I believe that was in the context of
21 what was called Exhibit 1032, that counsel introduced.
22 Do you recall that?
23 A. Yes, I recall that.
24 Q. Okay. I want to take you to paragraph 139 of
25 your declaration.

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1 A. Okay.
2 Q. Let me know when you're there.
3 A. I'm there.
4 Q. Okay. And let me know when you've had a chance
5 to read it.
6 A. Yes, I've had a chance to read it.
7 Q. Okay. Does that refresh your recollection on
8 whether your declaration provided any opinions on a
9 construction for the term "independently configurable"
10 that reads, quote, "'Able to be configured with
11 connection properties that do not depend on those of
12 another configuration,'" closed quote?
13 A. Yes, I did discuss that in paragraph 139.
14 Q. Okay. And what was the opinion that you --
15 A. That that claim construction did not alter my
16 opinions in my declaration.
17 Q. Okay. And then if you go to paragraph 203.
18 Let me know when you've had a chance to read that.
19 A. Yes, I am there.
20 Q. Okay. Does that also refresh your recollection
21 regarding whether you -- your declaration offered
22 opinions regarding that alternative construction?
23 MR. CHRISTOPHER: Objection to form.
24 THE WITNESS: Yes, that's -- I also refer to
25 the fact here that that construction does not alter my

Page 233 1 opinions. They're the same with -- with that 2 construction. 3 BY MR. KOHLHEPP: 4 Q. You were also asked some -- some questions, 5 excuse me, about specifically where the Drake QoS 6 requestor manager would be implemented within the chip 7 in Goossens2002 and Goossens2003. Do you recall those 8 questions? 9 A. Yes, I do. 10 Q. Is deciding where specifically to implement the 11 QoS requestor manager within the chip of Goossens2002 -- 12 would that have been something that was within the 13 ordinary skill of a POSA in early 2002? 14 MR. CHRISTOPHER: Objection to form. 15 THE WITNESS: Well, absolutely. It would be 16 something that a POSA in that time frame would be very 17 comfortable doing, because, as I mentioned, it would be 18 clear -- obvious that it could go anywhere on the chip 19 as long as it had a connection to the interconnect, 20 because the only requirement, similar to figure 1 in 21 Drake, is that it just has to be -- have connectivity 22 with the -- with the IPs through the interconnect. 23 BY MR. KOHLHEPP: 24 Q. Would the answer you just gave change at all if 25 the relevant time frame was early 2003?	Page 235 1 THE WITNESS: Not that I can think of. 2 BY MR. KOHLHEPP: 3 Q. How about using a switch? 4 MR. CHRISTOPHER: Objection to form and scope, 5 and leading. 6 THE WITNESS: Well, a switch is another -- I 7 mean, a switch and a router are often used as -- 8 synonymously. A router contains a switch. 9 BY MR. KOHLHEPP: 10 Q. Have you provided any opinions in this 11 declaration about what the boundaries of the term "hop" 12 would be to a person of ordinary skill in the art? 13 MR. CHRISTOPHER: Objection to form, scope. 14 THE WITNESS: I don't think so, no. 15 BY MR. KOHLHEPP: 16 Q. Have you analyzed that issue? 17 MR. CHRISTOPHER: Same objections. 18 THE WITNESS: No, I have not. 19 BY MR. KOHLHEPP: 20 Q. Earlier you were asked some questions on 21 whether connections were preferable for multimedia 22 stream implementations. Do you recall that? 23 A. Yes. 24 Q. Are connections required to implement 25 multimedia streams, or are there other ways to do it?
Page 234 1 A. No, it would not. 2 Q. You were also asked some questions about what a 3 hop is. Do you recall that? 4 A. Yes. 5 Q. Okay. And if you could go to paragraph 89. 6 A. Okay. 7 Q. And then about the third sentence, you say, 8 "Specifically Goossens2002 explains that a NOS packet 9 traverses a number of routers, and refers to each such 10 traversal as a 'hop.'" Do you see that? 11 A. Yes. 12 Q. So there you're identifying an example of a hop 13 using a -- a router; is that correct? 14 A. Yes. 15 MR. CHRISTOPHER: Objection; leading. 16 BY MR. KOHLHEPP: 17 Q. Are you offering opinion that a hop is limited 18 to using a router? 19 MR. CHRISTOPHER: Objection; form. 20 THE WITNESS: Well, as I explain here, Goossens 21 says that a hop involves traversing a number of routers. 22 BY MR. KOHLHEPP: 23 Q. Were there other ways known in the art to have 24 hops other than traversing routers? 25 MR. CHRISTOPHER: Objection to form and scope.	Page 236 1 MR. CHRISTOPHER: Objection to form; leading. 2 THE WITNESS: Well, as I mention in my report, 3 there -- at the transport layer there can be either 4 connection-oriented or connectionless. Those are two 5 different ways to implement moving data through a 6 network. It is possible to have a multimedia stream 7 over something that does not have connections. It's -- 8 it would not necessarily have any quality-of-service -- 9 good quality-of-service characteristics in that case. 10 So that makes it preferable to use connections with 11 quality-of-service properties. But it's possible to do 12 it without connections. 13 MR. KOHLHEPP: Okay. Let's take a just 14 one-minute break, and then we can get right back on. 15 (Recess taken.) 16 MR. KOHLHEPP: Thank you for your time, 17 Dr. Mowry. And no further questions at this time for 18 me. 19 EXAMINATION BY MR. CHRISTOPHER 20 Q. I have a few follow-up questions for you, 21 Dr. Mowry. 22 In the time between I ended my questioning and 23 Mr. Kohlhepp began his questioning, did you have any 24 conversations with counsel? 25 A. No, I did not.

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1 Q. Okay. And did you discuss your testimony with
2 counsel during the last break that we took?
3 A. No, I did not.
4 MR. CHRISTOPHER: Okay. Well, with that, I
5 have no further questions. Thank you again, Dr. Mowry.
6 THE WITNESS: Okay. Thank you.
7 (Whereupon, the deposition session ended at
8 6:57 p.m.)
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1 CERTIFICATE OF REPORTER
2 I, JOHN WISSENBACH, hereby certify that the
3 witness was duly sworn by me, before commencement of
4 testimony by the witness, to testify the truth, the
5 whole truth, and nothing but the truth in the
6 within-entitled cause; that said deposition was taken at
7 the time and place therein stated, in the presence of
8 the above-noted people; that the testimony of said
9 witness was reported by me, a Certified Shorthand
10 Reporter and disinterested person, and was thereafter
11 transcribed into typewriting and is a true record of the
12 testimony given by the witness, and that the pertinent
13 provisions of the applicable code or rules of civil
14 procedure relating to the notification of the witness
15 and counsel for the parties hereto of the availability
16 of the transcript of the deposition for reading and
17 signing have been met.
18 And I further certify that I am not a relative or
19 employee of a party or of an employee of an attorney or
20 agent of a party, or interested, directly or indirectly,
21 in the proceeding either as counsel, attorney, agent, or
22 otherwise.
23 DATED: 11/11/2024
24 
25 JOHN WISSENBACH, CSR No. 6862

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1 DECLARATION UNDER PENALTY OF PERJURY
2 Case Name: Qualcomm vs. Network System Technologies
3 Date of Deposition: 11/04/2024
4 Job No.: 10152347
5
6 I, TODD C. MOWRY, PH.D., hereby certify
7 under penalty of perjury under the laws of the State of
8 _____ that the foregoing is true and correct.
9 Executed this _____ day of
10 _____, 2024, at _____.
11
12
13 _____
14 TODD C. MOWRY, PH.D.
15
16 NOTARIZATION (If Required)
17 State of _____
18 County of _____
19 Subscribed and sworn to (or affirmed) before me on
20 this _____ day of _____, 20____,
21 by _____, proved to me on the
22 basis of satisfactory evidence to be the person
23 who appeared before me.
24 Signature: _____ (Seal)
25

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1 DEPOSITION ERRATA SHEET
2 Case Name: Qualcomm vs. Network System Technologies
3 Name of Witness: Todd C. Mowry, Ph.D.
4 Date of Deposition: 11/04/2024
5 Job No.: 10152347
6 Reason Codes: 1. To clarify the record.
7 2. To conform to the facts.
8 3. To correct transcription errors.
9
10 Page _____ Line _____ Reason _____
11 From _____ to _____
12 Page _____ Line _____ Reason _____
13 From _____ to _____
14 Page _____ Line _____ Reason _____
15 From _____ to _____
16 Page _____ Line _____ Reason _____
17 From _____ to _____
18 Page _____ Line _____ Reason _____
19 From _____ to _____
20 Page _____ Line _____ Reason _____
21 From _____ to _____
22 Page _____ Line _____ Reason _____
23 From _____ to _____
24 Page _____ Line _____ Reason _____
25 From _____ to _____

Page 241 1 DEPOSITION ERRATA SHEET 2 Page ____ Line ____ Reason ____ 3 From _____ to _____ 4 Page ____ Line ____ Reason ____ 5 From _____ to _____ 6 Page ____ Line ____ Reason ____ 7 From _____ to _____ 8 Page ____ Line ____ Reason ____ 9 From _____ to _____ 10 Page ____ Line ____ Reason ____ 11 From _____ to _____ 12 Page ____ Line ____ Reason ____ 13 From _____ to _____ 14 Page ____ Line ____ Reason ____ 15 From _____ to _____ 16 Page ____ Line ____ Reason ____ 17 From _____ to _____ 18 Page ____ Line ____ Reason ____ 19 From _____ to _____ 20 Page ____ Line ____ Reason ____ 21 From _____ to _____ 22 _____ Subject to the above changes, I certify that the transcript is true and correct 23 _____ No changes have been made. I certify that the transcript is true and correct. 24 25 _____ TODD C. MOWRY, PH.D.	

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