

1           UNITED STATES PATENT AND TRADEMARK OFFICE  
2           BEFORE THE PATENT TRIAL AND APPEAL BOARD  
3       RESMED CORP,                                )CASE IPR 2025-00159  
                                                          )U.S. PATENT NO. 11,375,921  
4                    PETITIONER,                    )  
                                                          )CASE IPR 2025-00160  
5       V.                                            )U.S. PATENT NO. 11,786,680  
                                                          )  
6       CLEVELAND MEDICAL                        )MOBILE VIDEOCONFERENCE  
      DEVICES, INC.,                                )DEPOSITION OF  
7                                                        )SANDEEP CHATTERJEE, Ph.D.  
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MOBILE VIDEOCONFERENCE DEPOSITION OF SANDEEP  
CHATTERJEE, Ph.D., taken remotely before Cheryl A.  
Rooney, RPR, CRR, Online General Notary Public within  
and for the State of Nebraska, beginning at 9:58 a.m.  
PST, on January 27th, 2026.

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1                   SANDEEP CHATTERJEE, Ph.D.,  
2                   having been first duly sworn,  
3                   was examined and testified as follows:

4                   DIRECT EXAMINATION

5       BY MS. FULLER:

6           Q.    Good morning, Dr. Chatterjee.  How are  
7   you today?

8           A.    Good morning.  I'm doing well.

9           Q.    Thank you for being here.  Do you  
10 understand why you are here today?

11          A.    To have my deposition taken.

12          Q.    And your deposition taken in  
13 connection with your reply declaration submitted  
14 in IPR 2024-00159 and 00160; is that correct?

15          A.    I do not recall the IPR numbers, but  
16 it's the IPR numbers related to the '921 and  
17 '680 patents.

18          Q.    Is that okay today when referencing  
19 your declarations that we call them the '921  
20 declaration or the '680 reply declaration?

21          A.    Yes, that will be great.

22          Q.    And just a little housekeeping before  
23 we get started.  Do you have your declarations  
24 available to you, or would you like them  
25 uploaded?  Let me know.

1           A.    I have printed out a hard copy of the  
2    declarations in front of me.

3           Q.    And aside from the hard copies of the  
4    declarations, what other materials do you have  
5    in front of you?

6           A.    I have a coffee and a water.  And a --  
7    it looks like a binder that has the patents,  
8    like all of the materials for the IPRs.

9           Q.    Okay.  Good to know.  Then if I  
10   reference something outside of your reply  
11   declaration you'll have a binder available to  
12   you for hard copies of exhibits, for example;  
13   correct?

14          A.    I believe so.  I'm not sure if it has  
15   everything, but it's a pretty thick binder.  I  
16   haven't looked through it.  But I know for a  
17   fact it has the two reply decs.

18          Q.    Okay.  Well, we'll cross that bridge  
19   if we get there.  If you need something that's  
20   not available to you in your binder, I can  
21   upload it to the chat.  Is that all right?

22          A.    That sounds great.

23          Q.    So in preparing for your deposition  
24   today, did you review any materials, exhibits in  
25   that preparation?

1           A.    I did.

2           Q.    And what were those materials that you  
3 reviewed?

4           A.    I reviewed my two reply declarations.  
5 I reviewed Dr. Goodrich's declarations. I  
6 obviously reviewed the patents. I reviewed my  
7 original declarations. So those are some of the  
8 items that come to mind, but there were quite a  
9 few documents that I reviewed in preparation for  
10 today.

11          Q.    Just giving me a ballpark, how much  
12 time did you spend in your preparation for  
13 today's deposition?

14          A.    So do you mean only for preparing for  
15 the depo today, not like everything, like from  
16 my original declarations, just for preparation  
17 for today?

18          Q.    Yes, just for preparation for today's  
19 deposition.

20          A.    I don't know, but probably in the  
21 20ish hours, I would think.

22          Q.    So Dr. Chatterjee, can you open your  
23 '921 reply declaration, and you just spoke that  
24 you have that available to you.

25          A.    Okay. I have my '921 declaration in

1 front of me.

2 Q. So I'm going to direct you to  
3 Paragraph 3 where you state that you've reviewed  
4 the patent owner response and the declaration of  
5 Dr. Goodrich, and provide opinions to certain  
6 arguments made in those documents. Do you see  
7 that?

8 A. I do.

9 Q. Why did you only provide opinions to  
10 certain arguments? Did you agree with the other  
11 arguments that Dr. Goodrich provided?

12 A. No. Dr. Goodrich's analysis and  
13 opinions are just wrong, and fundamentally wrong  
14 from a technical perspective.

15 Q. So then what made you only submit a  
16 reply declaration that addressed certain  
17 arguments as opposed to his whole declaration?

18 A. Well, I think some of the arguments  
19 that he makes I had previously addressed. For  
20 example, even at my deposition -- like for  
21 example, his assertions about NAT technology is  
22 just plain wrong. And this was addressed  
23 earlier, I believe, in my earlier declaration so  
24 there was no need to again respond to things  
25 that already have been identified as being

1       fundamentally flawed and incorrect.

2           Q.    Did you address NAT technology in your  
3       opening brief -- or opening declaration?

4           A.    I don't believe I did, but I believe I  
5       addressed it -- I believe you asked me questions  
6       during my deposition in relation to my first  
7       declaration.

8           Q.    So during your testimony in your --  
9       during your first deposition and testimony,  
10      that's where you addressed the NAT, network  
11      address translation issues; is that correct? Is  
12      that what you're saying?

13          A.    I believe so, because like I'm saying,  
14      what he's saying in his declaration is just  
15      fundamentally wrong. Like you can read any  
16      basic computer science textbook and that would  
17      show that what he's saying in his declaration is  
18      wrong. So it was addressed -- you asked me --  
19      you or your colleague asked me questions, and I  
20      addressed some of those at the deposition.

21          Q.    What do you believe Dr. Goodrich  
22      opined to in his opinions on network address  
23      translation that is fundamentally wrong?

24                   MS. ALEXANDER:  Objection.  
25      Outside the scope.

1                   THE WITNESS: Well, for example,  
2     I don't have his declaration here in front of  
3     me, but he seems to say that if a server is  
4     behind a NAT, that it's unreachable, and that is  
5     just fundamentally wrong. I've built web  
6     servers, I've had web servers that are behind  
7     the NAT, and they're clearly reachable. And so  
8     the fact that he makes these kind of statements  
9     which are fundamentally flawed demonstrates  
10    that his -- as I've pointed to in some of my  
11    other statements and opinions in my reply  
12    declaration, that his opinions and his technical  
13    analyses are wrong and flawed.

14   BY MS. FULLER:

15         Q.    So you believe that his opinions for  
16    NAT is fundamentally wrong, but you did not  
17    provide the reasoning in your reply declaration;  
18    is that correct?

19               MS. ALEXANDER: Objection;  
20    mischaracterizes his testimony.

21               THE WITNESS: Well, what I stated  
22    was that I -- you or your colleague asked me  
23    questions about NAT, and then on top of that,  
24    even the point that he makes about NAT doesn't  
25    impact the analysis because he seems to say that

1 NAT is used prevalently. But that doesn't mean  
2 that it's used all the time. And so there was  
3 really no need for me to respond, even though  
4 his opinions are fundamentally wrong and flawed  
5 and just picking up a basic computer science  
6 textbook would demonstrate that it's wrong. But  
7 his opinion doesn't really impact the opinions  
8 that I stated because he himself is conceding  
9 that NAT is not used a hundred percent of the  
10 time. So clearly one of ordinary skill would  
11 understand that web servers don't have to be  
12 behind the NAT.

13 But what I'm saying is that even his  
14 arguments that are not relevant to the analysis  
15 here, it just shows that his technical analyses  
16 and the technical facts that he believes are  
17 correct are fundamentally flawed and incorrect.

18 BY MS. FULLER:

19 Q. Can we turn to paragraph -- let's  
20 start at Paragraph 5 of your '921 declaration.

21 A. Okay. I'm there.

22 Q. So in this section is it a correct  
23 understanding that you're opining that a POSITA  
24 would have implemented Toge's physician-side  
25 computer as both a client device and a web

1 server?

2 A. Say that again? I'm not sure I  
3 understood your question.

4 Q. So starting off of Paragraph 5, which  
5 is under the section Toge and BEO Kumar renders  
6 obvious a remote Internet site, is it your  
7 opinion that a POSITA would have implemented  
8 Toge's physician-side computer as both server  
9 and client?

10 A. I'm not sure what you mean by  
11 implemented as both a server and a client. What  
12 I'm stating is that one of ordinary skill would  
13 have known that implementing the physician-side  
14 computer as, for example, a web server was well  
15 known and common, even at that time period. And  
16 then in addition, with regards to the Kumar  
17 reference, it expressly talks about the use of  
18 web technologies and web pages.

19 And so what I'm stating here is that  
20 the physician-side computer could have a server  
21 running on it, as well as a client running on  
22 that same machine on the physician-side computer  
23 in order to, for example, allow that physician  
24 to access the data from that server.

25 Q. So when you speak to improving Toge's

1 system based on Kumar's web server teaching, is  
2 this in reference to the implementing of server  
3 on Toge's physician-side computer? And speak to  
4 it in Paragraph 20, for example. Or pardon me,  
5 Paragraph 15, a POSITA implementing the improved  
6 Toge system.

7 MS. ALEXANDER: Counsel, what's  
8 the pending question?

9 BY MS. FULLER:

10 Q. So where you speak to a POSITA  
11 implementing the approved Toge system, is that  
12 in reference to a physician-side computer that  
13 is implemented with a web server?

14 A. I'm not sure I understand your  
15 question still.

16 Q. I'll break it down. The improved Toge  
17 system, what is improved in the Toge system?

18 MS. ALEXANDER: Objection.  
19 Vague.

20 THE WITNESS: So are you -- you  
21 first asked me about Paragraph 5. And I think  
22 you read from the subtitle that's above  
23 Paragraph 5, which states that Toge, in view of  
24 Kumar, renders obvious a "remote intranet site  
25 where Toge's physician-side computer is

1 implemented as the web server."

2 So in view of what the title is  
3 saying, I'm not sure I understand your question.

4 BY MS. FULLER:

5 Q. I'm just trying to understand what is  
6 improved in Toge's system.

7 MS. ALEXANDER: Objection.

8 Vague.

9 BY MS. FULLER:

10 Q. So is it a correct understanding that  
11 what is improved in Toge's system is its  
12 physician-side computer because that is  
13 implemented now as a web server in addition to a  
14 client?

15 A. I don't understand --

16 MS. ALEXANDER: Same objection.

17 Sorry.

18 THE WITNESS: I didn't understand  
19 the last part of your question where you're  
20 saying it's implemented as to web server in  
21 addition to a client. What does that mean?

22 BY MS. FULLER:

23 Q. Is a physician-side computer in Toge's  
24 unmodified system, is that just a personal  
25 computer?

1           A.    It's a computer.  I'm not sure it's  
2    limited to a personal computer but it could be a  
3    personal computer.

4           Q.    And now that it's in the modified  
5    system, it would be implemented with a web  
6    server based on Kumar's teaching; is that  
7    correct?

8           A.    Well, just to be clear, when you're  
9    saying a web server, it's software that would be  
10   running on Toge's physician-side computer.

11          Q.    So in running software on Toge's  
12   physician-side computer, which is the web server  
13   software, is that the improvement that you speak  
14   to in Toge's improved system?

15          A.    That is one aspect of it, and I think  
16   I talk about it in my original declaration, the  
17   numerous benefits of that.  And I believe it's  
18   readily obvious, for example, in Toge.  Toge  
19   doesn't provide implementation details, and so a  
20   POSITA would naturally look to, for example,  
21   Kumar, and as I explained earlier, even outside  
22   of Kumar, one of ordinary skill would have  
23   readily known about web servers and web client  
24   technology or web-based technologies, and the  
25   fact that it would allow access to the data from

1 multiple devices and from different locations as  
2 well.

3 Q. Can we turn to Paragraph 8 of your  
4 '921 reply declaration.

5 A. Okay.

6 Q. So you say in the case of client and  
7 server both residing on the same computer, that  
8 communications from client server are located on  
9 the same machine. Are these communications  
10 going through a virtual interface on the local  
11 machine to allow, for example, the client  
12 browser and the local server to communicate with  
13 one another?

14 MS. ALEXANDER: Objection.  
15 Outside the scope.

16 Jenna, your words are getting clipped  
17 a little bit. If you could just enunciate a  
18 little better.

19 MS. FULLER: Oh, are they?

20 MS. ALEXANDER: Yes. Thank you.

21 MS. FULLER: Thank you for  
22 bringing that to my attention.

23 THE WITNESS: So I'm not sure I  
24 understand your question. What do you mean by  
25 virtual interface?

1 BY MS. FULLER:

2 Q. I want to understand how the  
3 communications from a client to server occur on  
4 the same machine. Could you walk me through  
5 that?

6 A. How they occur on the same machine?  
7 Well, like I mentioned, for example, server is a  
8 software, and if we're looking at specifically  
9 web server, it's a specific type of software.  
10 And a POSITA would know that web servers  
11 typically accept connections to port 80 or port  
12 443.

13 And so with regards to what I'm  
14 talking about in Paragraph 8, a client, for  
15 example a web browser, which is an example of a  
16 client software, if the client is connecting to  
17 the local host, the operating system would  
18 deliver that message to port 80 or port 443 of  
19 the web server.

20 So what I'm talking about here is that  
21 the specific design of having a client and a  
22 server on a single machine is so common that  
23 there is a shorthand that is used called local  
24 host, and anyone who has ever developed  
25 software, especially network communication

1 software or web-based software, knows the use of  
2 local host.

3 And so I was very surprised in reading  
4 in Dr. Goodrich's statements that people don't  
5 have clients and servers running on the same  
6 machine, and in fact, even his own documents  
7 that he cites to disproves his own statements.  
8 He cites to one portion of a document, and if  
9 you look up like 10, 15 lines above to the  
10 document that he's citing to, it even says that  
11 clients and servers can be on the same machine.

12 And so what I'm simply stating here is  
13 again, like I explained to you at the beginning,  
14 that Dr. Goodrich's technical analyses and  
15 opinions are fundamentally incorrect,  
16 fundamentally flawed, and this is just another  
17 example, another datapoint of why Dr. Goodrich's  
18 statements and opinions are wrong and flawed.

19 Not only is it possible to have client  
20 and server software on the same machine, but  
21 it's common to do so, and it's so common that  
22 there is a shorthand called local host to allow  
23 this kind of communications between clients and  
24 servers running on the same machine to happen.

25 Q. So in this local host example, the

1 client browser that's on the machine would send  
2 a request for data to the local host server  
3 that's on the same client machine, and the local  
4 host server would send back the data; is that  
5 correct, what's going on in the communication?

6 A. Yes. So for example, if the server is  
7 a web server and the client is a web client, for  
8 example, a browser, you would type into the part  
9 of the browser where you put in the URL, you  
10 would put in HTTP://localhost, and then you  
11 would put a colon for either port 80 -- even if  
12 you don't put the colon, the browser will  
13 automatically put in port 80. And it will send  
14 the message to the server software listening on  
15 that port and the server software will respond  
16 to that request, that HTTP request with the  
17 data. Which would be, for example, HTML page or  
18 HTML formatted web page.

19 Q. And that's the local host server  
20 that's on the same machine; correct, that's  
21 responding?

22 A. No, it's not a local host server.  
23 It's a web server. Local host is simply a  
24 shorthand to refer to servers on that machine.

25 Q. So it's a web server on that same

1 machine that's responding to the HTTP request  
2 from the client browser; that's a correct  
3 understanding?

4 A. On that same machine, yes.

5 Q. Dr. Chatterjee, do you have  
6 Exhibit 2020 available to you? Let me know.

7 A. I'm being told that I do have it.

8 MS. ALEXANDER: At the other end,  
9 the back are exhibits, these are some of them.

10 THE WITNESS: Oh, okay, I see it.

11 BY MS. FULLER:

12 Q. You have a good team on your side  
13 prepping you.

14 A. Yeah. Okay, I have Exhibit 2020 open.

15 Q. Can I direct you to the first page of  
16 that exhibit, specifically where it says servers  
17 play very important roles in information  
18 systems. It's right under the server heading.

19 A. The servers heading, like --

20 Q. Yes, page one. Let me know when you  
21 get to that sentence and I'll let you read it.

22 A. So it's the second sentence in that  
23 section?

24 Q. Yes.

25 A. Okay. I've quickly scanned through

1       it.

2           Q.    So in that sentence it has the term  
3       distributed computing environments.  Do you see  
4       that term?

5           A.    I do.

6           Q.    Do you have an understanding what  
7       distributed computing environments means?  And  
8       if so, could you elaborate on that?

9                   MS. ALEXANDER:  Objection.  
10       Outside the scope.

11                  THE WITNESS:  So distributed  
12       computing typically refers to computing  
13       resources and functionality that's distributed  
14       and connected by a network.

15       BY MS. FULLER:

16           Q.    And what are the advantages that flow  
17       from distributed computing environments?

18           A.    Well, it can -- like we've talked  
19       about, it can allow access to data from  
20       different devices and different locations.

21           Q.    So for an example, a client device  
22       could access data from a database server that's  
23       at a different location?  Is that an example of  
24       an advantage of a distributed computing  
25       environment?

1           A.    It could, yes.

2           Q.    And do you have an understanding of  
3 why a computer could not take advantage of this  
4 distributed mobile -- distributed computing  
5 environment? For example, why a client device  
6 would not be able to access a database server?

7                   MS. ALEXANDER: Objection; vague.

8                   THE WITNESS: I'm not sure I  
9 understand the question. What do you mean, why  
10 a client device would not be able to access a  
11 database server?

12 BY MS. FULLER:

13           Q.    Are there reasons why a computer could  
14 not take advantage of the distributed computing  
15 environment?

16                   MS. ALEXANDER: Objection; vague.

17                   THE WITNESS: I'm still not  
18 understanding the question. If a client device  
19 is meant to be used within that distributed  
20 computing environment, I'm not sure your  
21 question makes sense.

22 BY MS. FULLER:

23           Q.    Well, let's go to -- give me one  
24 second. Okay. Let's go to Page 4.

25           A.    Of Exhibit 2020?

1           Q.    Page 4 of Exhibit 2020, under the  
2    heading Servers For Multiple Tiers of Client  
3    Server.

4           A.    Okay. I'm there.

5           Q.    So this states or discusses a  
6    single-tier client server application. Do you  
7    see that discussion?

8           A.    Are you looking above Section 2 or  
9    below?

10          Q.    I'm looking in the paragraph below  
11    Section 2.

12          A.    You mean the sentence where it  
13    confirms that a client process and server  
14    process can be on the same computer?

15          Q.    The sentence after that, A single-tier  
16    client server application.

17          A.    Okay. I'm there.

18          Q.    So it talks about a single-tier client  
19    server application. And then in the next  
20    sentence it says, This kind of application is  
21    rarely used today because it will not take  
22    advantage of the distributed computing  
23    environment.

24                Do you see that?

25          A.    I do.

1           Q.    Do you have an understanding why a  
2           single-tier client server application cannot  
3           take advantage of the distributed computing  
4           environment?

5           A.    Well, it's saying if the application  
6           is limited to having the user interface, the  
7           business rules, and the data manipulation  
8           processees all on one computer. But that's not  
9           what we're talking about. We're talking about  
10          you have the server and you have the client, and  
11          in that typical web server with a web client  
12          it's not precluded from having other devices  
13          access that server on that machine as well.

14                And so I don't really understand the  
15          relevance of what you're pointing me to, to what  
16          we're talking about in the combination based on  
17          Toge that I opined on.

18          Q.    What is your understanding of a  
19          single-tier client server application? Is that  
20          where a client and server are on the same  
21          machine?

22          A.    Well, it's talking about where you  
23          have the user interface, the business rules, and  
24          the data manipulation processees all on one  
25          computer. But what we're talking about in the

1       Toge system, in combination with the knowledge  
2       of a POSITA or with Kumar, we're talking about a  
3       web server and a web client, and clearly there  
4       can be other clients that are able to access  
5       that web server.

6               And so this is talking about something  
7       completely different than what the actual  
8       combination that we're talking about in my  
9       declarations.

10            Q.    A user interface, is that part of a  
11       client browser?

12            A.    It could be.

13            Q.    And then the business rules, what --  
14       is that part of a server?

15                   MS. ALEXANDER:  Objection.  
16       Relevance.

17                   THE WITNESS:  The business rules  
18       could be part of the business logic that the  
19       server performs.

20       BY MS. FULLER:

21            Q.    And the data manipulation processees,  
22       could that also be part of the server?

23            A.    Could be part of the functionality  
24       that the server performs.  But again, like I  
25       explained, this is not what we're talking about.

1 We're talking about a web client and the web  
2 server, and this is talking about something else  
3 where it's not a web client, it's talking about  
4 a client which cannot be used on any other  
5 device.

6 As we know, a web client by  
7 definition, for example, a web browser, can be  
8 used on multiple devices. And so you can have a  
9 web client on that same machine that is hosting  
10 the server, but you can also have web clients on  
11 a multitude of other machines as well, and  
12 access the server on the physician-side computer  
13 in the combination that we're talking about.

14 Q. And the combination we're talking  
15 about in which Toge's physician-side computer is  
16 operating as a web client, as well as a web  
17 server; is that correct?

18 A. Yes. But like I explained, that's not  
19 what this is talking about. This is talking  
20 about the situation where you don't have or  
21 cannot have other clients that are accessing the  
22 server.

23 With the web client, a web browser can  
24 be run on multiple devices, and by putting in  
25 the URL for the physician-side computer, which

1 is running the server, any of those devices can  
2 access the data from the physician-side  
3 computer. So in the combination, the benefits  
4 of distributed computing directly come into  
5 play. And I talked about that throughout my  
6 original declaration, and I talked about it  
7 additionally in my reply declarations.

8 And I just show why what Dr. Goodrich  
9 is saying is wrong because he seems to believe  
10 that people don't do this, people don't run a  
11 web client and a web server on the same machine.  
12 In fact, a lot of the management software for  
13 managing web servers are in fact run as web  
14 clients as well. And even back in the relevant  
15 time period, in the 2005 time period, that was  
16 the case as well.

17 Q. And that goes back then to your  
18 Paragraph 8 that you speak to of communications  
19 from clients and servers known as a local host;  
20 is that correct?

21 A. Like I explained, local host is a  
22 shorthand for a specific IP address which sends  
23 the message data to that same machine.

24 Q. So in this Paragraph 8 then, this is  
25 how clients and server are then communicating

1 with one another; is that correct?

2 A. It's not that they're designed to  
3 communicate like that. This is industry  
4 standard technology. You just type in local  
5 host into the browser. If the browser is on the  
6 same machine as the server, you just type in  
7 local host and you're able to access that web  
8 server on that same machine.

9 If you have a browser on a different  
10 machine you type in the IP address of the  
11 physician-side computer that's running the web  
12 server and you can equally access the data that  
13 is hosted by that web server running on the  
14 physician-side computer. This is all industry  
15 standard, common -- well-known industry standard  
16 technology that has existed from the 1990s.

17 Q. And you speak to -- in your reply  
18 declaration you speak to this as shorthand  
19 communication known as local host; that's  
20 correct?

21 A. I state that local host is a shorthand  
22 for IP address 127.0.0.1, and that sends the  
23 message to that same machine.

24 Q. Can we go to Paragraph 15 of your '921  
25 reply declaration.

1           A.    Okay.  I'm there.

2           Q.    So in this paragraph you say that if  
3   clients and server are implemented in the proper  
4   way, the principal concern of computer  
5   architecture such as security can be addressed.  
6   Do you see that?

7           A.    Yes, I do cite to some language that  
8   talks about implementing in the proper way, yes.

9           Q.    How would a POSITA implement a clients  
10   and server that are on the same machine in a  
11   proper way such that security vulnerabilities  
12   for example, web server vulnerabilities, would  
13   be mitigated?

14          A.    I'm not sure I understand the  
15   question.  If you have the web browser and the  
16   web server on the same machine, you have very  
17   few, if any, vulnerabilities.  And like I've  
18   explained, security is handled by, for example,  
19   the use of HTTPS.  Again, these are all industry  
20   standard technologies.  The use of web servers  
21   and web pages and web browsers was not new or  
22   uncommon.  There's a reason why there were web  
23   pages and websites for millions of companies,  
24   banks, because this was all secure, well-built  
25   technology if you did it the correct way.

1                   For example, by using the secure form  
2   of HTTP for communications, if you're using  
3   standard web browser technologies, standard web  
4   server technologies. So these are all well  
5   understood industry standard technologies that  
6   were used throughout the world for different  
7   types of businesses, including banks and  
8   governments. And I, in fact, was making my  
9   mobile banking technology at that time, and we  
10   also used web technologies, and clearly web  
11   technologies were secure and safe, even to  
12   perform banking transactions.

13           Q.   In your banking transaction example  
14   were you working with a database server that was  
15   located at a different location than the client  
16   devices?

17           A.   There were a large number of client  
18   devices that were located remotely, but we  
19   also -- like I explained, having a client  
20   running on the same server, that's very common.  
21   And that's common for doing things like  
22   management of the web server, as well as all you  
23   have to do was open a web browser on that server  
24   where you are running the web server to access  
25   the data.

1                   And so, yes, exactly what I'm talking  
2    about in my combinations for the patents that  
3    we're talking about here, that's precisely what  
4    was done in the software industry at that time  
5    and even before that time, and I myself, in  
6    developing one of the first mobile banking  
7    systems in the world, if not the first mobile  
8    banking system in the world, used the same  
9    secure web technologies to do this.

10           Q.    When you reference management, what do  
11   you mean by management? Is that like for  
12   testing purposes?

13           A.    It could be for testing. Like you  
14   were saying, oftentimes you would simply open up  
15   a browser and see that you're able to access the  
16   data on the web server, see that it's being  
17   displayed correctly. But what I really mean by  
18   management is more generically configuring the  
19   web server, how you want the web server to  
20   behave. Potentially having whitelists or  
21   blacklists. So it's more generically managing  
22   the web server software and changes to the  
23   configuration or data files that the web server  
24   might be using.

25           Q.    So the configurations, is this like

1 all making a web server ready for deployment?

2 MS. ALEXANDER: Objection.

3 Outside the scope.

4 THE WITNESS: It's not really

5 about making it ready for deployment only.

6 There's ongoing configurations that you -- that

7 people do when running or managing a web server.

8 So like I said, uploading different entries to

9 the whitelist or the blacklist, that's one

10 example. So there's ongoing management that

11 happens all the time for a web server, and

12 oftentimes these web servers, the management of

13 the web server is done by simply opening a

14 browser, which is a client, and typing in a

15 local host and then you're able to access the

16 management dashboard, and then you are able to

17 make the configuration changes, the management

18 changes that I'm talking about.

19 BY MS. FULLER:

20 Q. So going back to the data improving

21 security, are you familiar with SQL injections

22 on databases?

23 A. I am, but I'm not sure I understood

24 the first part of your question where you said

25 database improving security.

1           Q.    So I want to go back to the line of  
2   questioning with improving the security.  And  
3   particularly how the clients and server are  
4   implemented in the proper way to improve the  
5   security.  And I just want to kind of get an  
6   understanding on that there existed SQL  
7   injection attacks; correct?  Or there exists SQL  
8   kind of malicious attacks.

9                   MS. ALEXANDER:  Objection.  
10   Vague.

11                   THE WITNESS:  Can you give me an  
12   example of what you're talking about?  There can  
13   be attacks, but I'm not sure I understand what  
14   you're talking about, or why the physician in  
15   the combined system that we're talking about  
16   would do any such attacks.  So I'm not really  
17   understanding your question.

18   BY MS. FULLER:

19           Q.    So SQL injections are web server  
20   vulnerabilities; correct?

21           A.    I'm not sure what you mean by it's a  
22   web server vulnerability.

23           Q.    Are web servers vulnerable to SQL  
24   injection attacks?

25           A.    I don't think web servers in general

1 are vulnerable to any type of attack. A  
2 specific web server that may have poor  
3 implementation can have vulnerabilities, but the  
4 point that I'm trying to make in Paragraph 15 is  
5 that if you implement web server technology and  
6 web client technology in the proper way -- and  
7 again, these are industry standard technologies.  
8 There were implementations available to build --  
9 or to take advantage of existing web server  
10 technologies and web browser technologies. So  
11 I'm not sure I understand your question about  
12 web servers being, in general, vulnerable to any  
13 type of attack.

14 Q. Well, a web server can be injected  
15 with a -- or have an SQL injection; correct,  
16 where it targets the database?

17 MS. ALEXANDER: Objection; vague.

18 BY MS. FULLER:

19 Q. Does it happen in the art that an SQL  
20 injection targets a web server's database?

21 A. Which database are you running? Which  
22 immersion are you running? What is the  
23 software? I don't understand this question.  
24 And I can't answer it without you giving me  
25 details about the architecture, the software,

1     what the system is doing, what this alleged  
2     attacker is trying to do.

3           Q.    What is an SQ injection attack?  Can  
4     you just provide that to me?

5           A.    Well, this is a high level concept  
6     that is like an umbrella term that can -- that  
7     says that, you know, you can put data into a  
8     database and you can corrupt the database by  
9     providing bogus data and potentially overriding  
10    existing data.

11                But the point that I'm trying to make  
12    is that if you develop these systems the correct  
13    way -- and it's not hard, even back then in 2005  
14    or even before that, these are industry standard  
15    technologies.  And so -- and then on top of  
16    that, the actual combination that we're talking  
17    about, we're talking about a web server running  
18    on the physician-side computer.  So it's a  
19    secured computer, as well.

20                So I don't see how the relevance of  
21    what you're talking about comes into the actual  
22    combination, the actual system that we're  
23    talking about in my declarations.

24           Q.    Well, if an SQL injection corrupts  
25    data, then it's getting on the computer that's

1 running the client and the web server; correct?

2 MS. ALEXANDER: Objection; vague.

3 THE WITNESS: Say that again,  
4 it's getting on the client --

5 MS. FULLER: Let me strike that.

6 BY MS. FULLER:

7 Q. You just testified to an SQL  
8 injection, in broad strokes, being an attack on  
9 the data; correct?

10 A. I explained that it's an umbrella term  
11 that could encompass something like that. But I  
12 also testified that I don't see the relevance of  
13 that to the combination that we're talking about  
14 because we're talking about industry standard  
15 technologies, which were well known how to  
16 implement them properly.

17 And then on top of that in the  
18 specific combination that we're talking about,  
19 the web server would be running on the  
20 physician-side computer, which would be secured  
21 as well. So I don't see how these attacks, not  
22 only this kind of attack that you're talking  
23 about, but any other attack, would be able to  
24 happen in the specific combination that we're  
25 talking about.

1                   So that's where the confusion is  
2   coming from. You're not really telling me how  
3   this attack is happening, why it's happening.  
4   But the fundamental point that I'm making in my  
5   declaration is that a POSITA would know how to  
6   implement industry standard technologies because  
7   it's already well known how to implement these  
8   technologies using best practices because these  
9   are industry standard technologies and industry  
10   standard software.

11           Q.    I want to get to two points on that  
12   line of questioning. One is you say that the  
13   physician-side computer would be secure. Why  
14   would it be secure?

15           A.    Well, it's the physician-side  
16   computer. So it's meant for the physician to be  
17   using. I would think that a POSITA would  
18   understand from the disclosure of the Toge  
19   reference that a physician-side computer would  
20   not be open and accessible to the public, for  
21   example, in the middle of a parking lot or in  
22   the middle of a mall or something.

23                   I think a POSITA reading the full  
24   disclosure of Toge would understand that the  
25   physician-side computer is a computer that is

1 accessible to one or more physicians, and so it  
2 would not be accessible to the general public.

3 Q. The physician-side computer has  
4 network access, though; correct?

5 A. It does have network access, yes.

6 Q. And with access to the general public  
7 network or other devices, doesn't that introduce  
8 security issues?

9 A. It does not. That's my point. If the  
10 use of web technologies, even in 2005 or even  
11 before that, introduced security issues, then  
12 nobody would be -- would have been using web  
13 technologies at that time.

14 And so the whole point I'm trying to  
15 make is that there are correct ways of using  
16 industry standard technologies. And even in the  
17 2005 and earlier time frame a POSITA would have  
18 known those best practices, and regardless,  
19 whatever issues there are -- and I think I touch  
20 on this in other portions of my reply  
21 declaration -- that there would not be these  
22 fundamental security vulnerabilities.

23 And one example to just understand  
24 this is that web pages and websites were used  
25 throughout the world even at that time, and like

1 I mentioned, even for performing secure  
2 transactions, governments were using it, banks  
3 were using it, even in the healthcare space  
4 people were using it. And like I said, I was  
5 developing technology myself at this time  
6 period, and we had the largest banks all around  
7 the world license our technology, and they were  
8 using it to serve millions of end users with  
9 huge numbers of devices accessing the web  
10 servers that were running our web server  
11 technology, as well as other application server  
12 technologies.

13 So it's just wrong to say that as soon  
14 as you have a network connection or as soon as  
15 you have a server and a client, that there's  
16 vulnerabilities.

17 Q. But you do admit that vulnerabilities  
18 exist at that time?

19 MS. ALEXANDER: Objection; vague.

20 THE WITNESS: If you --

21 BY MS. FULLER:

22 Q. I'm just trying to understand whether  
23 you're saying there's no vulnerabilities  
24 whatsoever, or that there are vulnerabilities,  
25 but a POSITA would know how to implement the

1 architecture in the proper way to mitigate.

2 A. Well, I'm not even sure that what you  
3 said in that second part is correct. I don't  
4 think that there are vulnerabilities and that a  
5 POSITA would know how to mitigate. What I'm  
6 trying to say is that there were best practices  
7 that were known. And in fact, even my book,  
8 which was published in 2004, talks about the  
9 best practices in how computers communicate.

10 So if you use the best practices, if  
11 you use encryption technology that existed at  
12 that time, and you developed these systems using  
13 the industry standard best practices, which were  
14 well known and publicized in many books,  
15 including my own book from 2004, then you would  
16 be able to develop a network-based system that  
17 is secure and safe to use. And I provided the  
18 example, the fact that there were a multitude,  
19 millions of websites that were available and  
20 used even at that time period to demonstrate  
21 that web technologies, if they're developed the  
22 right way, are secure and safe to use.

23 Q. So then let's drill down, then, on the  
24 specific implementation of the physician-side  
25 computer implemented as a client and a web

1 server. Can you give me concrete examples of  
2 the proper ways that such implementation would  
3 be done to mitigate the security concerns?

4 A. I think I disagree with your premise  
5 of the security concerns. Because you're  
6 like -- you're talking about the solution that  
7 I'm talking about where you have -- on the  
8 physician-side computer you're running the web  
9 server, as well as the client. And then you  
10 also have the ability to have other devices  
11 access that web server.

12 And so what -- I think I've explained  
13 this to you already that if you use standard  
14 encryption technologies, for example, HTTPS was  
15 well known way before 2005. In fact, my book  
16 talks about HTTPS and the encryption that it  
17 allows if you use things like proper  
18 authentication, for example, having a password  
19 and a user name to allow authorized people to  
20 get access to the data that the web server has,  
21 these were all well known concepts long before  
22 2005, and a POSITA would have known about these  
23 concepts. And again, like I mentioned, these  
24 are best practices, they were published heavily,  
25 including in my own book, and a POSITA would

1 have implemented these industry standard  
2 technologies using the best practices and using  
3 even third party software that was available.

4 And I'll give you another example.

5 Long before 2005 I worked at a company called  
6 Bluestone Software, which was acquired by  
7 Hewlett Packard. Bluestone developed Java 2  
8 Enterprise Edition application server  
9 technology, which incorporates a web server in  
10 it.

11 The reason people use software from  
12 Bluestone as well as from other competing  
13 companies like BEA and others is that you didn't  
14 have to worry about security issues. You would  
15 simply license the Bluestone application server  
16 or the BEA application server, or even IBM had  
17 its own technology called WebLogic, you could  
18 just license that software, and that server  
19 software, you could run it on your own machine  
20 or you could rent a machine and you could run  
21 BEA or IBM or Bluestone Software on it, and it  
22 handled all of the security authentication,  
23 authorization, everything that I'm talking  
24 about, all this plumbing was provided for you by  
25 these third parties, and all you had to do is

1     develop your website on top of it. You have to  
2     specify, well, I want to have a blue-colored  
3     page that has this log-in that asks for your  
4     user name and password, what designs you want.  
5     That's all you have to do.

6             Even by 2005 this technology was  
7     available, it was available to people in the  
8     industry. They didn't have to build it from  
9     scratch. They could simply license it and  
10    develop a website on it, and the security  
11    issues, the authentication issues, authorization  
12    issues would all be handled for them using these  
13    software that already had these issues worked  
14    out.

15            Q.    So what you just spoke to is where  
16    a -- you are using the software that is run on a  
17    server; correct, and that software then will  
18    provide the security?

19            A.    Yes. It provided the plumbing, so the  
20    basic concept of having these application  
21    servers is -- they were known as middleware  
22    because it was understood long before 2005 that  
23    whenever you're building anything for the web  
24    you have to build these same technologies for  
25    security, for authentication, for authorization,

1 and even other things. Everyone had to build  
2 it. So rather than everyone having to build it  
3 from scratch, you could simply license  
4 technology from BEA, IBM, or Bluestone, and you  
5 could just use that software and not worry about  
6 the plumbing, like the middleware functionality,  
7 because it was common to anyone using web-based  
8 technologies.

9 Q. So a person that is implementing a web  
10 page or implementing a web server would then  
11 just use this IBM software; correct?

12 A. Yes, they could license the IBM  
13 software. You would have to pay for it.  
14 Whereas the Bluestone Software was -- I believe  
15 there was a free license. And for support you  
16 could pay for more. But yes, it's that the  
17 basic middleware was provided by third parties.  
18 And again, web technologies are industry  
19 standard technologies. These are not some  
20 custom technology that somebody is making in  
21 their garage. These were industry standard  
22 technologies, they were robust technologies that  
23 incorporated security, authentication,  
24 authorization, all of these other  
25 functionalities that we've talked about, and all

1     you had to do is build whatever functionality  
2     you had for your web page, for your website,  
3     without having to worry about these underlying  
4     security issues.

5                   MS. FULLER: We've been going for  
6     about an hour on the record. So let's go off  
7     the record, Cheryl. Let's take a five-minute  
8     break, Dr. Chatterjee. Does that work?

9                   THE WITNESS: Sounds great.

10                  MS. ALEXANDER: Okay. So 11:05.

11                         (11:00 a.m. - Recess taken.)

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1                   (At 11:07 a.m., with parties present  
2    as before, the following proceedings were had,  
3    to-wit:)

4    BY MS. FULLER:

5           Q.    Dr. Chatterjee, in the 2005 time frame  
6    was it well known to run a web server on a  
7    physician's computer?

8           A.    In 2005 and even before that, it was  
9    well known to run a web server on any type of  
10   computer.

11          Q.    Do you have any examples that you are  
12   aware of where a web server was run on a  
13   physician computer?

14          A.    So when you say "physician computer,"  
15   you're talking about the disclosure from Toge of  
16   a physician-side computer; correct? That's how  
17   I understand your question.

18          Q.    Correct.

19          A.    Yes. So like I mentioned, even at  
20   that time period I was developing systems, and  
21   we were not only working in banking but also in  
22   healthcare as well, because the systems that we  
23   were doing in mobile banking were directed to  
24   villages in remote areas throughout the world,  
25   in countries throughout the world. And so there

1 was a need for healthcare and telemedicine type  
2 of services as well.

3 And so yes, there were examples of  
4 people running web servers on, for example, PCs  
5 in a doctor's office, and then people could  
6 access that PC based on other devices.

7 So like I mentioned, long before 2005  
8 it was well known and understood that using web  
9 server technology -- because again, like I  
10 talked about, there is all of this  
11 infrastructure was available, and it was easy to  
12 develop custom web pages and websites, and that  
13 builds upon this underlying middleware that was  
14 available that a lot of people developed custom  
15 applications based on these industry standard  
16 web technologies, not only in the banking space,  
17 but in the healthcare space, even in logistics  
18 management.

19 We were also working on transportation  
20 and logistics, and there were PCs that could run  
21 web server software in an office, like a  
22 trucking type of office. And then the truck  
23 drivers could connect into that web server and  
24 update it or provide information. And for  
25 example, that PC running the web server, it

1 would capture different information from those  
2 different truck drivers and have it available in  
3 that central location, which was that PC running  
4 that web server software.

5 Q. Are these computers that you are  
6 providing examples on, were they also operating  
7 as a personal computer to an end user, or just a  
8 computer in the office that was the server?

9 A. I think there were both. For example,  
10 like I talked about for each of those examples,  
11 for the medical example, the healthcare example,  
12 we're talking about villages, for example, in  
13 India or Mexico that they don't have a hundred  
14 machines lying around. So this would be a  
15 single PC that would be running the web server  
16 and then the doctor or like I was mentioning,  
17 logistics management, the office, logistics  
18 management company owner or somebody, they would  
19 be accessing that same computer.

20 So that same computer that is running  
21 the web server was also running other kinds of  
22 software, and there was client software,  
23 including a web browser that could be run and  
24 connect into those as well. This was all very  
25 standard technology. And that's the point that

1 I make, that it's really very surprising that  
2 Dr. Goodrich has testified through his  
3 declaration that this was not done, or that  
4 there were problems with having a client and  
5 server on the same machine, because it was used  
6 oftentimes -- and I've pointed to documentation  
7 that confirms that, and in fact, like I  
8 mentioned at the beginning of the deposition,  
9 that even Dr. Goodrich's -- the documentation  
10 that he himself points to contradicts him where  
11 it says that you can run client and server  
12 software on the same machine.

13 Q. Let's go to Paragraph 7 of your  
14 declaration where you cite to Exhibit 2020,  
15 Page 4. Do you see that?

16 A. I do.

17 Q. So in the first parenthetical you  
18 cite, In a typical client server based  
19 application, the client process and server  
20 process can be on the same computer.

21 Do you see that?

22 A. I do.

23 Q. Then it says, The 2-tiered client  
24 server structure is the simplest client server  
25 structure that is still in use for many

1 applications today.

2 Do you see that?

3 A. I do.

4 Q. Is a 2-tier client server structure,  
5 is that where the client and server are on  
6 different machines?

7 A. They could be on different machines,  
8 but they can also be on the same machine.

9 Q. What is a 2-tier client server  
10 structure?

11 A. Well, if you look at the first quote,  
12 it's simply saying that you can run the client  
13 process and the server process on the same  
14 machine. A 2-tier client server would be that  
15 you have a client, which is the user interface,  
16 and then you have a server that has both the  
17 business logic as well as the data manipulation,  
18 and then of course you can have a 3-tier where  
19 you have the data manipulation broken out as  
20 well.

21 And so it's simply saying that the  
22 2-tier is the simplest client server structure  
23 where you have the client providing the user  
24 interface and the server providing the business  
25 logic and the data manipulation.

1           Q.    So in the 2-tier, the user interface  
2    is on the client and then the business logic is  
3    on the server; is that correct?

4           A.    And the data manipulation is also on  
5    the server.

6           Q.    And this is the simplest client server  
7    structure that's still in use today? I guess we  
8    can go to Exhibit 2020 to discuss this.

9           A.    Okay. I'm at Exhibit 2020.

10          Q.    It says, The 2-tier client server  
11   structure is the simplest client server  
12   structure that is still in use for many  
13   applications today. That is on Page 4 of  
14   Exhibit 2020 under the 2-tier client server  
15   architecture.

16          A.    Okay.

17          Q.    So is this 2-tier client server  
18   architecture used for web-based applications  
19   where web clients are accessing web servers?

20          A.    I think it can be. I don't think this  
21   is -- this paper seems to be talking about  
22   server classification. So web servers and web  
23   clients are one examples of servers and clients.

24                So I think to the extent that your  
25   question is whether web clients and web servers

1 can follow what this document is talking about,  
2 they can.

3 Q. So following this document, the 2-tier  
4 architecture would be what would be implemented  
5 in a web server application such as the Toge  
6 system where the client and the server are on  
7 different computers?

8 MS. ALEXANDER: Objection.  
9 Vague.

10 THE WITNESS: I think that's  
11 where there's a fundamental misunderstanding or  
12 confusion. Having a client on the  
13 physician-side computer does not preclude having  
14 clients on other devices.

15 For example, I have a client on my  
16 laptop, which is a browser, and I also have a  
17 browser on my cell phone. Just because I have a  
18 browser on my laptop does not preclude the fact  
19 that I have or I can have a browser on my cell  
20 phone.

21 And so I can run a web server on my  
22 laptop and have a web client on my laptop and  
23 still have a web client on my cell phone, and my  
24 wife can have a web client on her laptop and her  
25 cell phone and they all, all of those web

1 clients, can access the web server running on my  
2 laptop.

3 BY MS. FULLER:

4 Q. And this would be in a web-based  
5 architecture that this would be allowed?

6 A. I'm not sure what you mean by "this  
7 would be allowed," but yes, you can use web  
8 technologies -- web technologies simply refers  
9 to industry standard protocols like HTTP, HTML.  
10 So it's just talking about these protocols, and  
11 HTML -- yeah, I think I mentioned HTTP, HTML.

12 So there could be other such client  
13 server architectures that you can develop as  
14 well that follow that same logic of what I  
15 explained of having a server and a client  
16 running on my laptop, and having clients run on  
17 my cell phone, my wife's laptop, my wife's cell  
18 phone, and they can all access the server on my  
19 laptop.

20 So one example of that scenario is  
21 using web technologies, but even nonweb  
22 technologies can use that. But for purposes of  
23 my declarations and the combinations that I'm  
24 talking about with regards to Toge, together  
25 with the knowledge of a POSITA and Toge with

1 Kumar, we are talking about web-based  
2 technologies, and yes, this was all commonly  
3 used, well-known concepts and technologies.

4 Q. And going back to your Paragraph 8 of  
5 your '921 reply declaration, that's where you  
6 use the example of this is shorthand known as a  
7 local host; is that correct?

8 A. I did talk about local host in my  
9 reply declaration, yes.

10 Q. So for a client to -- client browser  
11 to access a web server on the same machine, it  
12 would just do HTTP local host; is that correct?

13 A. They would use HTTPS://localhost and  
14 then they can even put a forward slash and put  
15 in other path entries as well, or they can just  
16 do local host and that will hit the web server  
17 running on the default port. So yes, that's all  
18 they have to do.

19 Q. Okay. So that's all they had to do  
20 for a client device to access a web server  
21 running on a computer; is that correct?

22 A. On that same computer, and at the same  
23 time other computers could simply type in  
24 HTTPS:// and use the IP address of that first  
25 computer, and they could also access the web

1 server as well.

2 Q. So they would have to type in that IP  
3 address of the computer to be able to access the  
4 server on that machine?

5 A. Well, that's how Internet  
6 communications works, it uses TCP/IP. You could  
7 use URL, which gets resolved to an IP address.  
8 You don't have to type in an IP address per se.  
9 You can type in a URL, like CNN.com or  
10 Google.com. Those get resolved. But URL is  
11 simply an easy way to remember a URL. And then  
12 those get resolved to an IP address.

13 Q. So if a physician computer is  
14 operating behind -- in a private network, a  
15 device that's outside the private network in the  
16 public network, they would have to know the IP  
17 address of the computer to be able to access the  
18 web server operating on that computer?

19 A. No, they would not. In fact, they  
20 will not know because that's on a private  
21 network. And so this is what we talked about  
22 when we talked about the NAT earlier, that a NAT  
23 or some other type of router would simply  
24 convert the incoming IP address or URL, and then  
25 it would simply route it to the web server,

1       whatever the IP address was. And that's what  
2       these home routers or NATs do. And that's  
3       precisely what I explained to you in the  
4       morning. Like even my home, I can literally run  
5       a web server on my laptop, connect it to my  
6       network within my home, which is on a private  
7       network, and you can access my web server by  
8       simply typing in the URL or the IP address, and  
9       the router, including the NAT on my home router,  
10      would forward that request to the web server.

11           Q.    Can we go to Paragraph 20 of your  
12      declaration.

13           A.    Okay. I am at Paragraph 20.

14           Q.    So in this paragraph you state, When  
15      the physician's web client is active, it could  
16      continuously query the server to see if new data  
17      has been received. When you say active, are you  
18      meaning that there is an active session?

19           A.    I'm just saying when the physician is  
20      using it, as meaning when it's active.

21           Q.    So when the physician is logged into  
22      the website and the application is open; is that  
23      correct?

24           A.    What do you mean that the application  
25      is open?

1           Q.    That there's a connection between the  
2   web server and the client browser.

3           A.    Well, this is talking about it could  
4   continuously query the server.  So it's not  
5   talking about leaving that connection open, but  
6   I think other parts of my reply declaration talk  
7   about you -- implementing push-type data, and  
8   that was also well known long before the 2005  
9   time period, that you could keep that connection  
10   open and then the server would provide the data  
11   as soon as new data came in.

12          Q.    In the HTTP/1 protocol at the time of  
13   the 2005 invention, did that terminate after a  
14   certain amount of time?

15          A.    That's simply based on configuration.  
16   This is what we talked about earlier about  
17   managing the web server.  You could connect  
18   using, for example, a client running on that  
19   machine that's running the web server, to manage  
20   the web server.  And you could configure how  
21   long to keep that connection open, and then like  
22   I explained, that even with HTTP/1 the concept  
23   of long polling was well known and that would  
24   simply -- the client would make a request to the  
25   server, and then the server would wait until new

1 data comes in, and then it would respond to that  
2 client request based on the new data. And then  
3 as soon as that new data was delivered to the  
4 client, the client would make a new request.  
5 And so that technology was well known even at  
6 HTTP/1.0.

7 So like I mentioned in my reply  
8 declaration, there were different ways that a  
9 POSITA would have known, even at 2005 and even  
10 earlier, how to get this kind of data to the  
11 client.

12 Q. Did web servers in the 2005 time frame  
13 have a push application available to them to  
14 push the data to a client device on another  
15 machine?

16 A. I'm not sure what you mean by "push  
17 application available to them." But the  
18 technology, like I just explained to you, where  
19 you're -- the client is making a request to the  
20 server, then that connection remains open, and  
21 then as soon as new data comes into the server,  
22 the server immediately provides that new data to  
23 the client. And that certainly existed at  
24 HTTP/1.0.

25 Q. But going to what you just spoke to is

1       that there had to be an active -- the web client  
2       is active to be able to receive that new data;  
3       is that correct?

4           A.   Well, I'm not sure like what you're  
5       saying by active. Like I was mentioning what I  
6       mean by active is like, for example, the  
7       physician sitting down in front of the computer.  
8       But it doesn't have to be like that. Like I  
9       just mentioned with regards to the long polling  
10      technology, which was known at 2005 and even  
11      before that, what would happen is that the  
12      client software would simply make a request to  
13      the server, the server would not respond  
14      immediately, the server would respond whenever  
15      new data comes in, and then it would send that  
16      new data to the client, and then in response to  
17      that, the client would again make an --  
18      immediately make another request. So that was a  
19      way of doing effectively push technology using  
20      the pull of HTTP.

21           And then I also talk about other ways  
22      that a POSITA would have known, for example,  
23      continuously polling as well.

24           Q.   So the effective way to push using  
25      HTTP would be a long pull, is that what you're

1       saying?

2           A.    One example of that, yes.

3           Q.    Where there's a request for the data,  
4   and then there is a wait until new data comes  
5   in? I'm just trying to get an understanding of  
6   what a long pull is.

7           A.    Yes. Long polling, it's where the  
8   client makes a request of the server, the server  
9   waits to respond until new data comes in. And  
10   then when that new data comes in, it immediately  
11   sends it to the client, based on that  
12   connection, and then as soon as a client  
13   receives it, it makes another request to the  
14   server.

15               And so clearly you can understand that  
16   in that concept, again, which was known in 2005  
17   and even before that, the client would be  
18   receiving the data as soon as it comes in.

19           Q.    And to receive the data, there's an  
20   active session between the client and the web  
21   server; correct?

22           A.    In long polling there would be the  
23   active connection. And if you look at how push  
24   technologies work even now, that's the same way  
25   it works. Again, I think we've talked about

1     this technology is not magic. You have to have  
2     a connection between the client and the server  
3     in order to even get a push. So it works the  
4     same way even now where you have that connection  
5     that's available, and then when there's new data  
6     that comes in, it's provided to the client.

7           Q.    Upon a request for that data, just  
8     delivered at a later time; correct?

9                   MS. ALEXANDER:  Objection.  
10    Mischaracterizes his testimony.

11                   THE WITNESS:  Are you talking  
12    about how --

13    BY MS. FULLER:

14           Q.    The long pull?

15           A.    -- the push --

16           Q.    Your long pull testimony. Long  
17    polling.

18           A.    Yeah, for long polling, it's not  
19    delivered at a later time, it's delivered  
20    immediately upon the new data coming in.

21           Q.    So there's a request for the data and  
22    then it's delivered when the new data comes in?

23           A.    Yes. And then the client immediately  
24    turns around and makes a new request, and then  
25    the same thing happens again. And this was one

1 way, even back in 2005 and before that, to have  
2 data delivered immediately, new data delivered  
3 immediately, as soon as it came in.

4 Q. What were the reasons why a client  
5 device would implement a long polling request?

6 A. Well, just for that same exact reason,  
7 to get data when it comes in. For example, if  
8 you have a website that is aggregating data or  
9 aggregating information when new data comes in,  
10 you would want the client to get that.

11 And so even back then there were news  
12 sites that -- like, for example, portals that  
13 would aggregate news and other types of website  
14 data. And so long polling was used to allow  
15 those kind of updates to be sent out immediately  
16 as soon as the new data became available.

17 Q. Dr. Chatterjee, can we turn to  
18 Paragraph 24 of your '921 declaration.

19 A. Okay. I'm there.

20 Q. You know what, I'm going to have you  
21 back up for a second. I'm going to have you go  
22 to Paragraph 22.

23 A. 22?

24 Q. Yes.

25 A. Okay.

1           Q.    In writing your opinion, did you apply  
2           or come to an understanding of what the plain  
3           and ordinary definition of retransmit is?

4                   MS. ALEXANDER:  Objection.  Calls  
5           for a legal conclusion.

6                   THE WITNESS:  So say that again.  
7           Because this section I'm talking about, what  
8           Dr. Goodrich is stating, I'm explaining that  
9           it's wrong, but then even if you adopt that  
10          wrong understanding, it would still be obvious,  
11          based on references and the knowledgeable of the  
12          POSITA that I talk about.

13          BY MS. FULLER:

14          Q.    In writing your declaration, did you  
15          apply a definition to the term retransmit?

16          A.    I think we -- that it would be  
17          understood that you're simply transmitting  
18          whatever you're retransmitting.  You're simply  
19          getting it and you're transmitting it.

20          Q.    And so are you saying that  
21          transmitting and retransmitting are one and the  
22          same?

23          A.    No.  I'm saying that within the --  
24          what we're looking at with regards to the  
25          claims, it would be that you're receiving it and

1       then you're retransmitting it. So even the  
2       retransmit is a transmit. But it's simply  
3       saying that you're getting it and then you're  
4       retransmitting it, or transmitting it.

5           Q.    So when a device gets it and then  
6       retransmits it, is that acting as an  
7       intermediary device to forward the data on to an  
8       end device?

9           A.    So what do you mean by acting as an  
10      intermediary? It could. It's getting the data  
11      and then it could do something with that data  
12      and then it could send it, again. So I'm not  
13      really sure what you mean by an intermediary.

14          Q.    It's an intermediary device that  
15      receives the data -- first receives the data,  
16      and then just pushes the data onward to an end  
17      device. That's what I mean by an intermediary  
18      device.

19          A.    So I'm not really sure -- like when  
20      you're talking about pushes the data, I don't  
21      think retransmit is limited to pushing data. It  
22      simply means to a POSITA that you're getting  
23      that data, and that you could do something with  
24      that data, and then you're sending that data.

25          Q.    And when you're sending that data, are

1     you waiting for a device to request that data or  
2     are you just automatically pushing it on?

3           A.    So I think that the term retransmit is  
4     not so limiting that it would be one of those.  
5     I think retransmit could include different ways  
6     of sending that data forward, like I talked  
7     about. And that's precisely what I've talked  
8     about in this section of my reply dec. where I  
9     say that Dr. Goodrich's understanding of the  
10    term seems to be overly restrictive and wrong,  
11    but that even if you assume that overly  
12    restrictive and wrong understanding, it's still  
13    obvious based on the combinations that I talk  
14    about in my declarations.

15           Q.    Well, you testified earlier that to --  
16    in your first deposition that retransmit is --  
17    pardon me, give me one second -- is receiving  
18    the data and then sending it to another device;  
19    correct?

20           A.    I believe that's consistent with what  
21    I just explained to you, yes.

22           Q.    And it's different from transmit,  
23    where in transmitting, a device first receives  
24    the data -- pardon me, where it's transmitting a  
25    device, transmits the data by itself.

1           A.    Are you reading --

2           Q.    Let me rephrase that. Retransmitting,  
3   you testified, is receiving data and then  
4   sending to another device, and you stand by that  
5   testimony today; correct?

6           A.    And I believe what I explained to you  
7   right now is consistent with that, yes.

8           Q.    And then transmitting, a device  
9   transmits the data by itself. You testified to  
10   that in your first deposition.

11                   MS. ALEXANDER:  Objection.  
12   Outside the scope.  Jenna, do you have something  
13   you'd like to point Dr. Chatterjee to in terms  
14   of this --

15                   MS. FULLER:  We can open  
16   Exhibit 2018 if that's available to you.  If  
17   not, I can upload it.

18                   THE WITNESS:  Okay.  What page on  
19   2018?

20                   MS. FULLER:  Page 38, Line 24  
21   through 25.

22                   THE WITNESS:  So it seems like  
23   you are asking me outside of the '921 with  
24   regards to this.

25   BY MS. FULLER:

1           Q.    I'm just trying to see if you stand by  
2    your testimony, your first deposition testimony  
3    today, that in transmitting -- that transmitting  
4    is receiving -- pardon me. Transmitting, a  
5    device transmits the data by itself. That was  
6    your testimony in your first deposition; is that  
7    correct?

8                       MS. ALEXANDER:  Objection.  
9    Mischaracterizes his testimony.

10                    THE WITNESS:  Yeah, I mean, if  
11   you read Page 38, starting at Line 11, I'm  
12   saying, well, again, I'm understanding your  
13   question to be limited to this sentence in a  
14   vacuum, and as I've explained to you a couple of  
15   times, I've not memorized everything in the  
16   '921, and if there is other disclosure about  
17   that question.

18                    And so I think I answered for you at  
19   my first deposition that it was only based on  
20   that one sentence, I guess, that you were  
21   pointing me to, and in a vacuum, not remembering  
22   everything that's in the '921.

23                    But again, to the extent your question  
24   right now is whether I stand by my testimony in  
25   the first deposition?  I a thousand percent

1 stand by it.

2 Q. So when a device is retransmitting, it  
3 first receives data from another device, and  
4 then retransmits it to the end device; is that  
5 correct?

6 A. That could be one example, and again,  
7 in a vacuum, based on what we've been talking  
8 about with regards to what I testified to in my  
9 first deposition.

10 Q. What are other examples, beyond the  
11 one we just spoke of?

12 A. Well, I think you talked about  
13 receiving it from another device, and we've been  
14 spending a lot of time this morning talking  
15 about how you can have different software  
16 running on to the same device, and how it was  
17 well known.

18 So you can even receive data from a  
19 different piece of software running on that same  
20 device and then potentially retransmit it as  
21 well. So that would be another example.

22 Q. And in retransmitting it, the device  
23 is simply forwarding it to the end device;  
24 correct?

25 A. I think that's one example. But I

1 think, like we've talked about, and if you look  
2 at the '921, there's clear disclosure even in  
3 the '921 that there could be processing of the  
4 data. And so even -- if you're coming back to  
5 the '921 and what's -- what a POSITA would  
6 understand in the context of the '921, it's not  
7 limited to simply getting it and forwarding it.  
8 Because like I just explained, even in the '921  
9 there is disclosure of optional processing of  
10 the data.

11 Q. So where a device gets it in -- let's  
12 try this example -- processes the data, after it  
13 processes the data, it then would forward it to  
14 the end device?

15 A. It could. That's one example. There  
16 are a lot of different examples. But yes, it  
17 could forward it. But even when you say forward  
18 it, it's kind of unclear because how technology  
19 works is that you're getting these electrical  
20 signals that are coming in, and then you're not  
21 forwarding those electrical signals. The  
22 computer will process those electrical signals  
23 that are coming in, it will take them from the  
24 analogue signals that are coming in, digitize  
25 them, and then, you know open the packet up,

1 look what's inside the packet, and then it would  
2 generate new electrical signals to send it out.

3 So it's not like -- it's not how  
4 computers work, electronic computers work is how  
5 I explained it, that you have these signals that  
6 are coming in and then signals that might be  
7 going out, and there could be some delay or lag  
8 in between the signals coming in or going out,  
9 and -- but it's not -- like I just want to be  
10 clear when you're using the term forward it,  
11 it's not just taking those same electrical  
12 signals that are coming in. Because those  
13 electrical signals are terminated when they get  
14 to that device. Or if they're not electrical  
15 signals, if it's on a Wi-Fi, there are RF  
16 signals that are coming in and they're  
17 terminated and new signals are generated.

18 Q. So these new signals that are  
19 generated, that's what is being then forwarded  
20 on to the end device, if I understand what  
21 you're saying?

22 A. Yes. For example, the packets that  
23 might go over a physical Ethernet network would  
24 be generated, and they would go over the network  
25 to their destination.

1           Q.    So in retransmitting, a device  
2    receives data from another device, can process  
3    it or not process the data, and then forward on  
4    processed or unprocessed data to another device;  
5    is that what you're testifying to?

6                   MS. ALEXANDER:  Objection.  
7    Mischaracterizes his testimony.

8                   THE WITNESS:  So I think I just  
9    explained to you -- I want to be clear about --  
10   you keep on using the term "forward it," and I  
11   want to explain to you, and I think I did  
12   explain to you, that how things work in reality  
13   with technology, that you're getting the  
14   signals, you're terminating the signals, you're  
15   performing processing potentially, and then  
16   you're generating new signals, either electronic  
17   signals or RF signals or optical signals or  
18   something, and that's one example.

19                  But you can also have that data sit  
20   there for some time and then send it on.  
21   There's nothing in the term retransmit,  
22   especially in the context of the '921.  But as I  
23   explained, even if you take Dr. Goodrich's  
24   incorrect and overly limiting understanding of  
25   the term, it's still disclosed by -- it's still

1 obvious in view of the combinations that I  
2 talked about in my declarations.

3 BY MS. FULLER:

4 Q. So your opinion that it's still  
5 obvious, even under the construction, is based  
6 upon processing of the data; is that correct?  
7 I'm looking at Paragraph 25 of your '921.

8 A. On 25 I'm simply stating that with  
9 respect to processing data sent or stored is the  
10 same data received. And so I'm explaining  
11 similar to what I explained for you that when  
12 the data comes in, the packet is inspected and  
13 then different things can happen to the actual  
14 payload, the actual data within the packet. It  
15 can be stored and then later retransmitted. It  
16 can be -- like I explained to you with regards  
17 to long polling, the data can come in and then  
18 it's immediately provided in response to long  
19 polling. So there are a lot of different ways  
20 and things that can happen to that data. I'm  
21 simply explaining how -- what actually happens  
22 with technology in real life.

23 Q. Okay. And then Paragraph 26 you  
24 alluded to that it is your automatically push  
25 data that has been received, where the data

1 would come in and then be pushed to another  
2 device?

3 MS. ALEXANDER: Objection; vague.

4 THE WITNESS: Well, what I'm  
5 stating in Paragraph 26 is that the Toge/Kumar  
6 system is not limited to a pull system and could  
7 be implemented to automatically "push data that  
8 has been received."

9 And I think I've explained to you in  
10 quite a bit of detail today why even in 2005 a  
11 POSITA would have understood that and known  
12 that, for example, with long polling.

13 Q. Was push protocols for web servers  
14 available in 2005?

15 A. What do you mean by push protocols?  
16 Like are you distinguishing between what I just  
17 explained?

18 Q. Like a push protocol in an HTTP/2.  
19 HTTP/2 has a push protocol where data is sent to  
20 a server and can be pushed to an end device.

21 A. So that protocol is different, but in  
22 terms of pushing data, to the extent you're  
23 talking about pushing data meaning that as soon  
24 as that data is available it's provided to one  
25 or more clients, I explained to you in quite a

1 bit of detail that the long polling achieves  
2 that same thing. Alternatively, I also  
3 explained to you that continuous polling  
4 achieves that same thing.

5 So they're different protocols, but  
6 they can achieve the same end result of  
7 providing data to clients immediately upon the  
8 server receiving.

9 Q. And then long polling, there is a  
10 client request for the data; correct?

11 A. And even in all push protocols, there  
12 is a connection that has to be open. Maybe  
13 you're having a misunderstanding about how push  
14 protocols work, even in 2026. You have to have  
15 a connection between the client and the server  
16 in order for the data to be, quote unquote,  
17 pushed.

18 Q. I was not speaking to a connection, I  
19 was speaking to the request in a long polling,  
20 there's a request for the data by the client;  
21 correct?

22 A. I'm not sure what you mean by a  
23 request for the data, even in push -- even in  
24 modern 2026 push protocols you have to identify,  
25 I want this data. It's not that the server

1       could magically figure out that you want some  
2       data and somebody else wants some other data.  
3       These are simply different protocols, but they  
4       achieve the same end result of getting data to  
5       clients immediately upon being received by the  
6       server.

7           Q.    And in your querying, the web server  
8       example that you also spoke to, that's where the  
9       web browser client is active on the computer; is  
10      that correct, for the querying?

11                   MS. ALEXANDER:  Objection.  
12      Mischaracterizes his testimony.

13                   THE WITNESS:  So like I explained  
14      to you, when I use the term active, I meant, as  
15      an example, the physician sitting in front of  
16      the computer and doing some work, but it doesn't  
17      even have to be like that.  Like I've explained  
18      to you, the long polling, it works by the data  
19      is received and then immediately the client in  
20      long polling will send another request.  And so  
21      the physician doesn't even have to be sitting  
22      there in front of the computer.  The data would  
23      show up using long polling, or even continuous  
24      polling.

25      BY MS. FULLER:

1           Q.    So in the long polling, a client would  
2    send a GET request to the server, and then the  
3    server would send the data when it shows up?

4           A.    That is one example, yes, of using  
5    long polling.

6           Q.    Are there other examples?

7           A.    Well, like I explained to you, there  
8    is continuous polling, where the client can  
9    issue a GET request and then it will get that  
10   data and then it will again issue another GET  
11   request. So it's a continuous polling example.

12          Q.    Are there HTTP time-outs for long  
13   polling that would terminate the request?

14          A.    So again, like I explained already, I  
15   think I answered this question before, where I  
16   explained that these are configurable. And so  
17   for -- and a POSITA knew that these were  
18   configurable, and if the time-out is set to a  
19   certain amount, when the time-out happens, the  
20   client simply sends a new request.

21                So with long polling, like I said, the  
22   end result is that the client gets the data as  
23   soon as a server has it, and it's simply using  
24   one protocol, one mechanism by which to do it,  
25   continuous polling is another way, and then, you

1 know, there are different types of protocols  
2 that are used, but they all achieve the same  
3 request -- the same end result of getting the  
4 data to the client as soon as the server has it.

5 MS. FULLER: Dr. Chatterjee,  
6 let's go off the record.

7 (Discussion was had off the record.)

8 MS. FULLER: Let's do a quick  
9 five-minute break.

10 (11:57 a.m. - Recess taken.)

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1                   (At 12:02 p.m., with parties present  
2    as before, the following proceedings were had,  
3    to-wit:)

4                   MS. FULLER: Dr. Chatterjee,  
5    thank you for your time today. I have no  
6    further questions.

7                   THE WITNESS: Thank you.

8                   MS. ALEXANDER: I have no further  
9    questions.

10                  COURT REPORTER: (Requests orders  
11   for the record.)

12                  MS. ALEXANDER: We'll take a  
13   rough. Standard turnaround.

14                  MS. FULLER: Thank you all.

15                  (2:02 p.m. - Adjournment.)

16                               \*\* \*\* \*

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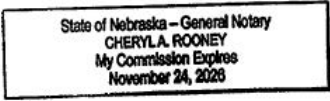
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1                                    C E R T I F I C A T E  
2                                    STATE OF NEBRASKA                    )  
3                                    COUNTY OF DOUGLAS                    )    Ss.  
4                                    I, Cheryl A. Rooney, Registered  
5                                    Professional Reporter, General Notary Public  
6                                    within and for the State of Nebraska, do hereby  
7                                    certify that the foregoing testimony of SANDEEP  
8                                    CHATTERJEE, Ph.D. was taken by me in shorthand  
9                                    and thereafter reduced to typewriting by use of  
10                                    Computer-Aided Transcription, and the  
11                                    seventy-eight (78) pages contain a full, true  
12                                    and correct transcription of all the testimony  
13                                    of said witness, to the best of my ability;  
14                                    That I am not a kin or in any way  
15                                    associated with any of the parties to said cause  
16                                    of action, or their counsel, and that I am not  
17                                    interested in the event thereof.  
18                                    IN WITNESS WHEREOF, I hereunto affix  
19                                    my signature and seal this 29th of January,  
20                                    2026.                                          
21                                    \_\_\_\_\_  
22                                    CHERYL A. ROONEY, RPR  
23                                    GENERAL NOTARY PUBLIC  
24                                    Registered Professional Reporter  
25                                    My Commission Expires: November 24, 2026

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