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Transcript of Todd C. Mowry, Ph.D.

Date: February 4, 2026

Case: Google LLC v. Sandpiper CDN, LLC (PTAB)

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Sandpiper EX2021
Google v. Sandpiper
IPR2025-00826

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

3 -----X

4 Google LLC, :
5 Petitioner , : Case No.
6 v. : IPR2025-00826
7 Sandpiper CDN, LLC :
8 Patent Owner. :

9 -----X

10
11 REMOTE STENOGRAPHIC DEPOSITION OF

12 TODD C. MOWRY, Ph.D

13 Wednesday, February 4, 2026

14 9:31 a.m. Eastern Time
15
16
17

18 Job No.: 617535

19 Pages: 1 - 97

20 STENOGRAPHICALLY REPORTED BY:

21 GISELLE MITCHELL-MARGERUM, RPR, CRI, CCR, LCR, ACCR, CSR

22 CALIFORNIA CSR 14424

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2

1 Deposition of TODD C. MOWRY, held
2 remotely, via videoconference at:

3
4
5 VIA VIDEOCONFERENCE
6
7
8

9 Pursuant to agreement, before Giselle
10 Mitchell-Margerum, Registered Professional Reporter,
11 Certified Reporting Instructor, Licensed Court
12 Reporter (TN), Certified Court Reporter (GA),
13 Certified Court Reporter (NJ), Certified Court
14 Reporter (WA), Certified Shorthand Reporter (OR),
15 Certified Shorthand Reporter (CA), Alabama Certified
16 Court Reporter (ACCR), Certified Court Reporter
17 (NM) .
18
19
20
21
22

A P P E A R A N C E S

ON BEHALF OF PETITIONER:

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ALSO PRESENT:

CHARESE HARRISON, Document Technician

W I T N E S S I N D E X

Witness	Page
TODD C. MOWRY (sworn)	5
Examination by STEVEN PAPPAS	5

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1	P R O C E E D I N G S	09:31:35
2	COURT REPORTER: Dr. Mowry, please raise	09:31:38
3	your right hand.	09:31:41
4	Do you swear to tell the truth, the whole	09:31:43
5	truth, and nothing but the truth?	09:31:45
6	THE WITNESS: I do.	09:31:50
7	COURT REPORTER: Okay. We can start.	09:31:51
8	TODD C. MOWRY	09:31:52
9	Having been duly sworn testified as follows:	09:31:52
10	EXAMINATION BY ATTORNEY PAPPAS:	09:31:52
11	Q. Good morning, Dr. Mowry. How are you?	09:31:53
12	A. I'm good. Thanks.	09:31:55
13	Q. Would you please state your full legal	09:31:56
14	name for the record?	09:31:59
15	A. It's Todd Carl Mowry.	09:31:59
16	Q. Thank you. And I apologize in advance.	09:32:03
17	I'm on the end of a cold. So if I sound a bit	09:32:06
18	raspy, don't worry about it. If you can't hear me,	09:32:09
19	then just ask and I will clarify what I previously	09:32:13
20	said.	09:32:17
21	A. Okay.	09:32:17
22	Q. Do you understand that you are having your	09:32:18

1	deposition taken today in connection with the	09:32:20
2	declaration you provided in IPR2025-00826?	09:32:22
3	A. Yes. I was just looking up the number	09:32:35
4	here to make sure that was the right number. But	09:32:37
5	yes. That's my understanding.	09:32:40
6	Q. This proceeding concerns U.S. Patent	09:32:41
7	No. 9,021,112. Is that right?	09:32:44
8	A. Yes. That's correct.	09:32:50
9	Q. If I refer to this patent as the	09:32:52
10	'112 Patent today, will you understand what I'm	09:32:54
11	referring to?	09:32:57
12	A. Yes.	09:32:57
13	Q. In terms of exhibits today, my plan is to	09:33:02
14	drag them into the chat for you to download. If you	09:33:05
15	have clean exhibits on your computer, that's all	09:33:08
16	right too.	09:33:11
17	Do you have any copies of the exhibits	09:33:12
18	with you today?	09:33:15
19	A. Yes. I have some clean hard copy exhibits	09:33:17
20	of -- I can tell you what they are. It's my	09:33:24
21	declaration; the '112 Patent; and then Glines,	09:33:28
22	Gupta, Chung, Chiou, and Colby. And then I also	09:33:38

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1	have a clean PDF version of those same things on the	09:33:43
2	laptop.	09:33:49
3	Q. Okay. And are there any notes on those	09:33:51
4	copies?	09:33:59
5	A. No.	09:33:59
6	Q. They are clean copies?	09:34:00
7	A. Yes.	09:34:01
8	Q. Okay.	09:34:01
9	For convenience, I will also drag them	09:34:02
10	into the chat as we discuss, but you are welcome to	09:34:04
11	use any clean copies that you have in front of you.	09:34:07
12	A. Okay.	09:34:09
13	ATTORNEY PAPPAS: So first, I'm going to	09:34:09
14	provide to you exhibits 1008 and 1009. 1008 is	09:34:11
15	the declaration you submitted in your	09:34:23
16	proceeding. And 1009 is a copy of your CV.	09:34:25
17	Let me know if you have access to those copies.	09:34:29
18	THE WITNESS: There is a message I'm	09:34:39
19	seeing in the chat. It says, "This content	09:34:40
20	can't be viewed here." I don't know if there	09:34:42
21	is some setting there.	09:34:48
22	ATTORNEY PAPPAS: That's a good question.	09:34:53

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1	If you have them in front of you, that's fine.	09:34:54
2	If you have a hard copy or a PDF, we can just	09:34:57
3	refer -- we'll start with Exhibit 1008.	09:35:00
4	Do you have a copy of that in front of	09:35:04
5	you?	09:35:05
6	THE WITNESS: Let's see. I do have a copy	09:35:05
7	of that; of my declaration. I don't have a	09:35:07
8	copy of my CV. I think you mentioned that you	09:35:10
9	want to -- you were including those two.	09:35:13
10	ATTORNEY PAPPAS: Let me -- Charese, do	09:35:18
11	you have the download link handy?	09:35:20
12	TECHNICIAN: Yes. Please stand by. I can	09:35:23
13	pull that up for you. And would you like me to	09:35:25
14	just share the exhibit on the screen? Would	09:35:29
15	that be easier for you?	09:35:31
16	ATTORNEY PAPPAS: If you could paste the	09:35:34
17	download link into the chat, that might be the	09:35:35
18	easiest way.	09:35:38
19	TECHNICIAN: Okay. Sounds good. One	09:35:40
20	second. All right.	09:35:42
21	ATTORNEY PAPPAS: Dr. Mowry, can you see	09:35:54
22	if you could access the download link that was	09:35:55

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1	pasted into the chat?	09:35:57
2	THE WITNESS: I am -- I clicked on the	09:36:01
3	link and it looks like it's starting to load.	09:36:03
4	I'm just waiting for that. Okay. It's taking	09:36:06
5	me to some site where I can see a number of	09:36:15
6	exhibits.	09:36:19
7	BY ATTORNEY PAPPAS:	09:36:25
8	Q. Do you see Exhibit 1009? We are still on	09:36:26
9	that site.	09:36:29
10	A. Yes. I do see that.	09:36:30
11	Q. And are you able to download the PDF?	09:36:31
12	A. I am going to do that now. Let's see.	09:36:35
13	Let's see. Will that take me out of here?	09:36:41
14	ATTORNEY BOYER: Just click on here. I'm	09:36:59
15	just going to help him here.	09:37:01
16	ATTORNEY PAPPAS: That's fine.	09:37:04
17	THE WITNESS: Okay. There we go.	09:37:09
18	ATTORNEY BOYER: And then you can get over	09:37:16
19	here if you need.	09:37:17
20	THE WITNESS: Okay.	09:37:18
21	ATTORNEY PAPPAS: Okay. Do you have	09:37:24
22	access to Exhibits 1008 and 1009 now?	09:37:25

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1	THE WITNESS: Yes. I do.	09:37:30
2	ATTORNEY PAPPAS: Okay.	09:37:34
3	BY ATTORNEY PAPPAS:	09:37:35
4	Q. Let's start with Exhibit 1008. Is this	09:37:35
5	the declaration that you submitted in this	09:37:38
6	proceeding?	09:37:41
7	A. Yes.	09:37:45
8	Q. Do you continue to hold the opinions	09:37:47
9	submitted in this declaration?	09:37:48
10	A. Yes.	09:37:55
11	Q. If you can flip to page 183? The last	09:37:56
12	page of the declaration. And let me know when you	09:38:01
13	are there.	09:38:03
14	A. Okay. I'm there.	09:38:10
15	Q. Is that your signature on this page?	09:38:12
16	A. Yes. It is.	09:38:14
17	Q. Did you review this declaration in	09:38:18
18	preparing for the deposition today?	09:38:20
19	A. Yes, I did.	09:38:22
20	Q. In your review, did you come across any	09:38:23
21	errors in the declaration?	09:38:25
22	A. I did not notice any when I was reviewing	09:38:31

1	it. No.	09:38:33
2	Q. Are there any opinions that you would like	09:38:34
3	to change or clarify before we get started today?	09:38:36
4	A. No.	09:38:41
5	Q. Do you understand you are under oath	09:38:45
6	today?	09:38:46
7	A. Yes.	09:38:46
8	Q. And you understand that you are here to	09:38:47
9	give complete and accurate testimony?	09:38:48
10	A. Yes.	09:38:51
11	Q. Is there any reason that you believe you	09:38:52
12	can't give complete and accurate testimony today?	09:38:55
13	A. No.	09:38:59
14	Q. Okay. You've been deposed before. Is	09:38:59
15	that correct?	09:39:03
16	A. Yes, I have.	09:39:03
17	Q. Approximately how many times have you been	09:39:05
18	deposed?	09:39:08
19	A. Roughly 25 times.	09:39:10
20	Q. And approximately how many of those	09:39:13
21	depositions were for proceedings before the	09:39:15
22	United States Patent and Trademark Office?	09:39:18

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1	A. Roughly 18 to 20.	09:39:28
2	Q. And were those all inter partes review	09:39:35
3	proceedings?	09:39:39
4	A. I believe so. I mean, of the 18 to 20.	09:39:45
5	Yes.	09:39:48
6	Q. Were the other depositions for District	09:39:48
7	Court proceedings?	09:39:50
8	A. Yes. That's correct.	09:39:53
9	Q. I know you have been deposed before, but I	09:39:56
10	just want to go over some basic ground rules to help	09:39:58
11	facilitate things today.	09:40:01
12	Everything you say will be written down by	09:40:03
13	the court reporter. So please try to give verbal	09:40:04
14	answers so the transcript is clear. Is that fair?	09:40:07
15	A. Yes.	09:40:10
16	Q. If you don't understand any part of a	09:40:11
17	question today, will you let me know so I can	09:40:13
18	clarify?	09:40:15
19	A. Yes.	09:40:17
20	Q. If you answer my question, I'm going to	09:40:18
21	assume that you understood it. Is that fair?	09:40:21
22	A. Yes.	09:40:24

1	Q. From time to time, your counsel may object	09:40:26
2	to questions. Do you understand that you still need	09:40:28
3	to answer the question unless your counsel instructs	09:40:29
4	you not to?	09:40:32
5	A. Yes.	09:40:33
6	Q. I expect to take breaks every hour or so.	09:40:36
7	If you need a break at any other time, just let me	09:40:38
8	know. Is that okay?	09:40:43
9	A. Yes.	09:40:45
10	Q. And I would just ask that you answer any	09:40:45
11	pending questions before we take a break. Is that	09:40:47
12	fair?	09:40:49
13	A. Yes.	09:40:50
14	Q. Since this is a remote deposition, let me	09:40:52
15	ask where you are right now?	09:40:55
16	A. I am in a conference room in the -- I'm in	09:40:58
17	Pittsburgh, in a hotel conference room.	09:41:02
18	Q. And who is with you today in the room?	09:41:07
19	A. Alex. The counsel here for Finnegan.	09:41:12
20	Q. Anyone else?	09:41:17
21	A. No. Just the two of us.	09:41:18
22	Q. Can you describe what you have with you	09:41:21

1	today?	09:41:24
2	A. Well, I have these clean paper printouts	09:41:28
3	of the exhibits that I -- that I mentioned earlier.	09:41:31
4	And on the laptop, there is a clean copy of -- PDFs	09:41:34
5	of those same exhibits. And that's it.	09:41:40
6	Q. Do you have any notes outside of the clean	09:41:45
7	copies of exhibits?	09:41:47
8	A. No.	09:41:48
9	Q. Okay.	09:41:49
10	Do you have any electronic devices with	09:41:50
11	you, aside from the computer that you are currently	09:41:52
12	using?	09:41:56
13	A. I have a phone and a watch that are in my	09:42:00
14	pocket, and I have -- I have a laptop that's stored	09:42:02
15	away.	09:42:05
16	Q. Okay.	09:42:09
17	Can you confirm you won't use any other	09:42:09
18	electronic devices to communicate with anyone during	09:42:12
19	this deposition?	09:42:13
20	A. Yes. I can -- I confirm that. Yes.	09:42:14
21	Q. Let's talk generally about your -- your	09:42:18
22	declaration and your preparation for your	09:42:22

1 declaration. Did you write your declaration
2 yourself?

3 A. I wrote it in collaboration with the
4 attorneys from Finnegan. I discussed my opinions
5 with them. They helped me draft the text. And I
6 reviewed every -- the entire declaration. So the
7 declaration represents my opinions.

8 Q. Approximately how much time did you spend
9 preparing your declaration?

10 A. I think it may have been on the order of
11 40 or 50 hours, maybe. Something in that ballpark.
12 It may have been more. Maybe 40 to 60 hours.

13 Q. In preparing your declaration, did you
14 talk to anyone outside of counsel for Google in the
15 process?

16 A. No.

17 Q. Did you review Google's IPR petition?

18 A. Yes.

19 Q. Did you review Google's IPR petition in
20 advance of preparing your declaration?

21 A. I don't recall exactly the timing of when
22 I reviewed it. I believe I reviewed it after I

09:42:23

09:42:27

09:42:31

09:42:34

09:42:38

09:42:43

09:42:48

09:42:53

09:42:56

09:43:07

09:43:10

09:43:14

09:43:20

09:43:22

09:43:27

09:43:29

09:43:32

09:43:46

09:43:46

09:43:48

09:44:03

09:44:04

1	prepared my declaration.	09:44:09
2	Q. Can you turn to paragraph 67 of your	09:44:12
3	declaration and let me know when you are there?	09:44:16
4	A. Okay. I am there.	09:44:34
5	Q. Here, you set forth combinations of	09:44:35
6	references that you believe render obvious the	09:44:38
7	claims of the '112 Patent.	09:44:41
8	Is that correct?	09:44:44
9	A. Yes.	09:44:51
10	Q. And you list the references in the table	09:44:51
11	below paragraph 67?	09:44:53
12	A. Yes. Actually, I just noticed that there	09:44:59
13	is a little glitch with the hard copy of my	09:45:05
14	declaration. It only has, for some reason, odd	09:45:08
15	numbered pages. So I will need to use the PDF	09:45:12
16	version of it. Hang on one second.	09:45:18
17	Q. If you want to take a minute and verify	09:45:22
18	the PDF version is an accurate copy of the	09:45:24
19	declaration you submitted in this proceeding?	09:45:26
20	A. Yes. Let's see.	09:45:28
21	[Witness reviewed document.]	09:45:43
22	A. The PDF is fine. It has all the pages.	09:45:43

1	Okay. Can you -- can you remind me the paragraph	09:45:53
2	number you pointed me to again? Is it --	09:45:55
3	Q. We were talking about paragraph 67.	09:45:59
4	A. Okay. Great.	09:46:01
5	Q. And the question was the list of	09:46:05
6	references appears in the table below paragraph 67.	09:46:07
7	Is that right?	09:46:12
8	A. Yes. That's correct.	09:46:14
9	Q. Did you find these references yourself	09:46:18
10	when preparing your declaration?	09:46:20
11	ATTORNEY BOYER: I'll just counsel the	09:46:23
12	witness not to divulge any attorney/client	09:46:24
13	communications, but otherwise, you can answer.	09:46:28
14	THE WITNESS: I searched for prior art	09:46:35
15	myself. And as I recall, I found some	09:46:37
16	references, and the counsel found some	09:46:40
17	references.	09:46:43
18	I don't remember specifically which of	09:46:44
19	these were found by me versus the counsel. It	09:46:46
20	was a combination of ones that I found and ones	09:46:53
21	that they found. But I reviewed all of the	09:46:55
22	ones that they found and determined what I	09:46:58

1	thought were the best references.	09:47:01
2	BY ATTORNEY PAPPAS:	09:47:03
3	Q. So is it fair to say that some of the	09:47:08
4	references were provided to you by counsel for	09:47:12
5	Google?	09:47:15
6	A. Yes. As I said, I think -- they did	09:47:17
7	provide some of them, which I reviewed, and compared	09:47:24
8	it with the ones that I found, and decided that this	09:47:27
9	final set was the best set of references. Yes.	09:47:30
10	Q. And the obviousness combinations that you	09:47:32
11	set forth here were determined in consultation with	09:47:36
12	counsel for Google?	09:47:40
13	ATTORNEY BOYER: Again, I'll counsel the	09:47:44
14	witness not to divulge any attorney/client	09:47:45
15	communication, but you can testify as to facts	09:47:46
16	otherwise, to the extent you can.	09:47:48
17	THE WITNESS: Well, the combinations were	09:47:57
18	the ones that I thought made the most sense. I	09:47:58
19	was having discussions with counsel as I was --	09:48:01
20	as I was preparing my report -- my declaration.	09:48:03
21	So I was having conversations with counsel	09:48:11
22	during this process.	09:48:14

1	But as I said, these are the ones that I	09:48:14
2	thought made the most sense.	09:48:17
3	ATTORNEY PAPPAS: Okay.	09:48:20
4	BY ATTORNEY PAPPAS:	09:48:20
5	Q. Let's talk about today's deposition. What	09:48:21
6	did you do to prepare for the deposition today?	09:48:24
7	A. I reviewed the '112 Patent. And my	09:48:32
8	declaration. And the references that I cite here.	09:48:34
9	And I met with counsel, just to review -- and just	09:48:42
10	part of reviewing those materials.	09:48:48
11	Q. You said you met with counsel. Who did	09:48:53
12	you meet with?	09:48:55
13	A. I met with Alex.	09:49:02
14	Q. Were those meetings -- sorry. Let's start	09:49:04
15	with when did you meet with Alex?	09:49:06
16	A. We met last week, and this week.	09:49:12
17	Q. Were those meetings in person? Or by	09:49:22
18	video?	09:49:24
19	A. They were through video.	09:49:28
20	Q. And approximately how long did you meet	09:49:31
21	with counsel?	09:49:32
22	A. Roughly six hours in total.	09:49:40

1	Q. Did you review each of the exhibits cited	09:49:46
2	in your declaration, in preparation for the	09:49:49
3	deposition today?	09:49:50
4	A. I believe so.	09:49:59
5	Q. Did you talk to anyone outside of counsel	09:50:00
6	for Google while preparing for the deposition today?	09:50:02
7	A. No.	09:50:05
8	Q. Let's flip to paragraph 18 of your	09:50:10
9	declaration. And here, you provide a table of	09:50:12
10	materials considered.	09:50:29
11	Is that right?	09:50:31
12	A. Yes. That's right.	09:50:35
13	Q. Did you review each exhibit listed in this	09:50:37
14	table, in preparation for your deposition today?	09:50:40
15	A. I reviewed all of them when I was	09:50:48
16	preparing my declaration, and I reviewed a number of	09:50:50
17	these recently, to prepare for this deposition. But	09:50:53
18	not all of them, necessarily.	09:50:59
19	Q. Do you recall which ones you reviewed?	09:51:07
20	A. Well, I reviewed the '112 Patent, and	09:51:24
21	Exhibits 1002 through 1006, certainly. I was	09:51:31
22	looking at Exhibit 1011; 1012; 1014.	09:51:38

1	Like I said, I reviewed the other ones	09:51:52
2	previously, when I was preparing the declaration.	09:51:54
3	But I don't -- but off the top of my head, I think	09:51:58
4	that those are the ones that I was looking at in the	09:52:02
5	past week or so.	09:52:05
6	Q. Did you review any other materials aside	09:52:09
7	from this list, in preparation for your deposition	09:52:12
8	today?	09:52:14
9	A. No.	09:52:19
10	Q. Did you review the Board's institution	09:52:27
11	decision in this case?	09:52:29
12	A. Sorry. Yes. I did review that. I	09:52:32
13	reviewed some other documents like the patent	09:52:35
14	owner's preliminary response. Those -- there were a	09:52:40
15	few of the documents like that, that I reviewed.	09:52:46
16	Q. Let's turn to paragraph 52 of your	09:53:01
17	declaration.	09:53:03
18	A. Okay.	09:53:04
19	Q. Do you know what the page number is in the	09:53:04
20	PDF?	09:53:06
21	A. Yes. Yeah.	09:53:07
22	Q. Would it be easier if I provide page	09:53:08

1	numbers --	09:53:10
2	A. Yes.	09:53:11
3	Q. -- because this is a --	09:53:12
4	A. That would help. I have to jump into the	09:53:14
5	PDF.	09:53:17
6	Q. Got it. So this is page 25 of the PDF.	09:53:18
7	A. Okay. All right. I'm there.	09:53:23
8	Q. In paragraph 52, you assert -- and I'll	09:53:27
9	read it verbatim:	09:53:32
10	"A POSITA at the time of the invention	09:53:33
11	would have had at least a bachelor's degree in	09:53:37
12	computer science, electrical engineering, or a	09:53:39
13	related folder, and at least two years of work or	09:53:43
14	research experience in the field of content delivery	09:53:46
15	management or networks."	09:53:49
16	Did I read that correctly?	09:53:51
17	A. Yes.	09:53:53
18	Q. You believe that's the correct level of	09:53:54
19	ordinary skill in the art for this proceeding?	09:53:55
20	A. Yes.	09:54:01
21	Q. In your opinion, what is the difference	09:54:02
22	between content delivery management and content	09:54:03

1	delivery networks?	09:54:07
2	A. Well, for example, in the field of	09:54:25
3	databases, some people just prefer to -- just talk	09:54:26
4	about databases, full stop. But people who are in	09:54:32
5	the field talk about database management systems.	09:54:34
6	So the term, "management," refers to -- in this type	09:54:39
7	of context, refers to the whole system of -- of how	09:54:45
8	the information is managed and delivered.	09:54:50
9	So, and a content delivery network is a --	09:54:54
10	a system that delivers content. So I wasn't	09:55:00
11	necessarily trying to draw some major distinction	09:55:04
12	between a content delivery network or content	09:55:09
13	delivery management.	09:55:12
14	But I think that the phrase, "content	09:55:13
15	delivery management," it would include how -- how	09:55:16
16	does a person -- how would a person in the field	09:55:18
17	design a content delivery network. I just felt that	09:55:22
18	that was a term that captured content delivery	09:55:25
19	networks, as well as their design.	09:55:32
20	Q. If I'm understanding you, content delivery	09:55:39
21	management, in the context of your statement, still	09:55:42
22	refers to content delivery networks, but more geared	09:55:44

1	towards the design of content delivery networks?	09:55:48
2	A. That's roughly correct. Yes. Yes. I	09:55:58
3	mean, it's about -- yeah. It's the field of	09:56:00
4	delivering content -- a content delivery network.	09:56:03
5	One could view that as being an artifact. It's a	09:56:08
6	thing.	09:56:12
7	And content delivery management is more of	09:56:13
8	the discipline of how do we make content delivery	09:56:15
9	networks work. So that's what I meant to capture	09:56:19
10	here. So that would be more, say, a skill of a	09:56:27
11	person would be understanding how to manage and	09:56:30
12	design content delivery networks.	09:56:31
13	Q. Okay. And you also say in this paragraph:	09:56:36
14	"I at least meet this definition of a	09:56:40
15	POSITA now, and as of the priority date of	09:56:43
16	'112 Patent."	09:56:46
17	Is that right?	09:56:47
18	A. Yes.	09:56:48
19	Q. Do you consider yourself to have more than	09:56:50
20	the requirements of a person of ordinary skill in	09:56:53
21	the art?	09:56:56
22	A. Well, I have a PhD in electrical	09:57:00

1	engineering, and my definition was just referring to	09:57:07
2	a bachelor's degree, for example.	09:57:09
3	Q. So is that yes, you consider yourself to	09:57:15
4	have more than the requirements of a person of	09:57:17
5	ordinary skill in the art?	09:57:19
6	A. Yes.	09:57:21
7	Q. If you turn to paragraph 17? I'll give	09:57:26
8	you the page in a second. That's page 12 of your	09:57:29
9	declaration. And let me know when you are there.	09:57:31
10	A. Okay. I'm there.	09:57:39
11	Q. Here, you state:	09:57:40
12	"I consider myself to be an expert in the	09:57:42
13	field of computer science."	09:57:45
14	Correct?	09:57:46
15	A. Yes.	09:57:46
16	Q. Do you also consider yourself to be an	09:57:47
17	expert in the fields of content delivery management	09:57:50
18	and content delivery networks?	09:57:55
19	A. Yes.	09:58:01
20	Q. Let's go up a little bit to page nine.	09:58:09
21	Paragraphs 11 and 12.	09:58:13
22	A. Okay.	09:58:16

1	Q. Here, you talk about articles and papers	09:58:17
2	that you have published. Is that right?	09:58:20
3	A. Yes.	09:58:23
4	Q. Are any of these articles or papers in the	09:58:26
5	field of content delivery networks?	09:58:30
6	A. Yes.	09:58:32
7	Q. Okay.	09:58:32
8	You have your CV in front of you. Could	09:58:34
9	you point out some examples of articles or papers	09:58:37
10	that are in the field of content delivery networks?	09:58:41
11	[Witness reviewed document.]	09:59:16
12	A. If it's okay, maybe I could refer to	09:59:17
13	numbers in my CV. And this starts on page seven of	09:59:19
14	the PDF of my CV. So the paper number 32. The	09:59:23
15	title is "Holistic Query Transformations for Dynamic	09:59:30
16	Web Applications." That's one example.	09:59:31
17	Paper number 34. "Scalable Query Result	09:59:39
18	Caching for Web Applications." Paper number 40.	09:59:41
19	"Invalidation Clues for Database Scalability	09:59:51
20	Services." Paper number 46, "Simultaneous	09:59:52
21	Scalability and Security for Data-Intensive Web	10:00:06
22	Applications."	10:00:06

1	Paper number 49, "A Scalability Service	10:00:16
2	for Dynamic Web Applications." And many of --	10:00:19
3	beyond those, many of my papers are related to	10:00:30
4	caching and data storage distributed systems, more	10:00:33
5	broadly.	10:00:40
6	Q. Okay.	10:00:41
7	We don't need to go through all of these,	10:00:53
8	but just as an example, you mentioned number 32.	10:00:55
9	Correct?	10:00:59
10	A. Yes.	10:01:11
11	Q. That's titled "Holistic Query	10:01:11
12	Transformations for Dynamic Web Applications?"	10:01:12
13	A. Yes.	10:01:16
14	Q. Do you recall, generally, what the subject	10:01:17
15	matter of that paper was?	10:01:18
16	A. I haven't looked at it in a little bit,	10:01:26
17	but off the top of my head, the PhD thesis of	10:01:28
18	Amit Manjhi, who is the first author on the paper.	10:01:33
19	What we were working on was techniques for	10:01:37
20	using content delivery networks to be able to	10:01:39
21	deliver not just static content; things like images	10:01:43
22	or movies that are -- that don't change. That's an	10:01:49

1 easy case for content delivery. We wanted to be 10:01:53
2 able to deliver dynamic web content. 10:01:57

3 Those are, for example, if you go to your 10:02:01
4 home page on, say -- at the time, say, Yahoo, or 10:02:04
5 Amazon, something like that, where there is a lot of 10:02:10
6 customization of what you are seeing, that that's 10:02:14
7 based on, for example, database contents. 10:02:16

8 That is a much more challenging thing to 10:02:21
9 support through web caching. So that was the 10:02:23
10 technical topic of a number of papers that I 10:02:28
11 mentioned. 10:02:32

12 Q. Okay. So related to this, in paragraph 12 10:02:40
13 of your declaration, you state: 10:02:44

14 "I have published a number of papers in 10:02:46
15 the top research conferences in the fields of data 10:02:49
16 storage caching, operating systems, and distributed 10:02:52
17 systems." 10:02:56

18 Correct? 10:02:57

19 A. Right. And that refers to not just the 10:02:58
20 papers that I just mentioned, but to quite a few 10:03:01
21 other papers. Yes. 10:03:04

22 Q. When you say "caching" in that sentence, 10:03:07

1 what types of caching are you referring to? 10:03:10

2 A. Well, I started working on the topic of 10:03:17
3 caching even in my PhD thesis at Stanford, starting 10:03:19
4 in 1989. And that was also -- my work on caching 10:03:24
5 was the thing that was cited when I was made an ACM 10:03:30
6 fellow. 10:03:34

7 And caching is used in many different 10:03:35
8 ways. In computer systems, it is a major trick for 10:03:38
9 accelerating data accesses. And I've worked on 10:03:42
10 caching in many different parts of systems. 10:03:49

11 The set of papers that I mentioned before, 10:03:51
12 that was where -- that was specifically for web 10:03:53
13 caching. But I've worked on other types of caching 10:03:56
14 where we are caching data from main memory into CPU 10:04:00
15 caches, or from disk storage into main memory. 10:04:06

16 I've had quite a few PhD students who have 10:04:11
17 worked on caching in different forms, including 10:04:15
18 Amit Manjhi, whose work I was mentioning a minute 10:04:17
19 ago. 10:04:22

20 Q. When you say "web caching," are you 10:04:26
21 referring to browser caching? Or something else? 10:04:28

22 A. No. Not in the browser -- not only in the 10:04:31

1 browser. I'm -- I am talking about caching related
2 to delivering web content, but although it's true
3 that web browsers have caches, that's -- that's not
4 what I was working on.

5 We were working on other forms of caching
6 that were -- that were basically more like content
7 delivery networks, where you are -- you have like
8 reverse proxies. Things like that. Content
9 servers, is I think the term that's used in the
10 '112 Patent.

11 So these are things that are
12 geographically placed, so that when you are trying
13 to access something that's not in your browser's
14 cache already, you can find it nearby and you don't
15 have to go all the way to the origin server.

16 Q. Okay. And you say that the example
17 articles that you previously pointed out, some of
18 those at least relate to what you just discussed.

19 Is that right?

20 A. Yes. They were -- the ones that I
21 mentioned specifically out of my CV, those were all
22 related to caching for web content.

10:04:34
10:04:37
10:04:42
10:04:47
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10:04:57
10:05:01
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10:05:08
10:05:10
10:05:14
10:05:18
10:05:22
10:05:29
10:05:32
10:05:35
10:05:39
10:05:43
10:05:44
10:05:49

1	Q. Okay. Let's move to paragraph 55 of your	10:06:06
2	declaration. And I will provide that page in a	10:06:10
3	moment as well. It is on page 26 of the PDF.	10:06:12
4	A. Okay.	10:06:22
5	Q. Here, you are discussing the Glines	10:06:23
6	reference. Is that correct?	10:06:25
7	A. Yes.	10:06:30
8	Q. And that is Exhibit 1002 in this	10:06:32
9	proceeding.	10:06:36
10	[Witness reviewed document.]	10:06:52
11	A. Sorry. I'm just double-checking that.	10:06:53
12	Yes. That's right.	10:06:59
13	Q. In the middle of that paragraph, you	10:07:05
14	state:	10:07:07
15	"The user request to resolve a domain name	10:07:08
16	is 'forwarded as an anycast message' over the	10:07:11
17	internetwork (e.g., Internet) 30 to the DNS servers	10:07:15
18	53, and the closest server 53 responds with a	10:07:18
19	network address of an associated content server 51."	10:07:22
20	Do you see that?	10:07:26
21	A. Yes. I see that.	10:07:27
22	Q. And the user then requests the content	10:07:33

1	from the content server 51. Is that right?	10:07:35
2	A. Yes.	10:07:40
3	Q. Is the network address of the content	10:07:43
4	server that is returned to the client an IP address?	10:07:45
5	A. Yes. That's right.	10:07:57
6	Q. And the network address of the content	10:08:00
7	server would be a unicast address, so that the	10:08:05
8	client could contact the content server?	10:08:08
9	Is that correct?	10:08:13
10	A. Yes. That's correct.	10:08:14
11	ATTORNEY PAPPAS: I'd like you to turn to	10:08:18
12	Glines; Exhibit 1002. Can you let me know if	10:08:20
13	you have access to that document?	10:08:23
14	THE WITNESS: Yes. I have the electronic	10:08:27
15	copy. I'm just going to quickly check to see	10:08:32
16	whether the hard copy is -- yeah. I have it	10:08:36
17	both in hard copy and electronic copy.	10:08:38
18	ATTORNEY PAPPAS: Okay.	10:08:41
19	You are welcome to use either one.	10:08:41
20	Whatever is most convenient for you.	10:08:44
21	BY ATTORNEY PAPPAS:	10:08:45
22	Q. And you said you reviewed Glines as part	10:08:45

1	of your preparation for this deposition today?	10:08:47
2	A. Yes.	10:08:51
3	Q. Let's turn to page 11 of Glines. And I'm	10:08:56
4	referring to the pages at the top of the page. Not	10:08:59
5	the PDF pages.	10:09:07
6	A. Okay. I'm on page 11.	10:09:09
7	Q. So starting around line 14 on page 11,	10:09:15
8	Glines here is discussing Figure 1. Correct?	10:09:21
9	A. Yes. That's right.	10:09:29
10	Q. You are welcome to refer to Figure 1 as	10:09:30
11	well, if it's helpful. Glines describes that there	10:09:33
12	is a personal computer 12 as part of Figure 1.	10:09:36
13	Is that right?	10:09:40
14	A. Yes.	10:09:45
15	Q. And that personal computer 12 is a client	10:09:46
16	computing device?	10:09:49
17	A. Yes.	10:09:54
18	Q. And the client is on a local area network	10:09:54
19	14. Is that right?	10:09:59
20	A. Yes.	10:10:10
21	Q. And then also on the local area network is	10:10:13
22	a local DNS resolver 18; a local content host 21;	10:10:16

1	and a local content storage device 22?	10:10:23
2	Is that right?	10:10:27
3	A. Can you repeat the question? I just want	10:10:42
4	to make sure I caught all the things you just said	10:10:44
5	in the question.	10:10:46
6	Q. Absolutely. Also on the local area	10:10:48
7	network is a local DNS resolver 18; a local content	10:10:50
8	host 21; and a local content storage device 22.	10:10:56
9	Is that correct?	10:11:00
10	A. Yes. In the page 11 discussion, it's	10:11:12
11	trying to see where it's describing that. But yes.	10:11:14
12	That's my understanding of -- yeah -- of what's	10:11:21
13	there. Yes. Oh, I guess it -- I see.	10:11:24
14	Okay. It's further down on the page.	10:11:28
15	Okay. Yes. That's correct.	10:11:30
16	Q. Okay. And these questions are mainly just	10:11:32
17	to establish your understanding of the architecture	10:11:35
18	of Glines. So I appreciate that.	10:11:37
19	Glines also says that the local area	10:11:44
20	network 14 is connected to an internetwork 30. Is	10:11:46
21	that right?	10:11:51
22	A. Yes.	10:11:56

1 Q. And that internetwork 30 may be, for 10:11:57
2 example, the internet? 10:12:00

3 A. Yes. 10:12:05

4 Q. And looking at Figure 1, there is also an 10:12:08
5 origin server 40. Correct? 10:12:10

6 A. Yes. 10:12:16

7 Q. What is origin server 40? 10:12:17

8 A. Well, in a system that did not have a 10:12:30
9 content delivery network, what would happen is if 10:12:35
10 you wanted to go to, say, ESPN.com -- in the 10:12:36
11 '112 Patent, they use "example.com" as a placeholder 10:12:43
12 domain name or host name. 10:12:46

13 But if you wanted to go there, there would 10:12:48
14 be -- the ESPN itself would have a machine that 10:12:50
15 could serve the content. So that's -- the origin 10:12:54
16 server refers to that centralized place that the -- 10:12:59
17 like, say, CNN, the business owns, like a server 10:13:05
18 that sits somewhere on the network. 10:13:09

19 So in theory, that's where you would go to 10:13:12
20 get the content. But, of course, it would be very 10:13:15
21 slow if everyone really had to go to the origin 10:13:17
22 server all the time, which is the motivation for 10:13:21

1 having a content delivery network. 10:13:23

2 But, generally speaking, the origin server 10:13:26
3 refers to the place where the content would normally 10:13:28
4 live, aside from the fact that it gets cached in a 10:13:31
5 content delivery network. 10:13:40

6 Q. Okay. 10:13:40

7 So in those examples you gave with ESPN 10:13:40
8 and CNN, ESPN or CNN would be the content provider 10:13:43
9 in that scenario? 10:13:49

10 A. Yes. That's right. 10:13:53

11 Q. And then origin -- the origin server would 10:13:54
12 be associated with the content provider; either ESPN 10:13:57
13 or CNN, in those scenarios? 10:14:02

14 A. That's how it would normally work. Yes. 10:14:05

15 Q. And then in Figure 1 of Glines, there are 10:14:12
16 also what Glines calls "replica content servers 10:14:15
17 50-1, 50-2, and 50-3." 10:14:22

18 Is that right? 10:14:29

19 A. Yes. That's right. 10:14:30

20 Q. Okay. Let's take replica content server 10:14:32
21 50-1 as an example. Replica content server 50-1 is 10:14:39
22 associated with a file server 51-1, and a storage 10:14:47

1	device, 52-1.	10:14:52
2	Is that correct?	10:14:54
3	A. Yes.	10:15:01
4	Q. And the storage device 52-1 stores content	10:15:02
5	files that originate at the origin server 40.	10:15:06
6	Correct?	10:15:11
7	A. Yes.	10:15:12
8	Q. So replica content servers 50, then, are	10:15:15
9	intended to provide access to files from the content	10:15:19
10	provider associated with origin server 40?	10:15:21
11	ATTORNEY BOYER: Objection. Form.	10:15:27
12	THE WITNESS: Can you repeat the question,	10:15:38
13	please?	10:15:41
14	ATTORNEY PAPPAS: Sure.	10:15:43
15	BY ATTORNEY PAPPAS:	10:15:43
16	Q. So is it your understanding that replica	10:15:43
17	content servers 50 are intended to provide access to	10:15:45
18	files from the content provider associated with	10:15:51
19	origin server 40?	10:15:55
20	A. The replica servers are intended to	10:15:57
21	provide -- I mean, they provide web content for all	10:16:00
22	of the different content providers that are	10:16:07

1 customers of the content delivery network.

10:16:10

2 So it could be, I mentioned before, ESPN,
3 or CNN, or Amazon -- whatever -- whatever companies
4 are customers of the content delivery network, it
5 would be -- it would be providing content from
6 those -- from those content providers.

10:16:13

10:16:18

10:16:23

10:16:25

10:16:30

7 Q. In the example that's illustrated in
8 Figure 1 of Glines, there is an origin server 40.
9 Right?

10:16:37

10:16:39

10:16:44

10 A. Figure 1 is showing an origin server 40.
11 Yes.

10:16:51

10:16:54

12 Q. And then in that scenario that -- or that
13 embodiment that's shown in Figure 1, the replica
14 content servers would store files that originated
15 from origin server 40. Correct?

10:16:55

10:16:58

10:17:02

10:17:07

16 A. Well, the replica servers are designed to
17 store content from content providers. And the
18 "example.com" is shown as an example of one such
19 content provider. And that's what's labeled as 40
20 in this case.

10:17:20

10:17:22

10:17:26

10:17:35

10:17:40

21 That's just one exemplary content provider
22 for -- you know, there is also just shown like one

10:17:41

10:17:47

1 client 12, but that's not the only client also, even 10:17:50
2 though they just show one of them. 10:17:57

3 Q. So in that example where the origin server 10:18:01
4 would correspond to "example.com," the replica 10:18:04
5 content servers 50 would store content files that 10:18:07
6 originated from the "example.com" origin server. 10:18:11

7 Is that right? 10:18:16

8 A. Yes. From "example.com," and from other 10:18:26
9 customers who are content providers. 10:18:28

10 Q. And the replica content servers in Glines 10:18:35
11 Figure 1 are also associated with name servers 53-1, 10:18:38
12 53-2, and 53-3. 10:18:44

13 Is that right? 10:18:47

14 ATTORNEY BOYER: Objection. Form. 10:18:58

15 THE WITNESS: Sorry. I just noticed there 10:19:14
16 appears to be a typo in the figure. 53.1, I 10:19:16
17 believe, does not appear. There are two 52-1s. 10:19:21
18 But, symmetrically, the one at the top, I 10:19:28
19 think, is supposed to be labeled 53-1. 10:19:33

20 I apologize. I was trying to figure out 10:19:36
21 why that was labeled incorrectly. Could you 10:19:39
22 please repeat the question? 10:19:41

1	ATTORNEY PAPPAS: Absolutely.	10:19:45
2	BY ATTORNEY PAPPAS:	10:19:45
3	Q. I agree. I think 52-1 was meant to be	10:19:47
4	53-1, referring to the DNS server in Figure 1.	10:19:51
5	Though my question is, the replica content	10:19:56
6	servers in Glines Figure 1 are associated with name	10:19:59
7	servers 53-1, 53-2, and 53-3. Is that right?	10:20:05
8	ATTORNEY BOYER: Objection. Form.	10:20:14
9	THE WITNESS: Well, in page 12 of Glines,	10:20:45
10	starting on line 24, it says:	10:20:46
11	"Also associated with each of the content	10:20:48
12	servers 50 is a respective DNS server."	10:20:51
13	And then it talks about the name servers,	10:20:59
14	53-1, 53-2, and 53-3. And they are all	10:21:01
15	addressable by a common anycast address.	10:21:08
16	BY ATTORNEY PAPPAS:	10:21:10
17	Q. So what is the purpose of the DNS servers,	10:21:11
18	53-1, 53-2, and 53-3?	10:21:16
19	A. Well the name servers, 53-1, 53-2, 53-3,	10:21:46
20	for example, when the user is requesting content,	10:21:51
21	they -- those -- those name servers share an anycast	10:21:56
22	address. The network routes the name resolution	10:22:02

1	request to one of them.	10:22:10
2	And then that name server is going to	10:22:11
3	select one of the content servers to provide the	10:22:18
4	content, and it will provide the IP address of the	10:22:24
5	content server.	10:22:27
6	ATTORNEY PAPPAS: Is this a good time to	10:22:40
7	take a quick break?	10:22:41
8	THE WITNESS: This is good for me. Yes.	10:22:43
9	ATTORNEY BOYER: Sure.	10:22:45
10	ATTORNEY PAPPAS: Ten minutes. Does that	10:22:47
11	work?	10:22:48
12	THE WITNESS: Sure. Okay.	10:22:49
13	ATTORNEY PAPPAS: All right. Thank you.	10:22:50
14	(Short break.)	10:22:55
15	BY ATTORNEY PAPPAS:	10:35:35
16	Q. Welcome back, Dr. Mowry.	10:35:36
17	A. Thank you.	10:35:40
18	Q. During the break, did you discuss the	10:35:41
19	substance of your testimony with counsel?	10:35:42
20	A. No.	10:35:44
21	Q. Let's turn to page 13 of Glines. Again,	10:35:46
22	that's 13 at the top of the page.	10:35:50

1	A. Okay.	10:35:57
2	Q. Starting around line 15, this is where	10:35:57
3	Glines discusses Figure 2. Correct?	10:35:59
4	A. Yes. It's discussing Figure 2 at that	10:36:08
5	part of Glines.	10:36:11
6	Q. And Figure 2 relates to the operation of	10:36:14
7	Glines' system when a client requests the URL,	10:36:16
8	http://www.example.com/homepage.html .	10:36:19
9	Is that right?	10:36:30
10	A. Yes. That's right.	10:36:36
11	Q. And I realize there may be a typo on line	10:36:37
12	20 of Glines, where the dot com was left out. Does	10:36:42
13	that look right?	10:36:45
14	A. Yes. I see what you mean. Yes. That	10:36:46
15	appears to be a typo.	10:36:48
16	Q. So in this example, Glines' system first	10:36:53
17	looks to see whether the requested content is stored	10:36:55
18	locally on the local web server. Correct?	10:36:58
19	A. Yes. That's right.	10:37:13
20	Q. And that local web server has a single IP	10:37:14
21	address?	10:37:18
22	A. Well, it has at least one unique IP	10:37:31

1	address. It doesn't say -- the only reason I'm	10:37:36
2	hesitating in my answer is, it's possible that it	10:37:40
3	would be configured to have additional IP addresses.	10:37:43
4	But yes. My understanding is that it	10:37:47
5	would have a unique -- at least one unique IP	10:37:49
6	address.	10:37:52
7	Q. Okay. If the content is available locally	10:37:54
8	in this example in Glines, then there would be the	10:37:57
9	unique IP address that's returned to the client for	10:38:01
10	that local web server?	10:38:04
11	Is that fair?	10:38:07
12	A. Yes.	10:38:08
13	Q. And if the content is not available	10:38:11
14	locally, Glines says that:	10:38:13
15	"A request to resolve the location of	10:38:15
16	'example.com' is then sent to a root DNS server 38	10:38:18
17	in step 108."	10:38:23
18	Is that correct?	10:38:25
19	ATTORNEY BOYER: Objection. Form.	10:38:31
20	THE WITNESS: I apologize. Can you please	10:38:52
21	repeat the question? I was just catching up on	10:38:53
22	the description here to make sure I could	10:38:55

1	answer it accurately.	10:38:57
2	ATTORNEY PAPPAS: Sure.	10:38:59
3	BY ATTORNEY PAPPAS:	10:38:59
4	Q. And I'm mainly reading from line -- page	10:38:59
5	14, starting at line eight. But the question was,	10:39:02
6	if the content is not available locally, Glines says	10:39:06
7	that:	10:39:10
8	"A request to resolve the location of	10:39:10
9	'example.com' is then sent to a root DNS server 38	10:39:12
10	in step 108."	10:39:19
11	Is that correct?	10:39:22
12	A. Well, I think you said if the content is	10:39:24
13	not available locally. But what happens is if the	10:39:26
14	name can't be resolved locally, then it sends the	10:39:30
15	request to resolve the name to the root DNS server.	10:39:35
16	It's possible that the local content	10:39:39
17	server might actually contain the content. But if	10:39:44
18	the local DNS server doesn't resolve the name, then	10:39:49
19	that's what causes it to go on to step 108.	10:39:53
20	Q. Okay. So let me rephrase, then. If the	10:40:01
21	local DNS resolver does not resolve the name to an	10:40:07
22	IP address of the local web server, then a request	10:40:12

1	to resolve the location of example.com is then sent	10:40:18
2	to a root DNS server 38 in step 108.	10:40:22
3	Is that fair?	10:40:27
4	ATTORNEY BOYER: Objection. Form.	10:40:28
5	THE WITNESS: No. As I recall in your	10:40:33
6	question, you said if it doesn't resolve it to	10:40:37
7	the local content server. But the issue is	10:40:40
8	whether the local DNS server can resolve the	10:40:43
9	name, full stop.	10:40:46
10	If it can't resolve the name, then it	10:40:49
11	sends on the request to the root DNS server.	10:40:52
12	ATTORNEY PAPPAS: Okay.	10:41:03
13	BY ATTORNEY PAPPAS:	10:41:03
14	Q. But in line -- let's go to page 13. Last	10:41:03
15	line, 27. Line says:	10:41:07
16	"The DNS resolver 18 determines whether or	10:41:09
17	not the requested content file is available	10:41:12
18	locally."	10:41:14
19	Correct?	10:41:16
20	A. It says that. Yes.	10:41:23
21	Q. And then in the next paragraph, it says:	10:41:27
22	"If the content is available locally, then	10:41:31

1	the local IP address is returned to the browser	10:41:32
2	program in step 106."	10:41:35
3	Right?	10:41:37
4	A. Right. Well if the local DNS resolver	10:42:01
5	18 -- if it is able to -- if it finds a mapping for	10:42:05
6	the name -- if it can resolve the name -- in other	10:42:12
7	words, locally, it has a cached translation or	10:42:15
8	mapping of the -- that domain name,	10:42:20
9	"example.com/home page.html."	10:42:23
10	If it finds the mapping and it turns out	10:42:30
11	that that -- the thing that it maps to also happens	10:42:33
12	to be the local content server number, say 21, if	10:42:37
13	that's the right number for the local content	10:42:46
14	server.	10:42:50
15	If those things are true, then it has	10:42:50
16	determined that it's available locally. But if it	10:42:53
17	does not have -- if it's not able to translate the	10:42:59
18	domain name or host name into an IP address locally,	10:43:03
19	then regardless of what's in a local content server,	10:43:07
20	it sends the name-resolving request on to the root	10:43:12
21	DNS server.	10:43:18
22	Q. Right. So at line seven -- I believe it's	10:43:26

1	line seven on page 14, Glines says:	10:43:30
2	"If, however, in step 104, the domain	10:43:33
3	'example.com' is not available locally, then the	10:43:36
4	process proceeds to step 108."	10:43:40
5	Is that right?	10:43:43
6	A. I think you just read the sentence	10:43:52
7	accurately.	10:43:54
8	Q. Do you agree that's what Glines discloses?	10:43:55
9	A. Well, for the content to be available	10:44:21
10	locally, two things need to happen. The local DNS	10:44:23
11	server needs to have locally, in its own mapping	10:44:26
12	tables, a mapping of the URL. In this case, the	10:44:31
13	"example.com/home page.html." It would have to have	10:44:39
14	a mapping for it.	10:44:45
15	And that mapping would need to point to	10:44:46
16	the IP address of the local content server. If both	10:44:48
17	of those things are true, then it is local content.	10:44:53
18	And then we move on to step 106, if both of those	10:44:58
19	things are true. Otherwise, we move on to step 108.	10:45:01
20	But if -- both of those things can go	10:45:07
21	wrong, or fail. It could be that the local DNS	10:45:11
22	server doesn't have a mapping. These things are	10:45:15

1	cached, and they only have a certain period of time	10:45:18
2	in which they are valid.	10:45:21
3	So if the -- if the time to live has	10:45:23
4	expired for that mapping in the local DNS server, it	10:45:26
5	won't be able to map it. So it will then have to go	10:45:31
6	on and forward this request on to the root DNS	10:45:34
7	server, regardless of what's in the -- stored in the	10:45:37
8	local content server.	10:45:41
9	And also, just to complete the scenario	10:45:46
10	there, if it is -- let's say it is mapped locally,	10:45:48
11	then it may or may not be that the location -- the	10:45:54
12	IP address, it might be local, or maybe it's not	10:45:57
13	local.	10:46:00
14	So they are really referring to the	10:46:01
15	combination of it being found in the local DNS	10:46:03
16	server, in the mapping table, and that the IP	10:46:07
17	address is for the local content server.	10:46:12
18	And that's described, like, on page 14,	10:46:25
19	starting at line eight. It says, if it failed to	10:46:27
20	resolve the requested name locally, then this is	10:46:31
21	sent on to the root DNS server.	10:46:34
22	Q. Okay.	10:46:45

1 In line seven, when it says "If, however,
2 in step 104, the domain 'example.com' is not
3 available locally," are you reading that as -- are
4 you reading "locally" in that context as the content
5 existing locally?

10:46:46

10:46:49

10:46:53

10:47:04

10:47:08

6 ATTORNEY BOYER: Objection. Form.

10:47:16

7 THE WITNESS: Well, it would be correct to
8 interpret this as -- I mean, in that line six
9 or seven, where it says, "If, however, in step
10 104, the domain 'example.com' is not available
11 locally, then it moves to step 108," that
12 sentence is correct.

10:47:56

10:47:57

10:47:59

10:48:04

10:48:06

10:48:11

13 If it means that the -- if we are talking
14 about the translation by trying to resolve
15 example.com, that domain, to an IP address. If
16 the local DNS server cannot, through purely
17 local information, resolve this, then you do
18 indeed go on to step 108, where you have to
19 talk to the root DNS server, because it's not
20 able to resolve the name.

10:48:13

10:48:15

10:48:19

10:48:23

10:48:29

10:48:32

10:48:36

10:48:39

21 ATTORNEY PAPPAS: Okay.

10:48:53

22 BY ATTORNEY PAPPAS:

10:48:53

1 Q. So is it fair to say there are two ways to 10:48:53
2 trigger step 108? And I'll ask these individually. 10:48:56
3 One way would be that the local DNS resolver does 10:49:02
4 not have a mapping for the domain, "example.com?" 10:49:08
5 Is that one way? 10:49:14
6 A. Yes. It's definitely the case that if 10:49:21
7 it -- if the local DNS does not have -- DNS 10:49:23
8 server -- if it does not have a mapping for the 10:49:29
9 domain, for example, "example.com," then it needs to 10:49:32
10 go on to send a request on to the root DNS server in 10:49:37
11 step 108. 10:49:45
12 Q. And a second way would be is if it has a 10:49:46
13 mapping to the local web server but the content 10:49:48
14 isn't actually available, that would trigger step 10:49:53
15 108? 10:49:56
16 Is that correct? 10:49:58
17 A. If the local DNS server -- if I understand 10:50:34
18 your scenario correctly, you are asking if the local 10:50:37
19 DNS server has a mapping and it thinks that the 10:50:39
20 domain, "example.com" should map to an IP address 10:50:43
21 for the local web server -- content server 20 -- if 10:50:49
22 it thinks that that's the mapping, if it's valid, 10:50:56

1	then it will return that as the place to go get the	10:50:59
2	content.	10:51:05
3	That it will then communicate with the	10:51:11
4	local -- with 20, with the local web server, to find	10:51:12
5	the content. The moving on to step 108 is triggered	10:51:15
6	by -- yeah. That's -- it's triggered by certainly	10:51:19
7	whenever the name isn't mapped there.	10:51:27
8	Q. I don't want to interrupt you if you were	10:52:05
9	still continuing.	10:52:06
10	A. No. Sorry. I was -- I was finished.	10:52:08
11	Q. Okay. So to be clear, step 108 would be	10:52:10
12	triggered when the local DNS resolver does not have	10:52:19
13	a valid mapping to the content from example.com.	10:52:25
14	Is that fair?	10:52:31
15	A. Yes.	10:52:34
16	Q. And then Glines says, starting at line	10:52:46
17	eight:	10:52:49
18	"A request to resolve the location of	10:52:49
19	'example.com' is then sent to a root DNS server 38	10:52:51
20	in step 108."	10:52:57
21	Is that right?	10:52:58
22	A. Yes.	10:52:59

1	Q. The root DNS server then returns to the	10:53:02
2	client, the anycast address corresponding to name	10:53:05
3	servers 53-1, 53-2, and 53-3.	10:53:09
4	Is that correct?	10:53:15
5	A. Yes. That's right.	10:53:22
6	Q. Can you flip to page seven of Glines for a	10:53:32
7	moment? In the first paragraph. And let me know	10:53:34
8	when you are there.	10:53:41
9	A. Okay. I'm there.	10:53:43
10	Q. Here, Glines states:	10:53:45
11	"The root Domain Name Servers defined, for	10:53:48
12	example, by the Internic, may be programmed to	10:53:50
13	return the common address of the group of name	10:53:55
14	server/content servers peers that share a common	10:53:58
15	anycast address."	10:54:01
16	Is that correct?	10:54:02
17	A. Yes. That's what it says.	10:54:06
18	Q. What is a root Domain Name Server?	10:54:08
19	A. Domain names are hierarchical. For	10:54:19
20	example, a university has a domain name that ends	10:54:23
21	with "dot edu," or businesses have a name that ends	10:54:25
22	with "dot com."	10:54:29

1 So a way to think of it is you start 10:54:30

2 with -- there is a text string with "something dot 10:54:33

3 something, dot something," and the root refers to -- 10:54:40

4 conceptually, it's similar -- it's a little bit like 10:54:42

5 an empty IP address. It's the top of the entire 10:54:45

6 hierarchy. 10:54:49

7 And below that are dot -- you know, edu, 10:54:51

8 gov; com. Sort of the dot com. The different 10:54:55

9 things you see at the suffixes at the very end of a 10:54:59

10 domain name or host name. 10:55:02

11 And then it's arranged hierarchically. 10:55:05

12 So, there is a Domain Name Server for the dot edu 10:55:07

13 addresses, and then they might go to, say, 10:55:13

14 "CMU.edu," or "MIT.edu." So the root refers to the 10:55:16

15 very top of the entire hierarchy. 10:55:24

16 Q. Do you know what the Internic -- sorry -- 10:55:32

17 sorry, the Internic, refers to in this sentence? 10:55:34

18 For clarity of the record, I'll just spell Internic. 10:55:59

19 I-N-T-E-R-N-I-C. 10:56:01

20 You can go ahead when ready. 10:56:05

21 A. I don't recall, off the top of my head, 10:56:14

22 what that is. It's talking -- the sentence is 10:56:15

1 talking about how you set up Domain Name Servers to 10:56:17
2 point to -- at the root Domain Name Server to point 10:56:23
3 to something. 10:56:28

4 Like I said, there is a hierarchy of these 10:56:29
5 things, and the people who administer the domains 10:56:31
6 enter the correct mapping for things. 10:56:36

7 So it looks like -- that's the 10:56:42
8 functionality that's being described by the 10:56:43
9 sentence. But I don't remember, off the top of my 10:56:45
10 head, what Internic is referring to. 10:56:48

11 Q. That's a good segue to the next question. 10:56:51
12 Do you know who manages or administers root Domain 10:56:53
13 Name Servers? 10:56:57

14 A. Well, the way -- I know this has changed 10:57:29
15 over time. I don't remember the exact organization 10:57:31
16 that manages the very top level root server. I know 10:57:33
17 that there is a set of root Domain Name Servers. 10:57:37

18 And when you go through the full process, 10:57:41
19 they point you to, you know, the next level of the 10:57:45
20 hierarchy, like "dot com;" "dot edu." 10:57:49

21 Since it's so common to access things that 10:57:53
22 are, say, "dot com" or "dot edu," there is also 10:57:55

1 something called a top-level domain server. 10:58:00

2 So, for example, in Figure 1, in box 38, 10:58:02

3 it says "TLD Name Server." And that usually refers 10:58:05

4 to something like the name server that handles 10:58:09

5 everything related to "dot com," for example. 10:58:13

6 So, for example, if you are Amazon or 10:58:16

7 ESPN, you will be able to set up mappings to 10:58:19

8 translate, you know, host names or domain names that 10:58:25

9 fall within, you know, ESPN.com or Amazon.com. 10:58:30

10 But, anyway, I don't remember right now 10:58:37

11 the exact organization that manages the very -- the 10:58:40

12 root servers. The things below them don't change 10:58:43

13 very often and they get probed very frequently, so 10:58:48

14 there is a lot of replication for those name 10:58:51

15 servers. 10:58:55

16 Q. And those root Domain Name Servers and 10:59:01

17 top-level Domain Name Servers are intended to be 10:59:03

18 accessed by everyone accessing the internet? 10:59:07

19 Is that fair? 10:59:11

20 A. Well, resolving host name involves 10:59:18

21 querying a whole set of different DNS servers. So 10:59:20

22 they do get accessed frequently. In terms of 10:59:25

1 updating their mappings, that's something that's 10:59:29
2 done by administrators. 10:59:31

3 But users of the web are frequently 10:59:32
4 entering new URLs that need to be resolved. And 10:59:38
5 they get sent through that hierarchy -- the 10:59:41
6 hierarchy of different DNS servers. 10:59:45

7 Q. So regardless of where a user is 10:59:49
8 geographically in the world, they may send a request 10:59:51
9 to a root Domain Name Server, or a top-level Domain 10:59:54
10 Name Server, to resolve a domain name? 10:59:58

11 ATTORNEY BOYER: Objection. Form. 11:00:04

12 THE WITNESS: Well, the thing that's 11:00:19
13 unclear about your question is, you said -- you 11:00:20
14 talked -- I think you referred to a root Domain 11:00:23
15 Name Server or a top-level Domain Name Server. 11:00:28
16 The way it works is these things are 11:00:34
17 replicated. 11:00:36

18 So if we are talking about a very specific 11:00:37
19 physical Domain Name Server, that doesn't -- 11:00:39
20 there is -- in order for the Domain Name 11:00:43
21 Serving to be scalable, those DNS servers are 11:00:47
22 replicated, as I mentioned. 11:00:54

1	So during DNS resolution, you query some	11:00:56
2	server, but you hopefully find one that's	11:01:02
3	physically near you, so that you don't have a	11:01:06
4	large amount of latency to go find something.	11:01:08
5	So it's not that there is a centralized,	11:01:11
6	like, single server sitting somewhere that does	11:01:13
7	this.	11:01:17
8	At an abstract level, they go through a	11:01:19
9	process that involves walking down a hierarchy	11:01:21
10	of levels to resolve the name. But as I said,	11:01:24
11	there is a lot of replication with these	11:01:29
12	servers.	11:01:33
13	BY ATTORNEY PAPPAS:	11:01:33
14	Q. So if I asked you -- rephrase the question	11:01:36
15	as regardless of where a user sits geographically in	11:01:42
16	the world, they may send a request to one of the	11:01:45
17	replicated root Domain Name Servers to resolve a	11:01:48
18	domain name they are requesting?	11:01:53
19	Is that accurate?	11:01:57
20	ATTORNEY BOYER: Objection. Form.	11:01:59
21	THE WITNESS: Well, another thing that's a	11:02:03
22	little confusing about the question, you	11:02:05

1 mentioned does a root -- a user send a request. 11:02:06

2 So the user is using their browser and they 11:02:09

3 type in the URL. It's actually the local 11:02:13

4 resolver, which is usually some software, that 11:02:17

5 starts -- starts off this process. 11:02:22

6 So I'm not sure that I would characterize 11:02:24

7 it as the user directly sending a message. And 11:02:26

8 there is also caching of these translations in 11:02:32

9 various DNS servers. 11:02:35

10 So it's possible that when I enter a URL, 11:02:40

11 that if I'm lucky, and if -- if I've accessed, 11:02:43

12 say, the same domain name recently, then there 11:02:48

13 might be a valid cache translation in maybe 11:02:53

14 even my own local DNS server, so it doesn't 11:02:56

15 necessarily have to go to a root DNS server to 11:03:00

16 resolve the name. 11:03:03

17 ATTORNEY PAPPAS: Understood. 11:03:05

18 BY ATTORNEY PAPPAS: 11:03:05

19 Q. What I'm trying to get at is there is no 11:03:05

20 restriction on who can initiate requests to root 11:03:09

21 Domain Name Servers, based on where the request 11:03:17

22 originates from geographically. 11:03:25

1	ATTORNEY BOYER: Objection.	11:03:29
2	ATTORNEY PAPPAS: Is that correct?	11:03:30
3	ATTORNEY BOYER: Objection. Form.	11:03:31
4	THE WITNESS: I'm having trouble following	11:03:49
5	the question, in that -- so, I mean, there are	11:03:50
6	parts of the world that restrict internet	11:03:55
7	access, for example.	11:03:59
8	So if I'm in countries that have a	11:04:00
9	firewall for their whole country, then I can't	11:04:04
10	necessarily have a request to an arbitrary	11:04:08
11	domain name and have that actually work. But	11:04:11
12	I'm not sure that I'm following the question.	11:04:15
13	BY ATTORNEY PAPPAS:	11:04:21
14	Q. Are there restrictions on which devices	11:04:21
15	are able to submit a request to a replicated root	11:04:24
16	Domain Name Server?	11:04:30
17	ATTORNEY BOYER: Objection. Form.	11:04:34
18	THE WITNESS: So as I said, often, there	11:05:22
19	are -- there are URLs that are -- or host names	11:05:23
20	that are resolved. It could be resolved in a	11:05:26
21	variety of different ways. Sometimes things go	11:05:29
22	right to a top-level Domain Name Server. You	11:05:31

1	don't necessarily have to start at the root.	11:05:34
2	And also, there might be different	11:05:37
3	policies and different organizations, and	11:05:39
4	things that may restrict the types of -- the	11:05:41
5	web traffic that you could have.	11:05:47
6	So the way the question is phrased,	11:05:50
7	it's -- it's difficult to answer that. Because	11:05:54
8	it's easy to imagine scenarios, I guess, where	11:05:59
9	internet traffic is limited due to different	11:06:03
10	policies, or due to just lack of internet	11:06:06
11	access, I guess.	11:06:10
12	BY ATTORNEY PAPPAS:	11:06:11
13	Q. The information available, where accessed	11:06:20
14	via a root Domain Name Server, is supposed to be	11:06:22
15	authoritative information.	11:06:27
16	Is that right?	11:06:28
17	ATTORNEY BOYER: Objection. Form.	11:06:31
18	THE WITNESS: Well, a particular DNS	11:06:35
19	server might be authoritative for a domain.	11:06:36
20	And so, but that -- I mean, that depends.	11:06:41
21	You know, a Domain Name Server is said to	11:06:50
22	be authoritative for some set of domain names,	11:06:53

1	if it is the thing that is able to give you a	11:06:57
2	response and tell you this is the IP address	11:07:01
3	you are looking for.	11:07:04
4	ATTORNEY PAPPAS: Right.	11:07:25
5	BY ATTORNEY PAPPAS:	11:07:25
6	Q. So if a request is made for a domain, and	11:07:25
7	there are no policy restrictions, and there are no,	11:07:37
8	like, valid cached entries in the initial domain	11:07:40
9	servers that are searched, then a request to a root	11:07:48
10	Domain Name Server would be used to resolve the	11:07:56
11	domain name.	11:08:01
12	Is that correct?	11:08:04
13	ATTORNEY BOYER: Objection. Form.	11:08:12
14	THE WITNESS: Well, again, the thing	11:08:16
15	that's confusing -- well, the thing that's	11:08:17
16	confusing about the question is, when people	11:08:19
17	talk about root Domain Name Server, sometimes	11:08:23
18	what they mean is the thing that knows how to	11:08:25
19	point you to dot -- you know, dot com; dot edu;	11:08:29
20	dot gov. There is a very small set of those	11:08:36
21	things.	11:08:39
22	But at that very top level, it doesn't --	11:08:39

1	I mean, it just points you to the next level.	11:08:43
2	So you typically go further down into the	11:08:46
3	hierarchy than that before you get the IP	11:08:50
4	address that you really want.	11:08:53
5	So, like, you need -- there are -- like as	11:08:56
6	I said, top-level Domain Name Servers, maybe if	11:08:58
7	you go to that one, it might be authoritative	11:09:03
8	for, say, ESPN.com. Maybe it can tell you,	11:09:05
9	"Okay, here is the IP address if you want to go	11:09:11
10	to homepage.espn.com."	11:09:14
11	But there is a hierarchy of these things,	11:09:18
12	and they are just set up so that a DNS -- a	11:09:20
13	particular DNS server is authoritative for some	11:09:24
14	set of domain names. I mean, it might be	11:09:28
15	authoritative for a set of domain names, but	11:09:34
16	not every server is authoritative for	11:09:38
17	everything.	11:09:40
18	And I think the way you phrased the	11:09:41
19	question, it sounds like it's suggesting that	11:09:43
20	the root DNS server for -- you know, for the	11:09:45
21	whole internet, would be authoritative for	11:09:50
22	everything.	11:09:52

1	I mean, that's not really how it works.	11:09:53
2	It just points you to the next level of the	11:09:55
3	hierarchy, typically.	11:09:58
4	BY ATTORNEY PAPPAS:	11:10:00
5	Q. So [Technical difficulty] sends a request	11:10:14
6	to a root Domain Name Server?	11:10:16
7	COURT REPORTER: Mr. Pappas, could you	11:10:23
8	repeat that question, please?	11:10:25
9	THE WITNESS: Yeah. You broke up.	11:10:27
10	BY ATTORNEY PAPPAS:	11:10:29
11	Q. Why, in your opinion, does Glines disclose	11:10:30
12	sending a request to a root Domain Name Server?	11:10:32
13	A. Well, what it's referencing there is when	11:10:59
14	you can't resolve it locally, you just go through	11:11:01
15	the normal process of querying the distributed	11:11:05
16	databases stored in this hierarchy of DNS servers,	11:11:11
17	to resolve the name.	11:11:15
18	And in Figure 1, it shows this as -- it's	11:11:18
19	actually labeled "Top Level Domain Name Server." In	11:11:26
20	the field of networking, people aren't necessarily	11:11:31
21	super precise. When they say "root DNS server,"	11:11:34
22	that could just mean a top-level Domain Name Server.	11:11:38

1 But that's shorthand for saying, just walk 11:11:42
2 through the normal process of querying a domain name 11:11:44
3 resolution. Walk through whatever -- it talks about 11:11:47
4 doing it recursively here, somewhere. 11:11:53

5 If you just go down the hierarchy until 11:11:56
6 you get a response, where you actually have an IP 11:11:59
7 address. And as described in Glines, this is going 11:12:01
8 to return an anycast address. 11:12:04

9 So eventually, by the time you get to step 11:12:29
10 112 in Figure 2, you have been given an anycast 11:12:32
11 address, and then it uses that as the next step in 11:12:36
12 doing the name resolution. 11:12:38

13 So I don't know if this is the point of 11:12:44
14 your question, but in box 110, when it says "root 11:12:46
15 DNS server," I don't think that -- I don't think -- 11:12:50
16 you know, a person of skill in the art doesn't 11:12:53
17 interpret that to be literally the root of the whole 11:12:56
18 domain name space for the internet. 11:13:00

19 It just means, start at whatever level at 11:13:03
20 the top and work your way down through the normal 11:13:04
21 process. Something will be authoritative and it 11:13:08
22 will give you a response. And in this case, the 11:13:10

1	thing that it gives you is that anycast address.	11:13:13
2	But you are not finished yet. Then you	11:13:16
3	use that to do another DNS probe. And then that	11:13:19
4	eventually ends up taking you to box 116, and so on.	11:13:22
5	Q. Right. So the root Domain Name Server in	11:13:26
6	Glines would be used to find the authoritative name	11:13:29
7	servers 53-1, 53-2, and 53-3, which have a common	11:13:37
8	anycast address?	11:13:44
9	Is that right?	11:13:45
10	A. Yes. The point of this step 110 is to get	11:13:52
11	that anycast address. And it is -- as you just	11:13:55
12	said, it's that common one that is shared by 53-1,	11:13:59
13	53-2, and 53-3.	11:14:05
14	Q. And then at step 112 of Glines, the client	11:14:18
15	sends the DNS request to the anycast address	11:14:22
16	returned by -- from the root Domain Name Server 38.	11:14:27
17	ATTORNEY BOYER: Objection.	11:14:32
18	ATTORNEY PAPPAS: Is that right?	11:14:34
19	ATTORNEY BOYER: Objection. Form.	11:14:36
20	THE WITNESS: I'm just trying to locate.	11:15:04
21	I know this is described in detail in Glines in	11:15:07
22	the spec. I'm just trying to find where that's	11:15:10

1	described.	11:15:11
2	But one thing that I noticed in your	11:15:12
3	question is you -- that you used the term,	11:15:13
4	"root DNS server," and you pointed to number	11:15:15
5	38, which is labeled "Top Level Domain Name	11:15:19
6	Server."	11:15:21
7	As I mentioned, like there is a hierarchy	11:15:24
8	type -- you know, top-level Domains, those are	11:15:27
9	things below the root. But you typically,	11:15:30
10	like, work your way down to some level.	11:15:33
11	At some point, there would be a level -- a	11:15:36
12	DNS server that would be authoritative. And	11:15:41
13	then, that would eventually give you that	11:15:43
14	anycast address that you use in step 112.	11:15:47
15	I'm trying to locate a more detailed	11:15:53
16	description of this step to answer your	11:15:57
17	question.	11:15:59
18	ATTORNEY PAPPAS: Right.	11:16:04
19	BY ATTORNEY PAPPAS:	11:16:04
20	Q. So I agree Glines is a little bit	11:16:04
21	inconsistent in its use of root DNS server versus	11:16:06
22	TLD server.	11:16:11

1	Would you agree that that is a Domain Name	11:16:14
2	Server somewhere near the top of the hierarchy, as a	11:16:15
3	starting point?	11:16:20
4	A. Yes. That's a fair characterization.	11:16:21
5	Q. And then I'm looking mainly at Glines on	11:16:27
6	page 15, starting around line six, where it refers	11:16:31
7	to step 112.	11:16:35
8	Do you see that?	11:16:36
9	A. Yes. I see -- I see that part of -- yeah.	11:16:40
10	I see that in that paragraph on page 115.	11:16:42
11	Q. And here, it says, "The browser then sends	11:16:48
12	out a DNS request for the IP address of	11:16:51
13	'www.example.com.'" And that request goes to the	11:16:53
14	common anycast address that was previously returned	11:16:59
15	by the root or TLD DNS server.	11:17:03
16	Is that right?	11:17:08
17	A. Yes. That's right.	11:17:16
18	Q. And then going down to step 116, which is	11:17:17
19	toward the bottom of page 15, the client then	11:17:19
20	receives a unique address for one of the replica	11:17:23
21	content servers 51.	11:17:26
22	Is that right?	11:17:28

1	A. Yes. That's correct.	11:17:29
2	Q. Then at step 118, which is on to page 16	11:17:35
3	of Glines, the client reaches out to the replica	11:17:39
4	content server to retrieve the content file in this	11:17:42
5	example, "homepage.html."	11:17:45
6	Is that right?	11:17:48
7	A. Yes. That's right.	11:17:49
8	Q. If you go down to page 19 of Glines?	11:17:54
9	Starting on line 13, Glines states:	11:17:59
10	"However, within the service group,	11:18:03
11	standard load balancing and replication techniques	11:18:06
12	can also apply, such as multiple content servers	11:18:09
13	(returning multiple local IP addresses to a name	11:18:11
14	lookup)."	11:18:15
15	Do you see that?	11:18:16
16	A. Yes.	11:18:16
17	Q. So in that example that I just read,	11:18:18
18	instead of returning one IP address to a client	11:18:22
19	corresponding to that content server, Glines would	11:18:27
20	return multiple IP addresses to a client?	11:18:30
21	Is that correct?	11:18:35
22	ATTORNEY BOYER: Objection. Form.	11:18:36

1	THE WITNESS: I was formulating my answer	11:19:04
2	but I lost track of every detail of your	11:19:05
3	question.	11:19:08
4	Can you please repeat the question?	11:19:08
5	ATTORNEY PAPPAS: Sure.	11:19:10
6	BY ATTORNEY PAPPAS:	11:19:10
7	Q. In the example I read, instead of	11:19:10
8	returning one IP address to a client corresponding	11:19:13
9	to the content server, Glines would instead return	11:19:17
10	multiple IP addresses corresponding to multiple	11:19:26
11	content servers.	11:19:28
12	Is that right?	11:19:29
13	ATTORNEY BOYER: Objection. Form.	11:19:31
14	THE WITNESS: Not necessarily. For	11:19:34
15	example, like in Figure 1, at the bottom of the	11:19:35
16	figure, there is the 50-3. That's one of those	11:19:42
17	sets. And it's showing 51-3 has three boxes	11:19:47
18	there.	11:19:52
19	So this is a case where there is a service	11:19:53
20	group that has multiple content servers. And	11:19:55
21	it's saying, in that paragraph that we were	11:19:58
22	just looking at -- so starting at line 13, on	11:20:01

1	page 19 -- it's saying that you -- you may have	11:20:05
2	replication or multiple servers there. So	11:20:09
3	there are different ways to handle this.	11:20:12
4	It mentions, for example, layer four	11:20:15
5	switches. And in that case, it would return a	11:20:18
6	single IP address that actually refers to any	11:20:21
7	of the content servers.	11:20:25
8	And then the layer four switch itself	11:20:31
9	would route that, using load balancing	11:20:34
10	techniques, to one of those things locally.	11:20:37
11	So in that scenario, if we are using a	11:20:39
12	layer four switch, the DNS in 50-3 would -- so,	11:20:42
13	for example, 53-3 -- it would return one IP	11:20:48
14	address in that case.	11:20:53
15	BY ATTORNEY PAPPAS:	11:20:53
16	Q. So what about the previous example where	11:20:56
17	it talks about multiple content servers returning	11:20:58
18	multiple local IP addresses to a name look up? How	11:21:01
19	do you interpret that?	11:21:05
20	A. Well, one potential design could be to	11:21:25
21	have the local DNS 53-3 -- it could potentially	11:21:27
22	return multiple IP addresses. That's one	11:21:33

1 possibility. And have the client start with the 11:21:37
2 first one and then switch over to another one, if it 11:21:40
3 doesn't respond. 11:21:42

4 That would be one design option. But you 11:21:43
5 could -- you could also -- I mean, what often 11:21:47
6 happens with replication in the scenario is -- like 11:21:50
7 you would have a way to talk -- you may be able to, 11:21:56
8 in some cases, talk individually to specific 11:21:59
9 replicated content servers. That would be one 11:22:02
10 design. 11:22:05

11 But you could just have them have a common 11:22:06
12 IP address. That's very common in web -- web 11:22:09
13 content serving, where you have a load balancing 11:22:12
14 switch or, in other words, a layer four switch, that 11:22:19
15 takes what's essentially a virtual IP address -- 11:22:23
16 it's an IP address that means "I want to talk to one 11:22:26
17 of these. Just send me to the appropriate one." 11:22:29

18 And then the layer four switch itself 11:22:31
19 would send it there. So I think what it's 11:22:33
20 describing is multiple design options when you have 11:22:37
21 multiple content servers. 11:22:40

22 Q. All right. And one of those design 11:22:47

1 options when you have multiple content servers,
2 then, like you said, would be to return multiple
3 unique IP addresses to the client, and then the
4 client would have multiple content servers to reach
5 out to?

11:22:48

11:22:51

11:22:53

11:22:55

11:22:58

6 Is that right?

11:22:59

7 A. Yes. That's one design option. And as we
8 said before, another would be to have the layer four
9 switch handle it for a single IP address.

11:23:03

11:23:05

11:23:09

10 Q. Could the DNS server 53-3 also handle load
11 balancing for those content servers?

11:23:14

11:23:21

12 ATTORNEY BOYER: Objection. Form.

11:23:34

13 THE WITNESS: Well, if there is a layer
14 four switch, then it would be the layer four
15 switch that would do the load balancing.
16 That's how it would typically be designed.

11:23:37

11:23:38

11:23:41

11:23:44

17 If -- an alternative design is if you are
18 not using a layer four or load balancing
19 switch, then the DNS server 53-3 could choose
20 which -- it could choose which of them to use,
21 based on load balancing considerations.

11:23:48

11:23:51

11:23:54

11:24:01

11:24:05

22 Although usually, a layer four switch is

11:24:08

1	considered to be a better way to do load	11:24:11
2	balancing, because it's more nimble than --	11:24:14
3	it's an easier thing to keep updated than a	11:24:17
4	DNS.	11:24:25
5	DNS is not -- yeah. It's not --	11:24:26
6	generally, layer four switches are more	11:24:28
7	typically used because they are just more	11:24:31
8	effective.	11:24:33
9	BY ATTORNEY PAPPAS:	11:24:40
10	Q. In the next paragraph, Glines talks about	11:24:40
11	load balance across service groups. Do you see	11:24:45
12	that?	11:24:47
13	A. I see that. Yes.	11:24:53
14	Q. How does this work in Glines?	11:24:54
15	A. What this is referring to is that -- so a	11:25:43
16	service group would be something like, say, 50-2	11:25:47
17	versus 50-3. And the scenario that's being	11:25:53
18	described here is that where one of these service	11:25:56
19	groups, as a whole, has become so busy, that it	11:25:59
20	would be a better idea to send the request to a	11:26:03
21	different one.	11:26:07
22	And what it's saying is if it notices that	11:26:08

1 it's overloaded, it could start pointing the name 11:26:12
2 resolution -- it could point them to a different 11:26:19
3 service group. 11:26:24

4 So even though the normal anycast 11:26:32
5 addressing might take you to, say, 50-3, 50-3 could 11:26:34
6 decide that what it wants to do is actually point 11:26:39
7 you -- because it's overloaded, it's going to point 11:26:43
8 you to, say, 53-2, or something like that. 11:26:46

9 It would basically -- that's what they 11:26:51
10 mean by shedding load. That means, essentially, 11:26:55
11 redirecting the request to another service group. 11:27:00

12 Q. Okay. 11:27:09

13 So the DNS servers 53, in this scenario, 11:27:09
14 would advertise their load to other service groups? 11:27:12
15 Correct? 11:27:20

16 A. That's what it says. Yes. 11:27:26

17 Q. And then when a request comes into a DNS 11:27:28
18 server, the DNS server could return the IP address 11:27:31
19 of a content server in another service group? 11:27:34

20 Is that how it works? 11:27:37

21 ATTORNEY BOYER: Objection. Form. 11:27:40

22 THE WITNESS: Well, it says that it sheds 11:27:56

1 load to other service groups. Now, that 11:27:58
2 could -- I think the most likely design for 11:28:02
3 that would actually be to point -- just have 11:28:05
4 the DNS, then iteratively switch over to the 11:28:11
5 DNS server in the other service group. I think 11:28:15
6 that would be a clean design for that. 11:28:17

7 So, for example, 53-3, if it realizes that 11:28:20
8 the service group 50-2 is much less busy than 11:28:26
9 it is, it could redirect the request over 11:28:31
10 there. 11:28:33

11 So one way to do that would be you respond 11:28:34
12 and say, "Okay, the next DNS name server that 11:28:36
13 you need to talk to is actually 53.2, for 11:28:41
14 example." That's a potential design. 11:28:45

15 BY ATTORNEY PAPPAS: 11:28:47

16 Q. When Glines says it can load shed to 11:28:52
17 content servers in other service groups by returning 11:28:55
18 their IP address, are you reading the IP address to 11:28:57
19 correspond to the content servers in other service 11:29:03
20 groups? Or something different? 11:29:05

21 A. Well, the idea would be to ultimately have 11:29:22
22 the user get their content from a content server in 11:29:24

1	a different service group that is far less loaded	11:29:27
2	than this one. But it -- it's going to -- sorry.	11:29:30
3	I'm sorry. There was a sort of person	11:29:39
4	wandering into the room by accident.	11:29:45
5	Okay. Ultimately, the goal is that this	11:29:48
6	request should be serviced by a content server in a	11:29:52
7	different service group.	11:29:57
8	And as I -- there is not a lot of detail	11:29:58
9	on exactly how this works in this sentence, other	11:30:02
10	than it's going to, you know, return an IP address	11:30:05
11	that will cause you to ultimately end up getting	11:30:11
12	that content server from a different service group.	11:30:17
13	And as I said a minute ago, I think the	11:30:19
14	most natural -- a natural design for this would be,	11:30:21
15	for example, that the DNS 53-3, when you -- when it	11:30:24
16	responds, it would actually point you to, say, the	11:30:34
17	unique IP address of 53-2. That would be one	11:30:36
18	potential design.	11:30:41
19	Now, designs all have trade off. So, you	11:30:44
20	know, another -- theoretically, another design would	11:30:47
21	be for it to point straight to 51.2. But it's	11:30:51
22	not -- the point of this is just that even -- you	11:30:54

1 could pay attention to whether one of these service
2 groups get overloaded, and potentially do load
3 balancing across them.

4 And there are some designs that would do
5 this by just extending how DNS responds. So I just
6 discussed that potential design for that.

7 Q. Okay. Understood.

8 In this scenario, though, at least the
9 load balancing across the service groups then would
10 be determined by the DNS server. For example, DNS
11 server 53-3. Right?

12 ATTORNEY BOYER: Objection. Form.

13 THE WITNESS: Well, it's -- as it says at
14 the beginning of this paragraph, this is --
15 this would be an additional mechanism that you
16 could build. We are talking about something
17 built on top of the basic design that's already
18 been described.

19 So on top of what has already been
20 presented, you would have to have more
21 information. As it says around line 18 or so,
22 that you have to have these service groups now

11:31:01

11:31:04

11:31:07

11:31:09

11:31:11

11:31:17

11:31:19

11:31:24

11:31:26

11:31:29

11:31:35

11:31:43

11:31:47

11:31:48

11:31:50

11:31:52

11:31:57

11:32:00

11:32:01

11:32:03

11:32:12

11:32:15

1	communicating with each other, and keeping	11:32:17
2	track of their load metric.	11:32:20
3	It doesn't say -- right. I mean, it could	11:32:23
4	be the DNS server, but it says this is an	11:32:27
5	additional mechanism. There are different	11:32:31
6	designs for making this work. It could just be	11:32:32
7	the different DNS servers.	11:32:35
8	But to your question, you said -- you	11:32:37
9	asked about whether 53-3 was making this	11:32:40
10	determination. And the thing I wanted to point	11:32:43
11	out is it's being done through additional	11:32:45
12	information that has to be exchanged across the	11:32:50
13	different service groups.	11:32:53
14	Because, for example, maybe service group	11:32:54
15	50-3 is busy, but maybe 50-2 is even busier.	11:32:59
16	So in that case, it would not make any sense to	11:33:05
17	divert traffic over to 50-2, because it's in	11:33:08
18	even worse shape.	11:33:12
19	So it's really something that has to be	11:33:13
20	done through this collective information	11:33:16
21	exchange that was described in this paragraph.	11:33:18
22	To figure out that my service group is	11:33:19

1	overloaded, but there is another one maybe	11:33:23
2	somewhat nearby, that is far less loaded. So	11:33:28
3	it would be a good idea to divert traffic over	11:33:31
4	to it.	11:33:34
5	ATTORNEY PAPPAS: Right.	11:33:36
6	BY ATTORNEY PAPPAS:	11:33:37
7	Q. And that information is exchanged between	11:33:37
8	service groups by the DNS servers advertising a load	11:33:39
9	metric to other service groups. Right?	11:33:43
10	A. That is -- yeah. That is something that's	11:33:49
11	described in that paragraph. Yes.	11:33:51
12	Q. Okay.	11:33:53
13	ATTORNEY PAPPAS: All right. Is this a	11:33:57
14	good time to take another quick break?	11:33:57
15	THE WITNESS: Yes.	11:34:00
16	ATTORNEY BOYER: Sure.	11:34:03
17	(Short break.)	11:34:18
18	BY ATTORNEY PAPPAS:	11:40:57
19	Q. Welcome back, Dr. Mowry.	11:40:57
20	A. Thanks.	11:41:00
21	Q. Again, I'll ask you, during the break, did	11:41:01
22	you discuss the substance of your testimony with	11:41:04

1	counsel?	11:41:06
2	A. No. I did not.	11:41:07
3	Q. Okay.	11:41:08
4	ATTORNEY PAPPAS: I want to turn to the	11:41:08
5	'112 Patent temporarily. Do you have a copy of	11:41:12
6	that in front of you?	11:41:15
7	THE WITNESS: Yes.	11:41:17
8	ATTORNEY PAPPAS: This is Exhibit 1001,	11:41:18
9	for the record.	11:41:24
10	THE WITNESS: Okay.	11:41:26
11	BY ATTORNEY PAPPAS:	11:41:27
12	Q. Did you review the '112 Patent as part of	11:41:27
13	your preparation for the deposition?	11:41:32
14	A. Yes.	11:41:33
15	Q. Can you please flip to claim 23 and let me	11:41:33
16	know when you are there?	11:41:37
17	A. Okay. I'm there.	11:41:46
18	Q. I just want to get your understanding of	11:41:56
19	the limitations of this claim. So starting with	11:41:57
20	step A, as shown in claim 23. Step A requires:	11:42:01
21	"Providing a plurality of DNS servers,	11:42:04
22	where each DNS server is associated with a	11:42:07

1 respective plurality of content servers.

11:42:10

2 Is that right?

11:42:13

3 A. Yes. It says that.

11:42:22

4 Q. And:

11:42:28

5 "Each DNS server and respective plurality
6 of content servers is configured to support content
7 delivery for a plurality of content providers."

11:42:28

11:42:30

11:42:34

8 Do you see that?

11:42:38

9 A. Yes. I see that.

11:42:38

10 Q. And step B involves:

11:42:41

11 "A first request for first content
12 associated with a first content provider of said
13 plurality of content providers."

11:42:43

11:42:44

11:42:48

14 Correct?

11:42:51

15 A. Yes.

11:42:51

16 Q. And step C involves:

11:42:52

17 "A second request for second content
18 associated with a second content provider of said
19 plurality of content providers."

11:42:54

11:42:57

11:43:01

20 Correct?

11:43:02

21 A. Yes.

11:43:08

22 Q. So in claim 23, the second request is for

11:43:09

1 different content than the first request. Correct.?

11:43:12

2 ATTORNEY BOYER: Objection. Form.

11:43:18

3 THE WITNESS: Well, part C says that the
4 second request includes at least the said first
5 host name associated with the first content
6 provider. It goes on to talk about resolving
7 the first host name to identity a second IP
8 address.

11:43:47

11:43:49

11:43:53

11:43:55

11:44:12

11:44:15

9 It doesn't say, as you asked in your
10 question, that the actual -- sorry. And I
11 forget the details of your question, but there
12 was -- can you please repeat the question?

11:44:17

11:44:20

11:44:26

11:44:29

13 ATTORNEY PAPPAS: Sure.

11:44:34

14 BY ATTORNEY PAPPAS:

11:44:35

15 Q. My question was, in this claim 23, the
16 second request is for different content -- second
17 content, than the content requested in the first
18 request.

11:44:35

11:44:38

11:44:44

11:44:47

19 Is that right?

11:44:48

20 ATTORNEY BOYER: Objection. Form.

11:44:50

21 THE WITNESS: It does not say that there
22 is different content. It says that there is a

11:44:54

11:44:55

1 second content -- you know, a second request 11:44:59
2 for second content. It goes on to talk about 11:45:02
3 how there are common -- at least a common host 11:45:04
4 name in both -- both things. 11:45:09
5 It's possible you can have different URLs 11:45:16
6 that ultimately end up pointing you to the same 11:45:18
7 content. It's not saying that it's different 11:45:20
8 content. 11:45:23
9 BY ATTORNEY PAPPAS: 11:45:27
10 Q. But the claim uses two terms. "First 11:45:27
11 content" and "second content." Correct? 11:45:36
12 A. Right. That phrase, the word "second" is 11:45:39
13 appearing many times here. "Second request." 11:45:41
14 "Second content." "Second content provider." 11:45:43
15 So it is -- it is showing up in many 11:45:46
16 places. But if you -- as you keep going through the 11:45:49
17 sentence, it says that the second request has this 11:45:52
18 common host name with the first content provider. 11:45:55
19 So there, it's talking about a commonality 11:46:03
20 between this first request and -- between the second 11:46:07
21 request and this first request. 11:46:10
22 Q. Let's compare to claim 13, which is on the 11:46:17

1	previous page. Do you see that?	11:46:20
2	A. I see claim 13. Yes.	11:46:27
3	Q. At step C2, as labeled in claim 13, it	11:46:29
4	recites:	11:46:35
5	"Responsive to a second request for said	11:46:35
6	first content, associated with said first content	11:46:37
7	provider."	11:46:39
8	Do you see that?	11:46:40
9	A. Yes. I see that.	11:46:41
10	Q. So in claim 13, the second request is for	11:46:45
11	the same first content as the first request? Is	11:46:47
12	that right?	11:46:50
13	A. That's my understanding. Yes.	11:46:56
14	Q. And in claim 23, the claim explicitly	11:47:01
15	recites separately, "first content" and "second	11:47:05
16	content." Right?	11:47:09
17	A. Claim 23 does use the terms, "first	11:47:20
18	content" and "second content." And I would also	11:47:23
19	point out that claim 13, in C2, also uses "first	11:47:25
20	content" and "second content." The phrase, "second	11:47:28
21	content," appears in C23.	11:47:31
22	Q. In claim 23, is it your opinion that a	11:47:36

1 person of ordinary skill in the art would not 11:47:43
2 interpret the first content and second content to be 11:47:44
3 different content? 11:47:47

4 ATTORNEY BOYER: Objection. Form. 11:47:56

5 THE WITNESS: So the question was whether 11:48:17
6 a person of ordinary skill in the art would 11:48:19
7 not -- would assume that this does not mean 11:48:20
8 that it's separate content? And -- correct? 11:48:23
9 That was your question? 11:48:26

10 ATTORNEY PAPPAS: Yes. Correct. 11:48:34

11 THE WITNESS: Well, it's -- I don't think 11:48:35
12 that claim 23 is being particularly specific 11:48:37
13 about that issue. I don't think that it says 11:48:39
14 that it's necessarily -- I'm not saying that 11:48:41
15 it's the same content, particularly. 11:48:48

16 It's -- it uses the term "first content," 11:48:50
17 and "second content," but it's then talking 11:48:53
18 about having this common host name in the -- in 11:48:58
19 the request. 11:49:04

20 So that's what's being discussed here. Is 11:49:08
21 that you have got two different requests, and 11:49:10
22 there is the same host name appearing in both 11:49:13

1	things. It is saying that there is second	11:49:15
2	content here.	11:49:21
3	So it may be -- it certainly may be	11:49:26
4	different content. In fact, I think in the	11:49:29
5	example I give in my declaration, it's	11:49:32
6	different content.	11:49:36
7	BY ATTORNEY PAPPAS:	11:49:45
8	Q. But you don't know whether claim 23 would	11:49:46
9	be interpreted to require the first content to be	11:49:48
10	different than the second content?	11:49:50
11	ATTORNEY BOYER: Objection. Form.	11:49:58
12	ATTORNEY PAPPAS: Is that fair?	11:49:59
13	ATTORNEY BOYER: Objection. Form.	11:50:00
14	THE WITNESS: Well, it's talking about	11:50:13
15	second content. So it's -- it may -- it could	11:50:15
16	very well be different content. That's -- it	11:50:18
17	is asking for second content. That would be --	11:50:22
18	yeah.	11:50:28
19	So it's -- the most natural	11:50:28
20	interpretation, I think, would be that this is	11:50:31
21	different content.	11:50:33
22	BY ATTORNEY PAPPAS:	11:50:34

1	Q. And then claim 23 also recites a "first	11:50:46
2	content provider" and a "second content provider."	11:50:48
3	Correct?	11:50:51
4	A. Yes. That's correct.	11:50:52
5	Q. In your opinion, what is a content	11:50:57
6	provider, in the context of the '112 Patent?	11:50:58
7	A. Well, one way to describe it is if I have	11:51:07
8	a -- if I have a business that is a content delivery	11:51:10
9	network business, I have customers. So I want to	11:51:14
10	provide content for, say, ESPN.com, or CNN.com. So	11:51:18
11	in that example, those things are different content	11:51:26
12	providers.	11:51:29
13	So in the '112 Patent, it is -- their	11:51:31
14	example is ABCD.com, I think. Yeah. That's just a	11:51:38
15	stand in name for a content provider. Well, the	11:51:42
16	content provider is the business or the entity for	11:51:51
17	whom you are providing this content. They would	11:51:53
18	have then their own origin server, for example.	11:51:55
19	Q. Okay.	11:52:03
20	So can you turn to column two, around line	11:52:03
21	60 of the '112 Patent? And let me know when you are	11:52:07
22	there.	11:52:18

1	A. Okay. I'm in column two. What was the	11:52:20
2	line again?	11:52:22
3	Q. Sixty.	11:52:24
4	A. Okay.	11:52:25
5	Q. Here, it says, "Content provider refers to	11:52:25
6	an entity having a website on a network." Do you	11:52:28
7	see that?	11:52:34
8	A. Yes. I see that.	11:52:34
9	Q. Is that consistent with your understanding	11:52:35
10	of a content provider, in the context of the	11:52:37
11	'112 Patent?	11:52:40
12	A. Yes.	11:52:40
13	Q. Let's turn to your declaration for a	11:52:48
14	moment. Exhibit 1008, at paragraph 446. I will	11:52:50
15	find the page. That is page 120 -- sorry, 130 of	11:52:56
16	the PDF.	11:53:09
17	A. Okay.	11:53:17
18	Q. Here, you address step B of claim 23.	11:53:17
19	Correct?	11:53:20
20	A. Yes.	11:53:28
21	Q. If you go down to paragraph 448, you	11:53:28
22	say -- and I'll read this into the record:	11:53:32

1	"It would have been obvious for Glines's	11:53:35
2	name servers to respond to an anycast message based	11:53:38
3	on a first request for first content associated with	11:53:42
4	a first content provider that includes a request for	11:53:44
5	a news aggregator website, such as Yahoo! News."	11:53:47
6	Did I read that right?	11:53:51
7	A. Yes.	11:53:53
8	Q. And you provided two exhibits associated	11:53:55
9	with Yahoo! News. Exhibits 1024 and 1025. Correct?	11:53:58
10	A. Yes.	11:54:05
11	Q. Do you have access to those exhibits	11:54:06
12	through the download link?	11:54:09
13	A. Let me check.	11:54:15
14	Q. Mainly, I just wanted you to have them in	11:54:22
15	front of you for reference, if needed.	11:54:25
16	A. Okay. I just have to -- you know, find	11:54:28
17	the browser. Okay.	11:54:30
18	COURT REPORTER: Mr. Pappas, when you	11:54:43
19	mention the exhibits, do I mark them?	11:54:45
20	ATTORNEY PAPPAS: No. These are	11:54:48
21	pre-marked for this -- they are already marked	11:54:49
22	in this proceeding, so we can just use the	11:54:51

1	exhibit numbers as marked.	11:54:54
2	COURT REPORTER: Okay. Thank you.	11:54:55
3	THE WITNESS: Okay. Let's see. I will	11:54:59
4	have it in a second. I'm just trying to go	11:55:06
5	through the download steps here. Okay. I have	11:55:09
6	the exhibit.	11:55:50
7	BY ATTORNEY PAPPAS:	11:55:56
8	Q. For step B, which is element 23C, as	11:55:56
9	referred to in your declaration, what entity are you	11:55:59
10	saying is the claimed first content provider?	11:56:03
11	[Witness reviewed document.]	11:57:52
12	A. Just checking. I want to make sure I	11:57:54
13	answer this accurately.	11:57:55
14	[Witness reviewed document.]	11:57:57
15	Q. Understood.	11:57:58
16	A. So, I believe the first content provider,	11:58:05
17	although this is somewhat symmetrical; you could	11:58:07
18	probably swap them around.	11:58:13
19	But one of them is Yahoo.com -- I mean	11:58:16
20	"dailynews.yahoo.com." That's one of the content	11:58:18
21	providers. And then the second content provider	11:58:22
22	would be Reuters.	11:58:26

1	Q. And that second content provider, you are	11:58:37
2	referring to step C of claim 23. Correct?	11:58:39
3	A. Yes. That's right. Yeah. Yes. At the	11:58:52
4	end of paragraph -- right. At the end of paragraph	11:58:56
5	461 in my declaration, I say that the first content	11:59:05
6	provider is Yahoo! News, and the second content	11:59:08
7	provider is Reuters.	11:59:11
8	And yes. To answer your question, the	11:59:13
9	second content provider is related to step C.	11:59:14
10	Q. And the first content is what's shown in	11:59:21
11	Exhibit 1024, that you are pointing to? Is that	11:59:23
12	right?	11:59:28
13	A. Yes. That's correct.	11:59:40
14	Q. And the second content you equate to is in	11:59:41
15	Exhibit 1025. Is that correct?	11:59:44
16	A. Yes. That's right.	11:59:46
17	Q. Both Exhibits 1024 and 1025 are displaying	11:59:52
18	websites hosted by Yahoo! News? Is that right?	11:59:59
19	A. Well, the URL for both of these has a	12:00:12
20	common part to it, which is they both have the	12:00:14
21	"dailynews.yahoo.com" as part of the URL.	12:00:18
22	Q. So is it correct that Exhibits 1024 and	12:00:43

1	1025 display Yahoo! News websites?	12:00:47
2	A. Well, Yahoo! News is the aggregator. The	12:01:02
3	content that we see within the middle of the web	12:01:05
4	page, on Exhibit 1025, that's the Reuters story.	12:01:09
5	Yeah. That's the full article from Reuters.	12:01:20
6	And what we see in Exhibit 1024 is several	12:01:24
7	things. It's just the first couple of lines of that	12:01:30
8	article, just like a little quick summary on the	12:01:36
9	top, along with other summaries of several other	12:01:38
10	stories.	12:01:42
11	So a person could click on the headline	12:01:43
12	for "U.S. Senate approves Ashcroft" on Exhibit 1024,	12:01:48
13	and then it would take them to what you see in	12:01:53
14	Exhibit 1025.	12:01:56
15	Q. So in paragraph 461, I think this is where	12:02:05
16	you discuss the second content [Technical	12:02:08
17	difficulty].	12:02:10
18	A. The audio broke up for me slightly. Can	12:02:13
19	you repeat that, please?	12:02:16
20	Q. Yes. In paragraph 461 of your	12:02:18
21	declaration, is this where you are discussing the	12:02:20
22	second content?	12:02:23

1	A. Right. The second content is in	12:02:26
2	Exhibit 1025.	12:02:28
3	Q. And you are referencing that in paragraph	12:02:33
4	461 of your declaration. Correct?	12:02:38
5	A. Yes. Let me just scroll back to that and	12:02:48
6	check. Yes. That's correct.	12:02:50
7	Q. And the second content that is requested	12:03:00
8	is that a URL around the middle of the paragraph,	12:03:03
9	starting with "http://dailynews.yahoo.com/h/nm," and	12:03:11
10	it continues to the rest of the article URL.	12:03:20
11	Correct?	12:03:22
12	A. That's right. Yes.	12:03:23
13	Q. Okay. And that's the second content you	12:03:25
14	are equating to in claim 23. Correct?	12:03:27
15	A. Yes.	12:03:30
16	ATTORNEY PAPPAS: I'm going to let you off	12:03:53
17	easy today and make your day, and that is all	12:03:55
18	the questions I have for you.	12:03:58
19	So I will pass the witness.	12:04:00
20	ATTORNEY BOYER: Thank you. No redirect	12:04:02
21	on behalf of petitioner.	12:04:03
22	ATTORNEY PAPPAS: Right. We can close	12:04:08

Transcript of Todd C. Mowry, Ph.D.
Conducted on February 4, 2026

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1	this deposition. Thanks so much for your time	12:04:09
2	today, Dr. Mowry.	12:04:11
3	THE WITNESS: Great. Thank you.	12:04:11
4	COURT REPORTER: I need to get the orders	12:04:20
5	for the transcript, please?	12:04:22
6	ATTORNEY PAPPAS: Yes. For us, if we can	12:04:24
7	get a same day rough. And then...	12:04:26
8	COURT REPORTER: I have your order	12:04:33
9	already.	12:04:34
10	ATTORNEY PAPPAS: Okay, thank you.	12:04:35
11	ATTORNEY BOYER: Yeah. Same day rough for	12:04:37
12	us as well. And then I guess normal delivery	12:04:39
13	on the transcript would be great.	12:04:41
14	COURT REPORTER: Okay. Thank you.	12:04:56
15	ATTORNEY PAPPAS: Thank you.	12:04:57
16	(Whereupon, the deposition adjourned at	12:04:57
17	12:04 p.m. Eastern Time)	12:04:57
18		
19		
20		
21		
22		

REPORTER'S CERTIFICATE

I, GISELLE MITCHELL-MARGERUM, Certified Reporter
within and for the State of California,
do hereby certify:

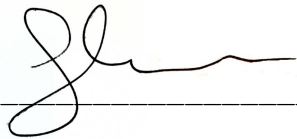
That TODD C. MOWRY, PH.D., the witness whose
deposition is hereinbefore set forth, was duly
sworn by me before the commencement of such
deposition and that such deposition was taken before
me and is a true record of the testimony given by
such witness.

I further certify that the adverse party,
SANDPIPER CDN, was represented by counsel at the
deposition.

I further certify that the deposition of TODD C.
MOWRY, PH.D., was taken remotely with Counsel
appearing from Virginia and Washington, D.C. on
Wednesday, February 4, 2026, commencing at 9:31 a.m.
to 12:04 p.m.

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

1 interested, financially or otherwise, in the outcome
2 of this matter.
3
4

5 
6

7 GISELLE MITCHELL-MARGERUM, RPR, CRI, CCR, LCR, ACCR, CSR
8 CALIFORNIA CSR 14424
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CERTIFICATE OF DEPONENT

I, TODD C. MOWRY, hereby certify that I have read
the foregoing pages, numbered 1 through 94, of my
deposition of testimony taken in these proceedings on
Wednesday, January 4, 2026 and, with the exception of
the changes listed on the next page and/or corrections,
if any, find them to be a true and accurate
transcription thereof.

Signed:

Name: TODD C. MOWRY

Date:

Transcript of Todd C. Mowry, Ph.D.
Conducted on February 4, 2026

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Transcript of Todd C. Mowry, Ph.D.
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