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Transcript of Aviel D. Rubin, Ph.D.

Date: August 14, 2025

Case: Genius Sports Ltd. -v- Sportscast, Inc. (d/b/a Panda Interactive) (PTAB)

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Genius Sports v. Sportscast

Genius Sports Ex. 1063

WORLDWIDE COURT REPORTING & LITIGATION TECHNOLOGY

Transcript of Aviel D. Rubin, Ph.D.
Conducted on August 14, 2025

1 (1 to 4)

1	2
1 UNITED STATES PATENT AND TRADEMARK OFFICE	1 A P P E A R A N C E S
2 BEFORE THE PATENT TRIAL AND APPEAL BOARD	2 ON BEHALF OF THE PETITIONER:
3 - - - - -	3 W. TODD BAKER, ESQUIRE
4 GENIUS SPORTS LTD.,	4 MICHAEL DINNELLA, ESQUIRE (via Zoom)
5 Petitioner	5 KIRKLAND & ELLIS LLP
6 v.	6 1301 Pennsylvania Avenue, NW
7 SPORTSCASTR INC.	7 One Freedom Plaza
8 (d/b/a PANDA Interactive),	8 Washington, DC 20004
9 Patent Owner.	9 202.389.5000
10 - - - - -	10
11 IPR2024-01305	11 ON BEHALF OF THE PATENT OWNER:
12 U.S. Patent No. 10,805,687	12 ANDREW SOLOMON, ESQUIRE
13 IPR2024-01307	13 CAHILL GORDON & REINDEL LLP
14 U.S. Patent No. 10,805,687	14 32 Old Slip
15 IPR2024-01308	15 New York, New York 10005
16 U.S. Patent No. 10,425,697	16 212.703.3585
17 IPR2024-01309	17
18 U.S. Patent No. 11,039,218	18
19 IPR2024-01310	19
20 U.S. Patent No. 11,039,218	20
21 IPR2024-01311	21
22 U.S. Patent No. 11,039,218	22
Deposition of AVIEL D. RUBIN, Ph.D.	
Annapolis, Maryland	
Thursday, August 14, 2025	
9:10 a.m.	
Job No. 595146	
Pages: 1 - 135	
Reported by: Janet A. Hamilton, RDR	
2	4
1 Deposition of AVIEL D. RUBIN, Ph.D., held	1 C O N T E N T S
2 at the location of:	2 EXAMINATION OF AVIEL D. RUBIN, Ph.D. PAGE
3	3 By Mr. Baker 6
4	4
5	5
6 The Westin Annapolis	6
7 100 Westgate Circle	7 E X H I B I T S
8 Annapolis, Maryland 21401	8 (Attached to the transcript)
9 410.972.4300	9 RUBIN DEPOSITION
10	10 Exhibit A US Patent Application 54
11	11 2013/0018960 (Knysz)
12	12
13	13 EXHIBITS PREVIOUSLY MARKED
14	14
15	15 Exhibit 2002 Curriculum Vitae of Dr. Rubin
16	16 Exhibit 2001 Declaration of Aviel Rubin, Ph.D.
17 Pursuant to Notice, before Janet A.	17 In Support of Patent Owner's
18 Hamilton, Registered Diplomate Reporter and Notary	18 Preliminary Response
19 Public in and for the State of Maryland.	19 Exhibit 1009 US Patent No. 11,039,218
20	20 Exhibit 1001 Declaration of Dr. Wicker
21	21 Exhibit 1015 US Patent Application
22	22 Publication 2015/0163379

5 1 EXHIBITS PREVIOUSLY MARKED (Continued) 2 3 Exhibit 1016 US Patent Application 4 No. 2014/0229992 5 Exhibit 1017 US Patent Application 6 No. 2016/0036910 7 Exhibit 1001 Declaration of 8 Dr. Stephen Wicker 9 10 11 12 13 14 15 16 17 18 19 20 21 22	7 1 A Yes. 2 Q All right. Let's get started. I'm going 3 to hand you what has been previously marked as 4 Exhibit 2002. 5 Are you familiar with that document? 6 A Yes, I am. 7 Q And can you identify for the record what 8 I've handed you? 9 A This is my CV. 10 Q When is the last time you updated your CV? 11 A I keep it up to date. I had a publication 12 this year and a couple more testifying – I gave 13 testimony a couple of times since I submitted 14 this, so I updated those three things on the CV 15 since this was submitted. 16 Q Thank you. Dr. Rubin, can you describe 17 your educational background, specifically your 18 degrees and the focus of your doctoral research? 19 A Yes. So I have a Bachelor's of Science in 20 computer science from the University of Michigan 21 which I received in 1989, received a Master's in 22 1991 in computer science and engineering, also at
6 1 PROCEEDINGS 2 ----- 3 AVIEL D. RUBIN, Ph.D., 4 a witness herein, being duly sworn, testified as 5 follows: 6 EXAMINATION BY COUNSEL FOR PETITIONER 7 BY MR. BAKER: 8 Q Good morning, Dr. Rubin. 9 A Good morning. 10 Q We're here today to ask some questions 11 related to your declarations. I believe you have 12 two declarations for an IPR. Are you aware of the 13 IPRs that we're discussing? 14 A Yes. 15 Q Do you recall how many IPRs you're 16 discussing today? 17 A I believe there are four. 18 Q Correct. All right. So when I ask you 19 questions, I hope that they're clear. To the 20 extent that you need additional clarity, please 21 request that from me, not from counsel here today. 22 Do you agree with that?	8 1 Michigan, and my Ph.D. in 1994, also at Michigan. 2 The thesis title I had was Non-Monotonic 3 Cryptographic Protocols, and it was broadly about 4 applied cryptography and computer security. 5 Q Did any of your research relate to 6 streaming technologies? 7 A There were projects that I worked on when 8 I was at AT&T Labs. So are you asking for my 9 Ph.D.? 10 Q Anywhere along your educational path have 11 you had experience studying the Internet or 12 streaming technologies generally? 13 A Yes. I studied the Internet, and the 14 Internet was pretty new at the time that I was in 15 graduate school. I think of the Internet as 16 starting in really 1993 when the web kind of was 17 introduced, and I finished my Ph.D. in 1994. So 18 in terms of my education it was focused more on 19 networking and computer security than, you know, 20 the modern Internet which didn't really exist yet. 21 Q As for work experience, you've worked at 22 both Bellcore and AT&T Labs; is that correct?

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9 1 A That's right. 2 Q Can you elaborate on the nature of your 3 work at those two institutions? 4 A Sure. So right after grad school I went 5 to work full time at Bellcore. I was in the 6 security group. We were called the Cryptography 7 and Network Security Research Group. I worked on 8 a project -- besides my research I also worked on 9 an internal project called Bill Keeper at Bellcore 10 which was used to send phone bills to customers of 11 the phone company, and I worked on the security 12 aspects of that, and I also -- it was -- it was 13 somewhat of an academic-oriented job, so I went to 14 conferences and did research and published papers, 15 and the research was in computer security. 16 Then I went to AT&T Labs, and I worked 17 there for I believe six years, and I worked on 18 networking, some cellular projects and telecom as 19 well as academic research in security. 20 Q Is it fair to characterize your focus as 21 being network security or cryptography? 22 A I would say it's more network security and	11 1 teaching or the types of classes you were teaching 2 at that point? 3 A Yes. So there were three primary classes 4 that I taught pretty much for my whole time at 5 Johns Hopkins. I taught the introductory 6 undergraduate networking course. So that was a 7 course where students learned what TCP IP was, 8 what routing was, what various Internet protocols 9 were, and then I taught a graduate course called 10 Introduction to Computer Security, and then I 11 taught a graduate course called Advanced Topics in 12 Computer Security. 13 Q Did you use a textbook for the Intro to 14 Networking class? 15 A Yes. 16 Q Do you recall which textbook you used? 17 A I don't recall what year I started using 18 it but most of the years that I taught it I used 19 Jim Kurose's book. The book title is Networks. 20 Q Can you spell his last name? 21 A Networks. 22 Q Can you spell his last name?
10 1 computer security and applied cryptography. 2 Q Can you tell me the distinction between 3 network security and computer security? 4 A Sure. Network security is concerned with 5 the protocols that are involved in communications 6 between devices and things like IP SAT, like 7 protecting the communication, protecting the 8 access to a particular device, whereas computer 9 security is focused on the device itself. So we 10 think of the operating system and the applications 11 that are running on the device as computer 12 security. 13 Q Where were you on your professional path 14 during the 2016-2017 time frame? 15 A I was a tenured full professor at Johns 16 Hopkins, and I was technical director of the 17 Information Security Institute at Johns Hopkins. 18 I had been tenured and full since 2004. 19 Q Were you teaching classes then actively in 20 that time frame? 21 A Yes. 22 Q Do you recall the classes you were	12 1 A K-U-R-O-S-E. 2 Q Kurose, yes. 3 A He may have had a co-author, but I 4 actually know Jim, so I already remembered his 5 name. 6 Q You've also authored or co-authored 7 numerous books; is that correct? 8 A Yes. 9 Q Are those books primarily in either 10 network security, applied cryptography or computer 11 network -- or I'm sorry -- computer security? Is 12 that fair? 13 A All but one of them. One of them is more 14 focused on electronic voting security. 15 Q Security applied to electronic voting? 16 A Yes. 17 Q Will you be called into action soon to 18 improve the voting? 19 A I have been several times. 20 Q I'm not surprised. Okay. 21 Do any of those books relate to streaming 22 or socket architecture or any of those topics?

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13 1 A Well, the book with Bellovin and Cheswick 2 called Firewalls and Internet Security: Repelling 3 the Wily Hacker, second edition, the second one 4 listed on my CV. There's a discussion, quite a 5 bit of discussion of sockets because that's 6 fundamental to firewalls. 7 Q Okay. Do any of your numerous 8 publications relate to sockets? 9 A Sockets are a fundamental construct in 10 networking, and so to the extent that a lot of my 11 publications relate to networking they would 12 involve sockets. 13 Q You have a list of patents on page 10 of 14 your CV; is that correct? 15 A Yes. 16 Q Is it fair to say that all of those 17 patents fall in one of three buckets: Either 18 network security, computer security or 19 cryptography? 20 A Broadly speaking, I think that's fair. 21 Q How about your work at Harbor Experts and 22 Harbor Labs? Well, first, you are a founder of	15 1 and myself working in litigation; like what I'm 2 doing right now is through Harbor Experts. In 3 that company a lot of the work has been on many 4 different topics besides security. There have 5 been several payment system cases. There have 6 been cases related to streaming. There have been 7 cases related to telecom. So I think that the 8 work in Harbor Experts is much broader. 9 Q And for some of your expert work you have 10 served as an expert in IPRs before the Patent 11 Trial and Appeal Board; is that correct? 12 A Yes. 13 Q Have any of those IPRs involved streaming 14 technologies? 15 A I don't remember. I would have to look. 16 Q Do you recall how many IPRs you've been an 17 expert for? 18 A We have my CV here, but if I -- if I'm 19 guessing off the top of my head, I would say 20 or 20 25. 21 Q What page of your CV has the list of your 22 IPRs?
14 1 those two entities. Is that accurate? 2 A Yes. 3 Q Is it fair to say that your consulting 4 also relates to one of the three buckets: Either 5 network security, computer security or applied 6 cryptography? 7 A So I would take the two companies 8 separately for that. 9 Q Please. 10 A Harbor Labs I founded in 2011, and then I 11 think about a year and a half ago I split out 12 Harbor Experts from Harbor Labs, so I took some of 13 the people that were in the company and went to 14 one company and some went to the other, got a CEO 15 for one of the companies. 16 So Harbor Labs is focused exclusively on 17 medical devices and it's a company that provides 18 guidance to medical device manufacturers on the 19 security of their devices and helps shepherd them 20 through the FDA certification process. 21 Harbor Experts is mostly former students 22 of mine and a few other people that I recruited	16 1 A So I should point out that the list which 2 starts on page 16 and ends on page 22, that is a 3 list of all the cases in which I provided 4 testimony. 5 Q Okay. 6 A So I have worked on IPRs. If I wasn't 7 deposed, then it didn't make the list here, and 8 your question was how many I worked on. So I 9 don't recall. But provided testimony, we could -- 10 I always say what the jurisdiction is in here, so 11 when it's PTAB, I have that listed here. 12 Q So your work as an expert in litigation 13 here listed on, starting on page 16 lists both 14 your work where your expert testimony was used in 15 district courts and at the PTAB? 16 A Correct. 17 Q Is that accurate? 18 A Right. 19 Q And you've only listed cases where you 20 submitted a declaration or given some form of 21 testimony? 22 A The latter. The testimony -- if I gave a

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17 1 declaration but I wasn't deposed, then it's not on 2 the list. 3 Q You're familiar with the concept of 4 one-to-many socket architecture; correct? 5 A I am familiar with that concept. 6 Q In your academic or industry work have you 7 ever developed or evaluated a system that uses a 8 one-to-many socket architecture? 9 A I have -- before this case I had not 10 looked at something that was referred to that way 11 that's specific to this, to the patents at issue 12 here, and it's -- it's I think a higher level of 13 abstraction of looking at sockets than what we 14 traditionally look at with TCP sockets. 15 Q So the phrase one-to-many sockets, that's 16 not a term of art. Is that accurate or fair to 17 say? 18 A I think that's correct. 19 Q So it doesn't have a widely understood 20 meaning in the field? 21 A I think that the words are simple enough 22 that one would hear that and have a pretty good	19 1 Q My apologies. No shot at you, but if I 2 had real time, I would look at that answer. 3 A Would you like me to repeat? 4 Q If you could repeat. 5 A I would say that Internet video streaming, 6 Internet communication and related protocols, and 7 I reference to page 42 of my declaration under 8 level of ordinary skill in the art. 9 Q Is that page 42 or paragraph 42? 10 A Page 42, paragraph 95. I'm sorry, 11 paragraph 96. 12 Q And what would be some of the related 13 protocols? 14 A So those are discussed in my report. Page 15 21 I mention real-time streaming protocol, 16 real-time messaging protocol, web real-time 17 communication, adaptive bit rate protocols such as 18 HLS and MSS, and the protocols involved with CDNs, 19 content distribution networks. 20 Q And you also give a definition of a person 21 of ordinary skill in the art; is that correct? 22 A Yes.
18 1 idea of what's meant by that, but prior to working 2 on this case I was not familiar with that term. 3 Q I used the word "field." Do you have an 4 understanding of what the relevant field is for 5 the IPR we're here to discuss? 6 A I think I have that covered in my report, 7 so. 8 Q Let me -- so I can give it to you so this 9 doesn't have to be a memory test. 10 So I will hand you what has been 11 previously marked as Exhibit 2001 for the '318 -- 12 I'm sorry -- the '218 patent IPR. 13 A Okay. And can I please have the patent as 14 well? 15 Q Yeah. Yes. So I'm also going to hand you 16 what has been previously marked as Exhibit 1009. 17 A Thank you. 18 Q So I'll repeat the question and give you a 19 chance. 20 What is the relevant field of these IPRs? 21 A I would say Internet video streaming, 22 Internet communication and related protocols.	20 1 Q Which paragraph is that found on? 2 A 96. 3 Q You indicate that a person of ordinary 4 skill in the art would have at least some 5 experience with live streaming network 6 architecture. What do you mean by at least some 7 experience? What would that constitute? 8 A I'm not sure I see where you're -- where 9 you're talking about. 10 Q So I'm in paragraph 97. I'm reading the 11 definition of a POSA, and about three-fourths down 12 that paragraph you indicate that that hypothetical 13 person would at least have some experience with 14 live streaming network architecture. 15 A So that is not my definition. That's the 16 Petitioner's definition. My definition is on 17 paragraph 96. 18 Q Okay. Thank you for that clarification. 19 Do you have an understanding what differences, if 20 any, are made in your definition of a person of 21 ordinary skill in the art and Petitioner's 22 definition?

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21 1 A I think for the purposes of my analysis in 2 this case they're close enough that it holds under 3 both. 4 Q Okay. Would you agree that a person of 5 ordinary skill in the art would need some level of 6 experience in networking architecture? 7 A Yes. 8 Q Any particular live streaming networking 9 architecture? 10 A I haven't looked at it from that 11 perspective. I didn't offer that specific 12 opinion, but I think that experience with live 13 streaming network architecture does fit into 14 something that a POSITA or POSA as we call it -- I 15 call it a POSITA. 16 Q Same thing. 17 A Yeah -- is likely to be familiar with, and 18 then in my definition I also say that more 19 advanced degrees and/or training in a related 20 discipline can compensate for shorter work 21 experience. 22 Q The '218 patent -- and I'm going to use	23 1 Internet for viewing, and it talks about how one 2 stream could take 15 seconds for one user and 10 3 seconds for another so the synchronization of the 4 stream so that videos see them at the same time is 5 the problem. 6 Q Does that passage reflect that latency is 7 a challenge that's confronted by the '218 patent? 8 A That type of latency, yes. 9 Q What do you mean by "that type of 10 latency"? 11 A The delay between a first user generating 12 a live video stream for transmission and the 13 second user receiving a copy of live video, that's 14 a type of latency. 15 Q Are there other types of latency? 16 A Yes. 17 Q Can you identify those? 18 A Like you can have transmission latency 19 which is how long it takes me to send something to 20 you, for example. That's different from what's 21 described here with two different users receiving 22 something from the same source.
22 1 that as a representative patent for most of my 2 discussion today. 3 A Okay. 4 Q And you have that in front of you; right? 5 Exhibit 1009? 6 A I do. 7 Q Is it fair to say that the '218 patent 8 discusses reduction of latency and synchronization 9 errors in live streaming environments? Is that a 10 fair characterization? 11 A I don't recall discussing a reduction in 12 latency. If there's somewhere in my report that I 13 do say that, then you can point me to that, but it 14 is about synchronizing events with a video stream. 15 Q Does synchronizing an event with a video 16 stream present any special challenges that you 17 believe is resolved by the '218 patent? 18 A So if we look at column 2, line 45, it 19 talks about latency being the delay between a 20 first user generating a live video stream for 21 transmission via the Internet and a second user 22 receiving a copy of the live video stream via the	24 1 Q Okay. Are there other forms of latency 2 related to, broadly speaking, network 3 architecture? 4 A Yes. 5 Q Can you identify those, please? 6 A So, like, there's latency caused by the 7 physical hardware. So, for example, if you have a 8 network, you have two computers communicating, and 9 packets come in to one of the computers, they're 10 processed, and then they're transmitted to the 11 other computer, you have the processing latency, 12 you have the physical latency of the hardware 13 copying the bits from one interface to another 14 interface. These are all -- in my course on 15 networks we cover the effect of all of these 16 different latencies on the total end-to-end 17 latency, which is another type of latency. 18 Q So there's end-to-end latency and there 19 are components that impact or affect that overall 20 end-to-end latency. Is that -- 21 A That's fair. 22 Q Okay. What are some of the events that

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25 1 can impact the overall end-to-end latency? 2 A Broadly speaking? 3 Q Mm-hmm. 4 A There can be a network outage. There can 5 be old hardware or newer hardware. You could have 6 algorithms that take a long time to process data 7 before it's transmitted. You could have high 8 quality networking equipment or lower quality 9 networking equipment, so the quality of the 10 networking equipment could affect it. You could 11 have firewalls. You could have in a network 12 traffic could be collected until it's checked 13 whether it's secure or not and then allowed to 14 cause latency. Computer can be down. Routers can 15 be down. Routing protocols can reroute traffic. 16 All of those are off the top of my head. I don't 17 think those are in my report, but you're asking 18 broadly, so... 19 Q Yes. And would a POSA be familiar with 20 all those forms of latency? 21 A Yes. 22 Q Okay. And would a POSA be familiar with	27 1 Q The declaration, yes. 2 A Yes. 3 Q And is that discussed in paragraph 5 of 4 your declaration? Is that accurate? 5 A That is mentioned in paragraph 5. 6 Q Do you recall why you reviewed the '218 7 file history? 8 A That's my standard practice when I work on 9 cases like this. 10 Q So whenever you evaluate a patent part of 11 that process involves reviewing the file history 12 for the patent? 13 A If I am working on validity issues, then 14 yes. 15 Q Is it your understanding that a 16 prosecution history of a patent informs a person 17 of ordinary skill in the art of the scope of the 18 claims? 19 A My understanding from lawyers I've worked 20 with in the past that the prosecution history is 21 one of the things to consider when looking at the 22 scope of the claims.
26 1 approaches or tools for reducing latency? 2 A They would be, yes. Not -- not every 3 possible -- you know, obviously you can have novel 4 inventions that can lead to other ways of reducing 5 latency, but, you know, things like buying better 6 hardware a POSITA would be familiar with. 7 Q Just confirming, I'm look at page 162 of 8 Exhibit 2001. That is your signature? 9 A Yes. 10 Q Is that a wet signature or an e-signature? 11 A That's my JPEG added to this document. 12 Q Did you add that signature or did you 13 authorize counsel to add that signature? 14 A I don't recall. 15 Q All right. In preparing for this 16 deposition did you review any materials not 17 identified in this declaration, Exhibit 2001? 18 A No. 19 Q In preparing your declaration, Exhibit 20 2001, did you review the prosecution file history 21 for the '218 patent? 22 A In preparing the declaration?	28 1 Q Do you also consult the prosecution 2 history when reviewing a prior art patent? 3 A The prosecution history of that patent? 4 Q Yes. 5 A Not always. 6 Q You've had occasion to; it depends on the 7 circumstance? 8 A I don't recall if I've done that or not. 9 Q Let's take a 10- or 15-minute break and 10 give you a chance to see if you can connect. 11 (A recess was taken.) 12 BY MR. BAKER: 13 Q I do want to revisit one of your answers 14 from earlier this morning. Do I recall correctly, 15 did you say that as of 2003 sockets were 16 fundamental? 17 A So sockets have been around since the 18 1970s and the idea of a TCP IP connection. TCP 19 requires sockets. Those are different from the 20 way that the patent refers to sockets which is the 21 many-to-one kind of higher level abstraction of 22 communication.

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29 1 Q In 2003 or as of 2003 could you use 2 sockets to transmit real-time information? 3 A Yeah. You -- anything with a TCP 4 connection, whether it was real-time or non-real- 5 time, anything that traveled over a network 6 connection that was using TCP would use a socket. 7 UDP also uses sockets but those sockets were 8 different. 9 Q So UDP sockets were different than TCP 10 sockets? 11 A Yes. 12 Q All right. Let's put Exhibit 2001 in 13 front of you. You got it? 14 A That is the report? 15 Q That's your report. 16 A Yes. 17 Q Just so we don't have to have a line of 18 questioning I'm also going to hand you what's 19 been -- I'm not sure there is an exhibit number on 20 there. That's your supplemental declaration. 21 A Okay. 22 MR. BAKER: Counsel, I believe it's	31 1 socket server, and we can see that the socket 2 server can offer sockets to different client 3 applications. 4 Let me look at the patent. 5 Q So you're looking at the '218 patent now? 6 A I am, and I'm in column 20, line 16. I'm 7 sorry. I'm refreshing myself. 8 Q Take your time. 9 A Okay. I don't remember what the question 10 was. 11 Q I was asking what your understanding is of 12 what is meant by the term one-to-many socket 13 architecture. 14 A Right. So if we look at column 22 15 starting line 5, we see that the webserver 16 provides an EventID and that there can be an event 17 socket. 602A would be a socket for a particular 18 event, and a second socket could be for another 19 event, and so the clients that are connecting to 20 each of those sockets for the particular event 21 there would be multiple clients and one socket. 22 So that's why it's many-to-one, or one-to-many.
30 1 Exhibit 2041. Is that consistent with your 2 memory? 3 MR. SOLOMON: I can confirm. 4 Yeah. This is Exhibit 2041. 5 MR. BAKER: Okay. Thank you. 6 BY MR. BAKER: 7 Q And, Doctor, can we turn to paragraph 78 8 of your declaration, please, 2001? 9 A Okay. 10 Q So this is where you indicate that the 11 '218 patent describes a one-to-many socket 12 architecture; correct? 13 A I say that in this paragraph. 14 Q Do you have an understanding of what a 15 one-to-many socket architecture is? 16 A Yes. 17 Q Can you provide your explanation -- I mean 18 can you please explain your understanding? 19 A If we look at the next page where we see a 20 diagram. 21 Q So you're on page 33? 22 A Yes, and there's a red box around the	32 1 Q So the one aspect of that in this example 2 would be the first event socket 602A; is that 3 correct? 4 A Yes. 5 Q And what would be the many aspect of that? 6 Where is the many explained? 7 A So if we look at paragraph -- sorry -- at 8 line 31, still on column 22, it says, "In 9 particular, the socket server similarly establish 10 one or more first chat/system event sockets 604A 11 dedicated to the first broadcaster's live stream 12 of digital content and one or more second chat/ 13 system event sockets dedicated to the second 14 broadcaster's live stream of digital content. So 15 we have one or more event sockets per live stream. 16 So the one-to-many is the live stream to the 17 number of sockets. 18 Q And it's your opinion that this concept 19 wasn't known before the disclosure of the '218 20 patent? 21 A I have not seen that before that. 22 Q In particular, what had you not seen?

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33 1 A Just one or more socket relationship for 2 each live stream. 3 Q Was live streaming a known concept at the 4 time, the relevant time period which we're going 5 to call 2016-2017, if you agree? 6 A Live streaming was known then. 7 Q Did live streaming evolve to the use of 8 sockets? 9 A Typically. 10 Q And is it your opinion that there was a 11 one-to-one socket relationship for live streaming? 12 A Before this invention, yes. 13 Q Before this invention? 14 A Well, there were things called multicast, 15 but that's -- that's different. 16 Q How is multicast different? 17 A Multicast is using a different type of 18 addressing, and so in multicast you have a 19 multicast address where something is being sent 20 out on the Internet to different clients, but it's 21 more viewed in terms of messaging than in terms of 22 like video streaming.	35 1 A Can I hear the question again, please? 2 Q I'm inquiring about your understanding of 3 what a webserver is. 4 A It's broadly in its most broad form a 5 server that speaks the HTTP protocol. 6 Q In the context of the '218 patent what is 7 a webserver? 8 A So the patent -- the webserver described 9 in the patent is an orchestrator webserver which 10 helps connect clients to particular media without 11 necessarily serving as an intermediary for all of 12 the media. 13 Q So let's unpack that a little bit. Does 14 the term webserver have an ordinary meaning to a 15 person of ordinary skill in the art? 16 A Yes. 17 Q Does the '218 patent use the term 18 webserver in a manner that's consistent with that 19 ordinary meaning? 20 A So the patent describes a webserver with 21 much more limited functionality than what could be 22 generally understood to be a webserver.
34 1 Q So there's no multicast streaming on the 2 2016-2017 time frame? 3 A Not using the routing protocol called 4 multicast. 5 Q Can you put in front of you your 6 supplemental declaration, Exhibit 2041? 7 A If you can keep referring to it as the 8 supplemental because I don't have an exhibit 9 number on it. 10 Q We will refer to it as the supplemental 11 declaration from here on out. 12 A Thank you. 13 Q Absolutely. And can you turn your 14 attention to paragraph 28 of your supplemental 15 declaration? 16 A Okay. 17 Q In that paragraph you discuss a webserver; 18 is that correct? 19 A Yes. 20 Q What is a webserver? 21 A I'm just going to read this paragraph. 22 Q Please, take your time.	36 1 Q And what in the '218 patent are you 2 referring to as the basis of that opinion? 3 A The webserver is described as providing 4 stream identifiers to client systems. In a broad 5 webserver description outside of this patent a 6 webserver could be something that maintains all 7 the content and that serves it to clients. 8 Q What portion of the '218 are you referring 9 to? 10 A One place where this is discussed is at 11 the top of column 24. It says, "In particular the 12 webserver or servers would provide to the first 13 viewer client device the first stream identifier, 14 the first StreamID, that corresponds to the first 15 chat/system event socket and provide to the second 16 viewer client device the second stream identifier 17 that corresponds to the second chat/system event 18 socket." 19 So you're asking about the difference 20 between that type of a webserver, and the way the 21 term is understood a webserver can be like 22 Amazon.com server which provides all the content

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37 1 directly to the users or like my home page 2 webserver that I can program myself versus one 3 here that's designed to provide stream 4 identifiers. 5 Q In your example is the Amazon.com server 6 an orchestrator type webserver or a relay type of 7 webserver? 8 A Maybe not a good example because the 9 Amazon server's actually a very complicated 10 network of servers, but one that -- one that 11 provides all of the, all of the content wouldn't 12 necessarily be a relay server. 13 Q So can you explain to me the difference 14 between a relay type server and orchestrator type 15 server? 16 A If we look on paragraph 28, I say, "An 17 orchestrator-type webserver may be used to 18 facilitate connections between various components 19 of a computer architecture or distributed network. 20 A relay-type webserver may function by serving as 21 an intermediary between different computing 22 modules, itself carrying the data between two	39 1 about. 2 Q So you testified earlier that in the 3 patent the webserver is an orchestrator-type web 4 server which helps connect clients to particular 5 media without necessarily serving as an 6 intermediary for all of the media. Do you recall 7 that? 8 A That -- I agree with that. 9 Q What do you mean by without necessarily 10 serving as an intermediary for all of the media? 11 A It's the difference between relaying the 12 data and not relaying the data. So let me kind of 13 give you the two examples. 14 So let's say that counsel to my right is, 15 is the web server and I have a video stream that 16 you want to see. 17 Q Yes. 18 A So you go to the web server and you ask 19 for the media, and in an orchestrating web server 20 he would send you my address and you would come to 21 me for the video and I would send it directly to 22 you. In a relay you would go to him for the video
38 1 modules, whereas an orchestrator webserver 2 facilitates the establishment of connections 3 between different computing modules so that those 4 computing modules may transmit data between 5 themselves." 6 So the difference is that a relay will 7 receive and send all of the content between 8 clients and some source, whereas an orchestrator 9 will point the client directly to the source and 10 then the media will transfer without going through 11 the webserver. 12 Q So I don't see a citation to anything for 13 that opinion. What's the basis of your conclusion 14 that there is this distinction between an 15 orchestrator type and a relay type of web server? 16 A Being an expert in the field and having 17 taught web communication protocols for years. 18 Q Is this distinction discussed by Kurose, 19 Jim Kurose in Intro to Networking? 20 A I don't recall specifically what's in that 21 book, but that is a well-known understood 22 distinction that I think a POSITA would know	40 1 and I would send -- he would ask me for the video. 2 I would send him the video and it would flow from 3 me to you through him. 4 Q So is it your opinion that webserver were 5 invented by the '218 inventors? 6 A No. 7 Q It's your opinion that the '218 invented a 8 narrower form of a web server? 9 A The '218 invented the claims of the '218 10 patent, the full claims, all the steps, and my 11 opinion is that Dr. Wicker has not shown that the 12 prior art references combinations that he's 13 suggesting disclose that and that those 14 combinations would not have made sense to a 15 POSITA. 16 Q Is there something in the '218 claims you 17 could point to regarding webserver that you 18 believe is new and nonobvious? 19 A What I -- if you look at paragraph 30 of 20 the supplemental report, I point out at the top of 21 page 20 that Spivey/Herzog combination describes 22 relay-type webserver and that those are not the

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41 1 type of webserver that is in the '218 claims, and 2 so I'm saying that Petitioner and Dr. Wicker have 3 not shown that there -- that there is a -- the 4 type -- they have not disclosed the type of 5 webserver that is described in the patents. 6 Q Can you point to a specific limitation in 7 the '218 patent claims that is not taught by 8 Spivey and Ellis? And I would like to focus on 9 the webserver aspect of the claims, if possible. 10 A The combination does not disclose claim 11 element 1, section C, subsection or sub-element C, 12 or element C. At least one webserver communicates 13 communicatively coupled to be at least one socket 14 server to transmit to the first viewer client 15 device, and then the two things that are supposed 16 to be transmitted to the -- to the first viewer 17 client device because this type of a webserver 18 that's described in the '218 patent is not the 19 type of webserver that's described in the 20 combination, and so these -- these steps do not 21 take place, or these components don't exist. 22 Q So I don't want to put words in your	43 1 Q So it's your opinion that the arrangement 2 of at least one webserver communicatively coupled 3 to the at least one socket server to transmit to 4 the first viewer client device, it's your opinion 5 that that's -- that was new and nonobvious during 6 the relevant time period? 7 A I'm saying that the prior combinations put 8 forth by Dr. Wicker do not disclose this type of a 9 webserver within the context of this claim. 10 Q Can you read claim 15 to yourself, please? 11 And we're still in Exhibit 1009, the '218 patent. 12 A Claim 15? 13 Q Yes. 14 A So I'm also going to look at 12 which is 15 what it depends on. 16 Q Okay. 17 A Okay. 18 Q Claim 15 recites transferring first 19 real-time information; correct? 20 A It does. 21 Q Claim 15 does not require receiving chat 22 information; correct?
42 1 mouth, but tell me if you agree. Is part of what 2 you are saying about claim 1C is that it requires 3 a direct connection between the webserver and the 4 client device? Is that part of the novelty? 5 A I don't believe I offered an opinion on 6 that. 7 Q Do you agree with that position or is that 8 not accurate? 9 A I haven't considered that. 10 Q You said you have not considered or 11 offered that opinion in your declaration before 12 today; correct? 13 A I mean, if it's in my declaration, the 14 declaration speaks for itself. As I sit here, I 15 do not recall offering that specific opinion. 16 Q Okay. Do any of the independent claims 17 for the '218 patent require synchronization? 18 A I don't believe I analyzed that or 19 provided any opinions on that in either of my 20 declarations. 21 Q Turning back to that limitation 1C. 22 A Okay.	44 1 A I have not looked at that question. 2 Q Do you have an opinion here at this 3 moment? 4 A If it's in my report and you can point me 5 to it, we can discuss it, but sitting here I don't 6 have an opinion on that. 7 Q Okay. Let's turn to paragraph 132 of your 8 original declaration, Exhibit 2001. 9 A Okay. 10 Q Why don't you go ahead and read that to 11 yourself, just that paragraph, or whatever else 12 you think you need for context, and I'll ask you a 13 question when you're done. 14 A Okay. I've read it. 15 Q In that paragraph you acknowledge that a 16 websocket connection supports a two-way 17 communication between entities; correct? 18 A Yes. 19 Q Is it true that in the 2016-2017 time 20 frame that websockets were used to build chat 21 applications? 22 A There were chat applications that used

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45 1 sockets. 2 Q When you say sockets, do you specifically 3 mean websockets? 4 A No. They usually -- chat applications 5 were, they use different port numbers than AD or 6 the web ones, so I wouldn't call them websocket. 7 Q So you're not aware of websockets being 8 used for that application in the 2016-2017 time 9 frame? 10 A I would have to go back and look. There 11 may have been web-based chat protocols where, 12 where that was possible, but I -- in the 13 applications themselves that were used would not 14 be websockets. 15 Q When we were discussing the '218 patent 16 earlier, you mentioned event socket. Do you 17 recall that? 18 A Yes. 19 Q What is your understanding of what an 20 event socket is in the context of the '218 patent? 21 A So the '218 patent describes a socket 22 server which has event sockets which are a	47 1 Q Column 22, lines 55 to 25 [sic]. Do you 2 need to reread those or -- 3 A Well, that's not where I was but I can 4 look down there. 5 Q So where were you on 22? 6 A I was in line 12. 7 Q That's part of the passage. I want 5 to 8 25. 9 A Oh, okay. I thought you said 55. 10 Q I'm sorry. I might have spoken too 11 quickly. Let's look at column 22, lines 5 to 25. 12 A Sure. 13 Q And let me know when you're done. 14 A Okay. 15 Q Okay. So is it fair to say that according 16 to the '218 specification an event socket is a 17 uniquely addressable communication endpoint 18 because, one, it is accessible through a URL, and 19 to, includes an EventID? 20 A I want to hear that question again. 21 Q I'll read it back to you. So is it fair 22 to say that according to the '218 specification an
46 1 construct of the patent, and it refers to a socket 2 that clients can connect to which relate to a 3 particular event. So there can be multiple 4 sockets that relate to the same event. 5 Q Can you identify which passage in the '218 6 you're referring to or what figure you're looking 7 at? 8 A Yes. I am looking at Figure 2. 9 Q And in Figure 2 where are event sockets 10 illustrated? 11 A Okay. So 602A is an example of an event 12 socket, and it's described in column 22, line 11 13 and 12. 14 Q Column 22. I'm sorry, which lines? 15 A Column 22 around line 12. It says, "Event 16 socket 602A." A few lines down it talks about 17 event socket 602B. So those are the little boxes 18 at the bottom of the socket server box on Figure 19 192. 20 Q Okay. So let's focus on that paragraph 21 for now. 22 A Okay.	48 1 event socket is a uniquely addressable 2 communication endpoint because, first, it is 3 accessible through a URL, and second, it includes 4 an EventID? 5 A Uniquely identified -- what was the first? 6 Q Uniquely addressable communication 7 endpoint. 8 A Right. The URL is sufficient for that. 9 Q What is the function of the EventID? 10 A So that the socket server knows which 11 event it corresponds to. 12 Q And can you tie that answer into Figure 2? 13 A So it seems that the EventID is part of 14 the URL. 15 Q Okay. Let's take a ten-minute break. 16 A Sure. 17 (A recess was taken.) 18 BY MR. BAKER: 19 Q Back on the record. Dr. Rubin, I'm going 20 to hand you what has been previously marked as 21 Exhibit 1017. Are you familiar with this 22 document?

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49 1 A Yes, I am. 2 Q And it's okay if we just refer to it as 3 Spivey? 4 A Spivey, sure. 5 Q Let's keep out Spivey and for now your 6 original declaration, Exhibit 2001. 7 A Okay. 8 Q Let's go ahead and have you read paragraph 9 233 of Exhibit 2001 to yourself. Then I'll ask 10 some questions. 11 A Okay. 12 Q So you agree that in Spivey the live data 13 access server is uniquely addressable; correct? 14 A Yes. 15 Q And that's because it has a URL associated 16 with it? 17 A Yes. 18 Q And paragraph 82 of Spivey identifies an 19 example URL torq.cbssports.com/torq; is that 20 correct? 21 A Yes. That's an example it gives. 22 Q And an exemplary EventID in Spivey may be	51 1 The example of a torq that you just gave does not 2 uniquely address any topic queue at all, so just 3 identifies the live access server. 4 Q So let's turn to paragraph 104 of Spivey. 5 A Okay. 6 Q Go ahead and read that to yourself. 7 A Okay. 8 Q Is it your opinion that the EventID has to 9 be part of the URL to qualify as an event topic? 10 A I don't have an opinion on that. 11 Q Did Spivey put an EventID come in the form 12 of a topic label? 13 A Spivey does not disclose EventIDs. There 14 are topic labels disclosed in Spivey, but they 15 don't necessarily map to events. 16 Q What part of Spivey are you citing to in 17 support of that answer? 18 A I'm just -- I, you know, know I've read 19 Spivey. I'm familiar with it. I've read '218 20 which does disclose EventIDs. I didn't see 21 EventIDs disclosed in Spivey. Spivey discloses 22 topics. Topics have labels, but Spivey did not
50 1 gamecenter.nfl.ravenssteelers, for example? 2 A Where -- where are you referring to? 3 Q I can't recall if I made that up or if 4 that's an actual example. One second, please. 5 But I can simplify it. 6 Does Spivey identify what would constitute 7 an EventID associated with a URL? 8 A I don't recall the term EventID appearing 9 in Spivey. 10 Q Not that the term itself EventID, but we 11 have an understanding of what an EventID is; is 12 that correct? 13 A Yes. 14 Q And what is the meaning of an EventID? 15 A It's the way in the '218 patent that 16 sockets that relate to particular event are 17 identified. 18 Q Does Spivey have an approach or 19 nomenclature for identifying an event for chat? 20 A I don't recall off the top of my head 21 there being a particular identifier that way for 22 an event. I don't recall one way or the other.	52 1 describe that labels correspond to one particular 2 event. 3 Q Could you turn to paragraph 52 of Spivey, 4 please? 5 A Okay. 6 Q You can go ahead and read that to 7 yourself, and let me know when you're done. 8 A Okay. 9 Q Doesn't that passage indicate that a topic 10 may be "gamecenter.nfl.ravenssteelers," which may 11 relate to a specific game between two NFL teams? 12 A It does say that in the context of 13 explaining how these are hierarchically related. 14 Other topics that are described there are not 15 related to a particular event. 16 Q Why in your opinion would the term 17 gamecenter.nfl.ravenssteelers not constitute an 18 EventID as described by the '218 patent? 19 A Because in the '218 patent an EventID is 20 used in order for a client who wishes to view a 21 video to identify which socket it's communicating 22 on. Spivey has nothing to do with video. It has

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53 1 nothing to do with the client's requesting from a 2 socket server the socket for a particular EventID. 3 So I think they're just completely unrelated. 4 Q Paragraph 51 of Spivey explains that data 5 payloads are placed and pushed to a subscribing -- 6 subscribing LDAS; correct? 7 A Yes. 8 Q And what does the LDAS do with that pushed 9 data payload? 10 A So the LDAS can, can serve data to 11 clients. 12 Q How does the LDAS know what data to give 13 to a specific client? 14 A Based on what the client subscribed to. 15 Q And when a client subscribes to something, 16 does it identify a particular event that it wants 17 to receive data for? 18 A I don't recall Spivey going into the 19 details of how clients specify what they want, but 20 they specify certain topics that they're 21 interested in, and so those, whatever those topics 22 are, when there's data related to those topics, it	55 1 certain. You can choose a different way to 2 pronounce it and I'll go along, but let's call it 3 the 960 publication, if you agree. 4 A Unless I'm missing it, I don't see it in 5 my exhibit list, and it does not look familiar to 6 me. 7 Q Can we turn to Figure 2 of the 960 8 publication? 9 A Okay. 10 Q Would you describe this configuration. 11 And take your time to look at it and any 12 corresponding disclosure, but would you consider 13 this a traditional architecture for a webserver? 14 MR. SOLOMON: Objection to form. 15 A The patent describes in the brief 16 description of the drawings that Figure 2 is a 17 schematic of an example of a system architecture 18 that enables the formation of groups for 19 collaborating around common content over a 20 network. 21 I'm not familiar with this document but it 22 seems that they are creating an architecture in
54 1 gets pushed to the client. 2 Q Thank you. Let's look at paragraph 234 of 3 your original declaration, Exhibit 2001. Let me 4 know when you're there. 5 A Okay. 6 Q You testify or state in your declaration 7 in the last sentence of 234 that "There is no 8 disclosure of any connection for the client to 9 anything other than the live data access server, 10 and certainly no disclosure that each topic queue 11 is a uniquely addressable communication endpoint"; 12 correct? 13 A Yes. 14 MR. BAKER: Counsel, we're going to 15 introduce one new exhibit today. 16 (Deposition Exhibit A was marked for 17 identification.) 18 Q Thank you. Dr. Rubin, are you familiar 19 with the US Publication 2013 0018960 to -- I'm 20 going to mangle this. So we're going to have to 21 agree how to say it -- Knysz? I think the K is 22 silent. I'm going to call it Knysz. I'm not	56 1 order to enable some sort of group protocol. I've 2 not seen this architecture, this specific 3 architecture before, and I don't have any opinions 4 about it. 5 Q Fair enough. I'm going to ask you some 6 basic questions. You can offer an opinion or if 7 you elect not to, we'll go forward. 8 Element 102 is the client in Figure 2; 9 correct? 10 A Yes. 11 Q Element 104 is identified as a webserver; 12 is that correct? 13 A Yes. 14 Q And element 214 is a message queueing 15 system? 16 A Yes. You've read those correctly. 17 Q Can you turn to paragraph 71 of the 960 18 publication? 19 A Do you want me to read it? 20 Q Read it to yourself, please, yeah. Let me 21 know when you're done. 22 A Okay. Okay. I've read it.

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57 1 Q Are you familiar with RabbitMQ? 2 A Where -- where are you? 3 Q Paragraph 71, maybe about two-thirds of 4 the way down. 5 A I've heard of it. 6 Q When you say you've heard of it, have you 7 ever used it or studied it? 8 A No. I believe that appears in some 9 documents that I read in this case. It's 10 recognizable to me but I have not worked with it. 11 Q How about Pusher? 12 A I'm not familiar with that. 13 Q Can you turn your attention to paragraphs 14 91 through 93 of the 960 publication? You can 15 take your time to read those three, please. 16 A Okay. 17 Q In paragraph 93 do you see the 18 statement -- actually, let's take a step back. 19 Paragraph 91 of the 960 publication indicates that 20 the following section is directed to other system 21 architecture implementations; correct? 22 A Yes.	59 1 A Yes. 2 Q Is it fair to characterize your opinion 3 regarding Spivey that it requires all client 4 connections to be provided through the live data 5 access server? 6 A Yes. 7 Q All right. Let's turn to Spivey which is 8 Exhibit 1017, and let's focus on paragraph 36. 9 Let me know when you've read that. 10 A Okay. 11 Q And that passage reads, "In some 12 embodiments, message queue server 120 is not 13 accessible to clients over the network directly." 14 Is that a correct reading? 15 A Yes. 16 Q Do you have an understanding of the phrase 17 "in some embodiments"? 18 A Yes. 19 Q What does that mean to you? 20 A In this particular document everything is 21 referred to as "may include" or "in some 22 embodiments." They're saying that that's the
58 1 Q And can we turn your attention to 2 paragraph 93, the first sentence. It states, "In 3 addition, the message queueing system 214 of 4 architecture 700 can communicate directly with 5 either the application server 104 or with the 6 client device 102." 7 Do you see that? 8 A Yes. 9 Q Do you understand that sentence to mean 10 that the Figure 2 of the 960 patent there can be a 11 direct connection between the message queueing 12 system and a user client device? 13 A I don't know. I'm not familiar with this 14 document, and I have no context for this. 15 Q Okay. Do you think that paragraph 93 16 speaks for itself? 17 A I have no idea. 18 Q All right. Let's turn our attention back 19 to Spivey. And if you can give the marked copy 20 back to the court reporter, please. 21 A Spivey or -- 22 Q Did she put a sticker on one?	60 1 disclosure. It is not the case that they are 2 implying that there are other embodiments where 3 this is not true. 4 Q What do you mean by that they're saying 5 that's the disclosure? 6 A For example, in paragraph 35 right above 7 it says, "The system may include a message queue 8 server 120." That's the disclosure of a message 9 queue server 120, and it's not saying that it's 10 possible for the system to not include the message 11 queue server even though it uses the word "may." 12 Similarly when it says "in some embodiments," 13 those are the embodiments that are being 14 disclosed, and there's no disclosure anywhere of 15 an embodiment where that's not true. 16 Q So you're saying whenever the passage in 17 Spivey uses the term may, in effect it means it 18 does include that particular structure or 19 functionality? 20 A I wouldn't go so far as to say that would 21 necessarily be the case everywhere that it says 22 may, but there are places where it says may and it

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61 1 means does. 2 Q How do I know when may means optional and 3 how do I know when may means does? 4 A You would have to ask Spivey. 5 Q How do you know as the POSA reading the 6 specification? 7 A Well, when I see that it says the system 8 may include a message queue server in the context 9 of this patent application, I say, well, it has to 10 because the invention doesn't make any sense 11 without it. So in that -- I mean I can look at it 12 case by case and say I don't recall seeing a place 13 where it said may and may not would have been 14 possible. 15 Q So are you saying absent the LDAS the 16 disclosure of Spivey doesn't make sense? Is that 17 your opinion? 18 A Absent the LDAS? 19 Q Mm-hmm. 20 A I don't recall offering that opinion in my 21 report. If I did, then the report would speak for 22 itself.	63 1 A I've done that. 2 Q Real time. 3 A I wasn't that organized today. I found it 4 though. 5 Q Is that paragraph 15 of your supplemental? 6 A Five-zero you said? 7 Q One-five of your supplemental I believe. 8 A I sure hope so. 9 Q I found it. 10 A I don't think that's what I was looking 11 for. I think it's in my main report where I 12 specifically address the word may in Spivey. 13 You know what, I think it was in the 14 claim-by-claim section, so I should get there 15 soon. 16 Okay. Paragraph 177. Yeah. That's the 17 point I was trying to make. 18 Q Okay. Having reviewed your paragraph 177 19 in Exhibit 2001 can you explain to me what 20 Spivey's use of may suggests to a POSA reading the 21 specification? 22 A I say that "The use of the word 'may' in
62 1 Q If I understand you correctly, you're 2 saying where Spivey uses the term may you have to 3 decide as the reader as a POSA whether or not the 4 invention makes sense with or without that 5 particular structure to determine whether or not 6 may means optional or may means required. Do I 7 understand you correctly? 8 A I think you're putting words in my mouth 9 that I never said. What I'm saying, and it is 10 described in my report, is that there are examples 11 in Spivey using the language may where there is no 12 logical way to understand it if it did not include 13 it. 14 Would you like me to find that in my 15 report? 16 Q Let's look at that, yes. 17 A This is where I miss Zoom depositions 18 where my report is searchable. 19 Q That's a good point. You can put this on. 20 That's fine. I have had cases where experts ask 21 to have the computer with it all loaded so they 22 can word search.	64 1 the context of Spivey, Spivey, does not, in fact, 2 teach a POSITA how Spivey's system and alleged 3 benefits would be achieved in the absence of a 4 live data access server." 5 The beginning of the paragraph is 6 Dr. Wicker places much emphasis on the fact that 7 Spivey states that the system may include a live 8 data access server. By the same logic Spivey's 9 system may include a message queue server or not 10 despite the fact that the message queue server is 11 critical and necessary to achieving Spivey's 12 invention. 13 So saying that in Spivey when he says 14 something may be the case, it can be the case that 15 it must be the case. 16 Q Can you point to any technical reason in 17 Spivey that would preclude a client from 18 connecting directly to the message queue server? 19 A Yes. The message queue server is a data 20 structure. It doesn't have -- well, there's no 21 disclosure anywhere of a client device being able 22 to connect to a topic in the message queue server,

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65 1 and with respect to whether something is 2 theoretically possible I haven't looked at that. 3 Q But I was asking is there anything that in 4 Spivey or Spivey that would preclude or would 5 teach a POSA, look, there's -- it's not possible 6 to connect the client directly with the message 7 queue server? 8 A Well, there's teaching that you would want 9 to connect to a live access server for performance 10 reasons, and so I think it teaches away from that 11 type of a solution. I have not looked at whether 12 it would be feasible or there's anything that 13 precludes it. 14 Q So what are you looking at in Spivey 15 related to the performance reasons for using the 16 LDAS? 17 A Well, one way to look at it is in the 18 background section. The last sentence said, 19 "However, the content providers may encounter 20 obstacles to providing the data to mobile devices 21 in real time and with minimal delays." 22 This patent is about real-time minimal	67 1 that case. I don't see how subscriptions would be 2 managed and how clients would be able to connect 3 to the system. 4 Q We'll get back to that. Let me ask you a 5 question about paragraph 34 of Spivey. 6 A Okay. 7 Q Go ahead and read that paragraph, please, 8 and in particular let's focus on the last sentence 9 in paragraph 34. 10 A Okay. 11 Q So do you see the passage "may include 12 more or fewer elements in alternate topologies as 13 desired for a given implementation"? Do you see 14 that? 15 A Yes. 16 Q What do you understand this passage to 17 mean? 18 A This is kind of standard language that you 19 see in patents to try to say that the invention 20 isn't limited just to everything in the document, 21 but it doesn't give any other specific details. 22 Q Does it suggest that Spivey's architecture
66 1 delay access to topics, and so adding to the data 2 structure that was designed to speed up access, 3 something that would require communications with 4 outside clients would affect the performance that 5 my experience as a computer scientist. 6 Q Sorry. You're reading paragraph 2? 7 A Yes. 8 Q Or you're referring to paragraph 2? 9 A Yes. 10 Q On Exhibit 1017? 11 A Yes. 12 Q Okay. And when you discuss adding to the 13 data structure that was designed to speed up 14 access, something that would require 15 communications with outside clients, are you 16 discussing the LDAS in that context? 17 A I was saying that if you were to add the 18 LDAS functionality to the message queue server, it 19 would negatively impact performance. 20 Q Okay. But if you remove the LDAS, isn't 21 that one less component involved in the network? 22 A I don't see how that system would work in	68 1 is modular and flexible? 2 A I don't know about that. It does say it 3 could include more or fewer elements in alternate 4 topologies, but in order for the system to 5 function it would need to at least -- let me start 6 that answer over. 7 It doesn't say more than it says it says. 8 It could include more or fewer elements, but 9 nowhere in the specification does it give examples 10 of that. 11 Q Aren't figures 21 and 22 alternate 12 topologies disclosed in Spivey? 13 A Yes. 14 Q And Figure 1 is a centralized 15 configuration. Is that accurate? 16 A Well, Figure 1 is a high level view of the 17 system. It doesn't give the details that are in 18 Figures 21 and 22. 19 Q So I'm sorry. Figure 21 is a centralized 20 version of Figure 1. Is that accurate? 21 A Of part of Figure 1. 22 Q Which part of figure 1?

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69 1 A The live data access server, and it's also 2 showing a device which presumably could be a 3 client device. It's focused on giving more detail 4 of what a system looks like. 5 Q What about Figure 22, same question. How 6 does it provide an alternative embodiment of 7 Figure 1? 8 A It drills down into more details. 9 Q So is Figure 22 just a more focused 10 discussion of Figure 1 or is it an alternative 11 embodiment to Figure 1? 12 A That question is outside the scope of what 13 I provided opinions on, so I haven't studied that. 14 Q I don't recall. You don't discuss Figure 15 22 in your -- 16 A I don't -- 17 Q -- declaration? 18 A I'm sorry. I thought you finished. I 19 don't recall that. If I do, I'm happy to talk 20 about it. If we can take a quick second. 21 Q Let me do a word search. Let's see. I 22 don't recall either.	71 1 A Okay. You said through 158 or -- 2 Q 157 through 160. 3 A Oh, I need to read a couple more. 4 Okay. 5 Q The 157 explains that the distributed 6 system may include a variety of architectures; is 7 that correct? 8 A It does. 9 Q And what type of architectures are 10 contemplated on Spivey? 11 A A distributed system may include a client- 12 server architecture, a 3-tier architecture, an N- 13 tier architecture, a tightly-coupled or clustered 14 architecture, a peer-to-peer architecture, a 15 master-slave architecture, a shared database 16 architecture, and other types of distributed 17 systems. 18 Q Were those standard well-known 19 architectures? 20 A Yes. 21 Q And looking at paragraph 158 does Spivey 22 indicate that server device 2250 may "be the same
70 1 When you consider a prior art reference, 2 do you consider that reference as a whole for all 3 that it teaches? 4 A It depends on the task that I'm given. 5 When I consider a prior art reference in an IPR 6 like this, I read the whole reference, and then I 7 focus on rebutting what the expert on the other 8 side said if I'm writing a rebuttal report. 9 Q When you reviewed Tom Spivey, had you 10 reviewed Figure 22? 11 A I looked at it with respect to the text 12 that I was reading, but I did not perform any 13 analysis if I don't discuss it in my report. 14 Q Let me clarify. When you prepared your 15 original report 2001 and you reviewed Spivey, do 16 you recall reviewing Figure 22? 17 A I read the entire patent but I don't 18 believe I performed any analysis on Figure 22. If 19 it's in my report, then my memory is wrong and I 20 can look at what I wrote. 21 Q Let's take a look at paragraphs 157 22 through 160 of Spivey.	72 1 or similar to" one or more of the following: 2 Message queue server, live data access server, or 3 the aggregator host server? Is that accurate? 4 A I think you read that right. 5 Q So in light of that passage doesn't Spivey 6 contemplate a configuration wherein a client 7 device requests and receives live data directly 8 from a client server device 2250 that may be the 9 same or similar to an LDAS? 10 MR. SOLOMON: Object to form. 11 A So what it says is that the distributed 12 system 2200, and from the figure, I think it's 13 Figure 22, the distributed system may have a 14 client and a server device. The client device can 15 be the same or similar as the client device 210. 16 That's in Figure 1, and the server device may be 17 the same or similar to the live data access 18 server, the message queue server and/or aggregator 19 host server, but it doesn't say that the client 20 would make a direct connection to the message 21 queue server. 22 Q But doesn't it illustrate that the client

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73 1 device makes a direct communication to the server 2 device 2250? 3 A Yes. 4 Q And doesn't Spivey indicate that the 5 server device 2250 may also implement some or all 6 of the components of a server device such as the 7 LDAS? 8 A Yes. 9 Q Can you turn to Figure 2 of Spivey? 10 A Okay. 11 Q Are you familiar with that figure? 12 A Yes. 13 Q So Spivey's client device does not require 14 a subscription or interface component; is that 15 correct? 16 A Figure 2 is an embodiment. It does not 17 show a -- what did you say? Subscription? 18 Q A subscription or interface component. 19 A Well, it shows the client communication 20 component which I would think would be an 21 interface. 22 Q Does it show anything that interfaces with	75 1 Q You think this is a good time to take a 2 45-minute break for lunch? 3 A Sure. 4 (A discussion was held off the record.) 5 (Lunch recess taken from 11:57 a.m. until 6 12:52 p.m.) 7 BY MR. BAKER: 8 Q Back on the record. Let's revisit one 9 concept you discussed earlier. Do you recall that 10 you testified that the one-to-many socket 11 architecture related to multiple event sockets 12 dedicated to a particular event? 13 A I don't recall using that language. So we 14 can go back to that discussion. 15 Q Sir, continue to consider your passage or 16 what you want to look at, but if you want me to, I 17 can read back your answer as well. 18 A Okay. That's great. 19 Q So the question was: "What's your 20 understanding of what is meant by the term 21 one-to-many socket architecture?" 22 And your answer was: "So if we look at
74 1 the LDAS? 2 A In the context of Figure 1, Figure 2 has 3 direct connection to the LDAS, and it shows that 4 it has the client communication component. So I 5 think it -- between the two figures it does show 6 that. 7 Q How about if you consider Figure 2 and 8 Figure 22 together? 9 MR. SOLOMON: Objection to form. 10 A What's the question? 11 Q Does Spivey's client device require a 12 subscription or interface component to communicate 13 with a LDAS? 14 A I'm not sure that I understand what you're 15 asking. Figure -- in the client device 200 and in 16 the client device 2210 both have communication 17 components which I read as an interface to 18 communicate with the server, in this case the live 19 data access server. 20 Q And in Figure 22 the server device 2250; 21 is that correct? 22 A Yes.	76 1 column 22 starting at line 5, we see that the 2 webserver provides an EventID and that there can 3 be an event socket 602A" -- I'm sorry "could be an 4 event socket, 602A would be a socket for a 5 particular event, and a second socket be for 6 another event, and so the clients that are 7 connecting to each of those sockets for a 8 particular event there would be multiple clients 9 and one socket, so that's why it's many-to-one or 10 one-to-many." 11 A Can you give me a second? 12 Q Mm-hmm. 13 A Can you read back the last part of what 14 you said that I said? 15 Q Yes. "And so the clients that are 16 connecting to each of those sockets for the 17 particular event there would be multiple clients 18 and one socket. So that's why it's many-to-one, 19 or one-to-many." 20 A Okay. 21 Q Is that your answer? 22 A Yes.

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77 1 Q Let's turn our attention to Spivey, 2 paragraph 104. 3 A Okay. 4 Q And that paragraph discusses hiarch -- oh 5 goodness -- hierarchically related topics; 6 correct? 7 A Yes. 8 Q And according to Spivey data related to 9 those topics are placed in their respective topic 10 queues; is that correct? 11 A Yes. 12 Q And a topic queue could be, for example, 13 related to a specific Ravens-Steeler game. Is 14 that accurate? 15 A That's possible. 16 Q And an example of a topic queue dedicated 17 to the Ravens-Steelers game could be 18 ravenssteelers.stats and another could be 19 ravenssteelers.plays. Is that a fair 20 characterization of Spivey? 21 A Yes. 22 Q And information, according to Spivey,	79 1 A I can't think of anything that I've said 2 today that wouldn't change it -- that would change 3 if we change to those dates. 4 Q Thank you. 5 Let's turn to the claims in Spivey. In 6 particular can you read claim 7 to yourself? 7 A Okay. 8 Q Would you agree that claim 7 reads on an 9 embodiment where the message queue server delivers 10 data directly to client devices? 11 A Can I hear the question part again? 12 Q Would you agree that claim 7 reads on an 13 embodiment where the message queue server delivers 14 data directly to client devices? 15 A It doesn't disclose that. 16 Q Do you understand what I mean if I say the 17 claim is broad enough to encompass certain subject 18 matter? Do you understand that? 19 A I think so. 20 Q Is claim 7 broad enough to read on an 21 embodiment where the message queue server delivers 22 data directly to client devices?
78 1 related to ravenssteelers.stats would not be 2 placed in the ravenssteelers.plays topic queue; 3 correct? 4 A I mean it doesn't specifically state that, 5 but the understanding is that you would put each 6 of the topics within the label that matches that 7 topic. 8 Q Okay. So Spivey discloses using multiple 9 topic queues dedicated to a single particular 10 event; correct? In this case the Ravens-Steelers 11 game? 12 A It doesn't have to relate to an event. In 13 this case it talks about the Ravens-Steelers game 14 which you could consider that to be an event, but 15 whatever the topics are they can be placed in 16 hierarchies, and topics can, can relate to each of 17 those labels. 18 Q So I've been saying, and I misspoke a 19 couple times, I referred to the 2016-2017 time 20 frame. I meant to say the 2015-2016 time frame. 21 Would any of your answers have changed if I 22 referred to the earlier time frame?	80 1 A I have not looked at that, and Dr. Wicker 2 did not claim that, and I was responding to him. 3 So I don't have any opinions on that. 4 Q Let's go to paragraph 24 of your 5 supplemental dec. 6 A Okay. 7 Q Do you recall testifying with regard to 8 RabbitMQ that you've heard of it, but when asked 9 whether you've used it you said no? 10 A Right. I haven't used that protocol 11 myself. 12 Q Okay. Go ahead and read paragraph 24 to 13 yourself, please. 14 A Okay. 15 Q All right. So it's your opinion, 16 according to paragraph 24 of your supplemental 17 declaration, that "the RabbitMQ discussed at 18 Spivey paragraph 58 would function according to 19 the principles set forth in relation to Spivey 20 Figures 1 and 4." 21 What's the basis of that opinion? 22 A Because there's no other disclosure in

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81 1 Spivey for any other architecture other than that. 2 Q Isn't Figure 22 alternative architecture? 3 A 22 – I'm sorry. 21 is an alternative to 4 22 but not to Figure 1, and in discussing the 5 client device, the live data access server, the 6 message queue server and the live data sources, 7 the only architecture described is Figure 1. 8 Q Does paragraph 58 of Spivey discuss a live 9 data access server? 10 A That particular paragraph does not. 11 Q Are you aware of any technical reason why 12 RabbitMQ would not function in the architecture 13 illustrated in Figure 22 of Spivey? 14 MR. SOLOMON: Objection to form. 15 A Yes. Figure 22 does not talk about the 16 message queue server device. It's showing the 17 client device and a server device. So that 18 figure's not relevant to this paragraph. 19 Q Doesn't paragraph 160 of Spivey indicate 20 that the server device 2250 in Figure 22 may 21 implement some or all of the components of the 22 message queue server device 310 or 410?	83 1 access server also. 2 Q Does may mean in this context that the 3 live data server is not part of that configuration 4 shown in Figure 22? 5 A I haven't formed opinions on what may 6 means in this paragraph. 7 Q I thought you had opinions what may means 8 for Spivey throughout. 9 MR. SOLOMON: Objection to form. 10 A I don't think that's what I said. 11 Q Looking at Figure 22 and paragraph 160 do 12 you have an opinion today whether or not the live 13 data access server is an optional device for the 14 architecture illustrated in Figure 22? 15 MR. SOLOMON: Objection to form. 16 A I think it's saying that it's describing 17 one embodiment where it is there. So it's there 18 in that embodiment. 19 Q Is it also describing an embodiment where 20 it's not there? 21 A No. At least not in that paragraph. 22 Q What does the language and/or mean to you?
82 1 A Which paragraph? 2 Q 160. 3 A So it says that the server device may 4 implement that functionality, but that's not being 5 shown in Figure 22. 6 Q Do you see the last sentence in paragraph 7 160 of Spivey? 8 A Client device 2210? 9 Q The sentence that begins "the server 10 device 2250 may implement"? 11 A Second-to-last sentence? 12 Q Yes. I'm sorry. 13 A Okay. 14 Q Yes, second-to-last sentence. 15 A So the functionality of the message queue 16 server can be implemented in the server device 17 2250. 18 Q Meaning it's optional? 19 A It says it may implement it. 20 Q And the same is true for LDAS 130? It's 21 optional? 22 A It says it may implement the live data	84 1 A It means that you can have both of the 2 things that are before and after the and or you 3 can have just one of them. 4 Q So if you have a list of four items, A, B, 5 C and/or D, what does that mean to you? 6 A I think that can be ambiguous. I think it 7 would depend on the context whether the and/or 8 applies to C and D or whether it applies to the 9 entire list. I haven't looked at that. 10 Q If it applies just to C or D, what does 11 that mean? That C or D are optional components of 12 the, I don't know, list, if you will, for A, B, C 13 and/or D? 14 A If the and/or is related only to the C and 15 D parts of that, then I would say that you have to 16 have -- if you say something has A, B, C and/or D, 17 that you have to have A and you have to have B, 18 again assuming the and/or only relates to C and D, 19 and then you have to have C or you have to have D 20 or you can have C and D. 21 Q And the same is applicable for a list of 22 three if it's A, B and/or C?

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85 1 A Again, if we're assuming that the and/or 2 only modifies the B and C, then you have to have 3 the A and then you have to have the B or you have 4 to have the A and you have to have the C or you 5 can have A, B and C. It's basically a truth 6 table. 7 Q Wouldn't a POSA reading paragraph 160 8 understand the second-to-last sentence of that 9 paragraph to mean that the structure listed is 10 optional? 11 MR. SOLOMON: Objection to form. 12 A I don't know. 13 Q Going back to your statement in paragraph 14 24 of your supplemental declaration. 15 A Okay. 16 Q What do you mean according to the 17 principles set forth in relation to Spivey Figures 18 1 and 4? 19 A The principle that the client devices 20 connect to the live data access server and do not 21 connect or include a message queue server. 22 Q So that statement finds its basis in	87 1 message queue and the client, and so the message 2 queue is -- its job is to provide low latency 3 access to topics, but the LDAS is needed to 4 provide the overhead of the connections to the 5 clients and the subscription management. 6 Q What do you mean by provide the overhead 7 of the connections? 8 A The LDAS is described as managing the 9 network connections to the -- to the clients, and 10 that takes a certain amount of overhead, and since 11 the goal of the system was real-time low latency 12 access, the architecture of having a separate 13 server that manages a message queue is to separate 14 out the process of running a message queue from 15 all of that network, all that network work, 16 network setup work. 17 Q Do you know if in the relevant time frame 18 whether or not RabbitMQ used a socket server? 19 A I don't know anything about how RabbitMQ 20 worked. 21 Q Do you know if RabbitMQ used event 22 sockets?
86 1 Spivey, is not based on your understanding of 2 RabbitMQ? 3 A Yes. 4 Q Quick word search. One second. 5 Looking at paragraph 58 of Spivey. 6 A Okay. Well, I'm sorry. I'm in my report 7 58. 8 Q Yeah, Spivey 58. 9 A Okay. 10 Q So you see the passage that reads: 11 "RabbitMQ facilitates topic queues that receive 12 published messages and push the messages to 13 clients that have subscribed to topic queues." 14 Do you see that? 15 A Yes. 16 Q Doesn't that suggest that in Spivey, if 17 you're using RabbitMQ, there's no need for an 18 LDAS? 19 A No. 20 Q Why not? 21 A Because the architecture in Spivey is that 22 you have the L -- the LDAS, the LDAS between the	88 1 A I don't know anything about how it worked. 2 Q If you're unaware how RabbitMQ works, what 3 was the basis of your opinion in 24 regarding the 4 use of RabbitMQ in Spivey? 5 A My opinion is not dependent on the actual 6 functionality of the RabbitMQ product. It has to 7 do with the functionality of a message queue 8 server and how Spivey describes a message queue 9 server interacts with clients through the data 10 access server. 11 Q In 24 of your supplemental dec you say 12 Spivey discusses a certain RabbitMQ as one 13 implementation of the MQSD. What do you mean by 14 certain? 15 A This is a form of speech of saying this is 16 a particular RabbitMQ or particular server 17 implementation. 18 Q Please return briefly to the claims of 19 Spivey. 20 A Okay. 21 Q Do you see claim 8? 22 A Yes.

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89 1 Q And that's a dependent claim; correct? 2 A Yes. 3 Q Depends from claim 7? 4 A Yes. 5 Q That claim requires that the connection be 6 a websocket connection; is that correct? 7 A Yes. 8 Q And can you turn to claim 12? 9 A Okay. 10 Q That depends from claim 7; correct? 11 A Yes. 12 Q And does claim 12 require pushing a data 13 payload to the client device? 14 A Yes. 15 Q And that push is done substantially 16 simultaneously with the message queue server 17 receiving the topic entry? 18 A Yes. 19 Q So there's no LDAS required by claim 12; 20 correct? 21 A So I've not provided any opinion in my 22 report about whether or not the claims are, how	91 1 communicates the gathered data to the message 2 queue server as live data. 3 Q All right. Now in reference to paragraph 4 35 of Spivey. Relatively long paragraph. Feel 5 free to read it. Does that paragraph disclose 6 that an electronic device can be a webserver? 7 A Yes. 8 Q Can we turn our attention to paragraph 161 9 of Spivey? 10 A Okay. 11 Q And doesn't that paragraph explain that 12 Figure 23 illustrates an electronic device 13 including those described in conjunction with 14 Figures 1 through 5? 15 Strike that. I'm not sure that was 16 clearly articulated. One second, please. 17 Does paragraph 161 explain that in one 18 embodiment the computing architecture 23 may 19 comprise or be implemented as part of an 20 electronic device? 21 A Yes. 22 Q And does it further explain that examples
90 1 they relate to the embodiments. The embodiments 2 in the patent do require an LDAS, but I can't 3 comment and offer any opinions on what embodiment 4 claim 12 has within its scope. 5 Q Can we go to paragraph 55 of Spivey? 6 A Okay. 7 Q In 55 the LDS communication component 418 8 receives live data; is that correct? 9 A What line are you in? 10 Q So the last sentence, LDS communication 11 component 418? 12 A Yes. 13 Q And if you look at paragraph 37 of Spivey 14 still, that paragraph describes various live data 15 sources; is that correct? 16 A Yes. 17 Q And what are those sources? 18 A Data feeds generated by computing devices 19 associated with a live event monitored by a 20 message queue server. Live data sources may also 21 include data gathered by human observers of a live 22 event and entered into an interface that	92 1 of an electronic device may include those 2 described in reference to Figures 1 through 5? 3 A Yes. 4 Q So isn't it clear that in Spivey 5 electronic device examples are not limited to the 6 MQSD? 7 A Spivey discloses different types of 8 electronic devices that are not limited just to 9 the MQSD. 10 Q Let's take a five- or ten-minute break, 11 please. 12 A Yeah. 13 (A recess was taken.) 14 BY MR. BAKER: 15 Q All right. Dr. Rubin, I'm going to hand 16 you what's been previously marked as Exhibit 1016. 17 Are you familiar with this reference? 18 A I am. 19 Q Would you identify it for the record, 20 please? 21 A This is the Ellis patent application that 22 I cite in my report.

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93 1 Q All right. Let's take a look at Figure 1. 2 A Okay. 3 Q So is element 152, is that a dedicated 4 channel for transmitting event information? 5 A I have to look at the text. And if 6 there's particular place in the spec but. 7 Q I think 152 is discussed. 8 A I see it mentioned in paragraph 45, but I 9 don't see the specific words you used. 10 Q Well, how would you characterize 11 communication path 152? 12 A One of the descriptions I see of it is 13 paragraph 42 of Ellis, and it says, "Some or all 14 of this sports-related information may be stored 15 in database 122 and provided to content source 130 16 or directly to user equipment 120 over 17 communications paths 154 and 152 respectively." 18 So that's describing 152 as being a communication 19 path that can take information and send it to user 20 equipment, which is what's shown in the figure. 21 It's the line connecting the database to the user 22 equipment.	95 1 question, then I'll read. If you know that, that 2 I don't need to read and you want to try to ask a 3 question, but I'm probably going to read it, so 4 I'll go ahead and read it. 5 Q Okay. 6 A Okay. 7 Q Do you see where it says the supplemental 8 content source may be an intermediate content 9 provider? It's about seven lines down. 10 A Yes. 11 Q If it functions as an intermediate content 12 provider, does that mean that the supplemental 13 content source doesn't originate the content? 14 A I think that could be read to mean that 15 the supplemental content source received the 16 content from somewhere else. 17 Q If it receives it from somewhere else does 18 that mean that the content didn't originate with 19 the supplemental content source? 20 A That's how I would understand that. 21 Q Looking at paragraph 41 of Ellis, does 22 that passage indicate that the path 152 can be
94 1 Q And how about communication path 150? 2 A That's between the content source and the 3 user equipment. 4 Q Can you also consider paragraph 39 and 5 tell me if that changes your opinion regarding 6 communication paths 152 and 150? 7 A So the 150 is used for the content source, 8 and the 152 is used for supplemental content 9 source. 10 Q And those are separate communication paths 11 to the user equipment 102; correct? 12 A That's what it looks like. 13 Q Let's go to paragraph 42 of Ellis. 14 A Okay. 15 Q Exhibit 1016. I don't know if you can 16 read that. 17 A Well, I don't know what the question is, 18 so I don't know. 19 Q Actually, I'll ask you. Do you prefer to 20 have the question and then read or read and then 21 receive the question? 22 A If reading is going to help answer the	96 1 implemented as a plurality of real-time feeds? 2 A It says, "In some embodiments the sports- 3 related information is provided to user equipment 4 102 as a plurality of real-time data feeds." 5 Q And what path does that come across? How 6 does a user get that information? 7 A I -- 8 Q You can refer to Figure 1 as well. 9 A Yeah. I would say from Figure 1 that it 10 looks like that would come across 152. 11 Q All right. So looking again at Figure 1, 12 but also you can refer to paragraphs 39 and 40 of 13 Ellis, isn't it accurate that content source 130 14 provides a video feed path using path 150? 15 A I'm sorry. Could -- I wanted to see what 16 I said about Ellis in my report. Could you please 17 repeat your question? 18 Q Does content source 130 initiate a video 19 path 150 to the user device? 20 A That's what I think it shows. 21 Q And with reference to Figure 1 and 22 paragraph 49, does the user equipment have an

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97 1 interactive sports watcher application? 2 A Yes. 3 Q And in paragraph 51 of Ellis do you 4 understand that Ellis renders video and data feed 5 as overlays on the user device? 6 A Yes. 7 Q Okay. So in light of those passages is it 8 accurate to summarize that Ellis's client device 9 receives a video stream, receives event 10 information as a feed, and renders those feeds to 11 show content to a user? 12 A I don't know where you're getting the 13 event information part of that. 14 Q What do you think the purpose of the 15 interactive sports watcher application is? 16 A To allow the user to decide what they're 17 watching. 18 Q But doesn't that render video and data as 19 overlays? Didn't we agree with that with citation 20 to paragraph 51? 21 A I don't see where it says video and data. 22 Q So what do you understand -- what do you	99 1 A If the event is the game that is being 2 scored, then I would say yes. 3 Q Let me do a fast word search. One second. 4 All right. 5 Look at paragraph 89 of Ellis, please. 6 A Okay. 7 Q And we're going to look at Figure 5 as 8 well together. Doesn't Figure 5 illustrate a game 9 status icon 502 in the right corner of the screen? 10 A Yes. 11 Q And that game status icon, among other 12 icons, is overlaid in video stream as illustrated 13 in Figure 5; correct? 14 A I don't see that this paragraph says that 15 it's done as an overlay, but it is what's 16 displayed in the corner. 17 Q And so doesn't paragraph 69 convey that 18 box as being an overlay? 19 A Yes. 20 Q Okay. So is it accurate to summarize that 21 Ellis's client -- we can use Figure 5 as an 22 example -- receives a video stream, game status
98 1 understand media content being displayed? What 2 would you understand that to mean? 3 A Media can include -- in general it would 4 include videos, audio files, pictures. 5 Q And what's your understanding of what 6 interactive application display displays? Does 7 that display data? 8 A I think it would display media. 9 Q Look at Figure 3. 10 A Yes. 11 Q What is element 302? 12 A It looks like it's a box in a corner. 13 Q And what's inside the box? 14 A Those look like scores. 15 Q And is it your understanding that those 16 scores are provided as a data feed? 17 A I don't see -- in paragraph 68 that 18 describes what's in that box on Figure 3. I don't 19 see it mention a data feed but it does say that 20 it's showing live scores. 21 Q Would you consider live scores to be event 22 information?	100 1 information as a feed, and renders those feeds 2 together to show content to a user? 3 A I don't see that -- you haven't shown me a 4 disclosure of game status coming in as a feed, but 5 it does show the game status information as an 6 overlay in the corner. 7 Q So would a POSA have understood that path 8 152 would provide a feed of supplemental content 9 to user equipment? 10 A I haven't looked at that. I do not offer 11 an opinion on that in my report. 12 Q Didn't we agree earlier that path 152 can 13 provide a plurality of real-time feeds with 14 reference to paragraph 41? 15 A Yes. 16 Q According to paragraph 41 of Ellis, can 17 wagering information be provided through the 18 supplemental content source? 19 A Yes. 20 Q With reference to Figure 6 of Ellis, in 21 paragraph 98, if you will, does Ellis in his 22 disclosure enable a user to gamble or wager?

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101 1 A That's what it says. 2 Q Where does it say it, or are you just 3 looking at the figure? 4 A Oh no. In paragraph the sports watcher 5 application may also provide comprehensive 6 wagering support. 7 Q That's paragraph 98; correct? 8 A Right. 9 Q And excuse me if we discussed this. I 10 apologize if we have. Does Ellis's supplemental 11 content source push event data to clients? And 12 I'm looking at 44. 13 A The database that has the -- you said 14 paragraph 44? 15 Q I believe so. Does that address pushing? 16 A That's -- no. That's about receiving the 17 application itself, unless it's later in that 18 paragraph. 19 Oh yes. I found it. May push application 20 updates to user equipment. 21 Q So let's make sure the record's clear. 22 Ellis discloses that supplemental content source	103 1 Q Okay. So in that paragraph, paragraph 47, 2 you state that the combination of an orchestrator- 3 type webserver with a relay-type webserver 4 architecture increases latency in certain 5 scenarios and adds further complexity and cost to 6 the system while providing no tangible benefit; is 7 that correct? 8 A Yes, a typo. You read it the way I 9 intended. 10 Q All right. Now let's turn -- you still 11 have Exhibit 2001, your original declaration? 12 A Yes. 13 Q And let's stick with page or 47. 14 A Okay. 15 Q Let's go to paragraph 182, Exhibit 2001, 16 and why don't you go ahead and read that one. 17 A Paragraph 182? 18 Q 182 on page 100. 19 A Okay. Okay. 20 Q All right. So in paragraph 182 of Exhibit 21 2001 you assert that removing the LDAS from 22 Spivey's message flow would increase latency
102 1 may push event data to clients; correct? 2 A That's not what we were talking about. We 3 were talking about pushing application updates to 4 user equipment. 5 Q And application updates, does that mean 6 like updating the software or updating the user? 7 How do you understand that? 8 A I understood that to mean updating the 9 software. 10 Q Okay. Take a look. Yeah. I agree it's 11 in here. All right. 12 Let's return to your supplemental 13 declaration, page 31 for the record. And we're 14 going to revisit the orchestrator type versus 15 relay type for discussion. 16 A Okay. 17 Q All right. So in paragraph 47 you state 18 that -- 19 A Sorry. Let me -- 20 Q Take your time. Go ahead and read 47 if 21 you want to take a look at that. 22 A Okay.	104 1 because the message queue server would have to 2 take on additional responsibilities; correct? 3 A Yes. 4 Q Okay. So how do you reconcile your 5 opinion in your supplemental declaration paragraph 6 47 with your opinion in paragraph 182 of your 7 first declaration, Exhibit 2001, given that in the 8 first instance you argue that adding a server 9 increases latency while in the second instance you 10 argue that removing a server also increases 11 latency? How do you reconcile those two 12 positions? 13 A I don't think there's any contradiction at 14 all in those because you're talking about 15 different systems and different pieces that are 16 being removed. So if you remove the part of the 17 system that handles subscriptions and handles 18 connections which is specific to the Spivey 19 system, you're going to increase latency, and in 20 this case if you add an additional webserver such 21 that you have to go to an orchestrator-type web 22 server before you can go to a relay-type web

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105 1 server, you're also increasing latency. So the 2 mere act in a vacuum of adding or removing a 3 server doesn't tell you whether you're increasing 4 latency. Everything's specific to the system in 5 which you're making the change. 6 Q So let's deal with the orchestrator 7 combined with the relay type. That description 8 was in response to what you call our 9 hypothetical -- what you call Petitioner's 10 hypothetical embodiment; is that correct? 11 A Yeah. 12 Q And which hypothetical embodiment? What 13 paragraph do you discuss that embodiment? 14 A In 47. 15 Q I'm sorry. It's illustrated in 45? 16 A Right. 17 Q And in 45 which one would be the 18 orchestrator server and which one would be the 19 relay? 20 A Do you have Wicker's declaration? 21 Q I actually do. 22 A Yeah, 500 pages.	107 1 A Oh, the '218. 2 Q '218 the whole day; right? 3 A Yes. 4 Q And you want the whole petition? 5 A Yeah. 6 Q This should do it. Let's see. 7 A Okay. So the top right corner of the 8 webserver would be acting as an orchestrator 9 server, and the message queue server would be 10 acting as a -- the message queue server will be 11 behaving as a relay-type server, and what's listed 12 as the webserver would be acting as an 13 orchestrator-type webserver, and my position and 14 my opinion that I state is that that would add 15 unnecessary latency to the system. 16 Q What would be the role of the webserver in 17 this figure? 18 A And again, this was Petitioner's diagram, 19 and I think that what they're thinking is that it 20 would act as an orchestrating webserver. 21 Q So what page of the petition are you on? 22 A 36.
106 1 Q I'm now handing you what was previously 2 marked as Exhibit 1001. Is this the declaration 3 that you're requesting from Dr. Wicker? 4 A Yes. Oh, you know what, this -- I'm 5 sorry. This is from the petition. I asked for 6 Wicker but the citation I have is to the petition. 7 Q Oh. You're looking for the petition for 8 the 182? 9 A Yes. 10 Q I might have that. I might. Let's see. 11 So yes. So we're talking about the '218 -- 12 A Yes. 13 Q -- petition? 14 A Exhibit 1001. 15 Q What did I give you? 16 A Oh. 17 Q But it might be for a different patent. 18 A Oh. So my citation is to petition page 35 19 to 36, paragraph 132, 133 and petition 36 is what 20 this comes from. 21 Q And the declaration, looking at the cover 22 page, which patent is this declaration for?	108 1 Q And in your supplemental declaration what 2 page are you on? 3 A 31. 4 Q Are those images identical? 5 A They're not. The application server is 6 what it says in the petition, and webserver is 7 what it says in my report. 8 Q Okay. And your discussion was most 9 recently to the petition; correct? 10 A I was looking at both of them and was 11 offering my opinions from my report. 12 Q So your opinions relate to both these 13 figures? 14 A Oh, I see what you're saying. Yes. 15 Q Okay. Just for the record. I mean 16 honestly I wasn't judging you. I just want to 17 know which figure we're speaking to. 18 A Yes. 19 Q So your most recent testimony is equally 20 applicable to the figure in the petition as well 21 as your declaration or is it one or the other? 22 A The comments in my report relate to

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109 1 commenting on the figure in the petition. 2 Q I want to stick with that one because that 3 has my question so it's consistent. And I 4 apologize. What page in the petition? 5 A 36. 6 Q Why do you characterize the MQS in the 7 figure on page 36 of the '218 petition as a relay- 8 type webserver? Doesn't it interface both with 9 the application server and the user equipment? 10 A So if you look at the green arrows. 11 Q Yes? 12 A Information is coming from the control 13 server through the MQS and to the user equipment 14 in this diagram that Petitioner created, and so 15 the MQS is acting as a relay server for that 16 information. 17 Q What's the role of the MQS as it relates 18 to the application server? How would a POSA have 19 understood that from this figure? 20 A So according to the Petitioner there is a 21 request from the user equipment to the application 22 server for metadata that has been sent. I don't	111 1 Q So you're saying a socket, and please, I'm 2 asking because I do not understand this point. A 3 socket server is neither a relay or an 4 orchestrator-type server; it's its own special 5 type of server? Is that what you're saying? 6 A The socket server manages the socket 7 connections, and I don't have an opinion – at 8 least if I do, I don't remember that I have, and 9 my report speaks for itself, but I don't believe 10 that it is orchestrator or a relay-type server. 11 It's a socket server. 12 Q But the MQSD is a socket server as well; 13 right? 14 A You're talking about Spivey now? 15 Q Spivey, whatever, yeah. 16 A No. The MQSD is a data structure that 17 holds topics in it. 18 Q So it's your opinion that Spivey or Spivey 19 doesn't disclose a socket server? 20 A Correct. 21 Q And what's your definition of a socket 22 server?
110 1 agree with this figure, but that is my 2 understanding of what they are saying. 3 Q Can we open up US Patent '218? 4 A Yes. 5 Q Exhibit 1009? In Figure 2 doesn't the 6 data flow from the control server directly into 7 the socket server? 8 A There's a direct link shown from the 9 control server to the socket server in Figure 2. 10 Q So in Figure 2 is a socket server a relay- 11 type server? 12 A Well, the opinions I have in my report are 13 about whether relay or orchestrating server have 14 to do with the webserver or not, the control 15 server. 16 Q Do you have an opinion whether or not the 17 socket server shown in Figure 2 constitutes a 18 relay-type server or an orchestrator-type server? 19 A It's a socket server. I don't think it's 20 either of those. 21 (The reporter requested clarification.) 22 A Sorry. It's a socket server.	112 1 A It's -- it -- I don't believe I offer a 2 specific definition, but it's a server that 3 manages the sockets for the events. 4 Q Are there certain characteristics that all 5 socket servers have? 6 A I -- I don't recall I offer any opinion on 7 that. 8 Q Do you have any understanding of what 9 characteristics a socket server has? 10 A It manages the sockets. 11 Q On behalf of? 12 A The system. 13 Q All right. Let's go back to the '218 14 disclosure. 15 A I didn't hear you. Which? 16 Q '218 disclosure, the patent. 17 A I'm sorry. 18 Q Apologies. Let's go to column 42, line 19 18. Do you see the discussion of a load balancer 20 386? 21 A Yes. 22 Q It's your opinion that a load balancer is

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113 1 an example of an orchestrator-type web server; is 2 that correct? 3 A I would need to word search my report, but 4 I don't recall rendering any opinion. 5 Q Paragraph 36. 6 A Of the main? 7 Q Supplemental. 8 A Oh, this is the petition. Too many 9 documents. Okay. So I say that a load balancer 10 is a common example of an orchestrator-type 11 webserver. 12 Q So what is a load balancer? 13 A Load balancer will keep the load on 14 various servers even so that not one server, for 15 example, gets too many requests and another server 16 sits idle. 17 Q And will load balancer help with 18 scalability of a system? 19 A Yes. 20 Q Can a load balancer spread new incoming 21 clients over a number of servers? 22 A To be more precise I would say incoming	115 1 supplemental content source and the content source 2 130 enable load balancing? 3 A Mm-hmm. Yes. 4 Q And you said load, the orchestrator type 5 webserver -- strike that. 6 You testified that a load balancer is an 7 orchestrator-type webserver; correct? 8 A Can be. 9 Q When is it not? 10 A Load balancer is a much more general 11 concept, so you can balance loads that aren't web 12 loads, for example. 13 Q In the context of Ellis, what type of load 14 balancer are you referring to when you say 15 supplemental content source 120 and 130 enable 16 load balancing? What does that mean? 17 A It means that if one of those sources were 18 -- there's a typo in my report. I think it should 19 say Ellis's supplemental content. It says 20 Spivey's. 21 Q I think you mean Ellis; right? 22 A Yeah. Yeah. Load balancing would mean
114 1 client requests can be spread across multiple 2 servers by load balancer. 3 Q What makes a load balancer an orchestrator 4 type of webserver? 5 A The fact that it's redirecting requests to 6 webserver as opposed to downloading the content 7 itself and then uploading the content. 8 Q I know there's a lot of paper. Can we go 9 back to Ellis, please? 10 A I've got it. 11 Q Does paragraph 40 of Ellis disclose a 12 content source 130 may be any suitable source of 13 media content such as a media webserver? 14 A That network media/webserver is listed as 15 one of the types of media -- of sources of media 16 content. 17 Q And do you still have your first 18 declaration in front of you? 19 A Yes. 20 Q Let's go to paragraph 190. 21 A Okay. 22 Q On page 104 you opine that Ellis's	116 1 that let's say that one of the content sources is 2 overwhelmed with requests. With the supplemental 3 content source some of those requests could be 4 taken off and be served from the supplemental 5 content source or vice versa. 6 Q And does that allow scalability? 7 A Yes. 8 Q Paragraph 190 of your first declaration 9 are you not indicating that supplemental content 10 source 120 and content source 130 in Ellis are 11 load balancers? 12 A No. They're the -- they're the thing 13 that's getting balanced. So the load balancer is 14 the one that makes the determination of where to 15 make the request from. So the content source is 16 in itself a load balancer. 17 Q Don't you say that communications between 18 content source 120 and content source 130 enables 19 centralized data control and management on content 20 source 130 and allows for load balancing and 21 scalability? 22 A Yes. The communication does. I was just

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117 1 saying that content source itself isn't doing the 2 load balancing. It's the thing being balanced. 3 Q So how does the communication itself 4 constitute a load balancer? 5 A There are different ways that this could 6 happen. So one example would be if the sources 7 share with each other how many requests they have, 8 and if they both have the content, let the one 9 who's less busy process the request. 10 Q So collectively they're load balancing 11 each other; correct? 12 A That doesn't sound like a typical way of 13 describing it, but I suppose. 14 Q If one is overworked, the other will take 15 on more of the load and vice versa? 16 A That would be a definition of load 17 balancing. 18 Q Under that definition what structure 19 constitutes the load balancer? 20 A Wherever the logic resides that leads to 21 that. 22 Q Couldn't that logic reside on the content	119 1 with the link to the user equipment and then from 2 that box the supplemental content source and 3 another line to the content source and that box in 4 the middle redirected requests to run to the 5 supplemental content source to the content source 6 and vice versa based on load, then I would say 7 that's an orchestrate -- orchestrator-type 8 webserver that's a load balancer, but that's not 9 what's in this patent. 10 Q So you distinguish that configuration from 11 the logic residing on the content source device 12 itself? 13 A From the hypothetical that I posted about 14 putting logic on one of the sources that's 15 different. 16 Q And is the difference just where the logic 17 resides? 18 A No. The difference is that when you put 19 an intermediary webserver there, then you have a 20 webserver there, but the logic doesn't necessarily 21 have to be a webserver. 22 Q The terminology orchestrator type and
118 1 source webserver? 2 A I don't recall seeing that disclosed in 3 there, but I suppose that would be one place it 4 could reside. 5 Q And if it did reside on content source 6 130, wouldn't Ellis's content source 130 7 constitute an orchestrator-type web server? 8 MR. SOLOMON: Objection to form. 9 A That's not how I would describe it. 10 Q Did you just say it depends on where the, 11 where the logic resides kind of dictates? 12 A Right. But if the logic resided on 13 content source 130, then I would say that it's not 14 an orchestrator webserver. So an orchestrator 15 webserver can be a type of load balancer. There 16 are other types of load balancers, so this would 17 be a different type of load balancing. 18 Q What would make this type of load 19 balancing different than what is discussed in the 20 '218 patent, for example? 21 A So if you had another box in between the 22 -- instead of 152 and 150 you had a box in between	120 1 relay type, are those widely adopted ways of 2 characterizing web servers? 3 A I think most -- outside of this case most 4 webserver would be considered the relay type, 5 but -- but there are orchestrator-type webserver 6 so those are terms of art. 7 Q And I think we might have discussed this 8 earlier. Could you give me an example of a real 9 world orchestrator-type web server? 10 A The machine that you actually first 11 contact when you go to Amazon.com is probably an 12 orchestrator one. 13 Q And what's its functionality? 14 A To get the request to the server that's 15 most able to process it. 16 Q And why is that not just a relay? 17 A Because the content isn't actually 18 traversing through that server. 19 Q The 218 spec of the patent doesn't 20 distinguish between orchestrator and relay-type 21 webserver, does it? 22 A I don't have a searchable capability right

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121 1 now, but I don't recall those words being used in 2 the specification of this patent. 3 Q Do you recall any of the prior art or 4 references identified in your declaration whether 5 any of those discuss an orchestrator type and 6 relay type of webserver? 7 A I don't recall those specific words being 8 used. Those concepts exist throughout, but I 9 believe I introduced those words in my report. 10 Q And looking at Figure 2 of the '218 11 patent, that doesn't illustrate a relay-type 12 server, webserver and an orchestrator-type 13 webserver, does it? 14 A In my report I identify the webserver 15 block as orchestrator-type webserver, but I don't 16 believe I identify anything as a relay webserver. 17 Q All right. Let's take our last break. 18 A Okay. 19 Q All right. 20 (A recess was taken.) 21 BY MR. BAKER: 22 Q Back on the record, please. Let's turn	123 1 A I don't think that's what this paragraph 2 was saying. 3 Q What do you believe it's saying? 4 A It's just saying that if their processing 5 requirements were such that more, more was needed, 6 there are known methods for pooling, load 7 balancing and increasing available bandwidth. 8 It's not saying what they are or referring to any 9 particular embodiment in this patent in this 10 paragraph. 11 Q What about Figure 24? 12 A So Figure 24 is showing the communication 13 framework in which these known techniques for load 14 balancing and increasing bandwidth could be 15 applied. 16 Q Would a POSA know what structure provides 17 that load balancing in Figure 24? 18 A I don't think that the structure to 19 provide that load balancing is found in Figure 24. 20 I think it would be in that cloud labeled 21 Communication Framework. A POSITA would know 22 various ways of doing that.
122 1 back briefly to Spivey, Exhibit 1017. So I'm 2 going to state what I understand a load balancer 3 to do, and you can either agree or correct me. So 4 -- and I'm sorry. I'm talking about an 5 orchestrator-type webserver. It would pull, load 6 balance and otherwise increase communicative 7 bandwidth required by clients and other servers. 8 Is that fair? 9 A Are you talking about something within 10 Spivey or within my report? 11 Q I want to tie it in to Spivey paragraph 12 179. 13 A So I think you're referring to the 14 sentence that reads: "Should processing 15 requirements dictate a greater amount speed and 16 capacity, distributed network controller 17 architectures may similarly be employed to pool, 18 load balance, and otherwise increase the 19 communicative bandwidth required by the clients 20 and the servers"? 21 Q Yes. So with server device 2250, did 22 Spivey constitute a load balancer?	124 1 Q Is that discussed in paragraph 179? 2 A It's just mentioned that that is something 3 that could be done. 4 Q Doesn't it state that the communications 5 framework 2406 may implement various network 6 interfaces and give a laundry list of potential 7 network interfaces? 8 A Sure. It's saying that you can use all of 9 these different technologies for the communication 10 in the communication framework. The load 11 balancing comment comes later and that is just 12 something saying like here are all the 13 technologies you could use for the network 14 communication and, by the way, if you need more 15 processing, there are ways that are known to do 16 load balancing. 17 Q Does Spivey disclose a webserver? 18 A I believe that Spivey discloses that the 19 client devices could communicate with a live data 20 access server over its GTP, so an access, yes. 21 Q What passage is that disclosed in? 22 A Paragraph 61 talks about a websocket

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125 1 connection. 2 Q Does Spivey illustrate a websocket 3 connection? 4 A In paragraph 82, going back to the 5 previous question to give you a full answer, it 6 also says that the address may resemble a URL, for 7 example, torq.cbssports.com/torq, which would be 8 another indication of a web, although it's not 9 definitive, so it may resemble it. I don't see 10 any illustration of a websocket in the figure. 11 Q Okay. Herzog, and that's pretty much it. 12 I'm going to hand you what's been previously 13 marked as Exhibit 1015. 14 Can you identify this reference for the 15 record, please? 16 A Yes. This is the Herzog patent 17 application that is in this case. 18 Q Did you review this document in 19 preparation for today's deposition? 20 A I did. 21 Q Figure 5 of Herzog illustrates the 22 provision of event information separate from a	127 1 A Yes. 2 Q All right. So with reference to Figure 6, 3 and we're going to start with paragraph 70. 4 A Okay. 5 Q So Figure 6 illustrates an operation of 6 sequences between a client app and integrator 87; 7 correct? I'm looking at paragraph 69. 8 A Yes. 9 Q And the first sequence or first step in 10 the sequence is sending the video data; is that 11 correct? 12 A It's requesting it. 13 Q After the request is there a response with 14 the video being sent? 15 A Yes. Step 3, the origin server streams 16 the HLS video. 17 Q And there's metadata which is buffered 18 with a time stamp; is that correct? 19 A Yes. 20 Q And if the metadata with the time stamps 21 match, is the metadata then forwarded to the 22 client? I'm in paragraph 78.
126 1 video feed; correct? 2 A Could you please say that again? I didn't 3 hear it right. 4 Q All right. So figure 5 Herzog, there are 5 two feeds to the client; correct? 6 A Yes. 7 Q Is one feed related to video? 8 A Yes. 9 Q And the other feed through the HTTPS, is 10 that event information? 11 A It's called metadata in this patent. 12 Q And how is the metadata used in this 13 patent? 14 A The metadata provides additional 15 information related to the HLS video. 16 Q So it's information related to the video? 17 A Yes. 18 Q And in Herzog the client device combines 19 the HLS input and the HTTPS input; correct? 20 A Yes. 21 Q I'm looking at paragraph 58, if that 22 helps.	128 1 A 78? 2 Q I'm looking for the paragraph that 3 discusses the time stamps matching. 4 A I think it's 77, but yeah. 5 Q Okay. So can you explain what paragraph 6 77 discloses? 7 A The client application receives the 8 metadata and cart and matches up the time stamps 9 with the video, and that relates to the video 10 being watched on the video player and is 11 synchronized to the video channel. 12 Q Herzog discusses a transmission delay of 2 13 seconds; is that correct, or less than 2 seconds? 14 Paragraph 74. 15 A For the metadata, yes. 16 Q And in paragraph 154 of your first 17 declaration -- 18 A Okay. 19 Q -- do you indicate that the user device in 20 Herzog retrieves the metadata with the 21 corresponding time stamp? 22 A Yes.

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129 1 Q So Herzog uses its video latency period to 2 provide synchronized metadata; is that correct? 3 A I don't see where you're referring to 4 there. 5 Q Let's take a look at paragraph 58 of 6 Herzog. 7 A I don't think it happens the way you said. 8 I don't think it uses the latency time to retrieve 9 the metadata. At least I don't see where it says 10 that. 11 Q Is latency used at all by Herzog to 12 provide synchronization between the video and the 13 metadata? 14 A Latency is the reason you need 15 synchronization. I don't think the latency is 16 used to synchronize. It's latency is the problem 17 and synchronization is the solution. 18 Q Can you ever take advantage of latency to 19 prevent synchronization between multiple users? 20 A I suppose you could. I don't recall 21 seeing that in here. 22 Q At the top of column 6, well, page 6, the	131 1 Q Why doesn't the time stamp matching result 2 in synchronization? 3 A The time stamp matching results in 4 synchronization of the video content with the 5 metadata, but that is different from synchronizing 6 two people or more watching a live event as it's 7 happening so that they can wager on it or so that 8 they don't see something that happens before 9 somebody else does because nothing in Herzog has 10 to do with the problem of watching things at the 11 same time and live, live video streaming. 12 Q What if there's a single stream? Wouldn't 13 a time stamp solution result in an end user's 14 watching that video simultaneously? 15 A No, because in Herzog you have to receive 16 the video, then you have to receive the metadata, 17 then you have to match it together. That could 18 take different amounts of time for different users 19 and there's no problem in Herzog with that because 20 the goal of Herzog is to match that metadata to 21 the video stream, not to match the combination of 22 video data and video streaming across different
130 1 top of the second column of Herzog it states that 2 the metadata with the .JSON time stamp and the 3 video audio data with the VITC time stamp are both 4 decoded inside the mobile device. The metadata -- 5 I'm sorry -- metadata is now synchronized to the 6 video audio data. Do you have an understanding 7 how that synchronization occurs? 8 A Yes. 9 Q Can you explain, please? 10 A They -- whenever -- wherever the time 11 stamps match the metadata corresponds to that 12 place in the video. 13 Q In Herzog, if multiple users were watching 14 the same video stream, would they be watching a 15 synchronized video stream? 16 A I don't see that I address that in my 17 report. If that's somewhere in Herzog you want to 18 point me to. 19 Q I'm trying to get an understanding from 20 your opinion in paragraph 158 of the original 21 declaration, Exhibit 2001. 22 A Okay. Which part of this isn't clear?	132 1 users. 2 Q Can you turn to page 158 of your first 3 dec? That's the page, not the paragraph. 4 A Okay. 5 Q Section 8 of your first declaration is 6 directed to the second area, indicia of 7 nonobviousness; correct? 8 A Yes. 9 Q In preparing your declaration or preparing 10 for today's deposition have you seen any evidence 11 of sales? 12 A I did not look at that. 13 Q Did you review or see any evidence of 14 copying? 15 A Just what I mention in paragraph 312. 16 Q And that's just based on an understanding? 17 You didn't review anything independently? 18 A Correct. 19 Q All right. Give me two minutes to talk to 20 my colleague. I may be done. 21 A Should I leave the room then? 22 (A discussion was held off the record.)

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133 1 (A recess was taken.) 2 MR. BAKER: I have no further questions. 3 MR. SOLOMON: No redirect from me. 4 MR. BAKER: Thank you very much. 5 THE WITNESS: Thank you. 6 (Transcript orders discussed off the 7 record. Off the record at 3:37 p.m.) 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22	135 1 of the parties to this action by blood or 2 marriage, I am not employed by or an attorney to 3 any of the parties to this action, and that I am 4 in no way interested, financially or otherwise, in 5 the outcome of this matter. 6 7 IN WITNESS WHEREOF, I have hereunto set my hand 8 this 18th day of August, 2025. 9 My commission expires: 10 11 12  13 February 4, 2028 14 STATE OF MARYLAND 15 16 17 18 19 20 21 22
134 1 CERTIFICATE OF SHORTHAND REPORTER-NOTARY PUBLIC 2 I, Janet A. Hamilton, Registered Diplomate 3 Reporter and Notary Public within and for the 4 State of Maryland do hereby certify: 5 That AVIEL D. RUBIN, Ph.D., the witness whose 6 deposition is hereinbefore set forth, was duly 7 sworn by me before the commencement of such 8 deposition and that such deposition was taken 9 before me and is a true record of the testimony 10 given by such witness. 11 I further certify that the adverse party, 12 Sportscast, Inc., (d/b/a PANDA Interactive), was 13 represented by counsel at the deposition. 14 I further certify that the deposition of AVIEL 15 D. RUBIN, Ph.D., occurred at The Westin Annapolis, 16 100 Westgate Circle, Annapolis, Maryland, 21401, 17 on Thursday, August 14, 2025, commencing at 9:10 18 a.m. to 3:37 p.m. 19 I further certify the inspection, reading and 20 signing of said deposition was not discussed on 21 the record. 22 I further certify that I am not related to any	

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