



Planet Depos®
We Make It *Happen™*

Transcript of Jeremy R. Cooperstock, Ph.D.

Date: July 9, 2024

Case: Peloton Interactive, Inc. -v- NEC Corporation (PTAB)

Planet Depos

Phone: 888.433.3767

Email: transcripts@planetdepos.com

www.planetdepos.com

1 UNITED STATES PATENT AND TRADEMARK OFFICE

2
3 BEFORE THE PATENT TRIAL AND APPEAL BOARD

4
5 PELOTON INTERACTIVE, INC.,

6 Petitioner,

7 v.

8 NEC CORPORATION,

9 Patent Owner.

10
11 Case IPR2023-01241

12 U.S. Patent No. 9,769,427

13
14
15 Deposition of JEREMY R. COOPERSTOCK, PH.D.

16 Conducted Virtually

17 Tuesday, July, 9, 2024

18 10:01 a.m. EST

19 Job No.: 543232

20 Pages: 1 - 154

21 Stenographically reported by: Judith E. Bellinger,

22 RPR, CRR, CSR-TX CCR-WA, CCR-NM

1 Deposition of JEREMY R. COOPERSTOCK, PH.D.,
2 conducted virtually.

3

4

5

6

7

8

9

10

11 Pursuant to notice, before Judith E.
12 Bellinger, Registered Professional Reporter,
13 Certified Realtime Reporter, and Notary Public in
14 and for the State of Maryland.

15

16

17

18

19

20

21

22

1 A P P E A R A N C E S

2 ON BEHALF OF THE PETITIONER:

3 EMILY MONDRY, ESQUIRE

4 COVINGTON & BURLING LLP

5 850 Tenth Street, NW

6 One City Center

7 Washington, DC 20001

8 202.662.6000

9

10 ANUPAM SHARMA, ESQUIRE

11 COVINGTON & BURLING LLP

12 3000 El Camino Real

13 5 Palo Alto Square

14 Palo Alto, CA 94306-2112

15 650.632.4702

16

17 ON BEHALF OF THE PATENT OWNER:

18 MICHAEL E. KNIERIM, ESQUIRE

19 BAKER BOTTS

20 30 Rockefeller Plaza

21 New York, NY 10112

22 212.408.2500

1 A P P E A R A N C E S C O N T I N U E D

2

3 ALSO PRESENT:

4 Rachel Tolan, Planet Depos Technician

5 Janice Jabido, Peloton Interactive

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

C O N T E N T S

EXAMINATION OF JEREMY R. COOPERSTOCK, PH.D. PAGE

By Ms. Mondry 6

E X H I B I T S

(Attached to the transcript)

Peloton Exhibits: PAGE

Exhibit 1001 United States Patent Number 56

9,769,427 B2

Exhibit 1003 United States Patent Application 82

Publication 2009/0094321 A1

Exhibit 1004 SIP: Session Initiation Protocol 40

Exhibit 1005 SDP: Session Description Protocol 80

Exhibit 2001 Declaration of Jeremy R. 14

Cooperstock, Ph.D. in Support of.

Patent Owner Preliminary Response

Exhibit 2010 Supplemental Declaration of Jeremy 16

R. Cooperstock, Ph.D. in Support of.

Patent Owner Response

P R O C E E D I N G S

JEREMY R. COOPERSTOCK, PH.D.,

being first duly sworn, was examined
and testified as follows:

EXAMINATION BY COUNSEL FOR THE PETITIONER

BY MS. MONDRY:

Q Good morning, my name is Emily Mondry.
I'm with the law firm Covington & Burling, and I'm
representing the petitioner here today, which is
Peloton Interactive, Inc. Also on with me is my
colleague, Anupam Sharma, who is also from
Covington.

And if we could just get started today
by giving us your full name.

A Jeremy Cooperstock. Noted, it's
Cooperstock, not Coopersmith.

Q Yes.

A That's taken care of.

Q Thank you.

Before we get started, I just want to
go over a couple of basics for the deposition

1 today. The first is that we do have a court
2 reporter, who is taking down the questions and
3 answers. If you could try to answer audibly. So,
4 if you have a nod, making sure you also say yes,
5 just so we have a verbal record of your answers so
6 that the court reporter can record, that would be
7 great.

8 Does that sound good?

9 A Very good.

10 Q It's also important, because we're
11 remote, that we try not to talk over each other.
12 I know it does happen. I do it too. I'm going to
13 try, as best as I can, to wait until you're done
14 answering a question before I ask another one. By
15 the same token if you could try to wait until I am
16 done asking a question before you answer, that
17 would be good.

18 Does that sound good?

19 A Very good.

20 Q If you need a break, we can take one at
21 any time. Just let us know. The only thing I ask
22 is that if we do have a question pending, that you

1 answer the question before we take a break, okay?

2 A Understood.

3 Q If you don't understand a question,
4 please, tell us so that we can clarify. Because
5 if you do answer the question, I am going to
6 assume that you did understand that question.

7 Does that make sense?

8 A It does.

9 Q Although this is a virtual deposition,
10 the oath that you took is the same oath that you
11 would take in a court, given under the penalty of
12 perjury.

13 Do you understand that?

14 A I do.

15 Q Is there any reason that you cannot
16 provide truthful and accurate testimony today?

17 A No reason.

18 Q Where are you located today?

19 A In Westmount, Quebec.

20 Q Is there anyone else in the room with
21 you?

22 A There is not.

1 Q Have you testified as an expert before?

2 A I have.

3 Q About how many times?

4 A Approximately, 20, 25.

5 Q And were all of those related to patent
6 cases or patent proceedings, like an IPR?

7 A Most of them.

8 Q What sort of technology, generally, was
9 at issue in those cases?

10 A It's been highly varied.

11 Q Have you testified as an expert in any
12 cases involving streaming media technology before?

13 A Yes, I have.

14 Q About how many of those, approximately,
15 20 would you say relates to streaming video
16 technology?

17 A Less than a handful.

18 Q So less than five, would you say?

19 A That would be correct.

20 Q What was the most recent case involving
21 streaming media technology that you testified as
22 an expert in?

1 A I believe it would have been either a
2 case involving Snapchat or one involving Meta.

3 Q And I know I said streaming media
4 technology, generally. But could you tell me a
5 little bit more about, specifically, the
6 technology at issue in the Snapchat case?

7 A The Snapchat case involved acquisition
8 of simultaneous video and audio that would be
9 correlated with a previous recording. The storage
10 and then the delivery of the subsequently produced
11 composite media to receivers.

12 Q Was the method of delivering that
13 content something that you provided testimony on
14 in that case?

15 A To a certain extent, I believe so. I
16 would have to sort of reflect back and go over the
17 details to be sure, but the case did involve some
18 aspects of delivery.

19 Q And what aspects of delivery did you
20 opine on in that case, to the best of your
21 recollection, sitting here today?

22 A I would not be able to recall without

1 going back over the files.

2 Q Did it involve specific protocols or
3 standards for sending media back and forth?

4 A I don't believe it got down to that
5 level of detail, with regard to the methods of
6 distribution.

7 Q Was -- were third-party vendors for
8 delivery of media part of that case, like, use of
9 a content delivery network?

10 A No --

11 MR. KNIERIM: Objection to form.
12 Objection to form.

13 A I don't recall details that involved
14 third-party vendors in that case.

15 Q Similar questions for Meta. Can you
16 describe a little bit more, specifically, what
17 streaming media technology was at issue that you
18 provided testimony on in that matter?

19 A That is even further -- further back in
20 my recollection. I would really have to go back
21 over the files and remember the patents at issue
22 in the case.

1 Q How long ago was the Meta case?

2 A I'm guessing, top of my head,
3 approximately, two years.

4 Q Was the Snapchat matter even further
5 away in time or was that a more recent case?

6 A I'm really having trouble recalling the
7 timeline. I would really have to go back to my CV
8 and pull up the details to answer those questions.

9 Q Who were you representing in the
10 Snapchat case? Were you representing Snapchat or
11 the other party?

12 A Snapchat.

13 Q Same question for Meta. Were you
14 representing Meta or the other party?

15 A Meta.

16 Q Okay. Did you meet with counsel to
17 prepare for today's deposition?

18 A I did.

19 Q Who did you meet with?

20 A I met with Mike, with Jennifer
21 Tempesta, and with Nick Palmieri.

22 Q Anyone else?

1 A That's all I can recall.

2 Q When did you meet with counsel?

3 A I met with counsel yesterday, briefly,
4 and I met with counsel last week.

5 Q How long did you meet with counsel
6 yesterday?

7 A Probably about three minutes,
8 five minutes, maybe.

9 Q And how long did you meet with counsel
10 last week?

11 A Roughly, two and a half hours, I'm
12 guessing.

13 Q Outside of the three to five minutes
14 yesterday and the two and a half hours from last
15 week, did you spend any other time with counsel
16 preparing for today's deposition?

17 A Approximately, one minute this morning,
18 saying hello to Mike.

19 Q You submitted two declarations, in this
20 matter, for each of the two petitions that we're
21 here to discuss today, correct?

22 A That is correct.

1 (Peloton Exhibit 2001 marked for
2 identification and attached to the transcript.)

3 Q And the first of those, which I
4 understand, going forward, we're going to refer to
5 the actual exhibit numbers as they were submitted
6 with the IPRs, that I understand you have with you
7 today. So, for example, Exhibit 2001, that's the
8 first of the two declarations that you submitted
9 for both of these IPRs, correct?

10 A I'm not sure about the numbering you're
11 using. I have, for example, 2010 for my
12 supplemental declaration, and I have the case
13 number for the first, but I don't have the number
14 that you read out, at least not on the document.
15 Oh, sorry, I see. Sorry. NEC Exhibit 2001, my
16 apologies, yes.

17 Q No worries.

18 So Exhibit 2001 is the first
19 declaration that you provided in each of the two
20 IPRs that we're discussing today, correct?

21 A That's correct. 2001 in both of the
22 IPRs.

1 Q About how long did you spend working on
2 the first declaration, the one in Exhibit 2001?

3 A I would hazard a guess it's somewhere
4 around 15 to 25 hours.

5 Q Were you the only person that worked on
6 this declaration?

7 MR. KNIERIM: Objection to form.

8 A I was certainly involved in discussions
9 of the declaration with counsel.

10 Q But were you the only person that
11 actually wrote the words that appear in this
12 declaration?

13 MR. KNIERIM: Objection to form.

14 A I don't write the declaration word for
15 word by myself, it's a cooperative writing process
16 that involves back-and-forth with counsel. I
17 draft some text, counsel drafts some text, I read
18 it, I comment, it goes back and forth, as a
19 typical process for preparing such documents.

20 Q So both you and counsel drafted
21 portions of this declaration?

22 MR. KNIERIM: Objection. Form.

1 A That's a reasonable statement.

2 (Peloton Exhibit 2010 marked for
3 identification and attached to the transcript.)

4 Q And the second declaration, which I
5 think you already referenced, Exhibit 2010, that
6 is the second declaration that you submitted, the
7 supplemental one, I think you identified it as,
8 correct?

9 A Yes. Exhibit 2010.

10 Q And about how long did you spend
11 working on the second declaration?

12 A That was probably between 10 and
13 15 hours.

14 Q Actually, if we could actually pull
15 open Exhibit 2001 for a second, the first
16 declaration. Let me know when you have that in
17 front of you.

18 A I do.

19 Q And that first declaration is 72 pages,
20 correct?

21 A That's correct.

22 Q And the second declaration,

1 Exhibit 2010, if you could open that as well.

2 Let me know when you have that.

3 A I do.

4 Q That one is 24 pages, correct?

5 A That is correct.

6 Q And you spent a similar amount of time
7 on both.

8 So I was just wondering if you could
9 tell me, what additional work went into the second
10 declaration that kind of amounted to a similar
11 amount of time between the two declarations?

12 MR. KNIERIM: Objection. Form.

13 A First, I should remind you that I was
14 hazarding very approximate guesses for both time
15 frames. I believe I suggested that the initial
16 declaration took me between 15 and 25 hours and
17 that the supplemental declaration took me between
18 10 and 15 hours. So I appreciate that there was a
19 difference in time and that I spent more hours
20 going through the initial work for the first
21 declaration.

22 The supplemental declaration required

1 proportionately more work per page involved, given
2 that it was more dense material, it didn't have as
3 much background, it was fairly lightweight to go
4 through, dealing with the legal principles
5 involved, and so forth, that is fairly standard
6 from declaration to declaration.

7 And it also involved considerable
8 back-and-forth cross-referencing of the
9 presentation by Mr. Taniguchi, as I was looking at
10 those contents and verifying the correspondence.

11 Q You mentioned correspondence with
12 Taniguchi; is that correct?

13 A The correspondence of the presentation
14 prepared by Mr. Taniguchi and the contents of the
15 patent itself.

16 Q Did you speak with Mr. Taniguchi in
17 preparing either of these declarations?

18 A I did not.

19 Q And Mr. Taniguchi, that we're referring
20 to, is an inventor listed on the patent that's at
21 issue here today, U.S. Patent Number 9,769,427; is
22 that right?

1 A That is the correct patent number.

2 Q But that is correct, the Mr. Taniguchi,
3 that you're referring to, is the inventor listed
4 on that patent, right?

5 A He is one of three inventors listed on
6 the patent.

7 Q Going forward, if either of us refer to
8 the '427 patent, can we understand that that
9 refers to that patent number I just read off,
10 which is the patent at issue in this petition?

11 A That is what I understand.

12 Q Okay. I'd like you to bring back up
13 the first declaration, the one marked 2001.

14 Let me know when you have that.

15 A I do.

16 Q You included a section on your
17 background and qualifications, right?

18 A That is correct.

19 Q Could you turn to paragraph 8 of that
20 declaration, which should be in that section of
21 your background and qualifications.

22 Let me know when you're there.

1 A I am there.

2 Q Here, you say you've done work with
3 network media distribution technologies; is that
4 right?

5 A Network media distribution
6 technologies, yes.

7 Q And I think you give one example of
8 that, among others, which is
9 Ultra-Videoconferencing system, right?

10 A Yes.

11 Q Can you tell me what that project was?

12 A Ultra-Videoconferencing was our effort,
13 at McGill University, to develop a high-fidelity,
14 that is high-resolution, and ultralow delay
15 videoconferencing system to enable simultaneous
16 music performance across the continent and to
17 deliver qualities of audio and video media at
18 levels that rival the state of the art at the
19 time.

20 Q What was your involvement in that
21 project?

22 A I led the project. I guided the

1 engineering development, the testing, the
2 demonstrations, the ongoing road map for further
3 iterations of improvements, publicity.

4 Q So, included in that work was designing
5 the system that would have been used for the
6 simultaneous music performance conferencing,
7 right?

8 A Parts of it. As I said, I led the
9 project. There were other people involved who
10 were very active in the design as well.

11 Q How did that system work? What was the
12 method that it used to deliver content to the
13 users who were tuning into the streaming
14 performance?

15 A The method was a proprietary software
16 and process, which did not base itself on existing
17 standards, since we wanted a minimally lightweight
18 method for acquiring, distributing, and minimizing
19 the buffers required. We were dealing with
20 uncompressed media so we didn't have to go through
21 codex, both on the sending side and the receiving
22 side, and dealt with various hooks directly into

1 the operating system, again, to minimize latency.
2 We employed a variety of strategies for giving the
3 receivers the choice between reliability and zero
4 to low latency values and included timing offsets
5 to allow for synchronization of the multimedia
6 streams.

7 Q Okay. So if I was a user at the time
8 and I wanted to connect to that project, and I'm
9 using your proprietary software, which did not
10 rely on any existing standards, how is my traffic
11 routed from my user device to the system that is
12 serving the request for the content? How does
13 that work?

14 A The communication was point-to-point.
15 We did not involve intermediary servers. The
16 receiver would establish a listening port, socket,
17 and the sender would connect or, it wasn't a
18 connection because it was connectionless protocol,
19 but would use UDP to transmit data to that
20 receiving socket.

21 Q And what sort of traffic, user traffic,
22 did you experience for that project? Like,

1 approximately, how many simultaneous viewers would
2 you have seen, on average?

3 A This was a point-to-point
4 communication, it was not a multicast or
5 broadcast. So, it was intended for
6 videoconferencing applications on a one-to-one
7 basis, as was commonplace for point-to-point music
8 performance or practice.

9 Q Was there any consideration about how
10 to handle periods of high amounts of requests
11 coming in at a given time, as part of that
12 project?

13 A Once again, since this was a
14 point-to-point communication, there was no
15 question of how many requests would come in, it
16 was one receiver and one sender.

17 Q So I guess, let me ask this a different
18 way.

19 The receiver that is receiving the
20 request, is that part of a larger distribution
21 network waiting to receive these requests? I
22 mean, is it one server in a room?

1 How is this set up on the back end for
2 receiving requests coming in from users?

3 A Your question is improperly worded,
4 since the receiver was not making requests.

5 Q Okay. My apologies.

6 If I'm the user, I'm sending my request
7 somewhere. Where does that physically go in the
8 system that you created? Is it part of a larger
9 distribution network that is handling requests?
10 Was it a single server in a room?

11 I'm just trying to get a sense for the
12 actual equipment and mechanics for how the setup
13 worked.

14 A Right. I understand the intent of your
15 question. But as I'm saying, it was a receiver
16 that opened a receiving socket, and the sender
17 would, then, connect to that or would send data to
18 that receiving socket. So the sender would
19 initiate the communication to the receiver; the
20 receiver would not make a request to the sender.

21 Q Okay. Then, it seems you've said you
22 understand the intent of the question, but perhaps

1 I got the language backwards, for sender and
2 receiver.

3 For the device that is handling
4 traffic, seeking to establish the communication to
5 get access to the streaming media project in order
6 to be able to see this music performance, the
7 machine that is handling that transmission, is
8 that part of a larger distribution network of, you
9 know, multiple servers working together? Is it
10 just one server in a room?

11 I'm just trying to get a sense for what
12 the back end of the system looked like.

13 A I'm afraid, though, the wording of your
14 question is, again, mixing up the relationships
15 between the different servers. There's a
16 receiving server and a sending server. The
17 receiving server opens the communication port.
18 The sending server transmits to that receiving
19 server. There's no request made. There's no
20 requesting of media. It's simply the two parties
21 agree, a priori, that there's going to be
22 communication, the receiver makes that receipt of

1 communication available, or enables it by starting
2 up the process on the receive machine, the sending
3 machine establishes communication to that
4 receiving machine.

5 Q The devices -- strike that.

6 Somewhere in the system has to be a
7 device that is streaming the media to another
8 device that desires to view that media in this
9 project, correct?

10 A That is correct. The sending machine
11 is the transmitter that sends the media to the
12 receiving machine.

13 Q The sending machine that is sending
14 this media transmission, is this part of a larger
15 distributed network of multiple devices? Is it
16 one single server sitting in a room? How did that
17 work for your project?

18 A It very much depended on what the
19 specific demonstration or activity involved. In
20 some cases, it was a single machine. In some
21 cases, there were several machines involved. When
22 we did our Ultra-Videoconferencing demonstration

1 at the 2005 Supercomputing conference in Seattle,
2 we had three sending machines, or possibly four,
3 and a similar number of receiving machines.

4 Q Why did you have multiple sending
5 machines at that particular conference, that you
6 just gave as an example, instead of one?

7 A That's because we were transmitting
8 three simultaneous streams of uncompressed
9 high-definition video and, I believe, five or more
10 channels of uncompressed high-definition audio.

11 Q And you couldn't have done that with
12 one sending machine?

13 A Not --

14 MR. KNIERIM: Objection. Form.

15 THE WITNESS: Sorry.

16 A Not at the time.

17 Q Why not at the time?

18 A At the time, the hardware interfaces
19 that we had available to us only allowed for the
20 routing through the PCI express bus -- I'm sorry,
21 the PCI-X bus, wasn't PCI express, PCI-X, of a
22 certain bandwidth limit within the time available

1 of transmitting or receiving those data from the
2 devices, like the cameras and the audio sources.
3 As such, each machine was capped at a certain
4 bandwidth that could be supported.

5 Q And you said that was a limitation of
6 the technology you had available to you at the
7 time.

8 Was that a physical constraint of not
9 being able to access a different machine or did a
10 machine that would be able to handle traffic
11 differently not exist at the time?

12 A We had not identified a single machine
13 that would have the capacity for transmitting
14 more -- or routing more data through its
15 architecture. There may well have been such a
16 machine, but it was more cost effective to use
17 reasonably, I wouldn't say, mid end, but not the
18 sort of highest standard of performance of
19 machines to enable the architecture that we needed
20 to support.

21 Q Was this a commercial project? Was
22 there any money involved? Were the users that

1 were connecting to the streams customers that had
2 to pay a fee to access the stream?

3 A No. We made our software available to
4 the research community for free.

5 Q Are any of the projects that you worked
6 on in the media distribution technologies space,
7 as you described it, for commercial purposes?

8 A To some degree, yes.

9 Q Can you explain what you mean by that?
10 What projects were you involved in that had
11 commercial aspects, in the network media
12 distribution technology space?

13 A I was involved, in the late 1990s and,
14 possibly, early 2000s, in a startup company that
15 was seeking to distribute, I believe it was AC3,
16 Dolby 5.1 audio, over the network. That was a --
17 intended to be a for-profit commercial venture.

18 Q What different considerations might
19 there be for you, as a designer, when you're
20 approaching a project that has commercial aspects,
21 like the one you just mentioned, versus the
22 Ultra-Videoconferencing project, which was not

1 meant to be commercialized?

2 A There are many considerations involved.
3 The first one that comes to mind is the network,
4 topology network resources that are available.

5 Q Can you explain what you mean by that?

6 A In a research project, we have
7 available to us resources of the Internet2, at
8 least at the time, in the United States, and the
9 Canarie, CAnet network, in Canada, that were much
10 higher bandwidth and higher-performance networks
11 than were available to the public at large.

12 We had smaller numbers of network
13 switches or hops in between sender and receiver
14 than would typically be expected in a public
15 network infrastructure. And as such, we could
16 reliably deliver higher-bandwidth data at lower
17 latency than would be possible for a public
18 project.

19 Q What about considerations for the size
20 of the audience? For example, if you're working
21 on a commercial project, is it important to
22 consider the volume of requests that a back end

1 receiver might be receiving as a given time?

2 MR. KNIERIM: Objection. Form.

3 A I think that very much depends on the
4 specifics of the application. There will be some
5 sorts of uses where the back end receiver would
6 only expect or anticipate receiving requests from
7 one or a very small number of subscribers or
8 receivers and others where it could be many. I
9 think it, you know, very much depends on the
10 scenario. What is the content being streamed?
11 Who is the audience? What is the intent of that
12 distribution?

13 And the same would apply in a research
14 scenario as well. You could easily have a
15 situation in which rather than a one-to-one
16 transmission, you're multicasting to thousands of
17 potential subscribers or receivers.

18 Q Okay. So in an instance where the
19 project might dictate that you would be in a
20 scenario where you might have to multicast to
21 thousands of different subscribers, how might that
22 affect design considerations for how to handle

1 that level of traffic?

2 A There are many factors that have to be
3 kept in mind. You, first, would have to determine
4 whether the media, that is being transmitted, is
5 being transmitted live or whether it's on-demand
6 content. That would dictate choices of storage
7 requirements and means of conveying the storage,
8 of the stored data to the distribution system, if
9 it's on demand. If it's live, you would have to
10 verify whether broadcast or multicast capabilities
11 exist throughout the network and, if not, whether
12 or not you have adequately positioned the
13 bandwidth available throughout the overall network
14 that is going from the sender to the multiple
15 receivers, wherever they may be.

16 Q Well, let's take the first example you
17 mentioned, for video on demand. You mentioned
18 that storage requirements and means of conveying
19 that stored data would be considerations. How
20 would you -- how might those problems be a part of
21 your design considerations when you're trying to
22 figure out what kind of the content delivery

1 system looks like?

2 A This would less be the content delivery
3 side than the server architecture side, since the
4 design considerations that play for the on-demand
5 distribution really impact the server,
6 specifically in a different manner from the way
7 they would for live streaming.

8 And in this case, for the server side,
9 you would be concerned with your overall storage
10 capacity, whether it be disc or other storage
11 devices, and the interconnect, the IO bandwidth
12 between that disc array and your transmission
13 capacity, that is your network interfaces.

14 Q So speaking about the server
15 architecture, then. If you are working on a video
16 on-demand project that anticipates having to
17 respond to thousands and thousands of different
18 requests from different users across a wide
19 geography, what does that architecture look like?
20 Is it -- could it be a single server that can --
21 would it make -- let me start over with a new
22 question.

1 In the context that you described
2 relating to server architecture issues, if you're
3 working on a project for video on-demand that
4 anticipates handling traffic of many, many
5 different users, up into the thousands and tens of
6 thousands, what exactly does that architecture
7 look like on the back end, in the context of the
8 time of the patents -- I'll strike that and ask a
9 simpler question.

10 Speaking about what you just mentioned,
11 the server architecture-related issues for when
12 you're dealing with video on-demand, for handling
13 traffic from a lot of different users, can you
14 explain a little bit more about what those server
15 architecture issues are that you might be facing?

16 MR. KNIERIM: Objection. Form.

17 A I'm not sure what, specifically, you're
18 inquiring about with regard -- whether it's with
19 respect to the IO bandwidth I was just describing
20 and the storage capacity, or whether you're
21 referring to something else. I think I've only
22 given, as the example, or in answer to the

1 previous question, the storage capacity that would
2 be required.

3 So if you could rephrase your question
4 to be more specific, I can try my best to give you
5 a coherent answer.

6 Q Sure. Let me ask about -- kind of on
7 very specific issue. Scalability. How is the
8 system server architecture impacted when you're
9 considering a project for a very small amount of
10 people versus a project for a larger commercial
11 enterprise, involving many thousands of
12 individuals?

13 MR. KNIERIM: Objection. Form.
14 Incomplete hypothetical.

15 A So, somewhat like I was describing with
16 respect to our Ultra-Videoconferencing project and
17 with -- in terms of our use of multiple servers to
18 transmit multiple streams of data, as opposed to
19 trying to get one big, super expensive machine
20 that would have the capacity for handling all of
21 that. As you scale up to large numbers of streams
22 or large numbers of receivers, it generally

1 becomes more cost effective to consider
2 replication of data over multiple machines,
3 multiple transmitters, multiple different
4 locations where the servers can be housed, to
5 position them closer to some of the receiver
6 communities.

7 So, a more distributed architecture
8 would often be a favored solution. But it very
9 much depends on the specific scenario that you're
10 dealing with, with regard to the bandwidth
11 requirements, the number of streams, the number of
12 simultaneous streams, the capacity of the
13 intervening network, the number of receivers that
14 are multicast capable.

15 So it's really very much a case-by-case
16 basis. It has to be considered by the designer,
17 it's not as if you could give me a cursory list of
18 specifications and I would be able to say, ah,
19 here's the right architecture.

20 Q Sure. But a distributed architecture
21 is something that you might consider as something
22 that would help with issues of scalability?

1 MR. KNIERIM: Objection. Form.

2 A It may help with issues of scalability.
3 It may be completely redundant and could introduce
4 additional unnecessary complexity. Again, it very
5 much depends on the specific scenario.

6 Q Sure. I'm not speaking globally for
7 every situation.

8 My question is solely that, in some
9 instances, distributed architecture would be
10 something that could help to address issues of
11 scalability when you're dealing with a project for
12 commercial purposes that involves many, many
13 thousands of users on the client side?

14 MR. KNIERIM: Objection. Form. Asked
15 and answered.

16 A Once again, it very much depends, it's
17 a case-by-case situation. There could be
18 scenarios in which commercial application with
19 thousands or hundreds of thousands of receivers
20 works perfectly well with a single server with
21 content that is, effectively, multicast, whether
22 it's live or even on-demand. If the on-demand

1 streams are low bandwidth or sufficient to be
2 encapsulated within the capacity of the server and
3 the network infrastructure between that server and
4 the multiple receivers, there may be no need for a
5 distributed architecture. So we really have to
6 get into what are the specifics of each of the
7 streams, the timing constraints, the intervening
8 network, the capacities of the clients to receive
9 and buffer data, timing constraints, quality
10 constraints, encoding standards. There are a
11 myriad number of factors that the designer has to
12 consider when weighing these design choices.

13 Q I understand and I just want to
14 clarify. I think my question is still a little
15 different.

16 I'm not asking would someone never
17 choose distributed architecture.

18 My question, instead, is, is
19 distributed architecture something that one could
20 consider as a means to address issues of
21 scalability?

22 MR. KNIERIM: Same objections.

1 A A distributed architecture can provide
2 an option for scalability, but a single server can
3 also be scaled effectively by adding more network
4 capacity, in terms of interface cards, more disc
5 or storage capacity, in terms of the array of
6 storage devices available to it. So, once again,
7 the ideal choice or preferred choice of the
8 designer is very much a case-by-case
9 consideration.

10 Q Do you think that YouTube, for example,
11 utilizes a distributed architecture to help handle
12 its traffic for people requesting to watch videos,
13 or is that one single server that's handling all
14 of that traffic across the world?

15 MR. KNIERIM: Objection. Form.

16 A Well, I'm not privy to the details of
17 Google's architecture for handling YouTube video
18 distribution, but my guess would be that they use
19 a distributed architecture.

20 Q What about Netflix? Do you think that
21 they use a distributed architecture or do you
22 think that there's a server somewhere that has one

1 big server handling all the traffic for Netflix?

2 MR. KNIERIM: Objection. Form.

3 Outside the scope.

4 A Once again, I'm not privy to the
5 details of Netflix's architecture. My guess would
6 be that they use a distributed architecture.

7 (Peloton Exhibit 1004 marked for
8 identification and attached to the transcript.)

9 Q I'd like to introduce what would be a
10 new exhibit for us today, but one that has already
11 been a part of the IPR. This one would be marked
12 Exhibit 1004.

13 Do you have that one with you?

14 A That's Ueda? Which file opened here?
15 I clicked on 1004 and why is it showing me -- it's
16 showing Ueda. No, here is 1004. My preview is
17 acting funny.

18 This is SIP.

19 PLANET DEPOS TECHNICIAN: Are we
20 marking this as Cooperstock 1?

21 MS. MONDRY: I think we decided that we
22 can use the exhibits as they've been previously

1 marked in the IPR itself. So we're going to
2 continue referring to this as Exhibit 1004.
3 Apologies for the prior instructions before we
4 began.

5 And if we need to go off record briefly
6 to clarify anything, please, let me know;
7 otherwise, we can continue.

8 MR. KNIERIM: On our end, that sounds
9 great with us. We use the exhibit numbers as
10 they've already been marked.

11 MS. MONDRY: Okay.

12 Q So Exhibit 1004 is the SIP, or S-I-P,
13 standard, which stands for Session Initiation
14 Protocol, that has been submitted in the IPRs
15 we're here to discuss today, correct?

16 A That is what I have in front of me,
17 yes.

18 Q Going forward, if either of us say
19 "SIP" or S-I-P, can we agree that we understand
20 that that refers to Session Initiation Protocol,
21 just for shorthand, to make things easier?

22 A That's perfectly fine.

1 Q I just want to also clarify. For all
2 of the documents that you might have in front of
3 you today that are exhibits to the IPR, that you
4 would open, none of them have any of your personal
5 notes or any other markings in them at all; is
6 that correct?

7 A That is correct.

8 Q All right. I'd like to direct your
9 attention to page 10. Let me know when you get
10 there.

11 A Okay.

12 Q Very bottom of the page is a Section 4,
13 titled "Overview and Operations," that begins
14 there.

15 Do you see that?

16 A I do.

17 Q And that first paragraph below the
18 section header explains that this section
19 introduces basic operations of SIP, using some
20 simple examples, right?

21 A That is what it reads.

22 Q And those examples include a Figure 1,

1 which is produced on page 12, correct?

2 A Correct.

3 Q And Figure 1 represents a SIP exchange
4 between users Alice and Bob; is that right?

5 A A SIP exchange between devices
6 belonging to Alice and Bob, yes.

7 Q And Alice initiates a call to Bob or
8 Alice's device initiates a call to Bob's device,
9 and there are two SIP proxy servers, atlanta.com
10 proxy and biloxi.com proxy, that help establish
11 the connection, correct?

12 A The establishment of the connection
13 between Alice's cell phone and Bob's SIP phone
14 involved the intermediaries of two proxies that
15 you've noted.

16 Q Okay. Could you also turn to page 11.
17 Let me know when you are there.

18 A I'm there.

19 Q The first full paragraph, starting
20 "Figure 1 shows a typical example."

21 Do you see that paragraph?

22 A I see it.

1 Q There's a sentence that explains "also
2 shown are two SIP proxy servers that act on behalf
3 of Alice and Bob to facilitate the session
4 establishment."

5 Do you see that?

6 A I do.

7 Q So the two SIP serves here, atlanta.com
8 proxy and biloxi.com proxy, help to establish a
9 connection between Alice's device and Bob's
10 device, right?

11 A As is stated, the two proxy servers
12 facilitate the establishment of the connection --
13 of the session.

14 Q Referring back to Figure 1, it
15 identifies a series of transmissions using arrows,
16 correct?

17 A They indicate messages being sent, yes.

18 Q Those messages, they also refer to with
19 the shorthand starting with F, for example, invite
20 F1 or invite F4, correct?

21 A The messages include the F, followed by
22 a number as a sequencing.

1 Q I mentioned this only so that if I, for
2 example, refer to step F10, you'll understand I'm
3 referring to the 200 OK message F10?

4 A Very good.

5 Q Okay. So, F1 is an invite message
6 that's sent from Alice's device, correct?

7 A That is correct.

8 Q And right below Figure 1, the SIP
9 standard provides an example of that invite
10 message, correct?

11 A Yeah, as is described at the bottom of
12 page 11, the invite that is message F1 is provided
13 below Figure 1.

14 Q The first line of that invite message,
15 that's provided below Figure 1, that indicates the
16 type of message, that it's an invite message,
17 correct?

18 A That seems correct.

19 Q And the lines that follow in that
20 invite message, that's provided below Figure 1,
21 those are all header fields, correct?

22 MR. KNIERIM: Objection. Form.

1 A That seems to be confirmed by the
2 paragraph at the bottom of page 12, that the lines
3 that follow the first line are a list of header
4 fields.

5 Q And those header fields give additional
6 information about that invite message, correct?

7 A That is also sensible.

8 Q The first header field that's provided,
9 so below the invite indication, is a via field.

10 Do you see that?

11 A I do.

12 Q And that identifies the proxy server
13 that Alice expects is going to handle her request,
14 right?

15 A As is described at the top of page 13,
16 the PC33.atlanta.com is, rather, the address at
17 which Alice is expecting to receive responses to
18 the request.

19 Q And the next higher field is max
20 forwards, right below via, correct?

21 A That is correct.

22 Q And that indicates the number of hops

1 that the request can make, and it's limited to 70,
2 right?

3 A Yeah, to be exact about it, it's as
4 stated, again, on page 13, max forwards serves to
5 limit the number of hops a request can make on the
6 way to its destination.

7 Q And the header below that is "to,"
8 right?

9 A That's correct.

10 Q And what's represented in the "to"
11 field?

12 A As is described at the top of page 13,
13 to contains a display name, in parentheses, Bob,
14 and a SIP or SIPs URI, in parenthesis, SIP:
15 bob@biloxi.com, towards which the request was
16 originally directed.

17 Q And a couple of further headers below
18 that is a content type header.

19 Do you see that?

20 A I do.

21 Q And that indicates via the type that
22 the body of the SIP message will be. Here, it's

1 indicating that it is an SDP, which is not shown
2 below, correct?

3 A I mean, I understand what you mean by
4 "not shown below," yeah. So, as is stated, again,
5 on page 13, content type contains a description of
6 the message body.

7 Q Right. And in here, it's describing
8 that the message body is of type SDP, even though
9 that's not physically shown right below Figure 1
10 in this example, correct?

11 A The message body, itself, is not shown
12 in Figure 1. All we have is the description of
13 the message body, as described by the content type
14 header field.

15 Q And the content type header field
16 indicates that that message body is of type SDP,
17 correct?

18 A It is of type application/SDP.

19 Q And here, SDP refers to session
20 description protocol, correct?

21 A Yes, that is confirmed in the SIP
22 document.

1 Q So all this information that we just
2 discussed is in the SIP invite request that is
3 sent in Alice's message in -- at step F1, correct?

4 A Yes, those contents are part of the
5 invite, indicated as step F1.

6 Q And F1 arrives at the first SIP proxy
7 service, atlanta.com proxy, correct?

8 A In this example, as shown in the
9 figure, that is correct.

10 Q Right. All my questions here are
11 referring specifically to Figure 1.

12 When F1 arrives at atlanta.com, the SIP
13 proxy, it needs to figure out where to send the
14 message next, correct?

15 MR. KNIERIM: Objection. Form.

16 A You're unclear as to "it needs to
17 figure out." What is the "it" in your question?

18 Q The atlanta.com proxy server.

19 A The accurate description as to what
20 takes place at the atlanta.com SIP server appears
21 in the second full paragraph on page 14 of the SIP
22 standard and, specifically, if we go down a few

1 lines, the proxy server receives the invite
2 request and sends a 100 (trying response) back to
3 Alice's cell phone, which indicates the -- that
4 the invite has been received and that the proxy is
5 working on her, that's Alice's, behalf, to route
6 the invite to the destination.

7 Q But, the proxy server, in addition to
8 sending a trying response, which we see at F3,
9 correct?

10 A That is the response that I referred
11 to, yes.

12 Q In addition to F3, the atlanta.com
13 proxy server also needs to figure out where to
14 direct Alice's invite message, correct?

15 A As I stated, the proxy is working on
16 her behalf to route the invite to the destination.

17 Q And as part of that, it needs to figure
18 out where to send that message next, in the
19 process of reaching Bob's cell phone?

20 A Yeah, so if we continue on through the
21 paragraph, the second full paragraph on page 14,
22 we have those steps described in terms of what the

1 atlanta.com server is doing in order to forward
2 the invite request.

3 Q So, the atlanta.com proxy server
4 identifies the next hop in its journey as the
5 biloxi.com proxy server, correct?

6 A The atlanta.com proxy server locates
7 the proxy server at biloxi.com possibly by
8 performing a particular type of DNS, which is a
9 domain and server lookup to find the SIP server
10 that serves the biloxi.com domain.

11 Q So the atlanta.com proxy recognizes the
12 next place it needs to go is the biloxi.com proxy
13 server, right?

14 A I wouldn't jump to say it's the next
15 place it goes. It is the destination and there
16 may be intermediate network hops before the invite
17 reaches there. But that is the target address to
18 which the atlanta.com server is then forwarding
19 the invite request.

20 Q Okay. So the atlanta.com proxy server
21 identifies that as its next target address in the
22 process of reaching Bob's cell phone, right?

1 A It identifies the biloxi.com proxy
2 server as a -- the next target destination for
3 that invite request to be forwarded to.

4 Q And the Atlanta proxy server knows it's
5 trying to reach Bob because of all the extra
6 information that we have in the invite message
7 that specifies where its -- where the message is
8 intending to go, right?

9 MR. KNIERIM: Objection. Form.

10 A No. It's not trying to reach Bob.
11 It's trying to reach a particular device.

12 Q Same question, but Bob's device. So
13 the atlanta.com proxy server knows that it's
14 trying to reach Bob's device because of all this
15 additional information that we walked through in
16 the invite message, correct?

17 MR. KNIERIM: Objection. Form.

18 A It's not all of the additional
19 information, it's simply the first line, the
20 invite, that specifies the device SIP Bob at
21 biloxi.com.

22 Q So the message generally whether or not

1 it's every single line that leads to this
2 conclusion hopes the atlanta.com proxy server
3 determine that it is trying to help Alice's cell
4 phone reach Bob's cell phone, correct?

5 MR. KNIERIM: Objection. Form.

6 A Sorry, there was a lengthy -- lengthy
7 question. But I'll say that the invite field and
8 the to field both specify the target address that
9 Alice's device wishes to carry out the session
10 initiation with. And that information is
11 available, as part of the SIP protocol, to
12 facilitate the establishment of that connection.

13 Q Okay. And we see that next message go
14 out from the atlanta.com proxy server to the
15 biloxi.com proxy server at arrow F2, correct?

16 A We do.

17 Q And the biloxi.com proxy server sends
18 another one of those trying messages back. This
19 time, from biloxi.com proxy to atlanta.com proxy,
20 right?

21 A That is the F5.

22 Q And additionally, the biloxi.com proxy

1 needs to determine where it's going to send out
2 the message next, in addition to the trying
3 message, right?

4 A So in that same paragraph, to which we
5 have been referring, the second large full
6 paragraph on page 14, we see that the biloxi.com
7 proxy server receives the invite and responds with
8 a 100 (trying response), back to the atlanta.com
9 proxy server, to indicate that it has received the
10 invite and is processing the request. The proxy
11 server consults the database, generally called a
12 location service, that contains the current IP
13 address of Bob.

14 Q And the biloxi.com proxy server knows
15 that it needs to look for Bob or Bob's phone -- or
16 Bob's SIP phone, excuse me, because the invite
17 message specifies that the intended recipient is
18 Bob, at that particular SIP address, correct?

19 A So the biloxi.com proxy is using the
20 destination address, that destination named
21 recipient device, to carry out the lookup in its
22 database.

1 Q And there are several other steps that
2 follows, again, indicated by F5, F6, F7. But,
3 ultimately, this process results in a media
4 session being established between Alice's cell
5 phone and Bob's SIP phone in Figure 1, right?

6 A We do see, between steps F12 and F13,
7 the establishment of a media session.

8 MS. MONDRY: We've been going for about
9 an hour. I think now might be a good chance for a
10 break, if you'd like to take one.

11 THE WITNESS: Yep, that would be great.

12 MR. KNIERIM: Off the record.

13 (Recess taken from 11:08 a.m. to
14 11:21 a.m.)

15 BY MS. MONDRY:

16 Q When we left off, we had just taken a
17 look at Figure 1 in Exhibit 1004, correct, which
18 is indicating a connection between Alice's cell
19 phone and Bob's SIP phone, right?

20 A Figure 1 is the illustration of the SIP
21 session setup example between those two devices.

22 (Peloton Exhibit 1001 marked for

1 identification and attached to the transcript.)

2 Q I'd like you to set that aside for a
3 moment and I would like you to pull up, and I
4 think this is the first time we've done so, the
5 '427 patent, itself, which should be Exhibit 1001.

6 And let me know when you have that with
7 you.

8 A I do.

9 Q The '427 patent provides several
10 figures that provide their own examples of SIP
11 invite messages, right?

12 A Sorry, could you repeat the question?

13 Q Sure. The '427 patent includes several
14 figures that include their own example SIP invite
15 messages, correct?

16 An example of that would be Figure 7,
17 if you want to direct your attention to that
18 specifically.

19 A Thank you. Yes.

20 Q So Figure 7 includes a SIP invite
21 message, right?

22 A It does.

1 Q And as we discussed before, an invite
2 message includes a first line that indicates the
3 type of message it is and then that's followed by
4 several lines that indicate headers for the SIP
5 message, right?

6 A Several lines following the invite
7 first line, until the blank or the empty line are
8 all header fields.

9 Q Right. So the via field being the
10 first one and then the last one of the SIP headers
11 being the content length field, correct?

12 A That is correct.

13 Q These are the same header fields and
14 values for those header fields as the example in
15 Figure 1 from the SIP standard, correct?

16 MR. KNIERIM: Objection. Form.

17 A They are not.

18 Q Okay. How are they different?

19 A As a starting point, the second line of
20 Figure 1 of the SIP standard ends with
21 branch=z9hG4bK776asdhds, whereas, in Figure 7, of
22 the '427 patent, that sequence ends with the

1 number 8.

2 The next difference that I noted, in
3 looking at this just briefly here, is the call ID
4 field, which in Figure 1 of the SIP standard,
5 contains the sequence
6 a84b4c76e66710@pc33.atlanta.com. Whereas, in
7 Figure 7 of the '427 patent, that call ID field
8 terminates before the @ sign, without the suffix
9 of the domain pc33.atlanta.com.

10 The next is the addition of the X video
11 sequence that appears only in Figure 7 of the '427
12 patent and is absent in Figure 1 of the SIP
13 standard.

14 The rest of the fields appear to be the
15 same, but they're certainly not a one-to-one match
16 between the two.

17 Q Sure. So there are some slight
18 differences. I think one you mentioned was, in
19 the via field, everything is exactly the same,
20 it's SIP/2.0/UDP has the same domain that it
21 references pc33.atlanta.com, but the branch is not
22 identical, correct?

1 A That is correct.

2 Q The invite message is, in the very
3 first line, also indicates that it has the same
4 recipient, sip:bob@biloxi.com, and also indicates
5 that this is a SIP message 2.0, correct?

6 A That is correct.

7 Q That's the same in both.

8 And it's the same amount of max
9 forwards in both messages?

10 A That is correct.

11 Q It is the same information in the to
12 field, indicating Bob as the recipient with his
13 SIP URL in brackets, for both the '427 patent's
14 Figure 7, and the example in the SIP standard,
15 correct?

16 A That is correct.

17 Q And the from field, again, is the same
18 between Figure 7 and the example in the SIP
19 standard, it's Alice, and it provides her SIP
20 address, sip:alice@atlanta.com, and it has the
21 exact same tag number provided between the two
22 messages as well, correct?

1 A That appears to be correct.

2 Q And it includes the same example CSEQ
3 value header as well, that's C-S-E-Q, which is
4 314159, and it indicates it's counting invite
5 messages.

6 That's the exact same between Figure 7
7 and the SIP standard, right?

8 A Figure 1 of the SIP standard, yes.

9 Q And the contact field for Figure 7 and
10 the example in Figure 1 in the SIP standard,
11 that's the exact same, it's
12 sip:alice@pc33.atlanta.com, the exact same?

13 A The contact is the same.

14 Q Yep. And content length -- or sure,
15 I'll start there. Content length of 142 is the
16 exact same between Figure 7 and the example below
17 Figure 1 in the SIP standard?

18 A That is the same between Figure 7 of
19 the '427 patent and Figure 1 of the SIP standard.

20 Q And it's also the exact same for
21 content type, indicating application/sdp between
22 Figure 7 and the example below Figure 1 in the SIP

1 standard?

2 A That is correct.

3 Q So the only differences between those
4 two, Figure 7 and the invite message in the SIP
5 standard below Figure 1, is a different branch ID,
6 a different call ID, and the addition of a play
7 list. But all of those other fields that we read
8 off are the exact same?

9 MR. KNIERIM: Objection to form.

10 A The fields, other than those that
11 identified exhibiting differences, appear to be
12 the same between Figure 1 of the SIP standard and
13 Figure 7 in the '427 patent.

14 Q Referring back to the '427 patent.
15 Could you, please, turn to column 15.

16 Let me know when you have that there.

17 A Okay.

18 Q And column 15 includes a paragraph that
19 ends at the parentheses "bandwidth guarantee
20 process," that last line is line 40.

21 Do you see that?

22 A I do.

1 Q So the paragraph beginning at line 29
2 and ending at line 40 discusses a bandwidth
3 guarantee process, correct?

4 A Yes, this section of the '427 patent
5 describes the communication bandwidth and
6 guaranteeing that bandwidth through the transport
7 functions part 80.

8 Q And the paragraph right before that
9 one, beginning line 21, it starts "further, the
10 service control functions."

11 Do you see that?

12 A I do.

13 Q This paragraph discusses a bandwidth
14 guarantee instruction, correct?

15 A It refers to the bandwidth guarantee
16 instruction, yes.

17 Q And it describes that the bandwidth
18 guarantee instruction includes communication
19 bandwidth information, indicating the determined
20 communication bandwidth and the received media
21 delivery specification information and playlist
22 information, right?

1 A Would you repeat that, please?

2 Q Sure. The patent explains, in this
3 paragraph, that we just identified, beginning at
4 line 21, that the bandwidth guarantee instruction
5 includes communication bandwidth information,
6 indicating the determined communication bandwidth.
7 And I'll pause there to make sure we agree on
8 that.

9 A Yeah. I was just thrown because it
10 seemed like you were reading directly, but then
11 you said includes, rather than containing. So I
12 was sort of trying to track where you jumped to.

13 But, yes, that content is included in
14 the paragraph.

15 Q And the bandwidth guarantee instruction
16 also includes or contains the received media
17 deliver specification information and playlist
18 information, right?

19 A That is included in the paragraph as
20 well.

21 Q And next, it explains that the core IMS
22 part 30, then, transmits, to the transport

1 functions, part 80, the information in that
2 bandwidth guarantee instruction, right?

3 A What's described in the paragraph
4 beginning on column 15, line 29, is that the core
5 IMS part 30 transmits, as you noted, to the
6 transport functions part 80, the received
7 communications bandwidth information. That's the
8 first part of what the service control functions
9 part 40 transmits, as described in lines 21 and
10 22. And the communication channel specification
11 information, which does not appear to be the same
12 information that's described in the previous
13 paragraph.

14 Q Part of the bandwidth guarantee
15 instruction, we agree, was the communication
16 bandwidth information, which indicates the
17 determined communication bandwidth, correct?

18 A The communication bandwidth information
19 indicates the determined communication bandwidth.
20 That is information that is conveyed from core IMS
21 part 30 to the transport functions part 80.

22 Q So, at least that part of the bandwidth

1 guarantee instruction is conveyed by core IMS part
2 30 to transport functions part 80, right?

3 A Sorry, that part of?

4 Q I'll just repeat my question.

5 So at least this portion of the
6 bandwidth guarantee instruction that we just
7 described, the communication bandwidth
8 information, that is conveyed by core IMS part 30
9 to the transport functions part 80, correct?

10 A That is correct.

11 Q And then, finally, the transport
12 functions part 80 uses that information to
13 guarantee the communication bandwidth represented
14 by the received communication bandwidth
15 information on the communication channel,
16 specified by the received communication channel
17 specification information, right?

18 A As it states in the paragraph,
19 transport functions part 80 executes a process to
20 do so.

21 Q Right. Referring to the communication
22 bandwidth information received -- by the received

1 communication bandwidth information?

2 A I think your question was misworded.
3 To repeat what is written from lines 35 to 40 of
4 the column, column 15, is the transport functions
5 part 80 executes the process to guarantee the
6 communication bandwidth represented by the
7 received communication bandwidth information on
8 the communication channel specified by the
9 received communication channel specification
10 information. And that is parenthetically referred
11 to as the bandwidth guarantee process.

12 Q You can set that document aside for
13 now. And can you, please, bring back up the SIP
14 standard, which is marked Exhibit 1004.

15 And let me know when you have that in
16 front of you.

17 A I do.

18 Q Okay. Would you, please, turn to
19 page 9. And let me know when you're there.

20 A Okay.

21 Q On page 9, there's a final paragraph
22 that begins "SIP is not a vertically integrated

1 communication system."

2 Do you see that?

3 A I do.

4 Q And it says here that SIP is a
5 component that can be used with other protocols to
6 build a complete multimedia architecture, correct?

7 A You've alighted some words but,
8 otherwise, that's correct.

9 Q It gives some examples of that, right?

10 A It gives some examples of other
11 protocols, other IETF protocols that can be used,
12 yes.

13 Q For example, one of the protocols that
14 it mentions is RTP, and that's for transporting
15 real-time data and providing QRS feedback.

16 That can be used in conjunction with
17 SIP, correct?

18 A That is correct.

19 Q And another example it gives is RTSP,
20 that's the real-time streaming protocol, and it
21 describes the use there for controlling deliveries
22 of streaming media.

1 That can also be used in conjunction
2 with SIP, right?

3 A That is correct.

4 Q Another example gives PSTN, it
5 describes that as controlling gateways to the
6 public switch telephone network.

7 That can also be used with SIP,
8 correct?

9 A No, PSTN is not a protocol. PSTN is a
10 network, as is explained in the paragraph.

11 Q So it is a network that can use SIP as
12 part of its functionality, correct?

13 A No. The network doesn't use SIP.
14 Rather, SIP can use, as is described here, MEGACO,
15 the media gateway control protocol, for
16 controlling gateways to the PSTN.

17 Q Another example it gives is SDP, the
18 session description protocol, for describing
19 multimedia sessions.

20 That can be used with SIP, correct?

21 MR. KNIERIM: Objection. Form.

22 A That is not in this paragraph.

1 Q SDP --

2 A Sorry, it is. I apologize. I missed
3 it there at the top.

4 Q Okay. So let me re-ask my question.

5 SDP, session description protocol,
6 which can be used for describing multimedia
7 sessions, that can be used in conjunction with
8 SIP, correct?

9 A That is correct.

10 Q So, SIP can be used to assist with
11 session establishment in conjunction with other
12 protocols that provide additional multimedia
13 functionality?

14 A To the extent that, for example, MEGACO
15 is considered something for multimedia
16 functionality, which is a dubious assertion, the
17 rest of that statement is reasonably valid.

18 Q I'd like you to bring back up your
19 declaration, specifically, Exhibit 2001. And let
20 me know when you have that.

21 A Yes.

22 Q Could you turn to paragraph 69, which I

1 believe is on page 28.

2 A Okay.

3 Q So, the paragraph begins on page 27,
4 but continues on to page 28. I would like to
5 direct you, specifically, to the top of page 28,
6 where you have a paragraph that begins "in
7 contrast, SIP does not."

8 Do you see that?

9 A I do.

10 Q In this letter, half of the paragraph,
11 you state that "unlike the SIP standard, in which
12 the requester directly specifies the media of
13 interest."

14 Do you see that?

15 A I'm not sure where I started from.

16 Q It should be --

17 A Oh, unlike the SIP standard. Okay.
18 You jumped down two lines. Okay.

19 Q What do you mean by that?

20 MR. KNIERIM: Objection, form.

21 A By jumping down two lines, I meant you
22 referred me to the top of the page, but then you

1 were reading from the third line of the paragraph
2 instead.

3 Q Let me rephrase. I was referring to my
4 question.

5 What do you mean by "unlike the SIP
6 standard, in which the requester directly
7 specifies the media stream of interest"?

8 Can you explain what you mean by that?

9 A Yeah. So when we were going through
10 the example from the SIP standard and the header
11 fields there, which, as you noted, are similar to
12 those that appear in Figure 7 of the '427 patent,
13 the information that is conveyed, in terms of the
14 media stream of interest, appears -- sorry, it
15 does not appear, as we do not have the SDP
16 information in the figure. So that was -- sorry,
17 I have to refer to -- yeah, unfortunately, we'd
18 have to go to look at some examples of the SDP,
19 where the information is described as to what
20 media content is being requested. So if we have,
21 as per page 13 of the SIP standard, the last
22 paragraph there explains the details of the

1 session, such as the type of media, codec or
2 sampling rate, are not described using SIP,
3 rather, the body of a SIP message contains a
4 description of a session encoded in some other
5 protocol format. One such format is the session
6 description protocol, and the SDP message is what
7 describes the media content that the sender and
8 receiver wish to share.

9 Whereas in Ueda, as I've explained, and
10 to which I refer, paragraphs 147 and 148 of Ueda
11 explain that instead of specifying explicitly what
12 information is to be exchanged from the sender to
13 the receiver, Ueda, instead, describes the
14 identification information that is used, it's
15 transmitted, by the content-providing device --
16 provided to the content-providing device. That
17 information is, then, used to select the content
18 management application that is activated --
19 carries out the processing and causes -- sorry,
20 just give me a second to remember where the
21 content management application runs.

22 Yeah, so weighted server determines

1 what content management application to provide to
2 the content-providing device and the
3 content-providing device, then, provides, to the
4 user, the selection of download content.

5 So there's the involvement of these
6 intermediate applications that are responsible for
7 determining what media is going to be sent to the
8 user, under Ueda, as opposed to SIP, where the
9 requester, that is ultimately the receiver,
10 explicitly specifies, as part of the SDP contents,
11 the media stream that it wishes to receive.

12 Q Okay. So, let's start with, I think
13 you said something about page 13 of SIP.

14 You referred to page 13 of SIP at the
15 very bottom paragraph, and I'd like you to have
16 that in front of you, so let me make sure you do
17 before I continue.

18 A Yes.

19 Q The details of the session, such as the
20 type of media codec or sampling rate, are not
21 described using SIP, correct?

22 A That's probably right.

1 Q So referring back to your paragraph 69,
2 where you state "Second, unlike the SIP standard
3 in which the requester directly specifies the
4 media stream of interest..."

5 That's not correct, right?

6 A The SIP standard provides for the SIP
7 message to contain the description of the session,
8 and within that SIP standard are other protocols,
9 such as SDP, that provide the detailed
10 specification.

11 So SIP is encapsulating an SDP message.
12 So, it is correct, it's just not elaborating in
13 the full detail that within SIP is a field
14 described by SDP that specifies the media content.

15 Q I'd like to be precise here. You
16 specifically say, in your sentence, "the SIP
17 standard." I understand it sounds like now you're
18 saying, in a particular given message, there may
19 be other content in the body of a SIP message.
20 But the SIP standard, itself, does not specify a
21 media stream of interest, correct?

22 MR. KNIERIM: Objection. Form.

1 A The SIP standard does not describe,
2 itself, the media, but it encapsulates, as part of
3 its body, other protocol, such as SDP, that
4 provide the details of the media in terms of, for
5 example, as noted in page 13, the media codec or
6 sampling rate.

7 Q Can you point me to where, I mean, we
8 have the SIP standard right in front of us. Can
9 you point me to where, in the SIP standard itself,
10 it describes specifying a media stream of
11 interest?

12 I understand that you are saying there
13 might be things in other protocols, but my
14 question is solely about SIP standard.

15 Can you show me where that is in the
16 SIP standard?

17 A Yeah, again, this is part of what's
18 described as included in the body of the SIP
19 message, is an SDP message, which, at the bottom
20 of page 13 of the SIP standard, it states "this
21 SDP message (not shown in the example) is carried
22 by the SIP message in a way that is analogous to a

1 document attached being carried by an email
2 message."

3 So your question is sort of like
4 asking, where, in the email specification, does it
5 include the attachment? It's like, well, the
6 email specification describes how attachments can
7 be included. The SIP standard describes how an
8 SDP message can be included as part of the body.

9 So, SIP encapsulates SDP, SDP describes
10 the media.

11 Q So, SDP is a part of SIP, then; is that
12 what you're saying?

13 A No. I'm saying that SDP is
14 encapsulated in this example as one of the
15 protocols that SIP can employ for describing the
16 media.

17 Q A moment ago, you sounded like you were
18 reading from something in the SIP standard. Can
19 you point me to where that was in the document?

20 A Page 13. And the top of page 14.

21 Q I just want kind of a simple answer to
22 my question. I understand you're saying the SDP,

1 itself, might say other things, but is there
2 anywhere specifically, in this document itself,
3 the SIP standard, that describes specifying the
4 media stream of interest?

5 MR. KNIERIM: Objection. Form. Asked
6 and answered.

7 A As I read at least twice, from the top
8 of the paragraph at the bottom paragraph of
9 page 13, the details of the session, such as the
10 type of media, codec or sampling rate are not
11 described using SIP, rather, the body of a SIP
12 message contains a description of the session
13 encoded in some other protocol format. One such
14 format is a session description protocol, SDP, and
15 gives the RFC number. "This SDP message (not
16 shown in the example) is carried by the SIP
17 message in a way that is analogous to a document
18 attached being carried by an email message or a
19 web page being carried in an HTTP message."

20 Q So, you're referring only to this
21 paragraph, itself, where it's specifically
22 discussing the functionality of SDP, and nothing

1 else, within the entirety of the SIP standard,
2 refers to specifying the media stream of interest;
3 is that correct?

4 MR. KNIERIM: Objection. Form.

5 A So I've only searched, so far, up to
6 page 68 of the SIP standard. The examples that
7 I'm seeing repeatedly referred to SDP as the
8 example protocol that would describe the media.

9 But on page 68, in the last paragraph,
10 it notes that a message body may be sent, the type
11 of which is determined by the accept header field
12 in the options request, and then, parenthetically,
13 application/SDP is the default if the accept
14 header field is not present. If the types include
15 one that can described media capabilities, the UAS
16 should include a body in the response for that
17 purpose. Details on the construction of such a
18 body, in the case of application SDP, are
19 described in 13.

20 So, we have frequent references to SDP,
21 as an example, as a default, but the SIP standard
22 is not ruling out the use of other protocols

1 for -- that can be encapsulated within the SIP
2 body to describe the media.

3 Q So, someone could use the SIP body to
4 describe a media stream; is that right?

5 A SIP would encapsulate a protocol, such
6 as SDP, that would describe the media.

7 Q So, you could use some other protocol,
8 besides SDP, to include in the body of a SIP
9 message that specifies the media.

10 Is that your testimony?

11 A That's correct. SIP describes SDP as a
12 default, but it's listed as an example.

13 Q Outside of referring to other
14 protocols, which I understand you've mentioned SDP
15 and that there could be the existence of others,
16 is there anything specifically, within the SIP
17 protocol itself, because SIP is not just conveying
18 SDP, it has its own headers and value information
19 that we looked at today, for example, correct?

20 So it performs other functions other
21 than conveying an SDP message, right?

22 A Yeah. SIP conveys other information

1 than, purely, the SDP message.

2 Q Within the functionality of SIP itself,
3 as described in the SIP standard, without
4 referring to any other protocols or anything
5 within the SIP standard, itself, that specifies a
6 media stream of interest?

7 MR. KNIERIM: Objection to form. Asked
8 and answered.

9 A I'm not sure I understand your
10 question. In terms of anything different from
11 what I've explained, that the SIP body can contain
12 information from a protocol, such as SDP, that
13 describes the media.

14 Q I'd like you to open, and I think this
15 will be the first time, Exhibit 1005.

16 Let me know when you have that.

17 (Peloton Exhibit 1005 marked for
18 identification and attached to the transcript.)

19 A Yes.

20 Q Would you turn to page 22.
21 Specifically, I'm looking for subheading 5.14.

22 A Yes.

1 Q And this subheading is titled "Media
2 Description ('m=')," right?

3 A That's correct.

4 Q And one of the subfields that can be
5 used with the m= field is the media tag.

6 Do you see that? That should be the
7 second paragraph in 5.14.

8 A Yeah, I'm not sure they describe these
9 as tags, as opposed to fields, but, yes, I see
10 the -- sorry, m= is the field and, so, the
11 material or the information that follows the
12 field, I'm not sure what terminology is used to
13 describe those components of the field.

14 Q I think the last -- sorry. Please
15 finish.

16 A Yeah. But I see media as a portion of
17 that.

18 Q Could we refer to this as a subfield?
19 In fact, I think the last sentence of that first
20 full paragraph states that.

21 A You are correct.

22 Q So there is a media subfield in the m=

1 field, described in the SDP standard, correct?

2 A That is one of the subfields, yes.

3 Q And it explains that media is -- it is
4 identifying the media type involved in SDP
5 message, correct?

6 A As is stated here, media is the media
7 type and provides what the currently defined media
8 are at that point, which is audio, video, text,
9 application, and message, although it notes that
10 it may be extended in the future.

11 Q Right. So this is indicating that
12 included in an SDP message, you can indicate that
13 the type of media to be transmitted could be
14 audio, could be video, it could be text, it could
15 be an application, it could be a message, not to
16 the exclusion of other things in the future,
17 right?

18 A That is correct.

19 (Peloton Exhibit 1003 marked for
20 identification and attached to the transcript.)

21 Q I'd like you to pull back up Ueda,
22 please, which is Exhibit 1003.

1 A Yes.

2 Q And I believe, earlier, you were
3 referring to paragraphs 147 to 149 or thereabouts;
4 is that correct?

5 A I believe 147 to 148 are the paragraphs
6 that I had cited, but there's -- with regard to
7 the section in my declaration that you pointed to,
8 I also referred to additional paragraphs,
9 including paragraph 149 of Ueda.

10 Q So I would like to refer back to some
11 of your earlier testimony, where you're describing
12 in paragraphs 147, 148 in Ueda.

13 You said that there's involvement of
14 intermediate applications that are responsible for
15 determining what media is going to be sent to the
16 user under Ueda.

17 Can you explain to me what you mean by
18 "what media is going to be sent"?

19 A So the details of what media would be
20 transferred to the user device is found more in
21 the areas of paragraphs 227 to 230 of Ueda, as I
22 described further down in paragraph 71 of my

1 declaration. And if we turn there to Ueda, in --

2 Q I'd like to pause and make sure I'm
3 getting my question answered as well.

4 So, am I correct that you're saying
5 that paragraphs 147 and 148 are not discussing
6 determining what media is going to be sent to the
7 user?

8 A They are describing the process, in
9 terms of the contact management application, that
10 is going to provide. But in terms of what media,
11 as I understood to be your question, that is
12 covered more directly in Ueda, beginning at
13 paragraphs 227, in which at least as one example,
14 we have --

15 Q I'd like to stop here again because I
16 think my question is separate from what is
17 happening in paragraph 227. And to return to what
18 you just said.

19 Take a look at paragraph 148, please,
20 in Ueda. The first sentence that begins "In steps
21 S102."

22 Let me know when you're there.

1 A Yes.

2 Q It says "In steps S102, the receiver
3 191 generates an allowed processing list, which is
4 a list of processing which the user (content
5 providing device 150) is allowed to perform, based
6 on the identification information included in the
7 received data, e.g., a content ID or user ID, and
8 selects the content management application."

9 So what's being described here, in
10 paragraphs 147 to 148, is not selecting the media,
11 it's determining what content management
12 application is sent back. Because that's already
13 done at this point in the process, correct?

14 A I don't understand what you mean by
15 "it's already done at this step."

16 This is what is happening. It's being
17 described there in that paragraph.

18 Q Let me cut off that last bit of the
19 question. I'll rephrase.

20 What's being described here, in
21 paragraph 148, states that the content management
22 application -- the determination of what that is,

1 is based off of a content ID or user ID, correct?

2 A Based on the content ID or user ID, a
3 content management application is selected.

4 Q So, this process is describing
5 selecting that content management application.
6 It's not describing selecting the media, which has
7 already occurred at this point in the process?

8 A Well, this, perhaps, gets a little
9 confusing because there's been media selected on
10 the disc that is on the user device and then there
11 is media that is determined by the content
12 management application, where I was referring to
13 those later paragraphs beginning at 227 in Ueda,
14 so the CD, itself, not the CD, the Blu-ray disc,
15 itself, has media. The user has selected that
16 media. But in terms of what media is going to be
17 delivered to the user, that's coming as part of
18 the responsibility of the content management
19 application.

20 Q Could you take a look at paragraph 135.

21 A Yes.

22 Q Paragraph 135 explains that it's

1 related to the content management application BD-J
2 app 2, correct?

3 A Well, it doesn't explain that. It's
4 simply a title, "Second Content Management
5 Application," BD-J app 2.

6 Q BD-J app 2 is the same content
7 management application that was described in
8 paragraphs 147 to 148, correct?

9 A Paragraph 147 talks about BD-J app 1,
10 not BD-J app 2.

11 Q In paragraph 148, where it describes
12 determining this content management application to
13 be sent to the user, that's referring to BD-J app
14 2, correct?

15 A Yes, in paragraph 148, that is correct.

16 Q And in paragraphs 136 to 139, it
17 describes the processes that are included in the
18 BD-J app 2, correct?

19 A No, it does not describe them.

20 Q Okay. What is your opinion of what is
21 included in paragraphs 136 to 139?

22 MR. KNIERIM: Objection. Form.

1 A It is a list of the processing steps
2 that are carried out by BD-J app 2.

3 Q And it lists three, the third of which
4 does indicate optional, starting in paragraph 137
5 and ending in 139, correct?

6 A So are you saying the third is
7 optional, the first two, that is steps A and B,
8 from paragraphs 137 and 138, are not optional.
9 That is correct.

10 Q And paragraph 137 states the first of
11 those steps, which is processing for allowing a
12 user to select a product, download data, correct?

13 A That is correct.

14 Q And the second step, in paragraph 138,
15 identified with subheading B is processing for
16 informing the server of the product selected by a
17 user, correct?

18 A That is correct.

19 Q And then, that third optional step
20 identified through subheading C is accounting
21 processing, optional, correct?

22 A That is also correct.

1 Q And Ueda doesn't describe any other
2 steps that are included in BD-J app 2, correct?

3 MR. KNIERIM: Objection to form.

4 A I think there's further information
5 that you'll find in paragraph 170 and, to a
6 certain extent, paragraph 171 of Ueda, and this is
7 referring to Figure 8, where the BD-J app 2 is
8 dealing with steps S124 and 125, involving
9 download and display of the allowed processing
10 list. And then, the selection of the download
11 content from the allowed processing list by the
12 user.

13 The steps 127, or step 127 -- S127,
14 execute billing processing that is described as,
15 what was it, settlement data, settlement
16 processing by transferring the settlement data,
17 I'm assuming to be encapsulated by the discussion
18 of accounting, which was an optional step. But
19 the contents of paragraph 170 and 171 seem to go
20 as providing further information or further steps
21 than those that you had mentioned earlier.

22 Q So these accounting steps, mentioning

1 processing payment, as you noted, that could be
2 encapsulated in the optional steps?

3 A It could be. I haven't considered
4 that -- sorry, my apologies for speaking over you.

5 Q That's all right.

6 Could be included in the optional step
7 c, accounting processing, correct?

8 A They may be. I haven't considered that
9 question prior to you mentioning it now. And I'd
10 have to go through and consider that more
11 carefully in order to give you a proper answer.

12 Q Okay. So including, then, the
13 discussion of payment processing that you mention
14 in paragraphs 170 and/or 171, there's no other
15 discussion of any other functionality of BD-J app
16 2 in Ueda?

17 A No, your question is incorrect. I did
18 not say that paragraphs 170 and 171 deal with
19 payment information or accounting information.
20 These are describing, rather, steps S124 and 125
21 of Figure 8 that -- yeah, Figure 8 of Ueda that,
22 as noted, are display -- download and display, the

1 allowed processing list. I don't believe that has
2 to do with payment or accounting. And then in
3 S125, select download content from allowed
4 processing list.

5 Q Let's start with Figure 8. You
6 mentioned S124. At the end of S124, it has, in
7 parens, "by BD-J app 2."

8 Do you see that?

9 A In S124 yes.

10 Q And in S127, it has, in parens, "by
11 BD-J app 2."

12 Do you see that?

13 A Yes, I do.

14 Q In S125, it doesn't say by BD-J app 2,
15 correct?

16 A That's correct. That's by the user.

17 Q Right.

18 In paragraph 171, just to clarify, my
19 reference to payments, do you see the sentence
20 that refers to -- strike that.

21 Let me start again.

22 In paragraph 171, it states that "Next,

1 in step S126, the content management application,
2 BD-J app 2, determines whether the content
3 selected by the user is a paid content or free
4 content, and in the case of paid content, the
5 processing proceeds to go to step 127." Let me
6 pause there.

7 So, is it fair to say that step -- or
8 paragraph 171 refers to BD-J app 2, involving
9 payment processing?

10 A If it proceeds to step 127, S127, it
11 does. But prior to that, it is, rather,
12 determining whether the content is paid content or
13 free content.

14 Q Outside of displaying the allowed
15 processing list, which you pointed to in S124, as
16 identified in Figure 8, and S127, execute billing
17 processing, which are both described in paragraph
18 170, 171, is there anything else in Ueda that
19 describes the functionality of BD-J app 2?

20 MR. KNIERIM: Objection. Form.

21 A From what I can tell of the cursory
22 search right now, it appears that other paragraphs

1 referring to BD-J app 2 are merely referring to
2 the same steps. I have not found, again, just
3 standing here today going through a cursory
4 search, any additional elements or functions of
5 that app.

6 Q Well, I would like to make sure that
7 the record has your complete and full testimony.
8 So is it your testimony that there is no other
9 description in Ueda of the functionality of BD-J
10 app 2, other than what we've discussed?

11 MR. KNIERIM: Objection. Form. Asked
12 and answered.

13 A It is my testimony that from a cursory
14 search through Ueda, that is all I'm seeing at
15 present. But I cannot give you a definitive
16 answer without going through exhaustively and
17 checking again for -- this is the first time I've
18 been asked to consider the limits as to what is
19 described with regard to that app.

20 Q The content management application,
21 BD-J app 2, I mean, that was included in your
22 declaration, correct?

1 And to save some time, I'm referring
2 specifically to our conversation about paragraph
3 69, where you refer to "Ueda server determines
4 what content management application to provide to
5 the content-providing device," at which point,
6 referring to paragraph 148, we agreed that
7 paragraph 148 is describing BD-J app 2.

8 Does that sound right?

9 A Paragraph 148 is describing BD-J app 2;
10 that is correct.

11 Q Which is discussed in your declaration
12 in paragraph 69, correct?

13 A My paragraph 69 describes BD-J --

14 Q I'm referring to the second half of
15 paragraph 69, on the top of page 28, the sentence
16 that begins "second," in that sentence, you
17 describe "Ueda server determines what
18 content-management application to provide to the
19 content-providing device."

20 Do you see that?

21 A I do. And in paragraph 148, that is
22 cited in that paragraph, refers to BD-J app 2.

1 But the rest of the paragraph refers to BD-J,
2 without specific reference to BD-J app, and I
3 cannot find, anywhere in my declaration, an
4 explicit naming of BD-J app 2. So with regard to
5 giving you are a fulsome answer as to the extent
6 of the description Ueda of the functionality of
7 BD-J app 2, as I stated before, I'm not able to do
8 so today without taking the time to go through
9 Ueda more exhaustively, considering that question.

10 Q So we have, in your testimony, a
11 description of this content management
12 application. I'm happy to give you as much time
13 as you need, but I really need to understand what
14 your opinion is on what BD-J app 2 was doing. It
15 is in your testimony and we need to understand
16 what your opinion is.

17 So if you'd like more time to look at
18 it, I'm happy to give it to you, but is it fair to
19 say that everything that we've discussed so far
20 about BD-J app 2 is all the description that Ueda
21 has about what BD-J app 2 is doing?

22 MR. KNIERIM: Objection. Form. Asked

1 and answered.

2 A If you'd like me to take the time, as I
3 said, I'm happy to go through Ueda to see, more
4 carefully than a cursory search, whether there is
5 further description of the functionality of BD-J
6 app 2. But so far, I can only agree to the extent
7 that the description that's provided in
8 paragraphs -- or I guess the summary of the steps
9 that are carried out in paragraphs 137 through
10 139, with possible elaboration if the accounting
11 processing is what is meant by the settlement and
12 those details there. Those are elements of BD-J
13 app 2. But, once again, I cannot, without going
14 through Ueda carefully, state that that is the
15 full extent of the responsibility or the
16 functionality of BD-J app 2.

17 Q Sure. Go ahead and take your time,
18 then.

19 A Okay. In that case, I'd probably
20 request a short break first, just so I can have
21 a -- because it'll take me some time to go through
22 Ueda and rather than taking a break in the middle

1 of that, I would say, take a short break now and,
2 then I'll resume looking at Ueda.

3 Q How about this: Before we take a
4 break, since I think we've been going a while
5 anyways, I'll ask you one follow-up question,
6 which I think we're getting close to the
7 agreed-upon time for lunch anyways. So let me
8 start there.

9 You have a digital file copy of Ueda in
10 front of you, correct?

11 A I do.

12 Q So, you have access to shortcut
13 functions, like control F, for finding text within
14 the document, correct?

15 A That is correct.

16 Q If you type in "BD-J app 2," you can
17 see that that text appears 15 times in Ueda,
18 correct?

19 A I did not do a count. But to sort of
20 short-circuit where you're going with that, as you
21 were just giving the example in my declaration,
22 you've stated that, well, I referred to BD-J app 2

1 or described BD-J app 2 in my declaration, and I
2 did not explicitly use BD-J app 2 as the
3 terminology there.

4 So if you're asking me to look through
5 Ueda to see what is described with respect to BD-J
6 app 2, I'm not going limit myself to simply using
7 control F or command F to look for it. I'm going
8 to read through and look for terminology that is
9 relevant to that app that may not use BD-J app 2,
10 but may say the app referred to previously or the
11 management functionality that is part of that
12 process.

13 So, as I said, I'm happy to take the
14 time to do so, but I'd like to take a short break
15 first.

16 Q Sure. I understand that. That's not
17 where I was going. I wanted to just look through
18 each of the references to BD-J app 2 before we go
19 on that break because I think there aren't many,
20 and we've covered most of them so far.

21 A Yeah, so I'm happy to look at those
22 with you. But as I said, I'm not willing to

1 stipulate that that's the full exhaustive set of
2 descriptions of BD-J app 2 in Ueda without taking
3 the time to go through Ueda carefully.

4 Q No, I understand. There might be some
5 other text saying the content management system
6 mentioned above, that could not be captured in
7 that. But I want to look, specifically, at the
8 language referring to BD-J app 2 for the moment.

9 So, the first of those is paragraph
10 122.

11 Please let me know when you're there.

12 A The first instance I find is actually
13 paragraph 124.

14 Q I'm looking at paragraph 122, which, I
15 believe, also includes BD-J app 2.

16 A I don't see that. I see, with the
17 processing example shown in Figure 7, the
18 following three content management applications
19 are employed.

20 That does not state BD-J app 2.

21 Q Maybe the numbering I'm looking at is
22 incorrect. There is a sentence, either at 122 or

1 124, that states "second content management
2 application BD-J app 2," correct?

3 A As I stated, paragraph 124 is the first
4 instance I find where BD-J app 2 is mentioned.

5 Q And in this paragraph, it just mentions
6 the application, it does not describe the
7 functionality, correct?

8 A That is correct.

9 Q And then the next instance is
10 paragraphs 135 through 139, which we already
11 discussed, correct?

12 A Sorry, paragraphs 135 through?

13 Q 139, 139 being the optional accounting
14 processing.

15 A That is correct.

16 Q So we've already discussed those.

17 The next is in paragraphs 148 to 149,
18 which we discussed previously, correct?

19 A That is correct.

20 Q Following that is the language that you
21 pointed us to in paragraphs 170 and 171, correct?
22 So we've already discussed that.

1 A That is correct.

2 Q And there are two more references in
3 paragraph 485. Let me know when you're at 485.

4 A Yes.

5 Q And the references to BD-J app 2 here
6 don't describe additional functionality that we
7 haven't already discussed for BD-J app 2, correct?

8 A Well, they're additional to the
9 information that was listed in the initial
10 paragraphs, and that deals with the display of the
11 information. That was not included.

12 Q So it's explaining that the information
13 from BD-J app 2 can be displayed, but it's not
14 describing additional functionality of BD-J app 2,
15 correct?

16 A Yes, it's the output information from
17 BD-J app 2 that is displayed and that would be,
18 presumably, the processing that is carried out
19 that was summarized in the list from paragraphs
20 136 through 138.

21 Q And understanding that there could be
22 some antecedent reference to BD-J app 2, like,

1 saying the application discussed above, that is
2 not captured by searching just for that term, that
3 encapsulates every reference, specifically, to the
4 language BD-J app 2 that's in Ueda, correct?

5 MR. KNIERIM: Objection to form.

6 A With regard to explicit mentionings of
7 the phrase "BD-J app 2," based on what I've been
8 able to find by search, that is all I've been able
9 to find.

10 Q And there's no other functionality of
11 BD-J app 2, in any of those references that we
12 have discussed today -- that we have not discussed
13 yet today, correct?

14 A I don't understand your question, given
15 the --

16 Q We have discussed all of -- let me
17 start over.

18 There is no additional functionality of
19 BD-J app 2 that is described in these explicit
20 references to BD-J app 2 by the language BD-J app
21 2, other than what we've already discussed here
22 today, correct?

1 MR. KNIERIM: Objection to form.

2 A I'd want to go over those paragraphs
3 carefully, once again, to be sure that I'm not
4 missing something, as this is the first time I'm
5 considering this specific question. And so far,
6 it's just been sort of cursory glance through
7 there. So, again, after the break, I'd be happy
8 to take a look at that.

9 Q I thought, before, your concern was
10 things that could be present anywhere else in
11 Ueda. Are you saying you haven't read the
12 paragraphs that we've been discussing yet either?

13 MR. KNIERIM: Objection to form.

14 A I've read the paragraphs --

15 THE WITNESS: Sorry. I was speaking
16 over your objection.

17 MR. KNIERIM: It's on the record, go
18 ahead.

19 A I was reading those paragraphs, but I
20 was not reading them in detail to analyze whether
21 there was a full alignment of the described
22 functionality with the summary that is provided in

1 only those paragraphs 136 through 139, in this
2 case.

3 MS. MONDRY: Okay. Then I think,
4 noting that it's 20 minutes earlier than we
5 originally discussed for lunch, now might be a
6 good time to take a break. And if you need
7 additional time to make sure that we understand
8 your testimony on this point, please, go ahead and
9 take it.

10 MR. KNIERIM: I would just say, I would
11 like to say on the record, if you would like the
12 witness to review the document, he should do that
13 on the record, on your time. But we can certainly
14 take a break and reconvene.

15 MS. MONDRY: I'm -- well, let's take a
16 break. We can do it on record, but I do think it
17 is fair that we get an answer about what the scope
18 of his testimony is, on something that's in his
19 declaration. I'm happy to do it on the record so
20 that he has the time to look through it, if he
21 doesn't feel comfortable having read the
22 paragraphs that discuss BD-J app 2.

1 MR. KNIERIM: I'll just say I disagree
2 that that's a fair question. His declaration is
3 his declaration. He has testified that he hasn't
4 considered your specific question.

5 But, let's go off the record, take a
6 break, and you can come back on.

7 (Recess taken from 12:41 p.m. to
8 1:31 p.m.)

9 BY MS. MONDRY:

10 Q I'd like, if we could turn, next, to
11 Ueda, specifically, and take a look at Figure 17.

12 Could you let me know when you have
13 that in front of you.

14 A I do.

15 Q And if you can take a look at paragraph
16 241, in relation to Figure 17, and let me know
17 when you have that in front of you, as well.

18 A Okay.

19 Q In paragraph 241, Ueda explains that
20 "The example in Figure 17 is not a replacement of
21 commercial content recorded in the disc but is an
22 example for adding new commercial content."

1 Do you see that?

2 A Again, slight misreading of the text,
3 but, generally, that's fine.

4 Q And Figure 17, generally, is a diagram
5 describing download process -- a download process?

6 A That's pretty much what's described in
7 the first sentence of paragraph 241.

8 Q Then it describes --

9 MS. MONDRY: I will repeat the stuff
10 about that.

11 Q Apologies, Dr. Cooperstock.

12 A No apologies necessary.

13 Q I think the next question was relating
14 to the steps that are identified in Figure 17.

15 Do you see those indicated by S and
16 following three digits, for example, S301?

17 A Yes, I see step S301.

18 Q And S301 is indicated by an area from
19 the user to the BD-J app that is on disc 100,
20 correct?

21 A That is correct.

22 Q And that step is titled "Activation

1 Specification of Title," right?

2 A That is correct.

3 Q So, in this step, this is the user
4 selecting a title off of the disc that they would
5 like to watch, correct?

6 A As paragraph 242 of Ueda describes,
7 step S301 is the user activating a content
8 management application, a BD-J app recorded in the
9 disc 100 through the input unit of the
10 content-providing device 150. And it seems that
11 the text that appears in Figure 17, accompanying
12 step S301, is rather than so much describing the
13 step, it's perhaps more the data that is conveyed
14 from the user to the BD-J app as part of that
15 step.

16 Q So, the data that's conveyed by the
17 user to the BD-J app is specifying the title that
18 the user would like to watch, correct?

19 A The specification of the title.
20 Specifying would be the app the user performs, the
21 specification would be the data that is resulting
22 from that app.

1 Q So, the data that the user transmits to
2 the BD-J app is the specification of the title it
3 would like to watch, correct?

4 A That would appear to be consistent with
5 Figure 17 and the description of the activity
6 carried out in that step.

7 Q And then, we have another step after
8 that, S302, which shows an arrow from the BD-J app
9 on disc 100 to server 191.

10 Do you see that in Figure 17?

11 A I see step S302 in the same figure,
12 yes.

13 Q And it is represented by an arrow going
14 from BD-J app on disc 100 to server 191, correct?

15 A That is correct.

16 Q And that arrow, for S302, shows
17 conveying information, such as content ID, volume
18 ID, media ID, et cetera, from disc 100, correct?

19 A As paragraph 243 elaborates, the
20 information that is obtained from the disc is at
21 least one of those items. So not necessarily all
22 of them, but at least one of them.

1 Q So at least one of those items is
2 conveyed from the application running on the disc
3 to server 191 in S302?

4 A The information is obtained that is
5 information recorded in the disc 100 and is
6 conveyed to the server -- conveyed to server 191.

7 Q That's occurring at step S302, correct?

8 A That is correct.

9 Q And after that, here, I'm referring to
10 paragraph 244, Ueda states "upon receiving a
11 download request from the content-providing device
12 150, the server 191 obtains a download content
13 from a database based on the received disc
14 recorded identification information, and so forth,
15 to transmit this to the content-providing device
16 150," correct?

17 A That's what is stated in paragraph 244.

18 Q So, after receiving this request from
19 the application, which is running on disc 100,
20 server 191 takes that information and obtains the
21 download content from a database resident on
22 server 191, correct?

1 MR. KNIERIM: Objection. Form.

2 A So let's break down the steps as are
3 described in paragraph 244. We have what you
4 described earlier, from step 302, is the
5 information conveyed by the BD-J app to the server
6 191. And when the server receives that
7 information, well, actually, it's saying upon
8 receiving a download request from the
9 content-providing device 150. So, we need to --
10 so we have the content-providing device 150 is in
11 the middle of the figure, and that download
12 request is not explicitly shown, it would seem, in
13 Figure 17, as I do not see an arrow from figure --
14 from the content-providing device to the server.
15 Upon receiving a download request from the
16 content-providing device 150, the server 191
17 obtains a download content from a data, based on
18 the received disc recorded information
19 identification information, and so forth, to
20 transmit this to the content-providing device 150.
21 So there's back-and-forth communication
22 there between element 191, the server, and the

1 content-providing device 150, again, not shown
2 explicitly as illustrated in Figure 17.

3 So I see the steps described in the
4 paragraph. I'm not sure those are the same steps
5 that you outlined in your question, but
6 summarizing what's in paragraph 242, those are
7 steps taking place, but, again, not explicitly
8 demonstrated or indicated in the figure.

9 Q Okay. We can put Ueda aside for the
10 moment.

11 Could you, please, bring back up your
12 declaration, specifically, Exhibit 2001.

13 A Yes.

14 Q Could you take a look at paragraph 71.

15 And let me know when you have that in
16 front of you.

17 A I have the paragraph in front of me.

18 Q In this paragraph, you state that Ueda
19 already characterizes the communication session,
20 correct?

21 MR. KNIERIM: Objection. Form.

22 A I state, at the beginning of paragraph

1 31, "Ueda discusses the use of various information
2 that 'Characterizes the communication session'."

3 Q For example, you point to an identifier
4 that's located on physical disc S282 in Ueda as an
5 example of characterizing the communication
6 session, right?

7 MR. KNIERIM: Objection. Form.

8 A I don't see any wording to state that
9 it's as an example. I state, "As shown, the user
10 selects a BD-J title S281, which in turn triggers
11 a BD-J app to select an identifier located on the
12 physical disc S282."

13 Q So that's not an example of Ueda
14 characterizing the communication session?

15 A It is, as shown, something that is
16 shown in Ueda. I haven't characterized it as an
17 example. I've said this is something that Ueda
18 shows.

19 Q Well, you have a statement at the
20 beginning of paragraph 71 saying that Ueda
21 discusses the use of various information and
22 characterizes the communication session, et

1 cetera.

2 I am just trying to ascertain, when
3 you're discussing an identifier, is that an
4 example of that statement that you have made or is
5 it not?

6 A What are you asking as to what is --
7 what may be an example of an identifier?

8 Q The very first sentence in paragraph
9 71, you state, "Ueda discusses the use of various
10 information that characterizes the communication
11 session in order to determine which content to
12 request from the content server," and so on.

13 Could you, please, explain to me what
14 was discussion of use of various information that
15 characterizes the communication session? I think
16 the implication here is that what you describe
17 here in this paragraph is meant to be an example
18 of that, but it seems like now you're saying that
19 that's not the case.

20 A I haven't stated one way or the other.
21 I just stated I have not described it as an
22 example. I did not use that language.

1 So, I'm going to take the time to look
2 through and see the text that Ueda provides that
3 will help me answer that.

4 Okay. The examples that I provide, I
5 do provide examples later in the paragraph that
6 we're referring to, paragraph 71, about halfway
7 down page 29, beginning with "Ueda also includes a
8 variety of additional information that
9 characterizes, as alleged by Peloton, the
10 communication session, including user ID
11 content-providing device ID and allowed processing
12 list and even management data."

13 Q Okay. So --

14 A Those are some of the examples that
15 Ueda describes that characterize the communication
16 session.

17 Q Okay. So a user ID is an example of
18 Ueda characterizing a communication session in
19 your testimony; is that right?

20 A That is correct. That is one such
21 example.

22 Q And that's because, as you state, this

1 information serves to characterize the
2 communication session by providing additional
3 metadata related to the nature of the session, as
4 well as information on what will or will not be
5 transmitted as part of the communication session,
6 right?

7 A I believe you've quoted that correctly.

8 Q Could you, please, pull back up the SIP
9 standard and, again, that's Exhibit 1004. And let
10 me know when you have that.

11 A I do.

12 Q Could you, please, turn to page 11.
13 And let me know when you're there.

14 A I am there.

15 Q That last paragraph on page 11 begins
16 "SIP is based on an HTTP-like request response
17 transaction model."

18 Do you see that?

19 A I do.

20 Q Okay. In this paragraph, the SIP
21 standard discusses that example invite message
22 that we discussed earlier today, correct?

1 A This appears to be connected, as well,
2 to Figure 1, yes.

3 Q And here, the SIP standard explains
4 that those invite messages -- those invite
5 requests can contain a number of header fields,
6 and we went over a couple of those earlier as
7 well, right?

8 A We did.

9 Q And those header fields are named
10 attributes that provide additional information
11 about a message, correct?

12 A That is stated in the paragraph.

13 Q Can you move back up in the same
14 document to page 5. That should be the table of
15 contents.

16 On page 5 you should see subheading 20,
17 which is identified header fields.

18 Do you see that?

19 A I do.

20 Q And below that are a bunch of
21 subheadings point 1 all the way through point 44,
22 within Section 20.

1 Do you see that?

2 A I do.

3 Q Each one of these subheadings is
4 describing header fields that are described in the
5 SIP standard, correct?

6 A Yeah. Section 20 provides a listing of
7 the header fields that are -- the full set of
8 header fields supported or described under the SIP
9 standard.

10 Q I'd like to take a look at a couple of
11 them, maybe starting with 20.13, Content Language,
12 which should be on page 169.

13 Let me know when you have that.

14 A Yes.

15 Q So, 20.13 is a header for content
16 language and it gives the example of FR, which
17 presumably stands for French, the French language,
18 right?

19 A Typically, that's the usage of that
20 notation, yes.

21 Q So, here, this header is providing a
22 way to characterize the language of the content

1 that is going to be conveyed during the session,
2 correct?

3 MR. KNIERIM: Objection to form.

4 A I would have to turn to, as what's
5 described in Section 7, the HTTP/1.1
6 specification, where details are offered as to
7 what the 14, I believe it was 14, H14.12 is all
8 about, given that there's minimal description, if
9 any, under 20.13.

10 Q Sure. Do you have any other possible
11 explanation for what content language could mean,
12 other than the language of the content?

13 A I would want to see the document that
14 refers to -- that is referred to in that section
15 to comment. I don't like to make guesses without
16 seeing the description of the document -- in the
17 document to which that section refers.

18 Q Okay. How about turning to page 48.

19 And let me know when you have that.

20 A Okay.

21 Q And there's a Section 8.2.3. The
22 second sentence in that section begins "If there

1 are any bodies."

2 Do you see that?

3 A I do.

4 Q It states "If there are any bodies
5 whose type, indicated by content type and
6 language, indicated by the content language, et
7 cetera."

8 So is it safe to say that content
9 language indicates the language of the message?

10 MR. KNIERIM: Objection to form.

11 A What this describes is bodies, whose
12 type is indicated by the content type.

13 Q So, the content language field
14 indicates a language of the body of a message to
15 be sent, correct?

16 MR. KNIERIM: Objection. Form.

17 A Sorry. In fact, what I read was not
18 even pertaining to language. I just read the
19 beginning of that sentence, which was "type
20 indicated by the content type, language indicated
21 by the content language." So any bodies whose
22 language is indicated by the content language, the

1 body, presumably, the same as that referred to in
2 the second line of that paragraph, the body of the
3 message. So it would seem to indicate the body --
4 the language of the body of the message indicated
5 by content language. But, again, to be sure, I
6 would want to look at the reference that was
7 provided, referring to the HTTP 1.1 document.

8 Q Does Ueda describe anywhere providing a
9 way to characterize the language of the messages
10 that are sent?

11 Dr. Cooperstock, is there something in
12 particular that you're reviewing that has anything
13 to do with characterizing the language of a
14 message in Ueda?

15 A Yes. I'm looking to see what would be
16 the appropriate descriptions for this sort of
17 general class of contents that the user would
18 select from, where language would be logically an
19 option, whether that would just be the list of
20 content itself or whether there might be some
21 preliminary selection that would specify that.

22 From what I've seen so far, obviously,

1 you interrupted my search, it would seem more
2 likely to just be in the set of contents
3 displayed, as probably part of that BD-J app 2
4 processing step that we were looking at earlier,
5 where you would potentially have different
6 languages of content from which the user could
7 select.

8 But as I'm sure you're aware, Ueda does
9 not explicitly recite language selection, so I'm
10 sort of speculating as to where that -- where such
11 choice would logically be available within the
12 description or the specification of Ueda.

13 Q Okay. So Ueda doesn't mention
14 characterizing anything about the language of the
15 content explicitly in the document itself?

16 MR. KNIERIM: Objection to form. I'll
17 note, counsel, you asked him anywhere and cut him
18 off while he was reviewing.

19 You can answer.

20 A From what I reviewed so far, I haven't
21 found anything explicit that talks about language
22 selection. And as I said, I was speculating as to

1 where, logically, a POSITA reading Ueda would
2 consider it appropriate to provide for the user of
3 the option of specifying the language of the
4 content to be delivered.

5 Q So this is something that a person of
6 ordinary skill in the art could consider as part
7 of Ueda, but nothing that Ueda describes itself?

8 MR. KNIERIM: Objection to form.

9 A Ueda does not explicitly articulate
10 anything involving language specification.
11 Rather, Ueda, talks about the list of content from
12 which a user can select. I'm happy to take more
13 time to search further to see whether there may be
14 anything more appropriate. But at a cursory
15 glance, from what I've been able to look through
16 so far, it would seem to me, as reading it through
17 the eyes of a POSITA, that the list of contents
18 could logically include, here's the English
19 version, here's the French version. Which one do
20 you want to select?

21 Q Okay. Let's look back at the SIP
22 standard. Another one of those headers is in --

1 is under subsection 20.26, priority.

2 Do you see that?

3 A I see 20.26, priority.

4 Q And that header indicates the urgency
5 of a request, as perceived by the client, right?

6 A That is what the first sentence of that
7 section states.

8 Q Ueda doesn't describe any way that the
9 messages sent by the client can characterize an
10 urgency to the request, correct?

11 A The architecture described by Ueda, I'm
12 having trouble speculating, as I'm standing here
13 right now, just sort of considering this question,
14 obviously, it's not something that I've addressed
15 anywhere in my declaration, so this is venturing
16 far into hypothetical territory. But the
17 architecture that Ueda describes is one in which
18 there is a known server and a fixed set of content
19 from which the user is going to be obtaining
20 information and, as such, urgency doesn't really
21 seem to make sense in this content, given that the
22 user, the client in this case, is going to issue

1 the request, and the server is going to respond to
2 it. There's not a matter of triaging different
3 levels of priority in what request needs to be
4 handled differently.

5 I don't recall, in my reading through
6 Ueda, anything involving multiple requests being
7 triaged and so forth. I'd have to go through Ueda
8 further to see if that is discussed. And if so, I
9 could speculate further on questions of priority.

10 But off the cuff, just trying to
11 speculate here as to whether Ueda's description
12 would anticipate -- or I shouldn't use the word
13 anticipate, I know that has a very clear legal
14 terminology -- or legal meaning.

15 Whether Ueda deals with -- let me just
16 see here. Yeah, Ueda describes multiple content
17 of information coming and multiple devices. But I
18 don't see multiple requests that it's for multiple
19 clients.

20 So, the concept of priority, again,
21 purely speculative here, doesn't seem to be
22 something that would be relevant to an

1 implementation of Ueda.

2 Q And because, per your testimony, it's
3 not relevant, it's not discussed at all in Ueda?

4 A Ueda's description is really dealing
5 with a single user communicating with the server,
6 obtaining -- there may be multiple servers, so
7 whichever server is specified by the URL contained
8 on the disc, on the Blu-ray disc, that's
9 specifying from where to get content. But Ueda is
10 not dealing with questions of priority.

11 Q Let's look at another header. There's
12 under subheading 20.42, referring back, again, to
13 the SIP standard, that should be page 179.

14 Let me know when you have that.

15 A Which field was it, 20-point?

16 Q 20.42.

17 A Yes.

18 Q And the via header indicates a path
19 taken by a request and indicates a path that
20 should be followed in routing responses, correct?

21 A That's what that section states.

22 Q Ueda doesn't disclose anything having

1 to do with the path that a message has taken so
2 far in its travels or the path that it should
3 follow in routing the response, correct?

4 A Yeah, again, this is well outside of --
5 to the best of my knowledge, anything I've
6 discussed in my declaration. So, to be clear,
7 again, you're asking me to speculate, unless you
8 want to point me to a section in my declaration
9 where I've addressed this sort of topic, I just, I
10 want to be clear that this is speculation that
11 Ueda, again, dealing with a known URL for which
12 the server is -- which the server is going to be
13 contacted, has reliance or it has the means of
14 relying on existing IP routing protocols, domain
15 name resolution, so forth, to get to that server
16 and for the server to return the requested
17 information. It's not going through the same
18 steps as the SIP standard envisions for locating a
19 mobile user who may be at an unknown address for
20 which the sort of protocols or the provisions of
21 this SIP standard become relevant. Ueda doesn't
22 consider that functionality because it's not

1 inherently something that Ueda needs, given that
2 the server is at a known fixed location and there
3 exists protocols, such as DNS, to determine the
4 path to that address.

5 Q So you kind of got there at the end.

6 In Ueda, though, a connection between
7 the client device and the server is not jumping
8 through the air from point A to point B. I mean,
9 there are intermediary, you know, switches and
10 backbones that are part of that process for the
11 connection, correct?

12 MR. KNIERIM: Objection to form.

13 A Internet communication, typically,
14 unless you're dealing with a local area network or
15 a communication isolated within a local area
16 network, involves going through some form of
17 intermediate network devices, switches, hubs,
18 routers, so forth. And there exists well-known
19 Internet protocols, such as DNS, that deal with
20 lookup and the general IP routing standards, as
21 part of the IP step, that handle the delivery of
22 messages or delivery of data from one machine or

1 one IP address to another.

2 So Ueda, in providing a URL at which
3 the server is going to be contacted, can rely, and
4 would logically rely, on those protocols for
5 transmitting the contents back and forth between
6 those end points, that is the user device and the
7 server.

8 Q Could you turn, next, in the SIP
9 standard, to 20.18 at 171.

10 Let me know when you're there.

11 A 20.18?

12 Q Yeah. And that header is Error Info,
13 correct?

14 A That is correct.

15 Q And that's a header that provides
16 information about errors, correct?

17 A Information -- additional information
18 about the error status response.

19 Q Ueda doesn't describe anything about
20 error handling or how to process that or ways to
21 provide additional information about errors,
22 right?

1 MR. KNIERIM: Objection to form.

2 A So, again, you're really asking me to
3 speculate on contents and topics that I have not
4 discussed at all in my declaration. So with that
5 caveat in mind, I'll note that this is an instance
6 where the SIP standard is intended for a wide
7 variety, almost generic types of media
8 communications or data communications between two
9 end points. And as such, includes, as per the
10 examples at the end of 20.18, a situation in which
11 one user is trying to reach a number that is not
12 in service.

13 So a telephony or a void-style
14 communication for which that kind of error would
15 logically be presumed to occur on occasion.

16 With Ueda, again, you're dealing with a
17 known server that is a repository of content that
18 is going to retrieve content relevant to the
19 material that's stored on the Blu-ray disc. It's
20 not an ad hoc communication between two
21 individuals for which such errors are going to
22 occur. Ueda has a very specific intent, in terms

1 of what content is being requested from where. It
2 is not intended to be generic. And as such, the
3 error info is something that is somewhat outside
4 of the scope of what would be relevant to a POSITA
5 reading Ueda and considering how to implement
6 that.

7 Q So, a user provides, according to Ueda,
8 attempting to connect to server 191 must always
9 succeed and will never experience any errors?

10 A If the communication path is not able
11 to succeed and the server is down, it's not going
12 to be a situation where displaying information to
13 the user as to the cause of that will help the
14 user resolve the situation. Whereas, for SIP, the
15 display, the number dialed is not in service, in
16 useful, actionable information. Again, the
17 purposes of Ueda and SIP are very different. Ueda
18 is in the background, invisibly to the user,
19 acquiring the information that the user as
20 requested -- or the content that the user has
21 requested. If that content cannot be delivered,
22 the user can't do anything about it to find

1 another number to call, for example, to reach that
2 content. They're going to be stuck.

3 So --

4 Q So --

5 A -- unless Ueda were meant to
6 encapsulate a larger scope of functionality that
7 involved users being able to say, okay, I want to
8 get my content from a different source instead,
9 then the provisions of SIP are not really relevant
10 for those needs.

11 So, again, a POSITA reading Ueda is not
12 going to consider what kind of error information
13 do I have to convey to the user. It's outside of
14 the scope of what would be useful.

15 Q So there's no description in Ueda of
16 error handling?

17 MR. KNIERIM: Objection to form.

18 A Once again, you're asking me questions
19 that are not part of my declaration or questions
20 that I've considered. If you want me to consider
21 this properly, I would have to go through Ueda
22 fairly exhaustively. With a quick search on terms

1 that come to mind very briefly, as I'm standing
2 here, I see success related to authentication.
3 So, presumably, there would be a failure of
4 authentication that could be considered. But
5 that's not to do with communication failure, that
6 would be the user is not authorized to receive
7 content or specific content.

8 Again, it would not make sense or be
9 useful for an implementer of Ueda to deal with
10 reporting of that error beyond saying that
11 authentication has not succeeded, in which case,
12 as per Figure 25 and the related discussion in
13 Ueda, at that point, the playlist download
14 processing is simply terminated.

15 Q Dr. Cooperstock, is it your testimony,
16 sitting here today, that in preparing this
17 declaration you read Ueda carefully and
18 thoroughly?

19 A I read Ueda. Ueda is a fairly lengthy
20 document, 58 pages. I did not read carefully
21 every single word in Ueda. And if you're asking
22 me, now, a very specific question that was outside

1 of my consideration when considering the teachings
2 of Ueda for the purposes of preparing my
3 declaration, I would have to take the time to go
4 through it again.

5 Q It's your testimony, referring to
6 paragraph 70 of your declaration, that Ueda's
7 transmission already does this, where "this"
8 refers to transmitting information characterizing
9 the communication session, correct?

10 A You'll have to give me a chance to turn
11 to paragraph 70 in my declaration first.

12 Yes, it is my testimony that Ueda's
13 transmission characterizes the communication
14 session.

15 Q So my questions, which I believe are
16 exactly related to this topic, are ways in which
17 the SIP standard provides for other ways that
18 characterize the session that are not described in
19 Ueda.

20 So I believe that's fairly on point for
21 the opinion that you've provided here.

22 MR. KNIERIM: Is that a question,

1 Counsel? Objection. Form.

2 MS. MONDRY: Yes.

3 Q Dr. Cooperstock, let me just return to
4 my question.

5 There is nothing in Ueda that describes
6 handling errors?

7 MR. KNIERIM: Objection to form. Asked
8 and answered.

9 A Again, I would have to go through Ueda,
10 once again, or through the document, to see what
11 is described or what may be described with regard
12 to error handling.

13 But as I stated earlier, it seems to be
14 outside of the scope of the intent of Ueda, and
15 outside of what a POSITA would consider relevant
16 to any limitation of Ueda, to be concerned with
17 reporting of the error status in the case of a
18 failure of communication with the server.

19 Q Okay. Let's turn, now, to the SDP
20 standard, which I believe is Exhibit 1005.

21 Let me know when you have that.

22 A I do.

1 Q Keep it to the side for a moment. I'd
2 like you, very briefly, to turn back to your
3 declaration, Exhibit 2001, paragraph 80.

4 Let me know when you have that.

5 A Yes.

6 Q Actually, we're going to jump ahead to
7 paragraph 79, very quickly, first.

8 Here, you say "Petitioner identifies
9 three pieces of information that use of the SDP
10 standard would provide."

11 Do you see that?

12 A I do.

13 Q And those three things that you put
14 down are media details, transport addresses, and
15 other session description metadata.

16 Do you see that?

17 A I do. Quoting from the reader
18 declaration and the petition.

19 Q And then, going into paragraph 80, you
20 say, "All of this information is already provided
21 for in Ueda."

22 Do you see that?

1 A I do.

2 Q Okay. So, now turning back to the SDP
3 standard.

4 Please take a look at page 22.

5 Let me know when you have that.

6 A Yes.

7 Q I believe we actually looked at this
8 earlier. This is the m= media description field,
9 correct?

10 A The media description, m=, yes, with
11 the subfields.

12 Q Right. So below, in this section, it
13 provides a list of subfields within the m= field,
14 correct?

15 A That is correct.

16 Q For example, one of those, on page 22,
17 is the ports subfield.

18 Do you see that?

19 A I do.

20 Q And on the next page, on page 23, is
21 subfield proto.

22 Do you see that?

1 A Yes.

2 Q And that indicates the transport
3 protocol to be used for communication, correct?

4 A Correct.

5 Q Ueda doesn't provide for a way to
6 indicate the transport protocol being used for
7 sending information, correct?

8 MR. KNIERIM: Objection to form.

9 A Again, as in your previous questions,
10 these are topics that have not been touched upon
11 as far as I know, at any extent, in my
12 declaration. So, again, with the caveat that this
13 is outside the scope of things I've considered
14 already.

15 Looking at Ueda, Ueda does not
16 prescribe a specific protocol for downloading of
17 contents. There is mention of URL for accessing
18 the server, as we know, accessing URLs is done
19 with one strict protocol, which is HTTP, and that
20 is a TCP-based protocol. For the downloading,
21 presumably, as of the time of Ueda, where live
22 streaming was not imperative and reliable delivery

1 was, a POSITA would likely turn to TCP, as well,
2 for that transfer, thinking in the eyes of the
3 practitioner or the POSITA reading Ueda. But,
4 again, Ueda is not, from what I can tell,
5 providing a specific prescription as to what
6 protocol or protocols should be used.

7 Q Let's take a step back from SDP, and I
8 have more of a general question for you.

9 Let's assume that you created a content
10 delivery system that practices claim 1 of the '427
11 patent. A user device, that wants to connect with
12 the media server of the '427 patent, requests a
13 connection that requires one million megabits per
14 second. If the content delivery system is unable
15 to handle that request, is it your opinion that
16 that device is not practicing the patent?

17 MR. KNIERIM: Objection to form.

18 A Let me, first, make sure I understand
19 the question before I can adequately consider it.

20 So, considering claim 1 of the '427, if
21 a client requests from the server media that has a
22 bandwidth requirement of one megabit per second --

1 Q One million.

2 A One million megabits?

3 Q One million megabits per second.

4 A One -- what is that? We're talking
5 about a million mega. So we're in, like, the
6 terabits. I can't -- anyway, some very large
7 number of megabits per second.

8 Q Yeah, some very large number of
9 megabits --

10 A Exceeding --

11 Q Yes.

12 A Exceeding media that anybody would
13 consider that a POSITA would consider, even today,
14 for the purposes of the '427 patent.

15 Q A very large number. I threw out
16 one million megabits per second.

17 A Right. If we're talking, again, a
18 million megabits, we're talking about something,
19 like, orders of magnitude more than the highest
20 fidelity video stream. So, again, something
21 dramatically hypothetical. But let's go on with
22 your extreme hypothetical.

1 So, the client is requesting media of
2 that bandwidth demand, or of that bandwidth
3 threshold, and you're saying, if the server cannot
4 meet that, or the server cannot guarantee that
5 bandwidth, then the system, as a whole, is not
6 practicing the patent?

7 Q That's correct.

8 A That's what you're asking me?

9 MR. KNIERIM: Objection to form.

10 Q While you're looking, I'd like to
11 quickly revise one aspect of my question. You
12 mentioned before, the highest fidelity systems
13 that are available.

14 Do you recall that?

15 A Approximately.

16 Q What would be the type of bandwidth
17 that those highest fidelity systems could be able
18 to handle?

19 A As of the time frame of Taniguchi for
20 public Internet use, probably something more in
21 the order of 5 megabits per second, maybe 10
22 megabits per second. That would be -- well, I

1 shouldn't say that would be the upper limit, but
2 that would be sort of a typical number. An upper
3 limit certainly -- well, not certainly, but I
4 would struggle to anticipate systems like
5 Taniguchi being deployed, as of 2017, to handle
6 more than a hundred megabits per second. That
7 would seem, for compressed media, extreme.

8 Q Okay. So then let me re-ask my
9 question.

10 Assuming a content delivery system that
11 practices claim 1 of the '427 patent, if a user
12 device sends in a request that requires a
13 bandwidth of 100 megabits per second and that
14 system is not able to guarantee 100 megabits per
15 second, does that mean that that system is not
16 practicing claim 1 of the '427 patent?

17 MR. KNIERIM: Objection to form.
18 Incomplete hypothetical.

19 A This is an interesting question, and
20 it's one that I am extremely reluctant to try to
21 answer without giving it serious thought in
22 considering the issues around us because, first of

1 all, of course, it's not something I've considered
2 in my declaration.

3 Secondly, it's dealing with a situation
4 that is quite potentially outside of the control
5 of the architecture itself. If the underlying
6 network fabric between sender and receiver cannot
7 support that 100 megabits per second, then all of
8 the systems, itself, all of the client, the media
9 delivery system, the IMS, the servers involved
10 could well be coded or architected to practice the
11 patent but are unable to provide that bandwidth
12 guarantee. Then the question is, what is supposed
13 to happen at that point?

14 What does the '427 patent say should be
15 the outcome? And I don't believe the '427 patent
16 specifies whether the system should simply
17 terminate, raise an error, or something else.

18 So, it's an interesting question, but
19 it's both outside of my declaration. I believe
20 it's outside of the scope of what the patent
21 describes, and it's something that I would have to
22 consider. It's sort of, like, what is the intent?

1 What does it mean if something cannot be -- a
2 bandwidth cannot be met outside of the scope of
3 the implemented entities that are intending to be
4 practicing that patent?

5 And then, conversely, what happens if
6 it's the entities, themselves, rather than the
7 underlying network, whose responsibility is it?
8 Does that mean they're not practicing the patent
9 or practicing claim 1 of the patent?

10 I'm really -- standing here, I'm just
11 sort of speculating on it. I really don't know
12 how to answer that question.

13 Q So the '427 patent doesn't specify how
14 to handle a scenario where it might not be able to
15 service the requested bandwidth?

16 MR. KNIERIM: Objection to form.

17 A Well, again, dealing with this
18 hypothetical and something that I have not
19 considered in preparing my declaration, what I'm
20 seeing in the specification of the '427 only
21 describes the -- part 80. I want to get the right
22 name for that component.

1 There it is. The transport functions
2 part, executing a process to guarantee the
3 communication -- come on, scroll. Communication
4 represented by the communication bandwidth
5 information. The specification, from what I can
6 tell, does not describe what should happen in the
7 case where transport functions part 80 is --
8 executes the process but is unable to provide that
9 necessary guarantee.

10 MR. KNIERIM: I'm sorry. Didn't
11 realize you were still going.

12 A This would be -- just to finish off. I
13 think this would be a case where a POSITA, reading
14 the patent, would, then, have the liberty of
15 deciding what to do in that situation. But it
16 would not preclude a -- one decision from breaking
17 with the teachings of the patent, since the patent
18 does not -- the '427 patent, that is, does not
19 appear to state what should happen in the case of
20 the bandwidth guarantee process not being able to
21 succeed.

22 MR. KNIERIM: Can we take a break in

1 the next couple of questions, if you don't mind?

2 You can finish your question.

3 MS. MONDRY: That was going to be my
4 suggestion. I was going to say, we've been going
5 a little bit over an hour. I think it would be a
6 good time for a break.

7 MR. KNIERIM: Off record.

8 (Recess taken from 2:41 p.m. to
9 2:53 p.m.)

10 BY MS. MONDRY:

11 Q I would like to turn back to the '427
12 patent, Exhibit 1001.

13 And let's start by turning to column 8.

14 Let me know when you have that in front
15 of you.

16 A I'm thinking 101 had to end the patent
17 number.

18 Okay. Column 8, yes.

19 Q Yes.

20 A Okay.

21 Q And the very last paragraph in column
22 8, which continues on to column 9, begins with

1 "the bandwidth guarantee part 81."

2 Do you see that?

3 A I do.

4 Q That paragraph, again, ending at the
5 top of column 9, has in parens there, "bandwidth
6 guarantee process," correct?

7 A That's correct.

8 Q So this paragraph is providing a
9 description of the bandwidth guarantee process,
10 right?

11 A This is providing the summary of the
12 bandwidth guarantee process.

13 Q And going back to column 15, which we
14 did take a look at earlier, there's another
15 paragraph that ends in parens "bandwidth guarantee
16 process," right? That paragraph is column 15,
17 beginning at line 29?

18 A That is correct.

19 Q And there's no other description in the
20 '427 patent of the bandwidth guarantee process,
21 other than the paragraph describing it here, in
22 column 15, and the one we just reviewed, the

1 bottom of column 8, the top of column 9, correct?

2 MR. KNIERIM: Objection to form.

3 A I would have no idea, without going
4 through the patent, exhaustively, to see what else
5 is described that encapsulates the bandwidth
6 guarantee process. There are quite a few
7 additional references that talk about steps
8 involving communicating information relevant to
9 the bandwidth guarantee process.

10 So it's, you know, finding that
11 dividing line between the preliminaries and the
12 actual process, itself, is not something that is
13 just a quick search. But the two paragraphs you
14 identified are examples that describe the -- or
15 summarize the process.

16 Q And you don't identify any other
17 examples, in your report, describing that
18 bandwidth guarantee process, right?

19 A I would have to go through my report to
20 see what paragraphs I have cited to relate to
21 that.

22 Q Did you review your report in

1 preparation for today's deposition,

2 Dr. Cooperstock?

3 A I did. But not with an eye to your
4 question of whether there were any other
5 paragraphs in the '427 patent, to which I
6 referred, that dealt with the bandwidth guarantee
7 process.

8 Q And the bandwidth guarantee process is
9 relevant to one of the few limitations that NEC is
10 disputing in the grounds in Peloton's petition,
11 correct?

12 A Could you repeat the question?

13 Q Sure. Let me ask you something a
14 different way.

15 Referring to your declaration,
16 specifically Exhibit 2001, you include an entire
17 section stating that the SIP standard does not
18 teach the -- sorry, let me rephrase that.

19 Yes, you have an entire section,
20 beginning on page 37, explaining that the SIP
21 standard does not teach the one or more connection
22 control servers executing a process for

1 guaranteeing a communication bandwidth required
2 for transmitting constant content data as a
3 process for establishing a connection, correct?

4 A I do have a section on that, yes.

5 Q And anywhere in that section, do you
6 point to any other examples for the bandwidth
7 guarantee process, other than what we have just
8 discussed in column 15 and the bottom of column 8
9 and the top of column 9?

10 A Sorry, I will come back to your
11 question, but as I'm going through this, I would
12 like to just go back and revise a previous answer
13 I gave when we were talking about protocols that
14 are taught -- I'm sorry, that was with Ueda. Was
15 that with Ueda or the '427?

16 No, I think you raised it with respect
17 to the '427 patent.

18 Q Do you mean protocols as in TCP?

19 A Yes.

20 Q That was in Ueda.

21 A It was Ueda? It was Ueda specifically.
22 Okay. So I don't need to go back to that. I

1 apologize.

2 Unless I'm missing something that you
3 can point me to, I'm not seeing references, in
4 this section, to anything in the '427 patent
5 regarding the bandwidth guarantee process.

6 Q Okay.

7 A That is, no citations to any specific
8 sections within the patent.

9 Q Sure. Okay.

10 Let's take a look at your other
11 declaration that you submitted, which is
12 Exhibit 2010, correct?

13 A That is correct.

14 Q And you also include another section on
15 this same limitation, which begins on page 14,
16 correct?

17 A Correct.

18 Q And you do refer to, for example,
19 column 15, here on page 18, in paragraph 29,
20 right?

21 A Sorry, which column, line numbers were
22 you referring to?

1 Q Column 15, and the paragraph we're
2 referring to begins at line 29.

3 A Right. And then I also note column 13,
4 59 to 64.

5 Q Right. And you quote some language
6 here, which is, "The core IMS part 30 executes a
7 bandwidth reservation process as a preparation for
8 guaranteeing a communication bandwidth," correct?

9 A Right.

10 Q So what's being described here, at
11 column 13, is a preparation for guaranteeing the
12 communication bandwidth, correct?

13 A That is correct.

14 Q But it's not guaranteeing the
15 bandwidth. It's a preparation for guaranteeing
16 the bandwidth?

17 MR. KNIERIM: Objection to form.

18 A Yeah, it appears that this section, in
19 column 13, talks about the preliminary -- line
20 number is 59. Preparation for guaranteeing a
21 communication bandwidth. Yeah, so it's a
22 preparatory step.

1 MS. MONDRY: Dr. Cooperstock, thank you
2 very much for your time. I have no further
3 questions for you.

4 THE WITNESS: Okay.

5 MR. KNIERIM: Let's go off the record
6 briefly. And I will determine if I have any
7 redirect.

8 MS. MONDRY: Sure.

9 (Recess taken from 3:04 p.m. to
10 3:16 p.m.)

11 MR. KNIERIM: Back on the record. I
12 have no questions for you. Thank you for your
13 time, Dr. Cooperstock.

14 THE WITNESS: Thank you.

15 MR. KNIERIM: Off the record.

16

17

18

19

20

21

22

1 CERTIFICATE OF SHORTHAND REPORTER - NOTARY PUBLIC

2
3 I, Judith E. Bellinger, Certified Reporter
4 and Notary Public within and for the State of
5 State of Maryland do hereby certify:

6 That JEREMY R. COOPERSTOCK, PH.D., the
7 witness whose deposition is hereinbefore set
8 forth, was duly sworn by me before the
9 commencement of such deposition and that such
10 deposition was taken before me and is a true
11 record of the testimony given by such witness.

12 I further certify that the adverse party,
13 NEC Corporation, was represented by counsel at the
14 deposition.

15 I further certify that the deposition of
16 JEREMY R. COOPERSTOCK, PH.D., occurred
17 virtually on Tuesday, July 9, 2024, commencing at
18 10:01 a.m. EDT.

19 I further certify that I am not related to
20 any of the parties to this action by blood or
21 marriage, I am not employed by or an attorney to
22 any of the parties to this action, and that I am

1 in no way interested, financially or otherwise, in
2 the outcome of this matter.

3

4 IN WITNESS WHEREOF, I have hereunto set my
5 hand this 23rd day of July, 2024.

6

7 My commission expires:

8 November 3, 2024

9

10

Judith E. Bellinger

11 E-NOTARY PUBLIC IN AND FOR THE

12 State of Maryland

13

14

15

16

17

18

19

20

21

22

A			
a1	accessing	addition	93:2, 93:17,
5:10	137:17, 137:18	50:7, 50:12,	96:13, 103:3,
ab4ce@pc	accompanying	54:2, 58:10,	103:7, 106:2,
58:6	107:11	61:6	111:1, 111:7,
able	according	additional	115:9, 120:5,
10:22, 25:6,	130:7	17:9, 37:4,	124:20, 125:12,
28:9, 28:10,	accounting	46:5, 52:15,	126:4, 126:7,
36:18, 95:7,	88:20, 89:18,	52:18, 69:12,	126:11, 129:2,
102:8, 122:15,	89:22, 90:7,	83:8, 93:4,	129:16, 130:16,
130:10, 131:7,	90:19, 91:2,	101:6, 101:8,	131:11, 131:18,
140:17, 141:14,	96:10, 100:13	101:14, 102:18,	132:8, 133:4,
143:14, 144:20	accurate	104:7, 114:8,	134:9, 134:10,
about	8:16, 49:19	115:2, 116:10,	137:9, 137:12,
9:3, 9:14,	acquiring	128:17, 128:21,	138:4, 139:17,
10:5, 13:7,	21:18, 130:19	147:7	139:20, 143:17,
14:10, 15:1,	acquisition	additionally	146:4
16:10, 23:9,	10:7	53:22	ago
30:19, 33:14,	across	address	12:1, 76:17
34:10, 34:14,	20:16, 33:18,	37:10, 38:20,	agree
34:18, 35:6,	39:14	46:16, 51:17,	25:21, 41:19,
39:20, 46:6,	act	51:21, 53:8,	63:7, 64:15,
47:3, 55:8,	44:2	54:13, 54:18,	96:6
73:13, 75:14,	acting	54:20, 59:20,	agreed
87:9, 94:2,	40:17	126:19, 127:4,	94:6
95:20, 95:21,	action	128:1	agreed-upon
97:3, 104:17,	153:20, 153:22	addressed	97:7
106:10, 114:6,	actionable	123:14, 126:9	ah
116:11, 118:8,	130:16	addresses	36:18
118:18, 121:14,	activated	135:14	ahead
121:21, 122:11,	72:18	adequately	96:17, 103:18,
128:16, 128:18,	activating	32:12, 138:19	104:8, 135:6
128:19, 128:21,	107:7	adverse	air
130:22, 139:5,	activation	153:12	127:8
139:18, 147:7,	106:22	affect	alice
149:13, 151:19	active	31:22	43:4, 43:6,
above	21:10	afraid	43:7, 44:3,
99:6, 102:1	activity	25:13	46:13, 46:17,
absent	26:19, 108:5	after	59:19
58:12	actual	103:7, 108:7,	alice's
ac3	14:5, 24:12,	109:9, 109:18	43:8, 43:13,
29:15	147:12	again	44:9, 45:6,
accept	actually	22:1, 23:13,	49:3, 50:3,
78:11, 78:13	15:11, 16:14,	25:14, 37:4,	50:5, 50:14,
access	99:12, 110:7,	37:16, 39:6,	53:3, 53:9,
25:5, 28:9,	135:6, 136:7	40:4, 47:4,	55:4, 55:18
29:2, 97:12	ad	48:4, 55:2,	alighted
	129:20	59:17, 75:17,	67:7
	adding	84:15, 91:21,	alignment
	39:3, 105:22		103:21

all 9:5, 13:1, 35:20, 39:13, 40:1, 42:1, 42:5, 42:8, 45:21, 48:12, 49:1, 49:10, 52:5, 52:14, 52:18, 57:8, 61:7, 90:5, 93:14, 95:20, 102:8, 102:16, 108:21, 116:21, 118:7, 125:3, 129:4, 135:20, 142:1, 142:7, 142:8 alleged 114:9 allow 22:5 allowed 27:19, 85:3, 85:5, 89:9, 89:11, 91:1, 91:3, 92:14, 114:11 allowing 88:11 almost 129:7 already 16:5, 40:10, 41:10, 85:12, 85:15, 86:7, 100:10, 100:16, 100:22, 101:7, 102:21, 111:19, 133:7, 135:20, 137:14 also 4:3, 6:11, 6:12, 7:4, 7:10, 18:7, 39:3, 42:1, 43:16, 44:1, 44:18, 46:7, 50:13, 59:3, 59:4,	60:20, 63:16, 68:1, 68:7, 83:8, 88:22, 99:15, 114:7, 150:14, 151:3 although 8:9, 82:9 alto 3:13, 3:14 always 130:8 among 20:8 amount 17:6, 17:11, 35:9, 59:8 amounted 17:10 amounts 23:10 analogous 75:22, 77:17 analyze 103:20 another 7:14, 26:7, 53:18, 67:19, 68:4, 68:17, 108:7, 122:22, 125:11, 128:1, 131:1, 146:14, 150:14 answer 7:3, 7:16, 8:1, 8:5, 12:8, 34:22, 35:5, 76:21, 90:11, 93:16, 95:5, 104:17, 114:3, 121:19, 141:21, 143:12, 149:12 answered 37:15, 77:6, 80:8, 84:3, 93:12, 96:1, 134:8 answering 7:14	answers 7:3, 7:5 antecedent 101:22 anticipate 31:6, 124:12, 124:13, 141:4 anticipates 33:16, 34:4 anupam 3:10, 6:12 any 7:21, 8:15, 9:11, 13:15, 22:10, 23:9, 28:22, 29:5, 42:4, 42:5, 80:4, 89:1, 90:15, 93:4, 102:11, 112:8, 118:9, 118:10, 119:1, 119:4, 119:21, 123:8, 130:9, 134:16, 137:11, 147:16, 148:4, 149:6, 150:7, 152:6, 153:20, 153:22 anybody 139:12 anyone 8:20, 12:22 anything 41:6, 79:16, 80:4, 80:10, 92:18, 120:12, 121:14, 121:21, 122:10, 122:14, 124:6, 125:22, 126:5, 128:19, 130:22, 150:4 anyway 139:6 anyways 97:5, 97:7 anywhere 77:2, 95:3, 103:10, 120:8,	121:17, 123:15, 149:5 apologies 14:16, 24:5, 41:3, 90:4, 106:11, 106:12 apologize 69:2, 150:1 app 87:2, 87:5, 87:6, 87:9, 87:10, 87:13, 87:18, 88:2, 89:2, 89:7, 90:15, 91:7, 91:11, 91:14, 92:2, 92:8, 92:19, 93:1, 93:5, 93:10, 93:19, 93:21, 94:7, 94:9, 94:22, 95:2, 95:4, 95:7, 95:14, 95:20, 95:21, 96:6, 96:13, 96:16, 97:16, 97:22, 98:1, 98:2, 98:6, 98:9, 98:10, 98:18, 99:2, 99:8, 99:15, 99:20, 100:2, 100:4, 101:5, 101:7, 101:13, 101:14, 101:17, 101:22, 102:4, 102:7, 102:11, 102:19, 102:20, 104:22, 106:19, 107:8, 107:14, 107:17, 107:20, 107:22, 108:2, 108:8, 108:14, 110:5, 112:11, 121:3 appeal 1:3 appear 15:11, 58:14,
--	--	---	--

61:11, 64:11, 71:12, 71:15, 108:4, 144:19 appears 49:20, 58:11, 60:1, 71:14, 92:22, 97:17, 107:11, 116:1, 151:18 application 5:9, 31:4, 37:18, 48:18, 60:21, 72:18, 72:21, 73:1, 78:13, 78:18, 82:9, 82:15, 84:9, 85:8, 85:12, 85:22, 86:3, 86:5, 86:12, 86:19, 87:1, 87:5, 87:7, 87:12, 92:1, 93:20, 94:4, 94:18, 95:12, 100:2, 100:6, 102:1, 107:8, 109:2, 109:19 applications 23:6, 73:6, 83:14, 99:18 apply 31:13 appreciate 17:18 approaching 29:20 appropriate 120:16, 122:2, 122:14 approximate 17:14 approximately 9:4, 9:14, 12:3, 13:17, 23:1, 140:15 architected 142:10	architecture 28:15, 28:19, 33:3, 33:15, 33:19, 34:2, 34:6, 34:15, 35:8, 36:7, 36:19, 36:20, 37:9, 38:5, 38:17, 38:19, 39:1, 39:11, 39:17, 39:19, 39:21, 40:5, 40:6, 67:6, 123:11, 123:17, 142:5 architecture-rel- ated 34:11 area 106:18, 127:14, 127:15 areas 83:21 aren't 98:19 around 15:4, 141:22 array 33:12, 39:5 arrives 49:6, 49:12 arrow 53:15, 108:8, 108:13, 108:16, 110:13 arrows 44:15 art 20:18, 122:6 articulate 122:9 ascertain 113:2 aside 56:2, 66:12, 111:9 asked 37:14, 77:5,	80:7, 93:11, 93:18, 95:22, 121:17, 134:7 asking 7:16, 38:16, 76:4, 98:4, 113:6, 126:7, 129:2, 131:18, 132:21, 140:8 aspect 140:11 aspects 10:18, 10:19, 29:11, 29:20 assertion 69:16 assist 69:10 assume 8:6, 138:9 assuming 89:17, 141:10 atlanta 43:9, 44:7, 46:16, 49:7, 49:12, 49:18, 49:20, 50:12, 51:1, 51:3, 51:6, 51:11, 51:18, 51:20, 52:4, 52:13, 53:2, 53:14, 53:19, 54:8, 58:6, 58:9, 58:21, 60:12 attached 5:5, 14:2, 16:3, 40:8, 56:1, 76:1, 77:18, 80:18, 82:20 attachment 76:5 attachments 76:6 attempting 130:8 attention 42:9, 56:17	attorney 153:21 attributes 116:10 audibly 7:3 audience 30:20, 31:11 audio 10:8, 20:17, 27:10, 28:2, 29:16, 82:8, 82:14 authentication 132:2, 132:4, 132:11 authorized 132:6 available 26:1, 27:19, 27:22, 28:6, 29:3, 30:4, 30:7, 30:11, 32:13, 39:6, 53:11, 121:11, 140:13 average 23:2 aware 121:8 away 12:5 B b2 5:8 back 10:16, 11:1, 11:3, 11:19, 11:20, 12:7, 15:18, 19:12, 24:1, 25:12, 30:22, 31:5, 34:7, 44:14, 50:2, 53:18, 54:8, 61:14, 66:13, 69:18, 74:1, 82:21,
---	--	---	--

83:10, 85:12, 105:6, 111:11, 115:8, 116:13, 122:21, 125:12, 128:5, 135:2, 136:2, 138:7, 145:11, 146:13, 149:10, 149:12, 149:22, 152:11 back-and-forth 15:16, 18:8, 110:21 backbones 127:10 background 18:3, 19:17, 19:21, 130:18 backwards 25:1 baker 3:19 bandwidth 27:22, 28:4, 30:10, 32:13, 33:11, 34:19, 36:10, 38:1, 61:19, 62:2, 62:5, 62:6, 62:13, 62:15, 62:17, 62:19, 62:20, 63:4, 63:5, 63:6, 63:15, 64:2, 64:7, 64:14, 64:16, 64:17, 64:18, 64:19, 64:22, 65:6, 65:7, 65:13, 65:14, 65:22, 66:1, 66:6, 66:7, 66:11, 138:22, 140:2, 140:5, 140:16, 141:13, 142:11, 143:2, 143:15, 144:4, 144:20, 146:1, 146:5, 146:9, 146:12,	146:15, 146:20, 147:5, 147:9, 147:18, 148:6, 148:8, 149:1, 149:6, 150:5, 151:7, 151:8, 151:12, 151:15, 151:16, 151:21 base 21:16 based 85:5, 86:1, 86:2, 102:7, 109:13, 110:17, 115:16 basic 42:19 basics 6:22 basis 23:7, 36:16 bd-j 87:1, 87:5, 87:6, 87:9, 87:10, 87:13, 87:18, 88:2, 89:2, 89:7, 90:15, 91:7, 91:11, 91:14, 92:2, 92:8, 92:19, 93:1, 93:9, 93:21, 94:7, 94:9, 94:13, 94:22, 95:1, 95:2, 95:4, 95:7, 95:14, 95:20, 95:21, 96:5, 96:12, 96:16, 97:16, 97:22, 98:1, 98:2, 98:5, 98:9, 98:18, 99:2, 99:8, 99:15, 99:20, 100:2, 100:4, 101:5, 101:7, 101:13, 101:14, 101:17,	101:22, 102:4, 102:7, 102:11, 102:19, 102:20, 104:22, 106:19, 107:8, 107:14, 107:17, 108:2, 108:8, 108:14, 110:5, 112:10, 112:11, 121:3 because 7:10, 8:4, 22:18, 27:7, 52:5, 52:14, 54:16, 63:9, 79:17, 84:15, 85:12, 86:9, 96:21, 98:19, 114:22, 125:2, 126:22, 141:22 become 126:21 becomes 36:1 been 9:10, 10:1, 21:5, 28:15, 40:11, 40:22, 41:10, 41:14, 50:4, 54:5, 55:8, 86:9, 93:18, 97:4, 102:7, 102:8, 103:6, 103:12, 122:15, 137:10, 145:4 before 1:3, 2:11, 6:21, 7:14, 7:16, 8:1, 9:1, 9:12, 41:3, 51:16, 57:1, 58:8, 62:8, 73:17, 95:7, 97:3, 98:18, 103:9, 138:19, 140:12, 153:8, 153:10 began 41:4	beginning 62:1, 62:9, 63:3, 64:4, 84:12, 86:13, 111:22, 112:20, 114:7, 119:19, 146:17, 148:20 begins 42:13, 66:22, 70:3, 70:6, 84:20, 94:16, 115:15, 118:22, 145:22, 150:15, 151:2 behalf 3:2, 3:17, 44:2, 50:5, 50:16 being 6:4, 28:9, 31:10, 32:4, 32:5, 44:17, 55:4, 57:9, 57:11, 71:20, 76:1, 77:18, 77:19, 85:9, 85:16, 85:20, 100:13, 124:6, 130:1, 131:7, 137:6, 141:5, 144:20, 151:10 believe 10:1, 10:15, 11:4, 17:15, 27:9, 29:15, 70:1, 83:2, 83:5, 91:1, 99:15, 115:7, 118:7, 133:15, 133:20, 134:20, 136:7, 142:15, 142:19 bellinger 1:21, 2:12, 153:3 belonging 43:6 below 42:17, 45:8,
---	--	--	---

45:13, 45:15, 45:20, 46:9, 46:20, 47:7, 47:17, 48:2, 48:4, 48:9, 60:16, 60:22, 61:5, 116:20, 136:12 besides 79:8 best 7:13, 10:20, 35:4, 126:5 between 16:12, 17:11, 17:16, 17:17, 22:3, 25:15, 30:13, 33:12, 38:3, 43:4, 43:5, 43:13, 44:9, 55:4, 55:6, 55:18, 55:21, 58:16, 59:18, 59:21, 60:6, 60:16, 60:18, 60:21, 61:3, 61:12, 110:22, 127:6, 128:5, 129:8, 129:20, 142:6, 147:11 beyond 132:10 big 35:19, 40:1 billing 89:14, 92:16 biloxi 43:10, 44:8, 51:5, 51:7, 51:10, 51:12, 52:1, 52:21, 53:15, 53:17, 53:19, 53:22, 54:6, 54:14, 54:19 bit 10:5, 11:16,	34:14, 85:18, 145:5 blank 57:7 blood 153:20 blu-ray 86:14, 125:8, 129:19 board 1:3 bob 43:4, 43:6, 43:7, 44:3, 47:13, 52:5, 52:10, 52:20, 54:13, 54:15, 54:18, 59:12 bob's 43:8, 43:13, 44:9, 50:19, 51:22, 52:12, 52:14, 53:4, 54:15, 54:16, 55:5, 55:19 bob@biloxi 47:15 bodies 119:1, 119:4, 119:11, 119:21 body 47:22, 48:6, 48:8, 48:11, 48:13, 48:16, 72:3, 74:19, 75:3, 75:18, 76:8, 77:11, 78:10, 78:16, 78:18, 79:2, 79:3, 79:8, 80:11, 119:14, 120:1, 120:2, 120:3, 120:4 both 14:9, 14:21, 15:20, 17:7, 17:14, 21:21, 53:8, 59:7,	59:9, 59:13, 92:17, 142:19 bottom 42:12, 45:11, 46:2, 73:15, 75:19, 77:8, 147:1, 149:8 botts 3:19 brackets 59:13 branch 58:21, 61:5 branch=z9hg4bkas- dhds 57:21 break 7:20, 8:1, 55:10, 96:20, 96:22, 97:1, 97:4, 98:14, 98:19, 103:7, 104:6, 104:14, 104:16, 105:6, 110:2, 144:22, 145:6 breaking 144:16 briefly 13:3, 41:5, 58:3, 132:1, 135:2, 152:6 bring 19:12, 66:13, 69:18, 111:11 broadcast 23:5, 32:10 buffer 38:9 buffers 21:19 build 67:6 bunch 116:20 burling 3:4, 3:11, 6:9 bus 27:20, 27:21	C c-s-e-q 60:3 ca 3:14 call 43:7, 43:8, 58:3, 58:7, 61:6, 131:1 called 54:11 cameras 28:2 camino 3:12 can't 130:22, 139:6 canada 30:9 canarie 30:9 canet 30:9 cannot 8:15, 93:15, 95:3, 96:13, 130:21, 140:3, 140:4, 142:6, 143:1, 143:2 capabilities 32:10, 78:15 capable 36:14 capacities 38:8 capacity 28:13, 33:10, 33:13, 34:20, 35:1, 35:20, 36:12, 38:2, 39:4, 39:5 capped 28:3 captured 99:6, 102:2 cards 39:4
---	---	---	---

care 6:19 carefully 90:11, 96:4, 96:14, 99:3, 103:3, 132:17, 132:20 carried 75:21, 76:1, 77:16, 77:18, 77:19, 88:2, 96:9, 101:18, 108:6 carries 72:19 carry 53:9, 54:21 case 1:11, 9:20, 10:2, 10:6, 10:7, 10:14, 10:17, 10:20, 11:8, 11:14, 11:22, 12:1, 12:5, 12:10, 14:12, 33:8, 78:18, 92:4, 96:19, 104:2, 113:19, 123:22, 132:11, 134:17, 144:7, 144:13, 144:19 case-by-case 36:15, 37:17, 39:8 cases 9:6, 9:9, 9:12, 26:20, 26:21 cause 130:13 causes 72:19 caveat 129:5, 137:12 ccr-nm 1:22 ccr-wa 1:22	cd 86:14 cell 43:13, 50:3, 50:19, 51:22, 53:3, 53:4, 55:4, 55:18 center 3:6 certain 10:15, 27:22, 28:3, 89:6 certainly 15:8, 58:15, 104:13, 141:3 certificate 153:1 certified 2:13, 153:3 certify 153:5, 153:12, 153:15, 153:19 cetera 108:18, 113:1, 119:7 chance 55:9, 133:10 channel 64:10, 65:15, 65:16, 66:8, 66:9 channels 27:10 characterize 114:15, 115:1, 117:22, 120:9, 123:9, 133:18 characterized 112:16 characterizes 111:19, 112:2, 112:22, 113:10, 113:15, 114:9, 133:13 characterizing 112:5, 112:14, 114:18, 120:13, 121:14, 133:8	checking 93:17 choice 22:3, 39:7, 121:11 choices 32:6, 38:12 choose 38:17 citations 150:7 cited 83:6, 94:22, 147:20 city 3:6 claim 138:10, 138:20, 141:11, 141:16, 143:9 clarify 8:4, 38:14, 41:6, 42:1, 91:18 class 120:17 clear 124:13, 126:6, 126:10 clicked 40:15 client 37:13, 123:5, 123:9, 123:22, 127:7, 138:21, 140:1, 142:8 clients 38:8, 124:19 close 97:6 closer 36:5 codex 72:1, 73:20, 75:5, 77:10 coded 142:10 codex 21:21	coherent 35:5 colleague 6:12 column 61:15, 61:18, 64:4, 66:4, 145:13, 145:18, 145:21, 145:22, 146:5, 146:13, 146:16, 146:22, 147:1, 149:8, 149:9, 150:19, 150:21, 151:1, 151:3, 151:11, 151:19 com 43:9, 43:10, 44:7, 44:8, 46:16, 47:15, 49:7, 49:12, 49:18, 49:20, 50:12, 51:1, 51:3, 51:5, 51:6, 51:7, 51:10, 51:11, 51:12, 51:18, 51:20, 52:1, 52:13, 52:21, 53:2, 53:14, 53:15, 53:17, 53:19, 53:22, 54:6, 54:8, 54:14, 54:19, 58:6, 58:9, 58:21, 59:4, 59:20, 60:12 come 23:15, 105:6, 132:1, 144:3, 149:10 comes 30:3 comfortable 104:21 coming 23:11, 24:2, 86:17, 124:17
--	--	--	--

command 98:7 commencement 153:9 commencing 153:17 comment 15:18, 118:15 commercial 28:21, 29:7, 29:11, 29:17, 29:20, 30:21, 35:10, 37:12, 37:18, 105:21, 105:22 commercialized 30:1 commission 154:7 commonplace 23:7 communicating 125:5, 147:8 communication 22:14, 23:4, 23:14, 24:19, 25:4, 25:17, 25:22, 26:1, 26:3, 62:5, 62:18, 62:20, 63:5, 63:6, 64:10, 64:15, 64:17, 64:18, 64:19, 65:7, 65:13, 65:14, 65:15, 65:16, 65:21, 66:1, 66:6, 66:7, 66:8, 66:9, 67:1, 110:21, 111:19, 112:2, 112:5, 112:14, 112:22, 113:10, 113:15, 114:10, 114:15, 114:18, 115:2, 115:5, 127:13, 127:15, 129:14, 129:20,	130:10, 132:5, 133:9, 133:13, 134:18, 137:3, 144:3, 144:4, 149:1, 151:8, 151:12, 151:21 communications 64:7, 129:8 communities 36:6 community 29:4 company 29:14 complete 67:6, 93:7 completely 37:3 complexity 37:4 component 67:5, 143:22 components 81:13 composite 10:11 compressed 141:7 concept 124:20 concern 103:9 concerned 33:9, 134:16 conclusion 53:2 conducted 1:16, 2:2 conference 27:1, 27:5 conferencing 21:6 confirmed 46:1, 48:21 confusing 86:9 conjunction 67:16, 68:1,	69:7, 69:11 connect 22:8, 22:17, 24:17, 130:8, 138:11 connected 116:1 connecting 29:1 connection 22:18, 43:11, 43:12, 44:9, 44:12, 53:12, 55:18, 127:6, 127:11, 138:13, 148:21, 149:3 connectionless 22:18 consider 30:22, 36:1, 36:21, 38:12, 38:20, 90:10, 93:18, 122:2, 122:6, 126:22, 131:12, 131:20, 134:15, 138:19, 139:13, 142:22 considerable 18:7 consideration 23:9, 39:9, 133:1 considerations 29:18, 30:2, 30:19, 31:22, 32:19, 32:21, 33:4 considered 36:16, 69:15, 90:3, 90:8, 105:4, 131:20, 132:4, 137:13, 142:1, 143:19 considering 35:9, 95:9, 103:5, 123:13, 130:5, 133:1, 138:20, 141:22	consistent 108:4 constant 149:2 constraint 28:8 constraints 38:7, 38:9, 38:10 construction 78:17 consults 54:11 contact 60:9, 60:13, 84:9 contacted 126:13, 128:3 contain 74:7, 80:11, 116:5 contained 125:7 containing 63:11 contains 47:13, 48:5, 54:12, 58:5, 63:16, 72:3, 77:12 content 10:13, 11:9, 21:12, 22:12, 31:10, 32:6, 32:22, 33:2, 37:21, 47:18, 48:5, 48:13, 48:15, 57:11, 60:14, 60:15, 60:21, 63:13, 71:20, 72:7, 72:17, 72:21, 73:1, 73:4, 74:14, 74:19, 85:4, 85:7, 85:8, 85:11, 85:21, 86:1, 86:2, 86:3,
--	---	--	--

86:5, 86:11, 86:18, 87:1, 87:4, 87:6, 87:12, 89:11, 91:3, 92:1, 92:2, 92:3, 92:4, 92:12, 92:13, 93:20, 94:4, 95:11, 99:5, 99:18, 100:1, 105:21, 105:22, 107:7, 108:17, 109:12, 109:21, 110:17, 113:11, 113:12, 117:11, 117:15, 117:22, 118:11, 118:12, 119:5, 119:6, 119:8, 119:12, 119:13, 119:20, 119:21, 119:22, 120:5, 120:20, 121:6, 121:15, 122:4, 122:11, 123:18, 123:21, 124:16, 125:9, 129:17, 129:18, 130:1, 130:20, 130:21, 131:2, 131:8, 132:7, 138:9, 138:14, 141:10, 149:2 content-manageme- nt 94:18 content-providing 72:15, 72:16, 73:2, 73:3, 94:5, 94:19, 107:10, 109:11, 109:15, 110:9, 110:10, 110:14, 110:16, 110:20, 111:1, 114:11 contents 18:10, 18:14, 49:4, 73:10,	89:19, 116:15, 120:17, 121:2, 122:17, 128:5, 129:3, 137:17 context 34:1, 34:7 continent 20:16 continue 41:2, 41:7, 50:20, 73:17 continues 70:4, 145:22 contrast 70:7 control 62:10, 64:8, 68:15, 97:13, 98:7, 142:4, 148:22 controlling 67:21, 68:5, 68:16 conversation 94:2 conversely 143:5 convey 131:13 conveyed 64:20, 65:1, 65:8, 71:13, 107:13, 107:16, 109:2, 109:6, 110:5, 118:1 conveying 32:7, 32:18, 79:17, 79:21, 108:17 conveys 79:22 cooperative 15:15 coopersmith 6:17 cooperstock 1:15, 2:1, 5:2, 5:14, 5:17, 6:3,	6:16, 6:17, 40:20, 106:11, 120:11, 132:15, 134:3, 148:2, 152:1, 152:13, 153:6, 153:16 copy 97:9 core 63:21, 64:4, 64:20, 65:1, 65:8, 151:6 corporation 1:8, 153:13 correctly 115:7 correlated 10:9 correspondence 18:10, 18:11, 18:13 cost 28:16, 36:1 could 6:14, 7:3, 7:15, 10:4, 16:14, 17:1, 17:8, 19:19, 28:4, 30:15, 31:8, 31:14, 33:20, 35:3, 36:17, 37:3, 37:10, 37:17, 38:19, 43:16, 56:12, 61:15, 69:22, 79:3, 79:7, 79:15, 81:18, 82:13, 82:14, 82:15, 86:20, 90:1, 90:3, 90:6, 99:6, 101:21, 103:10, 105:10, 105:12, 111:11, 111:14, 113:13, 115:8, 115:12, 118:11, 121:6, 122:6, 122:18,	124:9, 128:8, 132:4, 140:17, 142:10, 148:12 couldn't 27:11 counsel 6:6, 12:16, 13:2, 13:3, 13:4, 13:5, 13:9, 13:15, 15:9, 15:16, 15:17, 15:20, 121:17, 134:1, 153:13 count 97:19 counting 60:4 couple 6:22, 47:17, 116:6, 117:10, 145:1 course 142:1 court 7:1, 7:6, 8:11 covered 84:12, 98:20 covington 3:4, 3:11, 6:9, 6:13 created 24:8, 138:9 cross-referencing 18:8 crr 1:22 cseq 60:2 csr-tx 1:22 cuff 124:10 current 54:12 currently 82:7 cursorry 36:17, 92:21,
--	--	--	---

93:3, 93:13, 96:4, 103:6, 122:14 customers 29:1 cut 85:18, 121:17 cv 12:7	deciding 144:15 decision 144:16 declaration 5:13, 5:16, 14:12, 14:19, 15:2, 15:6, 15:9, 15:12, 15:14, 15:21, 16:4, 16:6, 16:11, 16:16, 16:19, 16:22, 17:10, 17:16, 17:17, 17:21, 17:22, 18:6, 19:13, 19:20, 69:19, 83:7, 84:1, 93:22, 94:11, 95:3, 97:21, 98:1, 104:19, 105:2, 105:3, 111:12, 123:15, 126:6, 126:8, 129:4, 131:19, 132:17, 133:3, 133:6, 133:11, 135:3, 135:18, 137:12, 142:2, 142:19, 143:19, 148:15, 150:11 declarations 13:19, 14:8, 17:11, 18:17 default 78:13, 78:21, 79:12 defined 82:7 definitive 93:15 degree 29:8 delay 20:14 deliver 20:17, 21:12,	30:16, 63:17 delivered 86:17, 122:4, 130:21 deliveries 67:21 delivering 10:12 delivery 10:10, 10:18, 10:19, 11:8, 11:9, 32:22, 33:2, 62:21, 127:21, 127:22, 137:22, 138:10, 138:14, 141:10, 142:9 demand 32:9, 32:17, 140:2 demonstrated 111:8 demonstration 26:19, 26:22 demonstrations 21:2 dense 18:2 depended 26:18 depends 31:3, 31:9, 36:9, 37:5, 37:16 deployed 141:5 depos 4:4, 40:19 deposition 1:15, 2:1, 6:22, 8:9, 12:17, 13:16, 148:1, 153:7, 153:9, 153:10, 153:14, 153:15 describe 11:16, 75:1, 78:8, 79:2,	79:4, 79:6, 81:8, 81:13, 87:19, 89:1, 94:17, 100:6, 101:6, 113:16, 120:8, 123:8, 128:19, 144:6, 147:14 described 29:7, 34:1, 45:11, 46:15, 47:12, 48:13, 50:22, 64:3, 64:9, 64:12, 65:7, 68:14, 71:19, 72:2, 73:21, 74:14, 75:18, 77:11, 78:15, 78:19, 80:3, 82:1, 83:22, 85:9, 85:17, 85:20, 87:7, 89:14, 92:17, 93:19, 98:1, 98:5, 102:19, 103:21, 106:6, 110:3, 110:4, 111:3, 113:21, 117:4, 117:8, 118:5, 123:11, 133:18, 134:11, 147:5, 151:10 describes 62:5, 62:17, 67:21, 68:5, 72:7, 72:13, 75:10, 76:6, 76:7, 76:9, 77:3, 79:11, 80:13, 87:11, 87:17, 92:19, 94:13, 106:8, 107:6, 114:15, 119:11, 122:7, 123:17, 124:16, 134:5, 142:21, 143:21
D			
data 22:19, 24:17, 28:1, 28:14, 30:16, 32:8, 32:19, 35:18, 36:2, 38:9, 67:15, 85:7, 88:12, 89:15, 89:16, 107:13, 107:16, 107:21, 108:1, 110:17, 114:12, 127:22, 129:8, 149:2 database 54:11, 54:22, 109:13, 109:21 day 154:5 dc 3:7 deal 90:18, 127:19, 132:9 dealing 18:4, 21:19, 34:12, 36:10, 37:11, 89:8, 125:4, 125:10, 126:11, 127:14, 129:16, 142:3, 143:17 deals 101:10, 124:15 dealt 21:22, 148:6 decided 40:21			

describing 34:19, 35:15, 48:7, 68:18, 69:6, 76:15, 83:11, 84:8, 86:4, 86:6, 90:20, 94:7, 94:9, 101:14, 106:5, 107:12, 117:4, 146:21, 147:17 description 5:12, 48:5, 48:12, 48:20, 49:19, 68:18, 69:5, 72:4, 72:6, 74:7, 77:12, 77:14, 81:2, 93:9, 95:6, 95:11, 95:20, 96:5, 96:7, 108:5, 118:8, 118:16, 121:12, 124:11, 125:4, 131:15, 135:15, 136:8, 136:10, 146:9, 146:19 descriptions 99:2, 120:16 design 21:10, 31:22, 32:21, 33:4, 38:12 designer 29:19, 36:16, 38:11, 39:8 designing 21:4 desires 26:8 destination 47:6, 50:6, 50:16, 51:15, 52:2, 54:20 detail 11:5, 74:13, 103:20	detailed 74:9 details 10:17, 11:13, 12:8, 39:16, 40:5, 71:22, 73:19, 75:4, 77:9, 78:17, 83:19, 96:12, 118:6, 135:14 determination 85:22 determine 32:3, 53:3, 54:1, 113:11, 127:3, 152:6 determined 62:19, 63:6, 64:17, 64:19, 78:11, 86:11 determines 72:22, 92:2, 94:3, 94:17 determining 73:7, 83:15, 84:6, 85:11, 87:12, 92:12 develop 20:13 development 21:1 device 22:11, 25:3, 26:7, 26:8, 43:8, 44:9, 44:10, 45:6, 52:11, 52:12, 52:14, 52:20, 53:9, 54:21, 72:15, 72:16, 73:2, 73:3, 83:20, 85:5, 86:10, 94:5, 94:19, 107:10, 109:11, 109:15, 110:9, 110:10, 110:14, 110:16, 110:20, 111:1,	114:11, 127:7, 128:6, 138:11, 138:16, 141:12 devices 26:5, 26:15, 28:2, 33:11, 39:6, 43:5, 55:21, 124:17, 127:17 diagram 106:4 dialed 130:15 dictate 31:19, 32:6 difference 17:19, 58:2 differences 58:18, 61:3, 61:11 different 23:17, 25:15, 28:9, 29:18, 31:21, 33:6, 33:17, 33:18, 34:5, 34:13, 36:3, 38:15, 57:18, 61:5, 61:6, 80:10, 121:5, 124:2, 130:17, 131:8, 148:14 differently 28:11, 124:4 digital 97:9 digits 106:16 direct 42:8, 50:14, 56:17, 70:5 directed 47:16 directly 21:22, 63:10, 70:12, 71:6, 74:3, 84:12 disagree 105:1	disc 33:10, 33:12, 39:4, 86:10, 86:14, 105:21, 106:19, 107:4, 107:9, 108:9, 108:14, 108:18, 108:20, 109:2, 109:5, 109:13, 109:19, 110:18, 112:4, 112:12, 125:8, 129:19 disclose 125:22 discuss 13:21, 41:15, 104:22 discussed 49:2, 57:1, 93:10, 94:11, 95:19, 100:11, 100:16, 100:18, 100:22, 101:7, 102:1, 102:12, 102:16, 102:21, 104:5, 115:22, 124:8, 125:3, 126:6, 129:4, 149:8 discusses 62:2, 62:13, 112:1, 112:21, 113:9, 115:21 discussing 14:20, 77:22, 84:5, 103:12, 113:3 discussion 89:17, 90:13, 90:15, 113:14, 132:12 discussions 15:8 display 47:13, 89:9, 90:22, 101:10, 130:15 displayed 101:13, 101:17,
---	---	--	---

121:3 displaying 92:14, 130:12 disputing 148:10 distribute 29:15 distributed 26:15, 36:7, 36:20, 37:9, 38:5, 38:17, 38:19, 39:1, 39:11, 39:19, 39:21, 40:6 distributing 21:18 distribution 11:6, 20:3, 20:5, 23:20, 24:9, 25:8, 29:6, 29:12, 31:12, 32:8, 33:5, 39:18 dividing 147:11 dns 51:8, 127:3, 127:19 document 14:14, 48:22, 66:12, 76:1, 76:19, 77:2, 77:17, 97:14, 104:12, 116:14, 118:13, 118:16, 118:17, 120:7, 121:15, 132:20, 134:10 documents 15:19, 42:2 doing 51:1, 95:14, 95:21 dolby 29:16 domain 51:9, 51:10, 58:9, 58:20,	126:14 done 7:13, 7:16, 20:2, 27:11, 56:4, 85:13, 85:15, 137:18 down 7:2, 11:4, 49:22, 70:18, 70:21, 83:22, 110:2, 114:7, 130:11, 135:14 download 73:4, 88:12, 89:9, 89:10, 90:22, 91:3, 106:5, 109:11, 109:12, 109:21, 110:8, 110:11, 110:15, 110:17, 132:13 downloading 137:16, 137:20 dr 106:11, 120:11, 132:15, 134:3, 148:2, 152:1, 152:13 draft 15:17 drafted 15:20 drafts 15:17 dramatically 139:21 dubious 69:16 duly 6:4, 153:8 during 118:1 E e-notary 154:11 each 7:11, 13:20,	14:19, 28:3, 38:6, 98:18, 117:3 earlier 83:2, 83:11, 89:21, 104:4, 110:4, 115:22, 116:6, 121:4, 134:13, 136:8, 146:14 early 29:14 easier 41:21 easily 31:14 edt 153:18 effective 28:16, 36:1 effectively 37:21, 39:3 effort 20:12 either 10:1, 18:17, 19:7, 41:18, 99:22, 103:12 el 3:12 elaborates 108:19 elaborating 74:12 elaboration 96:10 element 110:22 elements 93:4, 96:12 else 8:20, 12:22, 34:21, 78:1, 92:18, 103:10, 142:17, 147:4 email 76:1, 76:4, 76:6, 77:18	emily 3:3, 6:8 employ 76:15 employed 22:2, 99:19, 153:21 empty 57:7 enable 20:15, 28:19 enables 26:1 encapsulate 79:5, 131:6 encapsulated 38:2, 76:14, 79:1, 89:17, 90:2 encapsulates 75:2, 76:9, 102:3, 147:5 encapsulating 74:11 encoded 72:4, 77:13 encoding 38:10 end 24:1, 25:12, 28:17, 30:22, 31:5, 34:7, 41:8, 91:6, 127:5, 128:6, 129:9, 129:10, 145:16 ending 62:2, 88:5, 146:4 ends 57:20, 57:22, 61:19, 146:15 engineering 21:1 english 122:18 enterprise 35:11
--	--	--	--

entire 148:16, 148:19 entirety 78:1 entities 143:3, 143:6 envisions 126:18 equipment 24:12 error 128:12, 128:18, 128:20, 129:14, 130:3, 131:12, 131:16, 132:10, 134:12, 134:17, 142:17 errors 128:16, 128:21, 129:21, 130:9, 134:6 esquire 3:3, 3:10, 3:18 est 1:18 establish 22:16, 25:4, 43:10, 44:8 established 55:4 establishes 26:3 establishing 149:3 establishment 43:12, 44:4, 44:12, 53:12, 55:7, 69:11 et 108:18, 112:22, 119:6 even 11:19, 12:4, 37:22, 48:8, 114:12, 119:18, 139:13 every 37:7, 53:1,	102:3, 132:21 everything 58:19, 95:19 exact 47:3, 59:21, 60:6, 60:11, 60:12, 60:16, 60:20, 61:8 exactly 34:6, 58:19, 133:16 examination 5:2, 6:6 examined 6:4 example 14:7, 14:11, 20:7, 27:6, 30:20, 32:16, 34:22, 39:10, 43:20, 44:19, 45:2, 45:9, 48:10, 49:8, 55:21, 56:14, 56:16, 57:14, 59:14, 59:18, 60:2, 60:10, 60:16, 60:22, 67:13, 67:19, 68:4, 68:17, 69:14, 71:10, 75:5, 75:21, 76:14, 77:16, 78:8, 78:21, 79:12, 79:19, 84:13, 97:21, 99:17, 105:20, 105:22, 106:16, 112:3, 112:5, 112:9, 112:13, 112:17, 113:4, 113:7, 113:17, 113:22, 114:17, 114:21, 115:21, 117:16, 131:1, 136:16, 150:18 examples 42:20, 42:22,	56:10, 67:9, 67:10, 71:18, 78:6, 114:4, 114:5, 114:14, 129:10, 147:14, 147:17, 149:6 exceeding 139:10, 139:12 exchange 43:3, 43:5 exchanged 72:12 exclusion 82:16 excuse 54:16 execute 89:14, 92:16 executes 65:19, 66:5, 144:8, 151:6 executing 144:2, 148:22 exhaustive 99:1 exhaustively 93:16, 95:9, 131:22, 147:4 exhibit 5:7, 5:9, 5:11, 5:12, 5:13, 5:16, 14:1, 14:5, 14:7, 14:15, 14:18, 15:2, 16:2, 16:5, 16:9, 16:15, 17:1, 40:7, 40:10, 40:12, 41:2, 41:9, 41:12, 55:17, 55:22, 56:5, 66:14, 69:19, 80:15, 80:17, 82:19, 82:22, 111:12, 115:9, 134:20, 135:3, 145:12, 148:16, 150:12	exhibiting 61:11 exhibits 5:6, 40:22, 42:3 exist 28:11, 32:11 existence 79:15 existing 21:16, 22:10, 126:14 exists 127:3, 127:18 expect 31:6 expected 30:14 expecting 46:17 expects 46:13 expensive 35:19 experience 22:22, 130:9 expert 9:1, 9:11, 9:22 expires 154:7 explain 29:9, 30:5, 34:14, 71:8, 72:11, 83:17, 87:3, 113:13 explained 68:10, 72:9, 80:11 explaining 101:12, 148:20 explains 42:18, 44:1, 63:2, 63:21, 71:22, 82:3, 86:22, 105:19, 116:3 explanation 118:11
---	---	--	---

explicit 95:4, 102:6, 102:19, 121:21 explicitly 72:11, 73:10, 98:2, 110:12, 111:2, 111:7, 121:9, 121:15, 122:9 express 27:20, 27:21 extended 82:10 extent 10:15, 69:14, 89:6, 95:5, 96:6, 96:15, 137:11 extra 52:5 extreme 139:22, 141:7 extremely 141:20 eye 148:3 eyes 122:17, 138:2	facilitate 44:3, 44:12, 53:12 facing 34:15 fact 81:19, 119:17 factors 32:2, 38:11 failure 132:3, 132:5, 134:18 fair 92:7, 95:18, 104:17, 105:2 fairly 18:3, 18:5, 131:22, 132:19, 133:20 far 78:5, 95:19, 96:6, 98:20, 103:5, 120:22, 121:20, 122:16, 123:16, 126:2, 137:11 favor 36:8 fee 29:2 feedback 67:15 feel 104:21 few 49:22, 147:6, 148:9 fidelity 139:20, 140:12, 140:17 field 46:8, 46:9, 46:19, 47:11, 48:14, 48:15, 53:7, 53:8, 57:9, 57:11, 58:4, 58:7, 58:19, 59:12,	59:17, 60:9, 74:13, 78:11, 78:14, 81:5, 81:10, 81:12, 81:13, 82:1, 119:13, 125:15, 136:8, 136:13 fields 45:21, 46:4, 46:5, 57:8, 57:13, 57:14, 58:14, 61:7, 61:10, 71:11, 81:9, 116:5, 116:9, 116:17, 117:4, 117:7, 117:8 figure 32:22, 42:22, 43:3, 43:20, 44:14, 45:8, 45:13, 45:15, 45:20, 48:9, 48:12, 49:9, 49:11, 49:13, 49:17, 50:13, 50:17, 55:5, 55:17, 55:20, 56:16, 56:20, 57:15, 57:20, 57:21, 58:4, 58:7, 58:11, 58:12, 59:14, 59:18, 60:6, 60:8, 60:9, 60:10, 60:16, 60:17, 60:18, 60:19, 60:22, 61:4, 61:5, 61:12, 61:13, 71:12, 71:16, 89:7, 90:21, 91:5, 92:16, 99:17, 105:11, 105:16, 105:20, 106:4, 106:14, 107:11, 108:5, 108:10, 108:11,	110:11, 110:13, 111:2, 111:8, 116:2, 132:12 figures 56:10, 56:14 file 40:14, 97:9 files 11:1, 11:21 final 66:21 finally 65:11 financially 154:1 find 51:9, 89:5, 95:3, 99:12, 100:4, 102:8, 102:9, 130:22 finding 97:13, 147:10 fine 41:22, 106:3 finish 81:15, 144:12, 145:2 firm 6:9 first 6:4, 7:1, 14:3, 14:8, 14:13, 14:18, 15:2, 16:15, 16:19, 17:13, 17:20, 19:13, 30:3, 32:3, 32:16, 42:17, 43:19, 45:14, 46:3, 46:8, 49:6, 52:19, 56:4, 57:2, 57:7, 57:10, 59:3, 64:8, 80:15, 81:19, 84:20, 88:7, 88:10, 93:17, 96:20, 98:15, 99:9,
F			
f1 44:20, 45:5, 45:12, 49:3, 49:5, 49:6, 49:12 f2 53:15 f3 50:8, 50:12 f4 44:20 f5 53:21, 55:2 f6 55:2 f7 55:2 fabric 142:6			

99:12, 100:3, 103:4, 106:7, 113:8, 123:6, 133:11, 135:7, 138:18, 141:22 five 9:18, 13:8, 13:13, 27:9 fixed 123:18, 127:2 follow 45:19, 46:3, 126:3 follow-up 97:5 followed 44:21, 57:3, 125:20 following 57:6, 99:18, 100:20, 106:16 follows 6:5, 55:2, 81:11 for-profit 29:17 form 11:11, 11:12, 15:7, 15:13, 15:22, 17:12, 27:14, 31:2, 34:16, 35:13, 37:1, 37:14, 39:15, 40:2, 45:22, 49:15, 52:9, 52:17, 53:5, 57:16, 61:9, 68:21, 70:20, 74:22, 77:5, 78:4, 80:7, 87:22, 89:3, 92:20, 93:11, 95:22, 102:5, 103:1, 103:13, 110:1, 111:21, 112:7, 118:3, 119:10, 119:16, 121:16,	122:8, 127:12, 127:16, 129:1, 131:17, 134:1, 134:7, 137:8, 138:17, 140:9, 141:17, 143:16, 147:2, 151:17 format 72:5, 77:13, 77:14 forth 11:3, 15:18, 18:5, 109:14, 110:19, 124:7, 126:15, 127:18, 128:5, 153:8 forward 14:4, 19:7, 41:18, 51:1 forwarded 52:3 forwarding 51:18 forwards 46:20, 47:4, 59:9 found 83:20, 93:2, 121:21 four 27:2 fr 117:16 frame 140:19 frames 17:15 free 29:4, 92:3, 92:13 french 117:17, 122:19 frequent 78:20 front 16:17, 41:16, 42:2, 66:16, 73:16, 75:8,	97:10, 105:13, 105:17, 111:16, 111:17, 145:14 full 6:15, 43:19, 49:21, 50:21, 54:5, 74:13, 81:20, 93:7, 96:15, 99:1, 103:21, 117:7 fulsome 95:5 functionality 68:12, 69:13, 69:16, 77:22, 80:2, 90:15, 92:19, 93:9, 95:6, 96:5, 96:16, 98:11, 100:7, 101:6, 101:14, 102:10, 102:18, 103:22, 126:22, 131:6 functions 62:7, 62:10, 64:1, 64:6, 64:8, 64:21, 65:2, 65:9, 65:12, 65:19, 66:4, 79:20, 93:4, 97:13, 144:1, 144:7 funny 40:17 further 11:19, 12:4, 21:2, 47:17, 62:9, 83:22, 89:4, 89:20, 96:5, 122:13, 124:8, 124:9, 152:2, 153:12, 153:15, 153:19 future 82:10, 82:16 G gateway 68:15	gateways 68:5, 68:16 gave 27:6, 149:13 general 120:17, 127:20, 138:8 generally 9:8, 10:4, 35:22, 52:22, 54:11, 106:3, 106:4 generates 85:3 generic 129:7, 130:2 geography 33:19 getting 84:3, 97:6 give 20:7, 35:4, 36:17, 46:5, 72:20, 90:11, 93:15, 95:12, 95:18, 133:10 given 8:11, 18:1, 23:11, 31:1, 34:22, 74:18, 102:14, 118:8, 123:21, 127:1, 153:11 gives 67:9, 67:10, 67:19, 68:4, 68:17, 77:15, 117:16 giving 6:15, 22:2, 95:5, 97:21, 141:21 glance 103:6, 122:15 globally 37:6 go 6:22, 10:16,
---	---	--	---

11:20, 12:7, 18:3, 21:20, 24:7, 41:5, 49:22, 51:12, 52:8, 53:13, 71:18, 89:19, 90:10, 92:5, 95:8, 96:3, 96:17, 96:21, 98:18, 99:3, 103:2, 103:17, 104:8, 105:5, 124:7, 131:21, 133:3, 134:9, 139:21, 147:19, 149:12, 149:22, 152:5 goes 15:18, 51:15 going 7:12, 8:5, 11:1, 14:4, 17:20, 19:7, 25:21, 32:14, 41:1, 41:18, 46:13, 54:1, 55:8, 71:9, 73:7, 83:15, 83:18, 84:6, 84:10, 86:16, 93:3, 93:16, 96:13, 97:4, 97:20, 98:6, 98:7, 98:17, 108:13, 114:1, 118:1, 123:19, 123:22, 124:1, 126:12, 126:17, 127:16, 128:3, 129:18, 129:21, 130:11, 131:2, 131:12, 135:6, 135:19, 144:11, 145:3, 145:4, 146:13, 147:3, 149:11 good 6:8, 7:8, 7:9,	7:17, 7:18, 7:19, 45:4, 55:9, 104:6, 145:6 google's 39:17 great 7:7, 41:9, 55:11 grounds 148:10 guarantee 61:19, 62:3, 62:14, 62:15, 62:18, 63:4, 63:15, 64:2, 64:14, 65:1, 65:6, 65:13, 66:5, 66:11, 140:4, 141:14, 142:12, 144:2, 144:9, 144:20, 146:1, 146:6, 146:9, 146:12, 146:15, 146:20, 147:6, 147:9, 147:18, 148:6, 148:8, 149:7, 150:5 guaranteeing 62:6, 149:1, 151:8, 151:11, 151:14, 151:15, 151:20 guess 15:3, 23:17, 39:18, 40:5, 96:8 guesses 17:14, 118:15 guessing 12:2, 13:12 guided 20:22 H half 13:11, 13:14,	70:10, 94:14 halfway 114:6 hand 154:5 handful 9:17 handle 23:10, 28:10, 31:22, 39:11, 46:13, 127:21, 138:15, 140:18, 141:5, 143:14 handled 124:4 handling 24:9, 25:3, 25:7, 34:4, 34:12, 35:20, 39:13, 39:17, 40:1, 128:20, 131:16, 134:6, 134:12 happen 7:12, 142:13, 144:6, 144:19 happening 84:17, 85:16 happens 143:5 happy 95:12, 95:18, 96:3, 98:13, 98:21, 103:7, 104:19, 122:12 hardware 27:18 hazard 15:3 hazarding 17:14 head 12:2 header 42:18, 45:21, 46:3, 46:5, 46:8, 47:7, 47:18, 48:14,	48:15, 57:8, 57:13, 57:14, 60:3, 71:10, 78:11, 78:14, 116:5, 116:9, 116:17, 117:4, 117:7, 117:8, 117:15, 117:21, 123:4, 125:11, 125:18, 128:12, 128:15 headers 47:17, 57:4, 57:10, 79:18, 122:22 hello 13:18 help 36:22, 37:2, 37:10, 39:11, 43:10, 44:8, 53:3, 114:3, 130:13 here 6:10, 10:21, 13:21, 18:21, 20:2, 40:14, 40:16, 41:15, 44:7, 47:22, 48:7, 48:19, 49:10, 58:3, 67:4, 68:14, 74:15, 82:6, 84:15, 85:9, 85:20, 93:3, 101:5, 102:21, 109:9, 113:16, 113:17, 116:3, 117:21, 123:12, 124:11, 124:16, 124:21, 132:2, 132:16, 133:21, 135:8, 143:10, 146:21, 150:19, 151:6, 151:10 here's 36:19, 122:18, 122:19
--	---	---	---

hereby 153:5 hereinbefore 153:7 hereunto 154:4 high 23:10 high-definition 27:9, 27:10 high-fidelity 20:13 high-resolution 20:14 higher 30:10, 46:19 higher-bandwidth 30:16 higher-performan- ce 30:10 highest 28:18, 139:19, 140:12, 140:17 highly 9:10 hoc 129:20 hooks 21:22 hop 51:4 hopes 53:2 hops 30:13, 46:22, 47:5, 51:16 hour 55:9, 145:5 hours 13:11, 13:14, 15:4, 16:13, 17:16, 17:18, 17:19 housed 36:4 http 77:19, 118:5,	120:7, 137:19 http-like 115:16 hubs 127:17 hundred 141:6 hundreds 37:19 hypothetical 35:14, 123:16, 139:21, 139:22, 141:18, 143:18 I id 58:3, 58:7, 61:5, 61:6, 85:7, 86:1, 86:2, 108:17, 108:18, 114:10, 114:11, 114:17 idea 147:3 ideal 39:7 identical 58:22 identification 14:2, 16:3, 40:8, 56:1, 72:14, 80:18, 82:20, 85:6, 109:14, 110:19 identified 16:7, 28:12, 61:11, 63:3, 88:15, 88:20, 92:16, 106:14, 116:17, 147:14 identifier 112:3, 112:11, 113:3, 113:7 identifies 44:15, 46:12, 51:4, 51:21, 52:1, 135:8 identify 147:16	identifying 82:4 ietf 67:11 illustrated 111:2 illustration 55:20 impact 33:5 impacted 35:8 imperative 137:22 implement 130:5 implementation 125:1 implemented 143:3 implementer 132:9 implication 113:16 important 7:10, 30:21 improperly 24:3 improvements 21:3 ims 63:21, 64:5, 64:20, 65:1, 65:8, 142:9, 151:6 inc 1:5, 6:11 include 42:22, 44:21, 56:14, 76:5, 78:14, 78:16, 79:8, 122:18, 148:16, 150:14 included 19:16, 21:4, 22:4, 63:13, 63:19, 75:18, 76:7, 76:8,	82:12, 85:6, 87:17, 87:21, 89:2, 90:6, 93:21, 101:11 includes 56:13, 56:20, 57:2, 60:2, 61:18, 62:18, 63:5, 63:11, 63:16, 99:15, 114:7, 129:9 including 83:9, 90:12, 114:10 incomplete 35:14, 141:18 incorrect 90:17, 99:22 indicate 44:17, 54:9, 57:4, 82:12, 88:4, 120:3, 137:6 indicated 49:5, 55:2, 106:15, 106:18, 111:8, 119:5, 119:6, 119:12, 119:20, 119:22, 120:4 indicates 45:15, 46:22, 47:21, 48:16, 50:3, 57:2, 59:3, 59:4, 60:4, 64:16, 64:19, 119:9, 119:14, 123:4, 125:18, 125:19, 137:2 indicating 48:1, 55:18, 59:12, 60:21, 62:19, 63:6, 82:11 indication 46:9 individuals 35:12, 129:21
---	---	--	---

info 128:12, 130:3 information 46:6, 49:1, 52:6, 52:15, 52:19, 53:10, 59:11, 62:19, 62:21, 62:22, 63:5, 63:17, 63:18, 64:1, 64:7, 64:11, 64:12, 64:16, 64:18, 64:20, 65:8, 65:12, 65:15, 65:17, 65:22, 66:1, 66:7, 66:10, 71:13, 71:16, 71:19, 72:12, 72:14, 72:17, 79:18, 79:22, 80:12, 81:11, 85:6, 89:4, 89:20, 90:19, 101:9, 101:11, 101:12, 101:16, 108:17, 108:20, 109:4, 109:5, 109:14, 109:20, 110:5, 110:7, 110:18, 110:19, 112:1, 112:21, 113:10, 113:14, 114:8, 115:1, 115:4, 116:10, 123:20, 124:17, 126:17, 128:16, 128:17, 128:21, 130:12, 130:16, 130:19, 131:12, 133:8, 135:9, 135:20, 137:7, 144:5, 147:8 informing 88:16 infrastructure 30:15, 38:3 inherently 127:1	initial 17:15, 17:20, 101:9 initiate 24:19 initiates 43:7, 43:8 initiation 5:11, 41:13, 41:20, 53:10 input 107:9 inquiring 34:18 instance 31:18, 99:12, 100:4, 100:9, 129:5 instances 37:9 instead 27:6, 38:18, 71:2, 72:11, 72:13, 131:8 instruction 62:14, 62:16, 62:18, 63:4, 63:15, 64:2, 64:15, 65:1, 65:6 instructions 41:3 integrated 66:22 intended 23:5, 29:17, 54:17, 129:6, 130:2 intending 52:8, 143:3 intent 24:14, 24:22, 31:11, 129:22, 134:14, 142:22 interactive 1:5, 4:5, 6:11 interconnect 33:11	interest 70:13, 71:7, 71:14, 74:4, 74:21, 75:11, 77:4, 78:2, 80:6 interested 154:1 interesting 141:19, 142:18 interface 39:4 interfaces 27:18, 33:13 intermediaries 43:14 intermediary 22:15, 127:9 intermediate 51:16, 73:6, 83:14, 127:17 internet 127:13, 127:19, 140:20 internet2 30:7 interrupted 121:1 intervening 36:13, 38:7 introduce 37:3, 40:9 introduces 42:19 inventor 18:20, 19:3 inventors 19:5 invisibly 130:18 invite 44:19, 44:20, 45:5, 45:9, 45:12, 45:14, 45:16, 45:20, 46:6, 46:9, 49:2, 49:5, 50:1, 50:4, 50:6, 50:14, 50:16, 51:2, 51:16, 51:19, 52:3, 52:6, 52:16, 52:20, 53:7, 54:7, 54:10, 54:16, 56:11, 56:14, 56:20, 57:1, 57:6, 59:2, 60:4, 61:4, 115:21, 116:4 involve 10:17, 11:2, 22:15 involved 10:7, 11:13, 15:8, 18:1, 18:5, 18:7, 21:9, 26:19, 26:21, 28:22, 29:10, 29:13, 30:2, 43:14, 82:4, 131:7, 142:9 involvement 20:20, 73:5, 83:13 involves 15:16, 37:12, 127:16 involving 9:12, 9:20, 10:2, 35:11, 89:8, 92:8, 122:10, 124:6, 147:8 io 33:11, 34:19 ip 54:12, 126:14, 127:20, 127:21, 128:1 ipr 1:11, 9:6, 40:11, 41:1, 42:3 iprs 14:6, 14:9,
---	---	--

14:20, 14:22, 41:14 isolated 127:15 issue 9:9, 10:6, 11:17, 11:21, 18:21, 19:10, 35:7, 123:22 issues 34:2, 34:11, 34:15, 36:22, 37:2, 37:10, 38:20, 141:22 it'll 96:21 items 108:21, 109:1 iterations 21:3 itself 18:15, 21:16, 41:1, 48:11, 56:5, 74:20, 75:2, 75:9, 77:1, 77:2, 77:21, 79:17, 80:2, 80:5, 86:14, 86:15, 120:20, 121:15, 122:7, 142:5, 142:8, 147:12	judith 1:21, 2:11, 153:3 july 1:17, 153:17, 154:5 jump 51:14, 135:6 jumped 63:12, 70:18 jumping 70:21, 127:7	122:8, 127:12, 129:1, 131:17, 133:22, 134:7, 137:8, 138:17, 140:9, 141:17, 143:16, 144:10, 144:22, 145:7, 147:2, 151:17, 152:5, 152:11, 152:15 know 7:12, 7:21, 10:3, 16:16, 17:2, 19:14, 19:22, 25:9, 31:9, 41:6, 42:9, 43:17, 56:6, 61:16, 66:15, 66:19, 69:20, 80:16, 84:22, 99:11, 101:3, 105:12, 105:16, 111:15, 115:10, 115:13, 117:13, 118:19, 124:13, 125:14, 127:9, 128:10, 134:21, 135:4, 136:5, 137:11, 137:18, 143:11, 145:14, 147:10 knowledge 126:5 known 123:18, 126:11, 127:2, 129:17 knows 52:4, 52:13, 54:14	119:6, 119:9, 119:13, 119:14, 119:18, 119:20, 119:21, 119:22, 120:4, 120:5, 120:9, 120:13, 120:18, 121:9, 121:14, 121:21, 122:3, 122:10, 151:5 languages 121:6 large 30:11, 35:21, 35:22, 54:5, 139:6, 139:8, 139:15 larger 23:20, 24:8, 25:8, 26:14, 35:10, 131:6 last 13:4, 13:10, 13:14, 57:10, 61:20, 71:21, 78:9, 81:14, 81:19, 85:18, 115:15, 145:21 late 29:13 latency 22:1, 22:4, 30:17 later 86:13, 114:5 law 6:9 leads 53:1 least 14:14, 30:8, 64:22, 65:5, 77:7, 84:13, 108:21, 108:22, 109:1 led 20:22, 21:8 left 55:16
K			
	keep 135:1 kept 32:3 kind 17:10, 32:22, 35:6, 76:21, 127:5, 129:14, 131:12 knierim 3:18, 11:11, 15:7, 15:13, 15:22, 17:12, 27:14, 31:2, 34:16, 35:13, 37:1, 37:14, 38:22, 39:15, 40:2, 41:8, 45:22, 49:15, 52:9, 52:17, 53:5, 55:12, 57:16, 61:9, 68:21, 70:20, 74:22, 77:5, 78:4, 80:7, 87:22, 89:3, 92:20, 93:11, 95:22, 102:5, 103:1, 103:13, 103:17, 104:10, 105:1, 110:1, 111:21, 112:7, 118:3, 119:10, 119:16, 121:16,		
J			
jabido 4:5 janice 4:5 jennifer 12:20 jeremy 1:15, 2:1, 5:2, 5:13, 5:16, 6:3, 6:16, 153:6, 153:16 job 1:19 journey 51:4			
L			
		language 25:1, 99:8, 100:20, 102:4, 102:20, 113:22, 117:11, 117:16, 117:17, 117:22, 118:11, 118:12,	

legal 18:4, 124:13, 124:14 length 57:11, 60:14, 60:15 lengthy 53:6, 132:19 less 9:17, 9:18, 33:2 let's 32:16, 73:12, 91:5, 104:15, 105:5, 110:2, 122:21, 125:11, 134:19, 138:7, 138:9, 139:21, 145:13, 150:10, 152:5 letter 70:10 level 11:5, 32:1 levels 20:18, 124:3 liberty 144:14 lightweight 18:3, 21:17 likely 121:2, 138:1 limit 27:22, 47:5, 98:6, 141:1, 141:3 limitation 28:5, 134:16, 150:15 limitations 148:9 limited 47:1 limits 93:18 line 45:14, 46:3, 52:19, 53:1,	57:2, 57:7, 57:19, 59:3, 61:20, 62:1, 62:2, 62:9, 63:4, 64:4, 71:1, 120:2, 146:17, 147:11, 150:21, 151:2, 151:19 lines 45:19, 46:2, 50:1, 57:4, 57:6, 64:9, 66:3, 70:18, 70:21 list 36:17, 46:3, 61:7, 85:3, 85:4, 88:1, 89:10, 89:11, 91:1, 91:4, 92:15, 101:19, 114:12, 120:19, 122:11, 122:17, 136:13 listed 18:20, 19:3, 19:5, 79:12, 101:9 listening 22:16 listing 117:6 lists 88:3 little 10:5, 11:16, 34:14, 38:14, 86:8, 145:5 live 32:5, 32:9, 33:7, 37:22, 137:21 llp 3:4, 3:11 local 127:14, 127:15 located 8:18, 112:4,	112:11 locates 51:6 locating 126:18 location 54:12, 127:2 locations 36:4 logically 120:18, 121:11, 122:1, 122:18, 128:4, 129:15 long 12:1, 13:5, 13:9, 15:1, 16:10 look 33:19, 34:7, 54:15, 55:17, 71:18, 84:19, 86:20, 95:17, 98:4, 98:7, 98:8, 98:17, 98:21, 99:7, 103:8, 104:20, 105:11, 105:15, 111:14, 114:1, 117:10, 120:6, 122:15, 122:21, 125:11, 136:4, 146:14, 150:10 looked 25:12, 79:19, 136:7 looking 18:9, 58:3, 80:21, 97:2, 99:14, 99:21, 120:15, 121:4, 137:15, 140:10 looks 33:1 lookup 51:9, 54:21, 127:20 lot 34:13	low 22:4, 38:1 lower 30:16 lunch 97:7, 104:5 M m= 81:5, 81:10, 81:22, 136:8, 136:10, 136:13 machine 25:7, 26:2, 26:3, 26:4, 26:10, 26:12, 26:13, 26:20, 27:12, 28:3, 28:9, 28:10, 28:12, 28:16, 35:19, 127:22 machines 26:21, 27:2, 27:3, 27:5, 28:19, 36:2 made 25:19, 29:3, 113:4 magnitude 139:19 make 8:7, 24:20, 33:21, 41:21, 47:1, 47:5, 63:7, 73:16, 84:2, 93:6, 104:7, 118:15, 123:21, 132:8, 138:18 makes 25:22 making 7:4, 24:4 management 72:18, 72:21, 73:1, 84:9, 85:8, 85:11, 85:21, 86:3,
--	--	--	--

86:5, 86:12, 86:18, 87:1, 87:4, 87:7, 87:12, 92:1, 93:20, 94:4, 95:11, 98:11, 99:5, 99:18, 100:1, 107:8, 114:12 manner 33:6 many 9:3, 9:14, 23:1, 23:15, 30:2, 31:8, 32:2, 34:4, 35:11, 37:12, 98:19 map 21:2 marked 14:1, 16:2, 19:13, 40:7, 40:11, 41:1, 41:10, 55:22, 66:14, 80:17, 82:19 marking 40:20 markings 42:5 marriage 153:21 maryland 2:14, 153:5, 154:12 match 58:15 material 18:2, 81:11, 129:19 matter 11:18, 12:4, 13:20, 124:2, 154:2 max 46:19, 47:4, 59:8	maybe 13:8, 99:21, 117:11, 140:21 mcgill 20:13 mean 23:22, 29:9, 30:5, 48:3, 70:19, 71:5, 71:8, 75:7, 83:17, 85:14, 93:21, 118:11, 127:8, 141:15, 143:1, 143:8, 149:18 meaning 124:14 means 32:7, 32:18, 38:20, 126:13 meant 30:1, 70:21, 96:11, 113:17, 131:5 mechanics 24:12 media 9:12, 9:21, 10:3, 10:11, 11:3, 11:8, 11:17, 20:3, 20:5, 20:17, 21:20, 25:5, 25:20, 26:7, 26:8, 26:11, 26:14, 29:6, 29:11, 32:4, 55:3, 55:7, 62:20, 63:16, 67:22, 68:15, 70:12, 71:7, 71:14, 71:20, 72:1, 72:7, 73:7, 73:11, 73:20, 74:4, 74:14, 74:21, 75:2, 75:4, 75:5, 75:10,	76:10, 76:16, 77:4, 77:10, 78:2, 78:8, 78:15, 79:2, 79:4, 79:6, 79:9, 80:6, 80:13, 81:1, 81:5, 81:16, 81:22, 82:3, 82:4, 82:6, 82:7, 82:13, 83:15, 83:18, 83:19, 84:6, 84:10, 85:10, 86:6, 86:9, 86:11, 86:15, 86:16, 108:18, 129:7, 135:14, 136:8, 136:10, 138:12, 138:21, 139:12, 140:1, 141:7, 142:8 meet 12:16, 12:19, 13:2, 13:5, 13:9, 140:4 mega 139:5 megabit 138:22 megabits 138:13, 139:2, 139:3, 139:7, 139:9, 139:16, 139:18, 140:21, 140:22, 141:6, 141:13, 141:14, 142:7 megaco 68:14, 69:14 mention 90:13, 121:13, 137:17 mentioned 18:11, 29:21, 32:17, 34:10, 45:1, 58:18, 79:14, 89:21,	91:6, 99:6, 100:4, 140:12 mentioning 89:22, 90:9 mentionings 102:6 mentions 67:14, 100:5 merely 93:1 message 45:3, 45:5, 45:10, 45:12, 45:14, 45:16, 45:20, 46:6, 47:22, 48:6, 48:8, 48:11, 48:13, 48:16, 49:3, 49:14, 50:14, 50:18, 52:6, 52:7, 52:16, 52:22, 53:13, 54:2, 54:3, 54:17, 56:21, 57:2, 57:3, 57:5, 59:2, 59:5, 61:4, 72:3, 72:6, 74:7, 74:11, 74:18, 74:19, 75:19, 75:21, 75:22, 76:2, 76:8, 77:12, 77:15, 77:17, 77:18, 77:19, 78:10, 79:9, 79:21, 80:1, 82:5, 82:9, 82:12, 82:15, 115:21, 116:11, 119:9, 119:14, 120:3, 120:4, 120:14, 126:1 messages 44:17, 44:18, 44:21, 53:18, 56:11, 56:15,
---	---	---	---

59:9, 59:22, 60:5, 116:4, 120:9, 123:9, 127:22 met 12:20, 13:3, 13:4, 143:2 meta 10:2, 11:15, 12:1, 12:13, 12:14, 12:15 metadata 115:3, 135:15 method 10:12, 21:12, 21:15, 21:18 methods 11:5 michael 3:18 mid 28:17 middle 96:22, 110:11 might 29:18, 31:1, 31:19, 31:20, 31:21, 32:20, 34:15, 36:21, 42:2, 55:9, 75:13, 77:1, 99:4, 104:5, 120:20, 143:14 mike 12:20, 13:18 million 138:13, 139:1, 139:2, 139:3, 139:5, 139:16, 139:18 mind 30:3, 32:3, 129:5, 132:1, 145:1 minimal 118:8 minimally 21:17	minimize 22:1 minimizing 21:18 minute 13:17 minutes 13:7, 13:8, 13:13, 104:4 misreading 106:2 missed 69:2 missing 103:4, 150:2 misworded 66:2 mixing 25:14 mobile 126:19 model 115:17 moment 56:3, 76:17, 99:8, 111:10, 135:1 mondry 3:3, 5:3, 6:7, 6:8, 40:21, 41:11, 55:8, 55:15, 104:3, 104:15, 105:9, 106:9, 134:2, 145:3, 145:10, 152:1, 152:8 money 28:22 more 10:5, 11:16, 12:5, 17:19, 18:1, 18:2, 27:9, 28:14, 28:16, 34:14, 35:4, 36:1, 36:7, 39:3, 39:4, 83:20, 84:12, 90:10,	95:9, 95:17, 96:3, 101:2, 107:13, 121:1, 122:12, 122:14, 138:8, 139:19, 140:20, 141:6, 148:21 morning 6:8, 13:17 most 9:7, 9:20, 98:20 move 116:13 much 18:3, 26:18, 30:9, 31:3, 31:9, 36:9, 36:15, 37:5, 37:16, 39:8, 95:12, 106:6, 107:12, 152:2 multicast 23:4, 31:20, 32:10, 36:14, 37:21 multicasting 31:16 multimedia 22:5, 67:6, 68:19, 69:6, 69:12, 69:15 multiple 25:9, 26:15, 27:4, 32:14, 35:17, 35:18, 36:2, 36:3, 38:4, 124:6, 124:16, 124:17, 124:18, 125:6 music 20:16, 21:6, 23:7, 25:6 must 130:8 myriad 38:11 myself 15:15, 98:6	N name 6:8, 6:15, 47:13, 126:15, 143:22 named 54:20, 116:9 naming 95:4 nature 115:3 nec 1:8, 14:15, 148:9, 153:13 necessarily 108:21 necessary 106:12, 144:9 need 7:20, 38:4, 41:5, 95:13, 95:15, 104:6, 110:9, 149:22 needed 28:19 needs 49:13, 49:16, 50:13, 50:17, 51:12, 54:1, 54:15, 124:3, 127:1, 131:10 netflix 39:20, 40:1 netflix's 40:5 network 11:9, 20:3, 20:5, 23:21, 24:9, 25:8, 26:15, 29:11, 29:16, 30:3, 30:4, 30:9, 30:12, 30:15, 32:11, 32:13, 33:13, 36:13, 38:3, 38:8, 39:3, 51:16,
--	--	--	--

68:6, 68:10, 68:11, 68:13, 127:14, 127:16, 127:17, 142:6, 143:7 networks 30:10 never 38:16, 130:9 new 3:21, 33:21, 40:10, 105:22 next 46:19, 49:14, 50:18, 51:4, 51:12, 51:14, 51:21, 52:2, 53:13, 54:2, 58:2, 58:10, 63:21, 91:22, 100:9, 100:17, 105:10, 106:13, 128:8, 136:20, 145:1 nick 12:21 nod 7:4 none 42:4 notary 2:13, 153:1, 153:4 notation 117:20 note 121:17, 129:5, 151:3 noted 6:16, 43:15, 58:2, 64:5, 71:11, 75:5, 90:1, 90:22 notes 42:5, 78:10, 82:9 nothing 77:22, 122:7,	134:5 notice 2:11 noting 104:4 november 154:8 number 5:7, 14:13, 18:21, 19:1, 19:9, 27:3, 31:7, 36:11, 36:13, 38:11, 44:22, 46:22, 47:5, 58:1, 59:21, 77:15, 116:5, 129:11, 130:15, 131:1, 139:7, 139:8, 139:15, 141:2, 145:17, 151:20 numbering 14:10, 99:21 numbers 14:5, 30:12, 35:21, 35:22, 41:9, 150:21 nw 3:5 ny 3:21 O oath 8:10 objection 11:11, 11:12, 15:7, 15:13, 15:22, 17:12, 27:14, 31:2, 34:16, 35:13, 37:1, 37:14, 39:15, 40:2, 45:22, 49:15, 52:9, 52:17, 53:5, 57:16, 61:9, 68:21, 70:20, 74:22,	77:5, 78:4, 80:7, 87:22, 89:3, 92:20, 93:11, 95:22, 102:5, 103:1, 103:13, 103:16, 110:1, 111:21, 112:7, 118:3, 119:10, 119:16, 121:16, 122:8, 127:12, 129:1, 131:17, 134:1, 134:7, 137:8, 138:17, 140:9, 141:17, 143:16, 147:2, 151:17 objections 38:22 obtained 108:20, 109:4 obtaining 123:19, 125:6 obtains 109:12, 109:20, 110:17 obviously 120:22, 123:14 occasion 129:15 occur 129:15, 129:22 occurred 86:7, 153:16 occurring 109:7 offered 118:6 office 1:1 offsets 22:4 often 36:8 oh 14:15, 70:17 ok 45:3 okay 8:1, 12:16,	19:12, 22:7, 24:5, 24:21, 31:18, 41:11, 42:11, 43:16, 45:5, 51:20, 53:13, 57:18, 61:17, 66:18, 66:20, 69:4, 70:2, 70:17, 70:18, 73:12, 87:20, 90:12, 96:19, 104:3, 105:18, 111:9, 114:4, 114:13, 114:17, 115:20, 118:18, 118:20, 121:13, 122:21, 131:7, 134:19, 136:2, 141:8, 145:18, 145:20, 149:22, 150:6, 150:9, 152:4 on-demand 32:5, 33:4, 33:16, 34:3, 34:12, 37:22 once 23:13, 37:16, 39:6, 40:4, 96:13, 103:3, 131:18, 134:10 one 3:6, 7:14, 7:20, 10:2, 13:17, 15:2, 16:7, 17:4, 19:5, 19:13, 20:7, 23:16, 23:22, 25:10, 26:16, 27:6, 27:12, 29:21, 30:3, 31:7, 35:19, 38:19, 39:13, 39:22, 40:10, 40:11, 40:13, 53:18, 55:10, 57:10, 58:18, 62:9,
--	---	---	---

67:13, 72:5, 76:14, 77:13, 78:15, 81:4, 82:2, 84:13, 97:5, 108:21, 108:22, 109:1, 113:20, 114:20, 117:3, 122:19, 122:22, 123:17, 127:22, 128:1, 129:11, 136:16, 137:19, 138:13, 138:22, 139:1, 139:2, 139:3, 139:4, 139:16, 140:11, 141:20, 144:16, 146:22, 148:9, 148:21 one-to-one 23:6, 31:15, 58:15 ongoing 21:2 only 7:21, 15:5, 15:10, 27:19, 31:6, 34:21, 45:1, 58:11, 61:3, 77:20, 78:5, 96:6, 104:1, 143:20 open 16:15, 17:1, 42:4, 80:14 opened 24:16, 40:14 opens 25:17 operating 22:1 operations 42:13, 42:19 opine 10:20 opinion 87:20, 95:14, 95:16, 133:21, 138:15	opposed 35:18, 73:8, 81:9 option 39:2, 120:19, 122:3 optional 88:4, 88:7, 88:8, 88:19, 88:21, 89:18, 90:2, 90:6, 100:13 options 78:12 order 25:5, 51:1, 90:11, 113:11, 140:21 orders 139:19 ordinary 122:6 originally 47:16, 104:5 other 7:11, 12:11, 12:14, 13:15, 21:9, 33:10, 42:5, 55:1, 61:7, 61:10, 67:5, 67:10, 67:11, 69:11, 72:4, 74:8, 74:19, 75:3, 75:13, 77:1, 77:13, 78:22, 79:7, 79:13, 79:20, 79:22, 80:4, 82:16, 89:1, 90:14, 90:15, 92:22, 93:8, 93:10, 99:5, 102:10, 102:21, 113:20, 118:10, 118:12, 133:17, 135:15, 146:19, 146:21, 147:16, 148:4,	149:6, 149:7, 150:10 others 20:8, 31:8, 79:15 otherwise 41:7, 67:8, 154:1 out 14:14, 32:22, 49:13, 49:17, 50:13, 50:18, 53:9, 53:14, 54:1, 54:21, 72:19, 78:22, 88:2, 96:9, 101:18, 108:6, 139:15 outcome 142:15, 154:2 outlined 111:5 output 101:16 outside 13:13, 40:3, 79:13, 92:14, 126:4, 130:3, 131:13, 132:22, 134:14, 134:15, 137:13, 142:4, 142:19, 142:20, 143:2 over 6:22, 7:11, 10:16, 11:1, 11:21, 29:16, 33:21, 36:2, 90:4, 102:17, 103:2, 103:16, 116:6, 145:5 overall 32:13, 33:9 overview 42:13 own 56:10, 56:14, 79:18	owner 1:9, 3:17, 5:15, 5:18 P page 5:2, 5:6, 18:1, 42:9, 42:12, 43:1, 43:16, 45:12, 46:2, 46:15, 47:4, 47:12, 48:5, 49:21, 50:21, 54:6, 66:19, 66:21, 70:1, 70:3, 70:4, 70:5, 70:22, 71:21, 73:13, 73:14, 75:5, 75:20, 76:20, 77:9, 77:19, 78:6, 78:9, 80:20, 94:15, 114:7, 115:12, 115:15, 116:14, 116:16, 117:12, 118:18, 125:13, 136:4, 136:16, 136:20, 148:20, 150:15, 150:19 pages 1:20, 16:19, 17:4, 132:20 paid 92:3, 92:4, 92:12 palmieri 12:21 palo 3:13, 3:14 paragraphs 72:10, 83:3, 83:5, 83:8, 83:12, 83:21, 84:5, 84:13, 85:10, 86:13, 87:8, 87:16, 87:21, 88:8,
--	---	--	---

90:14, 90:18, 92:22, 96:8, 96:9, 100:10, 100:12, 100:17, 100:21, 101:10, 101:19, 103:2, 103:12, 103:14, 103:19, 104:1, 104:22, 147:13, 147:20, 148:5 parens 91:7, 91:10, 146:5, 146:15 parentheses 47:13, 61:19 parenthesis 47:14 parenthetically 66:10, 78:12 part 11:8, 23:11, 23:20, 24:8, 25:8, 26:14, 32:20, 40:11, 49:4, 50:17, 53:11, 62:7, 63:22, 64:1, 64:5, 64:6, 64:8, 64:9, 64:14, 64:21, 64:22, 65:1, 65:2, 65:3, 65:8, 65:9, 65:12, 65:19, 66:5, 68:12, 73:10, 75:2, 75:17, 76:8, 76:11, 86:17, 98:11, 107:14, 115:5, 121:3, 122:6, 127:10, 127:21, 131:19, 143:21, 144:2, 144:7, 146:1, 151:6 particular 27:5, 51:8, 52:11, 54:18,	74:18, 120:12 parties 25:20, 153:20, 153:22 parts 21:8 party 12:11, 12:14, 153:12 patent 1:1, 1:3, 1:9, 1:12, 3:17, 5:7, 5:9, 5:15, 5:18, 9:5, 9:6, 18:15, 18:20, 18:21, 19:1, 19:4, 19:6, 19:8, 19:9, 19:10, 56:5, 56:9, 56:13, 57:22, 58:7, 58:12, 60:19, 61:13, 61:14, 62:4, 63:2, 71:12, 138:11, 138:12, 138:16, 139:14, 140:6, 141:11, 141:16, 142:11, 142:14, 142:15, 142:20, 143:4, 143:8, 143:9, 143:13, 144:14, 144:17, 144:18, 145:12, 145:16, 146:20, 147:4, 148:5, 149:17, 150:4, 150:8 patent's 59:13 patents 11:21, 34:8 path 125:18, 125:19, 126:1, 126:2, 127:4, 130:10 pause 63:7, 84:2, 92:6	pay 29:2 payment 90:1, 90:13, 90:19, 91:2, 92:9 payments 91:19 pc 46:16, 58:9, 58:21 pci 27:20, 27:21 pci-x 27:21 peloton 1:5, 4:5, 5:6, 6:11, 14:1, 16:2, 40:7, 55:22, 80:17, 82:19, 114:9 peloton's 148:10 penalty 8:11 pending 7:22 people 21:9, 35:10, 39:12 perceived 123:5 perfectly 37:20, 41:22 perform 85:5 performance 20:16, 21:6, 21:14, 23:8, 25:6, 28:18 performing 51:8 performs 79:20, 107:20 perhaps 24:22, 86:8, 107:13 periods 23:10	perjury 8:12 person 15:5, 15:10, 122:5 personal 42:4 pertaining 119:18 petition 19:10, 135:18, 148:10 petitioner 1:6, 3:2, 6:6, 6:10, 135:8 petitions 13:20 ph 1:15, 2:1, 5:2, 5:14, 5:17, 6:3, 153:6, 153:16 phone 43:13, 50:3, 50:19, 51:22, 53:4, 54:15, 54:16, 55:5, 55:19 phrase 102:7 physical 28:8, 112:4, 112:12 physically 24:7, 48:9 pieces 135:9 place 49:20, 51:12, 51:15, 111:7 planet 4:4, 40:19 play 33:4, 61:6 playlist 62:21, 63:17, 132:13 plaza 3:20
--	---	--	--

please 8:4, 41:6, 61:15, 63:1, 66:13, 66:18, 81:14, 82:22, 84:19, 99:11, 104:8, 111:11, 113:13, 115:8, 115:12, 136:4 point 57:19, 75:7, 75:9, 76:19, 82:8, 85:13, 86:7, 94:5, 104:8, 112:3, 116:21, 125:15, 126:8, 127:8, 132:13, 133:20, 142:13, 149:6, 150:3 point-to-point 22:14, 23:3, 23:7, 23:14 pointed 83:7, 92:15, 100:21 points 128:6, 129:9 port 22:16, 25:17 portion 65:5, 81:16 portions 15:21 ports 136:17 posita 122:1, 122:17, 130:4, 131:11, 134:15, 138:1, 138:3, 139:13, 144:13 position 36:5 positioned 32:12 possible 30:17, 96:10,	118:10 possibly 27:2, 29:14, 51:7 potential 31:17 potentially 121:5, 142:4 practice 23:8, 142:10 practices 138:10, 141:11 practicing 138:16, 140:6, 141:16, 143:4, 143:8, 143:9 practitioner 138:3 precise 74:15 preclude 144:16 preferred 39:7 preliminaries 147:11 preliminary 5:15, 120:21, 151:19 preparation 148:1, 151:7, 151:11, 151:15, 151:20 preparatory 151:22 prepare 12:17 prepared 18:14 preparing 13:16, 15:19, 18:17, 132:16, 133:2, 143:19 prescribe 137:16 prescription 138:5 present 4:3, 78:14,	93:15, 103:10 presentation 18:9, 18:13 presumably 101:18, 117:17, 120:1, 132:3, 137:21 presumed 129:15 pretty 106:6 preview 40:16 previous 10:9, 35:1, 64:12, 137:9, 149:12 previously 40:22, 98:10, 100:18 principles 18:4 prior 41:3, 90:9, 92:11 priori 25:21 priority 123:1, 123:3, 124:3, 124:9, 124:20, 125:10 privy 39:16, 40:4 probably 13:7, 16:12, 73:22, 96:19, 121:3, 140:20 problems 32:20 proceedings 9:6 proceeds 92:5, 92:10 process 15:15, 15:19, 21:16, 26:2, 50:19, 51:22, 55:3, 61:20,	62:3, 65:19, 66:5, 66:11, 84:8, 85:13, 86:4, 86:7, 98:12, 106:5, 127:10, 128:20, 144:2, 144:8, 144:20, 146:6, 146:9, 146:12, 146:16, 146:20, 147:6, 147:9, 147:12, 147:15, 147:18, 148:7, 148:8, 148:22, 149:3, 149:7, 150:5, 151:7 processes 87:17 processing 54:10, 72:19, 85:3, 85:4, 88:1, 88:11, 88:15, 88:21, 89:9, 89:11, 89:14, 89:16, 90:1, 90:7, 90:13, 91:1, 91:4, 92:5, 92:9, 92:15, 92:17, 96:11, 99:17, 100:14, 101:18, 114:11, 121:4, 132:14 produced 10:10, 43:1 product 88:12, 88:16 professional 2:12 project 20:11, 20:21, 20:22, 21:9, 22:8, 22:22, 23:12, 25:5, 26:9, 26:17, 28:21, 29:20, 29:22, 30:6, 30:18, 30:21,
--	--	---	---

31:19, 33:16, 34:3, 35:9, 35:10, 35:16, 37:11 projects 29:5, 29:10 proper 90:11 properly 131:21 proportionately 18:1 proprietary 21:15, 22:9 proto 136:21 protocol 5:11, 5:12, 22:18, 41:14, 41:20, 48:20, 53:11, 67:20, 68:9, 68:15, 68:18, 69:5, 72:5, 72:6, 75:3, 77:13, 77:14, 78:8, 79:5, 79:7, 79:17, 80:12, 137:3, 137:6, 137:16, 137:19, 137:20, 138:6 protocols 11:2, 67:5, 67:11, 67:13, 69:12, 74:8, 75:13, 76:15, 78:22, 79:14, 80:4, 126:14, 126:20, 127:3, 127:19, 128:4, 138:6, 149:13, 149:18 provide 8:16, 39:1, 56:10, 69:12, 73:1, 74:9, 75:4, 84:10, 94:4, 94:18,	114:4, 114:5, 116:10, 122:2, 128:21, 135:10, 137:5, 142:11, 144:8 provided 10:13, 11:18, 14:19, 45:12, 45:15, 45:20, 46:8, 59:21, 72:16, 96:7, 103:22, 120:7, 133:21, 135:20 provides 45:9, 56:9, 59:19, 73:3, 74:6, 82:7, 114:2, 117:6, 128:15, 130:7, 133:17, 136:13 providing 67:15, 85:5, 89:20, 115:2, 117:21, 120:8, 128:2, 138:5, 146:8, 146:11 provisions 126:20, 131:9 proxies 43:14 proxy 43:9, 43:10, 44:2, 44:8, 44:11, 46:12, 49:6, 49:7, 49:13, 49:18, 50:1, 50:4, 50:7, 50:13, 50:15, 51:3, 51:5, 51:6, 51:7, 51:11, 51:12, 51:20, 52:1, 52:4, 52:13, 53:2, 53:14, 53:15, 53:17, 53:19, 53:22, 54:7, 54:9, 54:10,	54:14, 54:19 pstn 68:4, 68:9, 68:16 public 2:13, 30:11, 30:14, 30:17, 68:6, 140:20, 153:1, 153:4, 154:11 publication 5:10 publicity 21:3 pull 12:8, 16:14, 56:3, 82:21, 115:8 purely 80:1, 124:21 purpose 78:17 purposes 29:7, 37:12, 130:17, 133:2, 139:14 pursuant 2:11 put 111:9, 135:13 Q qrs 67:15 qualifications 19:17, 19:21 qualities 20:17 quality 38:9 quebec 8:19 question 7:14, 7:16, 7:22, 8:1, 8:3, 8:5, 8:6, 12:13, 23:15, 24:3, 24:15, 24:22,	25:14, 33:22, 34:9, 35:1, 35:3, 37:8, 38:14, 38:18, 49:17, 52:12, 53:7, 56:12, 65:4, 66:2, 69:4, 71:4, 75:14, 76:3, 76:22, 80:10, 84:3, 84:11, 84:16, 85:19, 90:9, 90:17, 95:9, 97:5, 102:14, 103:5, 105:2, 105:4, 106:13, 111:5, 123:13, 132:22, 133:22, 134:4, 138:8, 138:19, 140:11, 141:9, 141:19, 142:12, 142:18, 143:12, 145:2, 148:4, 148:12, 149:11 questions 7:2, 11:15, 12:8, 49:10, 124:9, 125:10, 131:18, 131:19, 133:15, 137:9, 145:1, 152:3, 152:12 quick 131:22, 147:13 quickly 135:7, 140:11 quite 142:4, 147:6 quote 151:5 quoted 115:7 quoting 135:17 R rachel 4:4
---	---	--	--

raise 142:17 raised 149:16 rate 72:2, 73:20, 75:6, 77:10 rather 31:15, 46:16, 63:11, 68:14, 72:3, 77:11, 90:20, 92:11, 96:22, 107:12, 122:11, 143:6 rd 154:5 re-ask 69:4, 141:8 reach 52:5, 52:10, 52:11, 52:14, 53:4, 129:11, 131:1 reaches 51:17 reaching 50:19, 51:22 read 14:14, 15:17, 19:9, 61:7, 77:7, 98:8, 103:11, 103:14, 104:21, 119:17, 119:18, 132:17, 132:19, 132:20 reader 135:17 reading 63:10, 71:1, 76:18, 103:19, 103:20, 122:1, 122:16, 124:5, 130:5, 131:11, 138:3, 144:13 reads 42:21 real 3:12	real-time 67:15, 67:20 realize 144:11 really 11:20, 12:6, 12:7, 33:5, 36:15, 38:5, 95:13, 123:20, 125:4, 129:2, 131:9, 143:10, 143:11 realtime 2:13 reason 8:15, 8:17 reasonable 16:1 reasonably 28:17, 69:17 recall 10:22, 11:13, 13:1, 124:5, 140:14 recalling 12:6 receipt 25:22 receive 23:21, 26:2, 38:8, 46:17, 73:11, 132:6 received 50:4, 54:9, 62:20, 63:16, 64:6, 65:14, 65:16, 65:22, 66:7, 66:9, 85:7, 109:13, 110:18 receiver 22:16, 23:16, 23:19, 24:4, 24:15, 24:19, 24:20, 25:2, 25:22, 30:13, 31:1, 31:5, 36:5, 72:8,	72:13, 73:9, 85:2, 142:6 receivers 10:11, 22:3, 31:8, 31:17, 32:15, 35:22, 36:13, 37:19, 38:4 receives 50:1, 54:7, 110:6 receiving 21:21, 22:20, 23:19, 24:2, 24:16, 24:18, 25:16, 25:17, 25:18, 26:4, 26:12, 27:3, 28:1, 31:1, 31:6, 109:10, 109:18, 110:8, 110:15 recent 9:20, 12:5 recess 55:13, 105:7, 145:8, 152:9 recipient 54:17, 54:21, 59:4, 59:12 recite 121:9 recognizes 51:11 recollection 10:21, 11:20 reconvene 104:14 record 7:5, 7:6, 41:5, 55:12, 93:7, 103:17, 104:11, 104:13, 104:16, 104:19, 105:5, 145:7, 152:5, 152:11, 152:15, 153:11 recorded 105:21, 107:8,	109:5, 109:14, 110:18 recording 10:9 redirect 152:7 redundant 37:3 refer 14:4, 19:7, 44:18, 45:2, 71:17, 72:10, 81:18, 83:10, 94:3, 150:18 reference 91:19, 95:2, 101:22, 102:3, 120:6 referenced 16:5 references 58:21, 78:20, 98:18, 101:2, 101:5, 102:11, 102:20, 147:7, 150:3 referred 50:10, 66:10, 70:22, 73:14, 78:7, 83:8, 97:22, 98:10, 118:14, 120:1, 148:6 referring 18:19, 19:3, 34:21, 41:2, 44:14, 45:3, 49:11, 54:5, 61:14, 65:21, 71:3, 74:1, 77:20, 79:13, 80:4, 83:3, 86:12, 87:13, 89:7, 93:1, 94:1, 94:6, 94:14, 99:8, 109:9, 114:6, 120:7, 125:12,
--	--	--	---

133:5, 148:15, 150:22, 151:2 refers 19:9, 41:20, 48:19, 62:15, 78:2, 91:20, 92:8, 94:22, 95:1, 118:14, 118:17, 133:8 reflect 10:16 regard 11:5, 34:18, 36:10, 83:6, 93:19, 95:4, 102:6, 134:11 regarding 150:5 registered 2:12 relate 147:20 related 9:5, 87:1, 115:3, 132:2, 132:12, 133:16, 153:19 relates 9:15 relating 34:2, 106:13 relation 105:16 relationships 25:14 relevant 98:9, 124:22, 125:3, 126:21, 129:18, 130:4, 131:9, 134:15, 147:8, 148:9 reliability 22:3 reliable 137:22 reliably 30:16 reliance 126:13	reluctant 141:20 rely 22:10, 128:3, 128:4 relying 126:14 remember 11:21, 72:20 remind 17:13 remote 7:11 repeat 56:12, 63:1, 65:4, 66:3, 106:9, 148:12 repeatedly 78:7 rephrase 35:3, 71:3, 85:19, 148:18 replacement 105:20 replication 36:2 report 147:17, 147:19, 147:22 reported 1:21 reporter 2:12, 2:13, 7:2, 7:6, 153:1, 153:3 reporting 132:10, 134:17 repository 129:17 represented 47:10, 65:13, 66:6, 108:13, 144:4, 153:13 representing 6:10, 12:9, 12:10, 12:14 represents 43:3	request 22:12, 23:20, 24:6, 24:20, 25:19, 46:13, 46:18, 47:1, 47:5, 47:15, 49:2, 50:2, 51:2, 51:19, 52:3, 54:10, 78:12, 96:20, 109:11, 109:18, 110:8, 110:12, 110:15, 113:12, 115:16, 123:5, 123:10, 124:1, 124:3, 125:19, 138:15, 141:12 requested 71:20, 126:16, 130:1, 130:20, 130:21, 143:15 requester 70:12, 71:6, 73:9, 74:3 requesting 25:20, 39:12, 140:1 requests 23:10, 23:15, 23:21, 24:2, 24:4, 24:9, 30:22, 31:6, 33:18, 116:5, 124:6, 124:18, 138:12, 138:21 required 17:22, 21:19, 35:2, 149:1 requirement 138:22 requirements 32:7, 32:18, 36:11 requires 138:13, 141:12 research 29:4, 30:6, 31:13	reservation 151:7 resident 109:21 resolution 126:15 resolve 130:14 resources 30:4, 30:7 respect 34:19, 35:16, 98:5, 149:16 respond 33:17, 124:1 responds 54:7 response 5:15, 5:18, 50:2, 50:8, 50:10, 54:8, 78:16, 115:16, 126:3, 128:18 responses 46:17, 125:20 responsibility 86:18, 96:15, 143:7 responsible 73:6, 83:14 rest 58:14, 69:17, 95:1 resulting 107:21 results 55:3 resume 97:2 retrieve 129:18 return 84:17, 126:16, 134:3 review 104:12, 147:22 reviewed 121:20, 146:22
--	---	--	--

reviewing 120:12, 121:18 revise 140:11, 149:12 rfc 77:15 right 18:22, 19:4, 19:17, 20:4, 20:9, 21:7, 24:14, 36:19, 42:8, 42:20, 43:4, 44:10, 45:8, 46:14, 46:20, 47:2, 47:8, 48:7, 48:9, 49:10, 51:13, 51:22, 52:8, 53:20, 54:3, 55:5, 55:19, 56:11, 56:21, 57:5, 57:9, 60:7, 62:8, 62:22, 63:18, 64:2, 65:2, 65:17, 65:21, 67:9, 68:2, 73:22, 74:5, 75:8, 79:4, 79:21, 81:2, 82:11, 82:17, 90:5, 91:17, 92:22, 94:8, 107:1, 112:6, 114:19, 115:6, 116:7, 117:18, 123:5, 123:13, 128:22, 136:12, 139:17, 143:21, 146:10, 146:16, 147:18, 150:20, 151:3, 151:5, 151:9 rival 20:18 road 21:2 rockefeller 3:20	room 8:20, 23:22, 24:10, 25:10, 26:16 roughly 13:11 route 50:5, 50:16 routed 22:11 routers 127:18 routing 27:20, 28:14, 125:20, 126:3, 126:14, 127:20 rpr 1:22 rtp 67:14 rtsp 67:19 ruling 78:22 running 109:2, 109:19 runs 72:21 S s-i-p 41:12, 41:19 safe 119:8 said 10:3, 21:8, 24:21, 28:5, 63:11, 73:13, 83:13, 84:18, 96:3, 98:13, 98:22, 112:17, 121:22 same 7:15, 8:10, 12:13, 31:13, 38:22, 52:12, 54:4, 57:13, 58:15, 58:19, 58:20, 59:3, 59:7, 59:8, 59:11, 59:17, 59:21, 60:2, 60:6, 60:11, 60:12, 60:13, 60:16, 60:18, 60:20, 61:8, 61:12, 64:11, 87:6, 93:2, 108:11, 111:4, 116:13, 120:1, 126:17, 150:15 sampling 72:2, 73:20, 75:6, 77:10 save 94:1 say 7:4, 9:15, 9:18, 20:2, 28:17, 36:18, 41:18, 51:14, 53:7, 74:16, 77:1, 90:18, 91:14, 92:7, 95:19, 97:1, 98:10, 104:10, 104:11, 105:1, 119:8, 131:7, 135:8, 135:20, 141:1, 142:14, 145:4 saying 13:18, 24:15, 74:18, 75:12, 76:12, 76:13, 76:22, 84:4, 88:6, 99:5, 102:1, 103:11, 110:7, 112:20, 113:18, 132:10, 140:3 says 67:4, 85:2 scalability 35:7, 36:22, 37:2, 37:11, 38:21, 39:2 scale 35:21 scaled 39:3 scenario 31:10, 31:14, 31:20, 36:9, 37:5, 143:14 scenarios 37:18 scope 40:3, 104:17, 130:4, 131:6, 131:14, 134:14, 137:13, 142:20, 143:2 scroll 144:3 sdp 5:12, 48:1, 48:8, 48:16, 48:18, 48:19, 60:21, 68:17, 69:1, 69:5, 71:15, 71:18, 72:6, 73:10, 74:9, 74:11, 74:14, 75:3, 75:19, 75:21, 76:8, 76:9, 76:11, 76:13, 76:22, 77:14, 77:15, 77:22, 78:7, 78:13, 78:18, 78:20, 79:6, 79:8, 79:11, 79:14, 79:18, 79:21, 80:1, 80:12, 82:1, 82:4, 82:12, 134:19, 135:9, 136:2, 138:7 search 92:22, 93:4, 93:14, 96:4, 102:8, 121:1,
--	---

122:13, 131:22, 147:13 searched 78:5 searching 102:2 seattle 27:1 second 16:4, 16:6, 16:11, 16:15, 16:22, 17:9, 49:21, 50:21, 54:5, 57:19, 72:20, 74:2, 81:7, 87:4, 88:14, 94:14, 94:16, 100:1, 118:22, 120:2, 138:14, 138:22, 139:3, 139:7, 139:16, 140:21, 140:22, 141:6, 141:13, 141:15, 142:7 secondly 142:3 section 19:16, 19:20, 42:12, 42:18, 62:4, 83:7, 116:22, 117:6, 118:5, 118:14, 118:17, 118:21, 118:22, 123:7, 125:21, 126:8, 136:12, 148:17, 148:19, 149:4, 149:5, 150:4, 150:14, 151:18 sections 150:8 see 14:15, 25:6, 42:15, 43:21, 43:22, 44:5, 46:10, 47:19, 50:8, 53:13,	54:6, 55:6, 61:21, 62:11, 67:2, 70:8, 70:14, 81:6, 81:9, 81:16, 91:8, 91:12, 91:19, 94:20, 96:3, 97:17, 98:5, 99:16, 106:1, 106:15, 106:17, 108:10, 108:11, 110:13, 111:3, 112:8, 114:2, 115:18, 116:16, 116:18, 117:1, 118:13, 119:2, 120:15, 122:13, 123:2, 123:3, 124:8, 124:16, 124:18, 132:2, 134:10, 135:11, 135:16, 135:22, 136:18, 136:22, 146:2, 147:4, 147:20 seeing 78:7, 93:14, 118:16, 143:20, 150:3 seeking 25:4, 29:15 seem 89:19, 110:12, 120:3, 121:1, 122:16, 123:21, 124:21, 141:7 seemed 63:10 seems 24:21, 45:18, 46:1, 107:10, 113:18, 134:13 seen 23:2, 120:22 select 72:17, 88:12, 91:3, 112:11, 120:18, 121:7,	122:12, 122:20 selected 86:3, 86:9, 86:15, 88:16, 92:3 selecting 85:10, 86:5, 86:6, 107:4 selection 73:4, 89:10, 120:21, 121:9, 121:22 selects 85:8, 112:10 send 24:17, 49:13, 50:18, 54:1 sender 22:17, 23:16, 24:16, 24:18, 24:20, 25:1, 30:13, 32:14, 72:7, 72:12, 142:6 sending 11:3, 21:21, 24:6, 25:16, 25:18, 26:2, 26:10, 26:13, 27:2, 27:4, 27:12, 50:8, 137:7 sends 26:11, 50:2, 53:17, 141:12 sense 8:7, 24:11, 25:11, 123:21, 132:8 sensible 46:7 sent 44:17, 45:6, 49:3, 73:7, 78:10, 83:15, 83:18, 84:6, 85:12, 87:13, 119:15, 120:10,	123:9 sentence 44:1, 74:16, 81:19, 84:20, 91:19, 94:15, 94:16, 99:22, 106:7, 113:8, 118:22, 119:19, 123:6 separate 84:16 sequence 57:22, 58:5, 58:11 sequencing 44:22 series 44:15 serious 141:21 server 23:22, 24:10, 25:10, 25:16, 25:17, 25:18, 25:19, 26:16, 33:3, 33:5, 33:8, 33:14, 33:20, 34:2, 34:11, 34:14, 35:8, 37:20, 38:2, 38:3, 39:2, 39:13, 39:22, 40:1, 46:12, 49:18, 49:20, 50:1, 50:7, 50:13, 51:1, 51:3, 51:5, 51:6, 51:7, 51:9, 51:13, 51:18, 51:20, 52:2, 52:4, 52:13, 53:2, 53:14, 53:15, 53:17, 54:7, 54:9, 54:11, 54:14, 72:22, 88:16, 94:3, 94:17,
---	---	--	---

108:9, 108:14, 109:3, 109:6, 109:12, 109:20, 109:22, 110:5, 110:6, 110:14, 110:16, 110:22, 113:12, 123:18, 124:1, 125:5, 125:7, 126:12, 126:15, 126:16, 127:2, 127:7, 128:3, 128:7, 129:17, 130:8, 130:11, 134:18, 137:18, 138:12, 138:21, 140:3, 140:4 servers 22:15, 25:9, 25:15, 35:17, 36:4, 43:9, 44:2, 44:11, 125:6, 142:9, 148:22 serves 44:7, 47:4, 51:10, 115:1 service 49:7, 54:12, 62:10, 64:8, 129:12, 130:15, 143:15 serving 22:12 session 5:11, 5:12, 41:13, 41:20, 44:3, 44:13, 48:19, 53:9, 55:4, 55:7, 55:21, 68:18, 69:5, 69:11, 72:1, 72:4, 72:5, 73:19, 74:7, 77:9, 77:12, 77:14, 111:19, 112:2, 112:6, 112:14,	112:22, 113:11, 113:15, 114:10, 114:16, 114:18, 115:2, 115:3, 115:5, 118:1, 133:9, 133:14, 133:18, 135:15 sessions 68:19, 69:7 set 24:1, 56:2, 66:12, 99:1, 117:7, 121:2, 123:18, 153:7, 154:4 settlement 89:15, 89:16, 96:11 setup 24:12, 55:21 several 26:21, 55:1, 56:9, 56:13, 57:4, 57:6 share 72:8 sharma 3:10, 6:12 short 96:20, 97:1, 98:14 short-circuit 97:20 shortcut 97:12 shorthand 41:21, 44:19, 153:1 should 17:13, 19:20, 56:5, 70:16, 78:16, 81:6, 104:12, 116:14, 116:16, 117:12, 125:13, 125:20, 126:2, 138:6, 142:14, 142:16, 144:6, 144:19	shouldn't 124:12, 141:1 show 75:15 showing 40:15, 40:16 shown 44:2, 48:1, 48:4, 48:9, 48:11, 49:8, 75:21, 77:16, 99:17, 110:12, 111:1, 112:9, 112:15, 112:16 shows 43:20, 108:8, 108:16, 112:18 side 21:21, 21:22, 33:3, 33:8, 37:13, 135:1 sign 58:8 signature-plkal 154:9 similar 11:15, 17:6, 17:10, 27:3, 71:11 simple 42:20, 76:21 simpler 34:9 simply 25:20, 52:19, 87:4, 98:6, 132:14, 142:16 simultaneous 10:8, 20:15, 21:6, 23:1, 27:8, 36:12 since 21:17, 23:13, 24:4, 33:3, 97:4, 144:17 single 24:10, 26:16, 26:20, 28:12,	33:20, 37:20, 39:2, 39:13, 53:1, 125:5, 132:21 sip:alice@atlanta 59:20 sip:alice@pc 60:12 sip:bob@biloxi 59:4 sips 47:14 sitting 10:21, 26:16, 132:16 situation 31:15, 37:7, 37:17, 129:10, 130:12, 130:14, 142:3, 144:15 size 30:19 skill 122:6 slight 58:17, 106:2 small 31:7, 35:9 smaller 30:12 snapchat 10:2, 10:6, 10:7, 12:4, 12:10, 12:12 socket 22:16, 22:20, 24:16, 24:18 software 21:15, 22:9, 29:3 solely 37:8, 75:14 solution 36:8 some 10:17, 15:17, 26:20, 29:8, 31:4, 36:5,
---	--	--	---

37:8, 42:19, 58:17, 67:7, 67:9, 67:10, 71:18, 72:4, 77:13, 79:7, 83:10, 94:1, 96:21, 99:4, 101:22, 114:14, 120:20, 127:16, 139:6, 139:8, 151:5 someone 38:16, 79:3 something 10:13, 34:21, 36:21, 37:10, 38:19, 69:15, 73:13, 76:18, 103:4, 104:18, 112:15, 112:17, 120:11, 122:5, 123:14, 124:22, 127:1, 130:3, 139:18, 139:20, 140:20, 142:1, 142:17, 142:21, 143:1, 143:18, 147:12, 148:13, 150:2 somewhat 35:15, 130:3 somewhere 15:3, 24:7, 26:6, 39:22 sorry 14:15, 27:15, 27:20, 53:6, 56:12, 65:3, 69:2, 71:14, 71:16, 72:19, 81:10, 81:14, 90:4, 100:12, 103:15, 119:17, 144:10, 148:18, 149:10, 149:14, 150:21 sort 9:8, 10:16,	22:21, 28:18, 63:12, 76:3, 97:19, 103:6, 120:16, 121:10, 123:13, 126:9, 126:20, 141:2, 142:22, 143:11 sorts 31:5 sound 7:8, 7:18, 94:8 sounded 76:17 sounds 41:8, 74:17 source 131:8 sources 28:2 space 29:6, 29:12 speak 18:16 speaking 33:14, 34:10, 37:6, 90:4, 103:15 specific 11:2, 26:19, 35:4, 35:7, 36:9, 37:5, 95:2, 103:5, 105:4, 129:22, 132:7, 132:22, 137:16, 138:5, 150:7 specifically 10:5, 11:16, 33:6, 34:17, 49:11, 49:22, 56:18, 69:19, 70:5, 74:16, 77:2, 77:21, 79:16, 80:21, 94:2, 99:7, 102:3, 105:11, 111:12, 148:16, 149:21	specification 62:21, 63:17, 64:10, 65:17, 66:9, 74:10, 76:4, 76:6, 107:1, 107:19, 107:21, 108:2, 118:6, 121:12, 122:10, 143:20, 144:5 specifications 36:18 specifics 31:4, 38:6 specified 65:16, 66:8, 125:7 specifies 52:7, 52:20, 54:17, 70:12, 71:7, 73:10, 74:3, 74:14, 79:9, 80:5, 142:16 specify 53:8, 74:20, 120:21, 143:13 specifying 72:11, 75:10, 77:3, 78:2, 107:17, 107:20, 122:3, 125:9 speculate 124:9, 124:11, 126:7, 129:3 speculating 121:10, 121:22, 123:12, 143:11 speculation 126:10 speculative 124:21 spend 13:15, 15:1, 16:10 spent 17:6, 17:19 square 3:13	standard 18:5, 28:18, 41:13, 45:9, 49:22, 57:15, 57:20, 58:4, 58:13, 59:14, 59:19, 60:7, 60:8, 60:10, 60:17, 60:19, 61:1, 61:5, 61:12, 66:14, 70:11, 70:17, 71:6, 71:10, 71:21, 74:2, 74:6, 74:8, 74:17, 74:20, 75:1, 75:8, 75:9, 75:14, 75:16, 75:20, 76:7, 76:18, 77:3, 78:1, 78:6, 78:21, 80:3, 80:5, 82:1, 115:9, 115:21, 116:3, 117:5, 117:9, 122:22, 125:13, 126:18, 126:21, 128:9, 129:6, 133:17, 134:20, 135:10, 136:3, 148:17, 148:21 standards 11:3, 21:17, 22:10, 38:10, 127:20 standing 93:3, 123:12, 132:1, 143:10 stands 41:13, 117:17 start 33:21, 60:15, 73:12, 91:5, 91:21, 97:8, 102:17, 145:13 started 6:14, 6:21,
--	--	--	--

70:15 starting 26:1, 43:19, 44:19, 57:19, 88:4, 117:11 starts 62:9 startup 29:14 state 2:14, 20:18, 70:11, 74:2, 96:14, 99:20, 111:18, 111:22, 112:8, 112:9, 113:9, 114:22, 144:19, 153:4, 153:5, 154:12 stated 44:11, 47:4, 48:4, 50:15, 82:6, 95:7, 97:22, 100:3, 109:17, 113:20, 113:21, 116:12, 134:13 statement 16:1, 69:17, 112:19, 113:4 states 1:1, 5:7, 5:9, 30:8, 65:18, 75:20, 81:20, 85:21, 88:10, 91:22, 100:1, 109:10, 119:4, 123:7, 125:21 stating 148:17 status 128:18, 134:17 stenographically 1:21 step 45:2, 49:3, 49:5, 85:15, 88:14, 88:19, 89:13, 89:18,	90:6, 92:1, 92:5, 92:7, 92:10, 106:17, 106:22, 107:3, 107:7, 107:12, 107:13, 107:15, 108:6, 108:7, 108:11, 109:7, 110:4, 121:4, 127:21, 138:7, 151:22 steps 50:22, 55:1, 55:6, 84:20, 85:2, 88:1, 88:7, 88:11, 89:2, 89:8, 89:13, 89:20, 89:22, 90:2, 90:20, 93:2, 96:8, 106:14, 110:2, 111:3, 111:4, 111:7, 126:18, 147:7 still 38:14, 144:11 stipulate 99:1 stop 84:15 storage 10:9, 32:6, 32:7, 32:18, 33:9, 33:10, 34:20, 35:1, 39:5, 39:6 stored 32:8, 32:19, 129:19 strategies 22:2 stream 29:2, 71:7, 71:14, 73:11, 74:4, 74:21, 75:10, 77:4, 78:2, 79:4, 80:6, 139:20	streamed 31:10 streaming 9:12, 9:15, 9:21, 10:3, 11:17, 21:13, 25:5, 26:7, 33:7, 67:20, 67:22, 137:22 streams 22:6, 27:8, 29:1, 35:18, 35:21, 36:11, 36:12, 38:1, 38:7 street 3:5 strict 137:19 strike 26:5, 34:8, 91:20 struggle 141:4 stuck 131:2 stuff 106:9 subfield 81:18, 81:22, 136:17, 136:21 subfields 81:4, 82:2, 136:11, 136:13 subheading 80:21, 81:1, 88:15, 88:20, 116:16, 125:12 subheadings 116:21, 117:3 submitted 13:19, 14:5, 14:8, 16:6, 41:14, 150:11 subscribers 31:7, 31:17, 31:21 subsection 123:1	subsequently 10:10 succeed 130:9, 130:11, 144:21 succeeded 132:11 success 132:2 sufficient 38:1 suffix 58:8 suggested 17:15 suggestion 145:4 summarize 147:15 summarized 101:19 summarizing 111:6 summary 96:8, 103:22, 146:11 super 35:19 supercomputing 27:1 supplemental 5:16, 14:12, 16:7, 17:17, 17:22 support 5:14, 5:17, 28:20, 142:7 supported 28:4, 117:8 supposed 142:12 sure 7:4, 10:17, 14:10, 34:17, 35:6, 36:20, 37:6, 56:13, 58:17, 60:14, 63:2, 63:7,
--	--	--	---

70:15, 73:16, 80:9, 81:8, 81:12, 84:2, 93:6, 96:17, 98:16, 103:3, 104:7, 111:4, 118:10, 120:5, 121:8, 138:18, 148:13, 150:9, 152:8 switch 68:6 switches 30:13, 127:9, 127:17 sworn 6:4, 153:8 synchronization 22:5 system 20:9, 20:15, 21:5, 21:11, 22:1, 22:11, 24:8, 25:12, 26:6, 32:8, 33:1, 35:8, 67:1, 99:5, 138:10, 138:14, 140:5, 141:10, 141:14, 141:15, 142:9, 142:16 systems 140:12, 140:17, 141:4, 142:8	97:1, 97:3, 98:13, 98:14, 103:8, 104:6, 104:9, 104:14, 104:15, 105:5, 105:11, 105:15, 111:14, 114:1, 117:10, 122:12, 133:3, 136:4, 138:7, 144:22, 146:14, 150:10 taken 6:19, 55:13, 55:16, 105:7, 125:19, 126:1, 145:8, 152:9, 153:10 takes 49:20, 109:20 taking 7:2, 95:8, 96:22, 99:2, 111:7 talk 7:11, 147:7 talking 139:4, 139:17, 139:18, 149:13 talks 87:9, 121:21, 122:11, 151:19 taniguchi 18:9, 18:12, 18:14, 18:16, 18:19, 19:2, 140:19, 141:5 target 51:17, 51:21, 52:2, 53:8 taught 149:14 tcp 138:1, 149:18 tcp-based 137:20 teach 148:18, 148:21 teachings 133:1, 144:17	technician 4:4, 40:19 technologies 20:3, 20:6, 29:6 technology 9:8, 9:12, 9:16, 9:21, 10:4, 10:6, 11:17, 28:6, 29:12 telephone 68:6 telephony 129:13 tell 8:4, 10:4, 17:9, 20:11, 92:21, 138:4, 144:6 tempesta 12:21 tens 34:5 tenth 3:5 terabits 139:6 term 102:2 terminate 142:17 terminated 132:14 terminates 58:8 terminology 81:12, 98:3, 98:8, 124:14 terms 35:17, 39:4, 39:5, 50:22, 71:13, 75:4, 80:10, 84:9, 84:10, 86:16, 129:22, 131:22 territory 123:16	testified 6:5, 9:1, 9:11, 9:21, 105:3 testimony 8:16, 10:13, 11:18, 79:10, 83:11, 93:7, 93:8, 93:13, 95:10, 95:15, 104:8, 104:18, 114:19, 125:2, 132:15, 133:5, 133:12, 153:11 testing 21:1 text 15:17, 82:8, 82:14, 97:13, 97:17, 99:5, 106:2, 107:11, 114:2 thank 6:20, 56:19, 152:1, 152:12, 152:14 themselves 143:6 thereabouts 83:3 thing 7:21 things 41:21, 75:13, 77:1, 82:16, 103:10, 135:13, 137:13 think 16:5, 16:7, 20:7, 31:3, 31:9, 34:21, 38:14, 39:10, 39:20, 39:22, 40:21, 55:9, 56:4, 58:18, 66:2, 73:12, 80:14, 81:14, 81:19, 84:16, 89:4, 97:4,
T			
table 116:14 tag 59:21, 81:5 tags 81:9 take 7:20, 8:1, 8:11, 32:16, 55:10, 84:19, 86:20, 96:2, 96:17, 96:21,			

97:6, 98:19, 104:3, 104:16, 106:13, 113:15, 144:13, 145:5, 149:16 thinking 138:2, 145:16 third 71:1, 88:3, 88:6, 88:19 third-party 11:7, 11:14 thoroughly 132:18 thought 103:9, 141:21 thousands 31:16, 31:21, 33:17, 34:5, 34:6, 35:11, 37:13, 37:19 three 13:7, 13:13, 19:5, 27:2, 27:8, 88:3, 99:18, 106:16, 135:9, 135:13 threshold 140:3 threw 139:15 through 17:20, 18:4, 21:20, 27:20, 28:14, 50:20, 52:15, 62:6, 71:9, 88:20, 90:10, 93:3, 93:14, 93:16, 95:8, 96:3, 96:9, 96:14, 96:21, 98:4, 98:8, 98:17, 99:3, 100:10, 100:12, 101:20, 103:6, 104:1, 104:20, 107:9, 114:2, 116:21,	122:15, 122:16, 124:5, 124:7, 126:17, 127:8, 127:16, 131:21, 133:4, 134:9, 134:10, 147:4, 147:19, 149:11 throughout 32:11, 32:13 thrown 63:9 time 7:21, 12:5, 13:15, 17:6, 17:11, 17:14, 17:19, 20:19, 22:7, 23:11, 27:16, 27:17, 27:18, 27:22, 28:7, 28:11, 30:8, 31:1, 34:8, 53:19, 56:4, 80:15, 93:17, 94:1, 95:8, 95:12, 95:17, 96:2, 96:17, 96:21, 97:7, 98:14, 99:3, 103:4, 104:6, 104:7, 104:13, 104:20, 114:1, 122:13, 133:3, 137:21, 140:19, 145:6, 152:2, 152:13 timeline 12:7 times 9:3, 97:17 timing 22:4, 38:7, 38:9 title 87:4, 107:1, 107:4, 107:17, 107:19, 108:2, 112:10 titled 42:13, 81:1,	106:22 today 6:10, 6:14, 7:1, 8:16, 8:18, 10:21, 13:21, 14:7, 14:20, 18:21, 40:10, 41:15, 42:3, 79:19, 93:3, 95:8, 102:12, 102:13, 102:22, 115:22, 132:16, 139:13 today's 12:17, 13:16, 148:1 together 25:9 token 7:15 tolan 4:4 took 8:10, 17:16, 17:17 top 12:2, 46:15, 47:12, 69:3, 70:5, 70:22, 76:20, 77:7, 94:15, 146:5, 147:1, 149:9 topic 126:9, 133:16 topics 129:3, 137:10 topology 30:4 touched 137:10 towards 47:15 track 63:12 trademark 1:1 traffic 22:10, 22:21,	25:4, 28:10, 32:1, 34:4, 34:13, 39:12, 39:14, 40:1 transaction 115:17 transcript 5:5, 14:2, 16:3, 40:8, 56:1, 80:18, 82:20 transfer 138:2 transferred 83:20 transferring 89:16 transmission 25:7, 26:14, 31:16, 33:12, 133:7, 133:13 transmissions 44:15 transmit 22:19, 35:18, 109:15, 110:20 transmits 25:18, 63:22, 64:5, 64:9, 108:1 transmitted 32:4, 32:5, 72:15, 82:13, 115:5 transmitter 26:11 transmitters 36:3 transmitting 27:7, 28:1, 28:13, 128:5, 133:8, 149:2 transport 62:6, 63:22, 64:6, 64:21, 65:2, 65:9, 65:11, 65:19, 66:4, 135:14,
--	---	---	---

137:2, 137:6, 144:1, 144:7 transporting 67:14 travels 126:2 triaged 124:7 triaging 124:2 trial 1:3 triggers 112:10 trouble 12:6, 123:12 true 153:10 truthful 8:16 try 7:3, 7:11, 7:13, 7:15, 35:4, 141:20 trying 24:11, 25:11, 32:21, 35:19, 50:2, 50:8, 52:5, 52:10, 52:11, 52:14, 53:3, 53:18, 54:2, 54:8, 63:12, 113:2, 124:10, 129:11 tuesday 1:17, 153:17 tuning 21:13 turn 19:19, 43:16, 61:15, 66:18, 69:22, 80:20, 84:1, 105:10, 112:10, 115:12, 118:4, 128:8, 133:10, 134:19, 135:2, 138:1, 145:11	turning 118:18, 136:2, 145:13 twice 77:7 two 12:3, 13:11, 13:14, 13:19, 13:20, 14:8, 14:19, 17:11, 25:20, 43:9, 43:14, 44:2, 44:7, 44:11, 55:21, 58:16, 59:21, 61:4, 70:18, 70:21, 88:7, 101:2, 129:8, 129:20, 147:13 type 45:16, 47:18, 47:21, 48:5, 48:8, 48:13, 48:15, 48:16, 48:18, 51:8, 57:3, 60:21, 72:1, 73:20, 77:10, 78:10, 82:4, 82:7, 82:13, 97:16, 119:5, 119:12, 119:19, 119:20, 140:16 types 78:14, 129:7 typical 15:19, 43:20, 141:2 typically 30:14, 117:19, 127:13	133:6, 133:12 ultimately 55:3, 73:9 ultra-videoconferencing 20:9, 20:12, 26:22, 29:22, 35:16 ultralow 20:14 unable 138:14, 142:11, 144:8 unclear 49:16 uncompressed 21:20, 27:8, 27:10 under 8:11, 73:8, 83:16, 117:8, 118:9, 123:1, 125:12 underlying 142:5, 143:7 understand 8:3, 8:6, 8:13, 14:4, 14:6, 19:8, 19:11, 24:14, 24:22, 38:13, 41:19, 45:2, 48:3, 74:17, 75:12, 76:22, 79:14, 80:9, 85:14, 95:13, 95:15, 98:16, 99:4, 102:14, 104:7, 138:18 understanding 101:21 understood 8:2, 84:11 unfortunately 71:17 unit 107:9 united 1:1, 5:7, 5:9,	30:8 university 20:13 unknown 126:19 unless 126:7, 127:14, 131:5, 150:2 unlike 70:11, 70:17, 71:5, 74:2 unnecessary 37:4 until 7:13, 7:15, 57:7 upper 141:1, 141:2 urgency 123:4, 123:10, 123:20 uri 47:14 url 59:13, 125:7, 126:11, 128:2, 137:17 urls 137:18 usage 117:19 use 11:8, 22:19, 28:16, 35:17, 39:18, 39:21, 40:6, 40:22, 41:9, 67:21, 68:11, 68:13, 68:14, 78:22, 79:3, 79:7, 98:2, 98:9, 112:1, 112:21, 113:9, 113:14, 113:22, 124:12, 135:9, 140:20 useful 130:16, 131:14, 132:9
U			
	uas 78:15 udp 22:19, 58:20 ueda's 124:11, 125:4,		

user 22:7, 22:11, 22:21, 24:6, 73:4, 73:8, 83:16, 83:20, 84:7, 85:4, 85:7, 86:1, 86:2, 86:10, 86:15, 86:17, 87:13, 88:12, 88:17, 89:12, 91:16, 92:3, 106:19, 107:3, 107:7, 107:14, 107:17, 107:18, 107:20, 108:1, 112:9, 114:10, 114:17, 120:17, 121:6, 122:2, 122:12, 123:19, 123:22, 125:5, 126:19, 128:6, 129:11, 130:7, 130:13, 130:14, 130:18, 130:19, 130:20, 130:22, 131:13, 132:6, 138:11, 141:11 users 21:13, 24:2, 28:22, 33:18, 34:5, 34:13, 37:13, 43:4, 131:7 uses 31:5, 65:12 using 14:11, 22:9, 42:19, 44:15, 54:19, 72:2, 73:21, 77:11, 98:6 utilizes 39:11 V valid 69:17	value 60:3, 79:18 values 22:4, 57:14 varied 9:10 variety 22:2, 114:8, 129:7 various 21:22, 112:1, 112:21, 113:9, 113:14 vendors 11:7, 11:14 venture 29:17 venturing 123:15 verbal 7:5 verify 32:10 verifying 18:10 version 122:19 versus 29:21, 35:10 vertically 66:22 via 46:9, 46:20, 47:21, 57:9, 58:19, 125:18 video 9:15, 10:8, 20:17, 27:9, 32:17, 33:15, 34:3, 34:12, 39:17, 58:10, 82:8, 82:14, 139:20 videoconferencing 20:15, 23:6 videos 39:12 view 26:8	viewers 23:1 virtual 8:9 virtually 1:16, 2:2, 153:17 void-style 129:13 volume 30:22, 108:17 W wait 7:13, 7:15 waiting 23:21 walked 52:15 want 6:21, 38:13, 42:1, 56:17, 76:21, 99:7, 103:2, 118:13, 120:6, 122:20, 126:8, 126:10, 131:7, 131:20, 143:21 wanted 21:17, 22:8, 98:17 wants 138:11 washington 3:7 watch 39:12, 107:5, 107:18, 108:3 way 23:18, 33:6, 47:6, 75:22, 77:17, 113:20, 116:21, 117:22, 120:9, 123:8, 137:5, 148:14, 154:1 ways 128:20, 133:16, 133:17 we're 7:10, 13:20, 14:4, 14:20, 18:19, 41:1, 41:15, 97:6, 114:6, 135:6, 139:4, 139:5, 139:17, 139:18, 151:1 we've 55:8, 56:4, 93:10, 95:19, 97:4, 98:20, 100:16, 100:22, 102:21, 103:12, 145:4 web 77:19 week 13:4, 13:10, 13:15 weighing 38:12 weighted 72:22 well-known 127:18 went 17:9, 116:6 westmount 8:19 whereas 57:21, 58:6, 72:9, 130:14 whereof 154:4 wherever 32:15 whether 32:4, 32:5, 32:10, 32:11, 33:10, 34:18, 34:20, 37:21, 52:22, 92:2, 92:12, 96:4, 103:20, 120:19, 120:20, 122:13,
--	--	--

124:11, 124:15, 142:16, 148:4 whichever 125:7 whole 140:5 wide 33:18, 129:6 willing 98:22 wish 72:8 wishes 53:9, 73:11 within 27:22, 38:2, 74:8, 74:13, 78:1, 79:1, 79:16, 80:2, 80:5, 97:13, 116:22, 121:11, 127:15, 136:13, 150:8, 153:4 without 10:22, 58:8, 80:3, 93:16, 95:2, 95:8, 96:13, 99:2, 118:15, 141:21, 147:3 witness 27:15, 55:11, 103:15, 104:12, 152:4, 152:14, 153:7, 153:11, 154:4 wondering 17:8 word 15:14, 15:15, 124:12, 132:21 worded 24:3 wording 25:13, 112:8 words 15:11, 67:7 work 17:9, 17:20,	18:1, 20:2, 21:4, 21:11, 22:13, 26:17 worked 15:5, 24:13, 29:5 working 15:1, 16:11, 25:9, 30:20, 33:15, 34:3, 50:5, 50:15 works 37:20 world 39:14 worries 14:17 wouldn't 28:17, 51:14 write 15:14 writing 15:15 written 66:3 wrote 15:11 Y yeah 45:11, 47:3, 48:4, 50:20, 63:9, 71:9, 71:17, 72:22, 75:17, 79:22, 81:8, 81:16, 90:21, 98:21, 117:6, 124:16, 126:4, 128:12, 139:8, 151:18, 151:21 years 12:3 yep 55:11, 60:14 yesterday 13:3, 13:6, 13:14	york 3:21 youtube 39:10, 39:17 Z zero 22:3 ' 'm=' 81:2 , ,9 1:17 . .2500 3:22 .3 118:21 .4702 3:15 .6000 3:8 0 0094321 5:10 01 1:18, 153:18 01241 1:11 04 152:9 08 55:13 1 1 105:8 1.1 118:5, 120:7 10 1:18, 16:12, 17:18, 42:9, 45:2, 45:3,	140:21, 153:18 100 50:2, 54:8, 106:19, 107:9, 108:9, 108:14, 108:18, 109:5, 109:19, 141:13, 141:14, 142:7 1001 5:7, 55:22, 56:5, 145:12 1003 5:9, 82:19, 82:22 1004 5:11, 40:7, 40:12, 40:15, 40:16, 41:2, 41:12, 55:17, 66:14, 115:9 1005 5:12, 80:15, 80:17, 134:20 101 145:16 10112 3:21 102 84:21, 85:2 11 43:16, 45:12, 55:13, 55:14, 115:12, 115:15 12 43:1, 46:2, 55:6, 105:7, 118:7 122 99:10, 99:14, 99:22 124 89:8, 90:20, 91:6, 91:9, 92:15, 99:13, 100:1, 100:3 125 89:8, 90:20, 91:3, 91:14
--	---	--	--

126 92:1 127 89:13, 91:10, 92:5, 92:10, 92:16 13 46:15, 47:4, 47:12, 48:5, 55:6, 71:21, 73:13, 73:14, 75:5, 75:20, 76:20, 77:9, 78:19, 151:3, 151:11, 151:19 135 86:20, 86:22, 100:10, 100:12 136 87:16, 87:21, 101:20, 104:1 137 88:4, 88:8, 88:10, 96:9 138 88:8, 88:14, 101:20 139 87:16, 87:21, 88:5, 96:10, 100:10, 100:13, 104:1 14 5:13, 49:21, 50:21, 54:6, 76:20, 118:7, 150:15 14.12 118:7 142 60:15 147 72:10, 83:3, 83:5, 83:12, 84:5, 85:10, 87:8, 87:9 148 72:10, 83:5,	83:12, 84:5, 84:19, 85:10, 85:21, 87:8, 87:11, 87:15, 94:6, 94:7, 94:9, 94:21, 100:17 149 83:3, 83:9, 100:17 15 15:4, 16:13, 17:16, 17:18, 61:15, 61:18, 64:4, 66:4, 97:17, 146:13, 146:16, 146:22, 149:8, 150:19, 151:1 150 85:5, 107:10, 109:12, 109:16, 110:9, 110:10, 110:16, 110:20, 111:1 154 1:20 16 5:16, 152:10 169 117:12 17 105:11, 105:16, 105:20, 106:4, 106:14, 107:11, 108:5, 108:10, 110:13, 111:2 170 89:5, 89:19, 90:14, 90:18, 92:18, 100:21 171 89:6, 89:19, 90:14, 90:18, 91:18, 91:22, 92:8, 92:18, 100:21, 128:9 179 125:13	18 150:19 191 85:3, 108:9, 108:14, 109:3, 109:6, 109:12, 109:20, 109:22, 110:6, 110:16, 110:22, 130:8 1990 29:13 2 2 94:9, 145:8, 145:9 2.0 58:20, 59:5 20 9:4, 9:15, 104:4, 116:16, 116:22, 117:6, 125:15 20.13 117:11, 117:15, 118:9 20.18 128:9, 128:11, 129:10 20.26 123:1, 123:3 20.42 125:12, 125:16 200 45:3 2000 29:14 20001 3:7 2001 5:13, 14:1, 14:7, 14:15, 14:18, 14:21, 15:2, 16:15, 19:13, 69:19, 111:12, 135:3, 148:16 2005 27:1	2009 5:10 2010 5:16, 14:11, 16:2, 16:5, 16:9, 17:1, 150:12 2017 141:5 202.662 3:8 2023 1:11 2024 1:17, 153:17, 154:5, 154:8 21 55:14, 62:9, 63:4, 64:9 2112 3:14 212.408 3:22 22 64:10, 80:20, 136:4, 136:16 227 83:21, 84:13, 84:17, 86:13 23 136:20, 154:5 230 83:21 24 17:4 241 105:16, 105:19, 106:7 242 107:6, 111:6 243 108:19 244 109:10, 109:17, 110:3 25 9:4, 15:4, 17:16, 132:12
---	--	--	--

27 70:3 28 70:1, 70:4, 70:5, 94:15 281 112:10 282 112:4, 112:12 29 62:1, 64:4, 114:7, 146:17, 150:19, 151:2 3 3 152:9, 152:10 30 3:20, 63:22, 64:5, 64:21, 65:2, 65:8, 151:6 3000 3:12 301 106:16, 106:17, 106:18, 107:7, 107:12 302 108:8, 108:11, 108:16, 109:3, 109:7, 110:4 31 105:8, 112:1 314159 60:4 33 46:16, 58:6, 58:9, 58:21, 60:12 35 66:3 37 148:20 4 40 5:11, 61:20, 	62:2, 64:9, 66:3 41 105:7, 145:8 427 19:8, 56:5, 56:9, 56:13, 57:22, 58:7, 58:11, 59:13, 60:19, 61:13, 61:14, 62:4, 71:12, 138:10, 138:12, 138:20, 139:14, 141:11, 141:16, 142:14, 142:15, 143:13, 143:20, 144:18, 145:11, 146:20, 148:5, 149:15, 149:17, 150:4 44 116:21 48 118:18 485 101:3 5 5.1 29:16 5.14 80:21, 81:7 53 145:9 543232 1:19 56 5:7 58 132:20 59 151:4, 151:20 6 64 151:4 650.632 3:15 66710 58:6 	68 78:6, 78:9 69 69:22, 74:1, 94:3, 94:12, 94:13, 94:15 7 70 47:1, 133:6, 133:11 71 83:22, 111:14, 112:20, 113:9, 114:6 72 16:19 76 58:6 776 57:21 79 135:7 8 8.2 118:21 80 5:12, 62:7, 64:1, 64:6, 64:21, 65:2, 65:9, 65:12, 65:19, 66:5, 135:3, 135:19, 143:21, 144:7 81 146:1 82 5:9 84 58:6 850 3:5 9 9,769,427 1:12, 5:8, 18:21 	94306 3:14
---	---	--	--------------------------