

1 UNITED STATES PATENT AND TRADEMARK OFFICE
2 BEFORE THE PATENT TRIAL AND APPEAL BOARD
3

4
5 CISCO SYSTEMS, INC.,
6 Petitioner

7 v.

8 ORCKIT CORPORATION,
9 Patent Owner.

10
11 Case IPR2023-00402
12 U.S. Patent No. 8,830,821
13

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16 DEPOSITION OF DR. HENRY HOUH
17 TAKEN REMOTELY BY VIDEOCONFERENCE
18 November 15, 2023
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24 Reported by: Mary Ann Payonk

25 Job No. 1199

November 15, 2023

9:30 a.m.

DEPOSITION OF HENRY H. HOUH, Ph.D., taken
remotely by videoconference pursuant to Notice and
agreement of counsel, stenographically reported by Mary
Ann Payonk, Shorthand Reporter and Notary Public, CA CSR
No. 13431.

All attorneys participating in this deposition
acknowledge that the reporter is not physically present
in the deposition room and there is no objection to the
oath being administered remotely.

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19 ALSO PRESENT:

20 Anniliese Coleman, BlueBear Solutions

21 Tiffany Salinas-Harwell, stenographer in training

1 THE REPORTER: Let me first give you my
2 California license number before we start, which is
3 13431. And now I'll swear the witness.

4 HENRY H. HOUH, Ph.D.,

5 called as a witness, having been duly
6 sworn, was examined and testified as
7 follows:

8 EXAMINATION

9 BY ATTORNEY STAMATOPOULOS:

10 Q. Good morning, Dr. Houh.

11 A. Good morning.

12 Q. Yesterday we went over some ground rules. I
13 won't tire you with going over the same ground rules
14 today.

15 Let me know if you have any questions about
16 process, and I'm happy to address them. As we did
17 yesterday, we'll be taking breaks at various times. If
18 you feel the need for a break, just let me know and
19 we'll try to take a break either immediately or after
20 I've finished, you know, my line of questioning at a
21 reasonable point.

22 Sir, yesterday I asked you some questions
23 about a declaration you provided in connection with an
24 IPR concerning Orckit Corporation's '740 patent.

25 Now, you've provided a declaration in this

1 case. Sorry. You provided a declaration in connection
2 with a second patent that's been assigned to Orckit
3 Corporation the '821 patent.

4 Is that right?

5 A. Yes.

6 ATTORNEY HUH: I apologize for interrupting,
7 but real time isn't operational.

8 (Discussion held off the record.)

9 ATTORNEY HUH: Okay, now it is.

10 BY ATTORNEY STAMATOPOULOS:

11 Q. So you provided a declaration in connection
12 with a second Orckit patent, the '821 patent. Is it
13 fair if I refer to it as just the '821 patent?

14 A. Sure.

15 Q. And at various times I'll be asking you
16 questions about the meaning of certain terms or words.

17 Is it fair to say here at the outset that when
18 I ask you such questions, I'm asking about the meaning
19 of such terms to a person of ordinary skill in the art?

20 A. Sure.

21 Q. Great. So did you -- let's start with this.
22 Did you prepare for your deposition today?

23 A. I did, yeah. Actually, what I -- could I just
24 supplement your -- what you're saying with -- with --
25 with "at the time of the invention"?

1 Q. Certainly, yes. Thank you for that, yes. So
2 it will be the meaning of a term to a person of ordinary
3 skill in the art or a POSITA at the time of the
4 invention.

5 Sir, what did you do to prepare for your
6 deposition today?

7 A. I met with an attorney, and I reviewed some
8 documents.

9 Q. How many documents, approximately, did you
10 review?

11 A. Six or seven or somewhere around there, give
12 or take a few. Probably more -- more on the give side,
13 if -- if anything.

14 Q. Okay. Were these documents all contained or
15 cited in your declaration?

16 A. No.

17 Q. There were documents outside of your
18 declaration?

19 A. Yeah. I reviewed some documents that were not
20 listed in my declaration or cited to therein.

21 Q. Were these documents the institution decision
22 and the patent owner's preliminary response?

23 A. Yes.

24 Q. Were there any documents in addition to those
25 two?

1 A. I can't think of any right now. And any other
2 ones besides those two that -- that are out -- not cited
3 in my declaration already.

4 Q. Fair enough.

5 Dr. Houh, yesterday I asked you some questions
6 about your CV.

7 Do you remember that?

8 A. Yes.

9 Q. I'm not going to ask you all the same
10 questions because I don't want to -- to waste anyone's
11 time here. I do have some questions on your background,
12 though.

13 The '821 patent is titled Method for
14 Supporting MPLS Transport Path Recovery with Multiple
15 Protection Entities.

16 Do you recall that?

17 A. Yeah, I mean, that -- that sounds right.

18 Q. Do you have the patent in front of you?

19 A. I do.

20 Q. All right. I'll -- I'll ask you that if you
21 need to refer to the patent, please feel free to do so.

22 A. Sure.

23 Q. So the -- and on the title of the patent
24 there's this term or this acronym, "MPLS."

25 Do you see that?

1 A. Yes.

2 Q. Do you have an understanding of what MPLS
3 means?

4 A. Generally, yes.

5 Q. Okay. Have you ever worked with MPLS
6 networks?

7 A. I have -- I have, and -- and what I studied
8 for my thesis was encompassed, and what I wrote about
9 encompassed kind of what -- what arose -- I believe it
10 arose kind of later or -- or concurrently around that
11 time as MPLS. I -- I studied label-switched paths in
12 a -- in a data network.

13 Q. What is a label-switched path in a data
14 network?

15 A. It was a -- it was -- so what I studied in my
16 thesis is -- is at the edge of the network, instead
17 of -- well, up -- prepending a -- a label to a
18 particular packet based on -- on characteristics of the
19 header and then using the label to determine how to
20 route or switch the packet within the -- within the core
21 network until being received on the other side by a -- a
22 node that could pop off label and -- and -- and -- and
23 continue on. And -- and my thesis basically studied the
24 most efficient way to classify packets. Well, various
25 methods of classifying packets at the -- at the input

1 and analyzing the amount of routing time kind of saved
2 within the network, you know, because label -- label
3 switching is -- is much more efficient than routing
4 based on IP addresses. So that -- that's kind of
5 basically a -- a lot of what my Ph.D. thesis was about.

6 And later I've done some other cases that
7 involved multiple MPLS aside from this case, and -- and
8 I've worked to help configure networks with MPLS working
9 with the network person as well.

10 Q. Around what time did you write your thesis?

11 A. It was in the -- I -- I -- I finished in
12 January 1998, so I was writing probably starting around
13 '97. Some point in early to mid '97 is when I did the
14 core of my writing for my thesis.

15 Q. Did your thesis in any aspect include recovery
16 with the use of protection entities in the context of
17 MPLS?

18 A. No, it didn't talk about that, but that's the
19 general thing that I -- I'd studied in, you know,
20 failure -- link failure and recovery in -- just
21 generally.

22 Q. What is link failure?

23 A. Well, you know, every -- every hardware
24 component, you know, is -- is a physical device that has
25 components on it that in some -- they can fail or --

1 the -- the -- the devices can fail, the power can fail,
2 you know. Also, you know, backhoes can -- can -- can
3 dig up and -- and break a cable.

4 So there's a lot of ways that connections
5 between various points can fail. And, you know, I think
6 we generally study that in like probability and
7 statistics generally about things like that.

8 But also with respect to links networking.
9 You know, a network is -- is designed around the ability
10 to recover from failures, generally speaking, or at
11 least the internet or -- or internet protocol networks
12 and -- and -- are based on that as -- as a design
13 principle.

14 Q. And can you describe for me what "recovery"
15 means in the context of MPLS?

16 A. Well, if a -- if a particular label-switched
17 path fails, then you'd have to find a new way to reach
18 the -- the same end point using the same type of -- of
19 label mapping.

20 So it -- it -- it's -- you know, like any
21 network link recovery, it's about figuring out how to
22 get the packets to the same destination.

23 In the case of MPLS, where you're going to
24 have a recovery path that's also MPLS, it would either
25 be about recovering and setting up a path after the fact

1 or -- or having a path preset up, you know, in case
2 of -- of failure, for example.

3 Q. Fair to say there's two principal categories
4 of recovery, one that includes precomputation of a
5 restoration path, and another one that involves
6 provisioning such a path after the failure?

7 A. I -- I -- I mean, with respect to fail -- I --
8 yeah, I -- I -- I mean, that sounds fair. I think
9 you've captured the -- the two. I -- I can't -- I can't
10 think of -- of -- I mean, I -- is your question whether
11 those are the only two possible?

12 Q. Well, let's start from this.

13 Those are two possible categories, right?

14 A. Sure, I -- I -- yes.

15 Q. Are there any other categories that you can
16 think of?

17 A. I mean, not at the moment. But there -- there
18 are -- there may be other ways, like, to -- to -- you
19 know, to -- to come up with failure recovery methods
20 that I -- that I haven't thought about while I'm sitting
21 here right now.

22 Q. Now, in preparation for this deposition you
23 studied your declaration. Correct?

24 A. Yes.

25 Q. When was the last time you studied your

1 declaration?

2 A. Last night.

3 Q. If there were such a different category set
4 forth in your declaration, you'd remember it sitting
5 here today, right?

6 A. Well, I don't have a perfect memory so I
7 don't -- you know, I did review my declaration last
8 night, but it still doesn't remember -- mean I remember
9 everything that I said in it.

10 Q. Okay. Fair enough. All right.

11 So is one way to refer to one of these two
12 categories protection? Well, let me withdraw the
13 question. Let me ask it in a slightly better way.

14 Is the term "protection" one way to refer to
15 the categories through which network recovery is
16 accomplished in the context of MPLS?

17 A. I mean, I think I've seen that refer -- yes,
18 I -- people have -- I've seen people using that -- that
19 term.

20 Q. And you said there's a method of recovery that
21 involves provisioning a restoration path after failure.

22 What would be a way to refer to that second
23 category of recovery?

24 ATTORNEY HUH: Objection. Form.

25 A. Yeah, I don't recall a -- a term that people

1 use for -- for that method sitting here right now.

2 BY ATTORNEY STAMATOPOULOS:

3 Q. Would "restoration" be such a term?

4 A. I think it could, but I -- I -- I don't know
5 if that would encompass only that -- that -- that method
6 because, you know, even cutting over to a pre-setup
7 path, it -- it would seem to me like restoring the --
8 the connection capability.

9 Q. Have you seen any restoration -- let me
10 withdraw the question.

11 Have you seen any references to "restoration"
12 in the literature regarding MPLS in connection with
13 after the failure recovery of -- of MPLS networks?

14 A. I mean, I don't remember everything I -- I
15 reviewed about MPLS. I have a number of textbooks and
16 things like that, but I, you know, I -- I -- I wouldn't
17 know to that level of detail like what -- what these
18 books say from -- from memory even if I've seen it
19 before.

20 Q. So in your thesis, you studied, among other
21 things, using a label to route or switch packets.

22 Is that fair?

23 A. Yes. At the time, I -- I may have referred it
24 to in -- in my thesis as flow switching because I was
25 familiar with some techniques that pretty much are the

1 same that were called flow switching. So I -- I may
2 have used that term in my thesis.

3 I don't think I used the term "MPLS" or --
4 or -- in my thesis, but it was effectively figuring out
5 how to -- attaching a label at the edge of a network,
6 popping it off at the -- at the other side, but -- but
7 using the label to switch within -- within the confines
8 of that -- that network.

9 Q. And you said that label switching was more
10 efficient than IP address-based switching?

11 A. Or routing. I mean, the -- the routing
12 function is -- is not -- not particularly efficient,
13 partly because IP routing uses the longest prefix match,
14 and -- and label switching just uses a table lookup.

15 Q. And why does that create more efficiency?

16 A. So the longest prefix match uses the --
17 because there -- there have to be multiple tables
18 examined and -- and -- and you -- you have to -- even if
19 there's a match for a -- at -- at a low number of prefix
20 bits that match, so longest prefix match is where you
21 look at how many bits from -- from the left to right
22 starting from the highest order bit to the lowest order
23 bit match with any entries in the routing table.

24 And -- and you have to kind of, for every
25 entry, see how many bits match and -- and use the one

1 where the longest number of bits match a routing table
2 entry.

3 And that's because routers don't route on --
4 there's -- there's -- there's too many -- the trust base
5 is too large to -- to -- to use the tables to route
6 based on the whole IP address, and you wouldn't
7 necessarily want to do that anyway because IP addresses
8 are clustered so there's some -- some efficiency there.

9 But it's still -- you still have to do a
10 longest prefix match with respect to IP address routing.
11 And that is -- is much more complex than just looking at
12 the label in a table where the label -- I mean, the idea
13 is the size of the label in -- in bits is -- is -- is
14 smaller than the -- the size of the address space for
15 the -- in IP addresses; and therefore, you can use a
16 table for that lookup. And then that's very -- it's --
17 it's much more efficient.

18 Q. So is -- is it -- is it fair to say that label
19 switching is computationally simpler for a router to
20 perform than IP address-based routing?

21 A. I mean, that's typically, the case. That's
22 why -- that's why -- and that's what I was studying in
23 my thesis is that how -- how much more efficient is it.

24 And I actually studied different ways to apply
25 labels based on different characteristics of a -- of a

1 packet. And I studied that kind of thing too, not --
2 not just having -- well, I mean, I studied alternative
3 types of -- of -- of -- of classification at the edge
4 and -- and how efficient each of those alternative
5 labeling methods were.

6 Q. And what were some of those methods?

7 A. Well, some were using both the source and
8 destination IP address, just using the destination IP
9 address, or -- and even actually using the destination
10 IP address and port number for -- for the next layer,
11 such as TCP or UDP.

12 Q. And were there substantial differences in
13 efficiency between different methods?

14 A. Well, I -- I -- some methods were better for
15 use in some server -- for some situations than others.
16 And if you are doing point-to-point streaming, it may
17 not matter as much.

18 But if you're talking to a server and there
19 are lots of people talking to a server, then -- then you
20 may not need to set up kind of a -- you -- you could set
21 up what I -- I think I called in my thesis an in-cast
22 tree where -- where there -- there's a label that is
23 used consistently throughout the network or -- or
24 that -- that refers to a many-to-one situation. And --
25 and -- and in that -- in that sense, it -- it may, you

1 know, may save on the amount of labels you have to use
2 in the network.

3 And -- and I kind of studied kind of -- and --
4 and, well, I think what -- also what I looked at is
5 whether you -- you'd go to an edge node of a network or
6 you could -- you could somehow go all the way up to
7 the -- the server or the router closest to the server.

8 And -- and I -- these in-cast trees is --
9 is -- I mean, I don't remember exactly what I said about
10 the -- the increased efficiency, but -- but that was one
11 possible method which I thought was -- I don't remember
12 exactly what I said about it at -- at the moment, just
13 that that was one of the alternative labeling and -- and
14 label setup methods that I talked about.

15 Q. And you said that efficiency might matter more
16 in some applications than it would to others.

17 Is that a fair summary of part of your
18 testimony?

19 A. Well, I don't think it changes the efficiency
20 of the routing, but it -- it changes like how many
21 labels you have to create and -- and, you know, the size
22 of the label address space needed, and -- and things
23 like that.

24 So I -- I'm -- perhaps it wasn't all about the
25 efficiency gain but, I mean, part of saving space or --

1 or having smaller -- a smaller label space does -- does
2 have some efficiencies of -- of, you know, memory, for
3 example.

4 Q. So smaller label space has -- has efficiencies
5 in terms of memory, you said?

6 A. Yes. I mean, you have -- you can have a
7 smaller table if -- if you don't have any possible
8 labels.

9 Q. And just to be clear, in memory of a router?

10 A. Or wherever you're doing the label switching,
11 but yes, in -- in -- in terms of holding the -- these --
12 these -- the -- the tables necessary to do the lookups
13 at -- at the nodes, which would be the routers.

14 Q. And how does saving on memory affect network
15 performance, if at all?

16 A. Well, I -- I mean, that's the point. It's --
17 I didn't say it was -- that was faster, but it would --
18 if it reduces the size of the label space needed,
19 then -- then you wouldn't have to have as much memory in
20 the router.

21 I mean -- so, I mean, that's -- that's --
22 that's -- that is an efficiency gain, it just isn't
23 necessarily efficiency in speed. It's efficiency in how
24 many memory you need.

25 Q. And why is that desirable?

1 A. Well, one reason is that, you know, memory
2 costs money. Now, so that's one way to save on, you
3 know, how much memory you have to put in a router.

4 You know, if your -- if -- if the label space
5 is, you know, 1/16 the size because you've done
6 something to -- to -- to that, then you need 16 times
7 less memory, which can be significant, especially back
8 in that time. I mean, memory's a lot cheaper today --

9 Q. You said "back in" --

10 A. -- than it was.

11 Q. You said "back in that time."

12 You mean what? What time?

13 A. When I write -- was writing my thesis.

14 Q. Would the same considerations with respect to
15 memory also apply as of, say, 2003, 2004?

16 ATTORNEY HUH: Objection. Form.

17 A. I mean, I haven't specifically looked at --
18 looked at that -- that -- that case. But, I mean,
19 generally, memory prices have gone down per bit over
20 time. But I don't -- I don't recall the exact price
21 during the day.

22 But, you know, if you have a 1/16 the size
23 label space, if you need 1/16 less memory, that -- that
24 can be significant. Or even one quarter, you know,
25 the -- the label space size.

1 Q. Do efficiencies in terms of saving memory also
2 affect the time it takes to perform a particular
3 computation by a router?

4 A. Well, I mean, I don't know exactly when but, I
5 mean -- or I haven't studied memory pricing, you know,
6 at that time. But I know today, faster memory costs
7 more even for the same size than slower memory, so it --
8 it --

9 Q. I guess I -- I just want to shift gears a
10 little bit from the question of memory cost and -- and
11 go to a slightly different topic, but related.

12 Is it fair to say that using label switching
13 as opposed to IP address-based routing, in addition to
14 producing economies in terms of memory, will also allow
15 a router to perform its function more quickly?

16 A. Well, I -- I'm sorry. What are you asking me
17 to set aside in the question?

18 ATTORNEY STAMATOPOULOS: Can you -- can the
19 court reporter please read the question back? Sorry.

20 (The reporter read from the record.)

21 ATTORNEY HUH: Objection. Form.

22 A. Well, I mean, a label-switched router would
23 not necessarily replace the IP routing tables with --
24 with -- with -- with -- with only label-switched paths.
25 I mean, I -- I don't know that people do that.

1 I mean, maybe people build MPLS-only switches,
2 but if it has a routing function, it still has to have
3 some memory for that.

4 So adding MPLS to a -- a routing device does
5 add memory, but the point is that the small label space
6 requires less memory needed additionally.

7 So I think the first part of that question,
8 I -- I would respond to the -- the way the question's
9 setup in that -- in that way. I'm not saying that it
10 saves memory overall, but from -- when you add this
11 function. I'm saying that a small label space requires
12 less additional memory to hold the -- the -- the --
13 the -- the tables.

14 BY ATTORNEY STAMATOPOULOS:

15 Q. And that is an advantage to MPLS, right?

16 A. Well, the advantage comes from the fact that
17 now, the router or, you know, the -- the router can
18 handle more packets per second because the -- the lookup
19 operation is -- is -- is more efficient, and -- and
20 that's part of the point.

21 Now, it -- it may add expense to add
22 functionality and memory, but, you know, with -- but --
23 but you can now handle more packets per second, you
24 know, if the packets are coming in faster and you're --
25 and you're processing limited on the router.

1 Maybe you can add more ports to the router
2 because of that. There's -- there -- there's
3 efficiencies that are gained that -- that can make up
4 for the cost of having additional features and
5 components to support, or needing larger memory to
6 support the additional features and functions.

7 Q. You said you could process more packets per
8 second. What do you mean by "process packets"?

9 ATTORNEY HUH: Objection. Scope. Relevance.
10 BY ATTORNEY STAMATOPOULOS:

11 Q. I see you're looking at your declaration.

12 A. Yeah. I mean, I don't know if I've gone into
13 much detail about -- about this level in my -- but --
14 in -- in my declaration, but -- but what was the
15 question again, please?

16 Q. You said "it is good to process more packets
17 per second" in your previous answer.

18 What did you mean? In that previous answer,
19 what did you mean by "process packets"?

20 ATTORNEY HUH: Objection. Scope. Relevance.

21 ATTORNEY STAMATOPOULOS: What's the basis for
22 the objection, counsel?

23 ATTORNEY HUH: Because your -- your question
24 is outside the scope of his original testimony, and it's
25 irrelevant to it.

1 ATTORNEY STAMATOPOULOS: I literally asked him
2 to explain the words that he used in his previous
3 answer. Do you maintain your objection?

4 ATTORNEY HUH: I do.

5 ATTORNEY STAMATOPOULOS: Okay. I just wanted
6 it on the record.

7 BY ATTORNEY STAMATOPOULOS:

8 Q. You can go ahead and answer my question,
9 Dr. Houh.

10 A. Well, the amount of work needed to -- to
11 consider how to route a packet can affect -- you know,
12 if it takes a whole lot of work and you only have so
13 much processing power, then -- then -- then -- and
14 you're processor bound on the -- on the packet routing,
15 then you won't be able to handle as -- as many packets
16 or as high bandwidth on the input links. I mean,
17 there's a number of factors there.

18 But if the amount of processing per packet
19 goes -- required goes down and you have the same
20 processing power, you can handle commensurately more
21 packets or you can handle -- handle, you know, if -- if
22 you were fairly balanced on the inputs and processor,
23 you could handle higher speed inputs, things -- things
24 like that. So, I mean, generally, that's -- that's the
25 case.

1 Q. Earlier, you mentioned the term "edge of a
2 network."

3 Do you recall that?

4 A. Yes.

5 Q. What do you mean by "edge of a network"?

6 A. Well, I mean, it could be applied in many
7 uses. But if you're talking about an MPLS kind of
8 network, the -- the edge would be where -- the boundary
9 where you would be applying the labels for switching
10 and -- and where packets go in and out.

11 So it wouldn't have to necessarily be the
12 whole network. I mean, you do -- you apply this at the
13 core, in which case the edge of the network is the
14 boundary between the -- the label-switched side and the
15 standard IP routing side.

16 Q. What determines the number of devices that
17 operate at the edge of a network?

18 A. It's how people want to set up their network
19 and where they want to -- where they have or want to
20 apply label switching techniques in -- in -- for the --
21 the edge of the -- this -- this kind of network.

22 I mean, again, they're -- depending on what
23 you're talking about, you know, the edge of the network
24 may be, you know, might be different than this. But if
25 you're talking about the edge of a -- what I consider a

1 label-switched network, it's where you have -- where do
2 you have the labels? Where don't you? And where are
3 you going to set up routers with -- with the label
4 classification? And -- and -- and where you set it up
5 is where you have it.

6 Q. Is there any upper boundary to the number of
7 devices that could operate in a label-switched network?

8 A. Yeah. I mean, physically, there's only so
9 many resources on -- on -- on the earth to -- to make
10 these types of devices. You can't -- you know, unless
11 somehow we mine for minerals and things in space, I
12 mean. So yeah, of course, there's always physical
13 limits. These are real things.

14 Q. Right. That -- I think -- let me -- let me
15 make this a little bit -- let me withdraw that last
16 comment.

17 You could conceive of an MPLS network that has
18 thousands of network devices operating on it
19 concurrently. Correct?

20 ATTORNEY HUH: Objection. Scope.

21 A. I mean, I haven't really gave much thought
22 about how -- how these things are sized or what
23 protocols can be used to distribute labels efficiently
24 or whatnot. I -- I mean, I think I'd want to look in
25 more to that before I give any answers about -- about

1 practical sizes of these things.

2 BY ATTORNEY STAMATOPOULOS:

3 Q. You mentioned earlier the term "many to one."

4 Do you recall that?

5 A. Yes.

6 Q. What is "many to one"?

7 A. Well, in the context of what I analyzed for my
8 thesis, it was about how to apply labels at many
9 different points, entry points into the -- the flow --
10 flow-switched network. But they all exited at -- at one
11 point. So that's the idea of this -- what I -- what I
12 was calling at the time an in-cast tree. But setting up
13 the label paths so that things flow and -- and merge
14 together into flows together, for example.

15 Q. What is an in-cast tree?

16 A. It -- it -- it's a tree rooted at the server
17 at the egress point where there are multiple in --
18 places in the network that -- that a user, or many
19 users, would be attempting to talk to the server from.

20 Q. What are examples of users?

21 A. Well, I mean, the ones that I was looking at,
22 for example, as a -- a -- a web browser. You know,
23 going to a website. You know, there -- there could be
24 hundreds or thousands or more people on any given time
25 going to the website.

1 And they're all going -- well, at that point,
2 it was to -- to one point. I mean, today -- well, I
3 mean, things are -- can be more distributed today and
4 managed more easily, but at that time, you might have a
5 server farm with a load balancer, but that's all in one
6 location. So it's many people trying to reach that
7 location where the server farm is.

8 Q. And those hundreds of thousands of people
9 could be attempting to reach a server that is part of an
10 MPLS network?

11 ATTORNEY HUH: Objection. Form.

12 A. Well, no. In -- in my thesis, I wasn't saying
13 the server was part of the network. It's -- but it's
14 attached to -- to the network.

15 BY ATTORNEY STAMATOPOULOS:

16 Q. And why is the server attached to the network?

17 A. Well, I mean, so people can reach the server.
18 Otherwise, what's -- you know, I mean, that's why
19 servers have -- are, you know, are connected to
20 networks.

21 Q. And a server like that could be attached to an
22 MPLS network. Correct?

23 A. The router, the -- the -- the router that --
24 that the -- that the server may use as its gateway
25 could -- could -- could be the -- the edge router.

1 In -- in -- in my thesis, again, I -- I didn't use the
2 phrase "MPLS," but to this flow-switched network.

3 Q. What is a flow-switched network?

4 A. Well, in my thesis, I was -- that was -- the
5 network would use these flow labels applying at the edge
6 to -- after classifying the packet in some way. And
7 I -- I discussed the different ways already that I --
8 some of the ways I discussed in my thesis of classifying
9 packets to the edge and then using those labels attached
10 to decide how to switch or route -- route or switch the
11 packets within a flow-switched network as opposed to
12 using IP addresses.

13 Q. Now, Dr. Houh, you prepared a declaration in
14 connection with the '821 patent, right?

15 A. Yes.

16 Q. How much time would you say you spent
17 preparing your declaration?

18 A. Again, I don't know the exact number of hours.
19 It's probably around 15-ish, give or take.

20 Q. 15 hours?

21 A. Yeah, a couple of days, probably.

22 Q. Okay. And in connection with preparing your
23 declaration, what did you do?

24 A. Oh, I had discussions with attorneys. I
25 reviewed a number of documents that I -- I think I've

1 listed them in my declaration.

2 And then, you know, I -- I had written some
3 portions; the attorneys had written some portions. It
4 was a collaborative effort. But in the end, you know,
5 I -- I signed and submitted the declaration, which --
6 which I stand by.

7 Q. Did you identify any errors in your
8 declaration in connection with preparing for your
9 deposition today?

10 A. No, I -- I didn't see any. I mean, I -- I
11 don't even remember seeing many typos, but -- which I
12 usually find, but I -- I don't recall any.

13 Q. Understood.

14 You've listed a number of prior art references
15 in your declaration. Correct?

16 A. Yes.

17 Q. And you've discussed these prior art
18 references in connection with the various grounds that
19 are asserted by the petitioner in this case, right?

20 A. Yes.

21 Q. Who selected the prior art references that are
22 discussed in your declaration?

23 A. I think the attorneys may have selected some,
24 but I think I -- I may have conducted a search on -- on
25 additional -- for additional references as well that

1 I -- that's what I can recall for this case.

2 Q. And do you have in front of you all the prior
3 art references that are part of the grounds discussed in
4 your declaration?

5 A. Yes, I -- I believe I -- I have a folder with
6 the electronic copies of everything, all the exhibits.
7 But I also have printouts of the -- of the -- the -- the
8 prior art references used for the grounds in the
9 challenges.

10 Q. Did you -- withdrawn.

11 Some of these -- withdrawn again.

12 Some of the literature cited in your
13 declaration has been attached to the declaration in
14 excerpt format.

15 Do you recall that?

16 A. You mean I -- I, like, quote things in my
17 declaration from -- from these references?

18 Is that what your question is about?

19 Q. No, I mean something different. Let me -- let
20 me make it a little bit clearer by sharing a document.
21 So the document -- can -- can you see the document I'm
22 sharing on my screen?

23 A. Yes.

24 Q. It's titled Definitive MPLS Network Designs,
25 right?

1 A. Yes.

2 Q. Do you recognize this as the Guichard
3 reference discussed in your declaration?

4 A. Yes.

5 Q. And it's Exhibit 1006?

6 A. Yeah, that's what it says.

7 Q. And at the bottom, it says page 1 of 5.
8 Do you see that?

9 A. Yes.

10 Q. And this is a five-page excerpt of a larger
11 book. Correct?

12 A. Oh, I see what you're saying now. Yes, this
13 is an excerpt from the -- from the book. The book is,
14 to my recollection, very long.

15 Q. Do you have that book?

16 A. I think that I do. I'm not sure where --
17 this -- this -- I think that I do. I'm not -- I'm not
18 sure. I have a number of MPLS books that look like
19 this.

20 Q. Okay. Who decided to make this excerpt?

21 A. I think in this case it may have been the
22 attorneys.

23 Q. Did you review the book to make sure that
24 everything relevant to your analysis was included in the
25 excerpt?

1 ATTORNEY HUH: Objection. Form.

2 BY ATTORNEY STAMATOPOULOS:

3 Q. Well, let me ask this.

4 Did you review the book prior to the excerpt
5 being made?

6 A. I -- I mean, I -- again, I -- I -- if -- I
7 think I may have this book, but I'm not totally sure.
8 But it -- but I probably went to my bookshelf to look
9 for this book when it was going to be used, and I -- I
10 probably flipped through it if it -- it was -- it was
11 there, because I have done that on occasion where
12 attorneys bring up a book, I get a -- I get something
13 like this and then go, oh, I have that book. Let me go
14 take a look at it.

15 Q. And do you know how long this book is?

16 A. I don't recall. I mean, it could be 700,
17 1,000 pages. I -- I -- I don't know offhand. But, you
18 know, some of the books I have on this topic are -- are
19 quite lengthy.

20 Q. And this is an important reference in your
21 declaration. Correct?

22 ATTORNEY HUH: Objection. Form.

23 A. Well, I do cite to -- to this reference
24 about -- for -- for a few -- well, I mean, I think
25 mainly in one element. But then I refer to that element

1 in numerous other places I think, you know, the
2 analysis.

3 So, I mean, I think the book captures, you
4 know, the -- the -- some knowledge at the time of the
5 invention, and -- and that's what I'm referring to.

6 Q. And when you flipped through the book, how
7 much time would you say you spent flipping through the
8 book?

9 A. Yeah, I mean, I don't recall. I -- I -- you
10 know, if -- when I do things like this, I -- I -- I
11 would scan through the table of contents [sic] and maybe
12 flip through some relevant chapters. But, I mean, I --
13 I don't think there's anything -- I would -- I would be
14 surprised if there were, you know, other passages that
15 contradicted these in -- in the book. That's not how
16 these books are -- are setup. And this is capturing the
17 knowledge of -- of, you know, people at the time.

18 Q. And when you flipped through the book you
19 didn't see anything else that was relevant to include in
20 your declaration. Correct?

21 A. Again, I don't recall specifically, you know,
22 but I -- there -- there are definitely times that I do
23 remember where I -- where I'd get a reference, I have
24 the book, I'd look through the book.

25 Q. Are there times when in performing --

1 withdrawn.

2 Now, you submitted a number of IPR
3 declarations in a number of different cases. Correct?

4 A. Yes.

5 Q. Fair to say you're familiar with how to
6 conduct a validity analysis in an IPR?

7 A. Well, I'm not a lawyer, but I -- I -- I've
8 gained an understanding of how to do that over time
9 as -- as the person that writes or -- you know, and
10 submits these declarations.

11 Q. And you'd agree with me that the context in
12 which certain teachings are presented in a prior art
13 reference often matters to the substance of what those
14 references teach. Correct?

15 A. I mean, I think it can. I -- I -- yeah, I
16 think you'd have to look at the cases. You know, every
17 case is specific in terms of what -- what the references
18 say and what their context is, and --

19 Q. Did you make any changes to the excerpts?
20 Well, withdrawn.

21 This particular excerpt that you've used in
22 your declaration, this was prepared by attorneys.
23 Correct?

24 A. Yeah, I think that's right.

25 Q. Did you make any changes to the excerpt?

1 A. No, I don't recall doing so.

2 Q. Did you discuss the contents of this excerpt
3 with your attorneys? Yes or no.

4 ATTORNEY HUH: Objection. Scope. To the
5 extent it requires privileged information, I instruct
6 the witness not to answer.

7 ATTORNEY STAMATOPOULOS: It's just a yes or no
8 question. You can answer unless instructed otherwise by
9 your counsel.

10 THE WITNESS: Well, I -- I -- was there an
11 instruction from counsel about that?

12 ATTORNEY STAMATOPOULOS: Counsel, are you
13 instructing him not to answer yes or no?

14 ATTORNEY HUH: Yes. I'm instructing him not
15 to answer our -- our privileged communications.

16 ATTORNEY STAMATOPOULOS: Your position is that
17 the information that this question seeks is privileged,
18 my yes or no question?

19 ATTORNEY HUH: I would ask that you rephrase
20 so it's not in the context of what we discussed.

21 ATTORNEY STAMATOPOULOS: Could you -- let me
22 ask the court reporter to repeat the question, and then
23 we'll see if I need to rephrase it.

24 (The reporter read from the record.)

25 ATTORNEY HUH: You can answer yes or no,

1 Henry.

2 A. Actually, I don't recall one way or the other
3 necessarily, so I -- I just don't remember.

4 BY ATTORNEY STAMATOPOULOS:

5 Q. Fair enough.

6 Now, you mentioned that there's a particular
7 element for which you used this excerpt. Correct?

8 A. Yes, and -- and many other elements I refer to
9 that analysis. But had some discussion but referred to
10 the main analysis for another element.

11 Q. Do you remember earlier when we were
12 discussing network recovery?

13 A. Yes.

14 Q. Is it okay if I refer to this reference as
15 just Guichard?

16 A. Sure.

17 Q. Guichard talks about reoptimizing a traffic
18 engineering LSP, right?

19 A. Well, that's what that subsection heading
20 says.

21 Q. What is reoptimizing?

22 A. I think it's -- what it's introducing here is
23 that network states keep changing, and links fail, links
24 and nodes fail and recover, and new TELSPs are set up
25 while others may be torn down.

1 So for any -- any TELSP, a more optimal path
2 may appear in the network, and it's -- it's highly
3 desirable to detect the existence of such paths, such a
4 path, and reoptimize a TELSP on a better path when it
5 becomes available.

6 So it's -- it's simply saying which -- this
7 isn't a surprise to anybody. The network is a dynamic
8 thing. Things fail and recover. And when things fail
9 or new things recover or additional, you know,
10 additional changes are made, like new paths appear, you
11 might not have an optimal path anymore.

12 And so this is talking about how it's -- it's
13 desirable to detect existence of such a path or any
14 changes, really, and -- and reoptimize your -- your --
15 your paths along a better path when things become --
16 when better things become available, generally.

17 Q. You said the network is a dynamic thing?
18 Did I hear that correctly?

19 A. Yeah. I mean, that's -- that's the first
20 sentence: Network state keeps changing.

21 Q. What is a network state?

22 A. Well, you know, it's talking here about the
23 state of -- of links and nodes and whether they're --
24 they're failed or not, for example. That's part of the
25 state.

1 Just that it -- it captures the -- the -- the
2 current -- I -- I -- I don't really know how to use --
3 talk about this without using the term. It -- it's
4 capturing the -- the current state of the network isn't
5 necessarily going to be the same tomorrow or the next
6 day or -- or even, you know, even along even shorter
7 time periods if, you know, considering link state
8 typically includes kind of congestion levels that can
9 change dynamically in short periods of time.

10 Q. Even every second?

11 A. Well, I mean, things like -- I mean -- I mean,
12 when it happens, it happens at a second, you know. I --
13 I don't know that something is happening every second,
14 if -- if that's what your question is.

15 But I don't think there's -- you know, if
16 there's enough network nodes and links then, you know,
17 you can figure out the -- the -- I -- I mean, could two
18 things fail within one second of each other? Yeah. I
19 mean, I don't -- that's a statistical probability, or
20 can be. But, you know, it depends. It -- it certainly
21 depends on whether things are, events are independent or
22 correlated as well.

23 Q. You said -- you used the phrase "calculating
24 the network state."

25 Do you remember that?

1 A. I -- I don't necessarily, but -- I don't
2 remember using those exact words, but I may have.

3 Q. Does "calculating the network" state mean
4 something to you?

5 A. Well, I mean, if I could -- I don't remember
6 that I said that, but I don't also -- there -- and I
7 don't remember the context in which -- which I said
8 that, but -- so I -- I don't -- I don't remember.

9 ATTORNEY STAMATOPOULOS: It was in your
10 previous response, actually. If the court reporter
11 would read to the witness his previous response, I
12 think -- or maybe you -- if you could locate the spot
13 where he said "calculating," that would be helpful.

14 THE REPORTER: All right, one moment.

15 (Discussion held off the record.)

16 THE REPORTER: I am not finding it.

17 BY ATTORNEY STAMATOPOULOS:

18 Q. So, Dr. Houh, Guichard says: It is then
19 highly desirable to detect the existence of such a path.
20 Do you see that?

21 A. Yes.

22 Q. How would a network detect the existence of a
23 new path?

24 A. Well, I mean, there's -- that's what a lot of
25 routing protocols are designed to do, which is, you

1 know -- and -- and, you know, if there's a new path, for
2 example, like someone plugs in a new link on a new
3 interface, and they're running the appropriate routing
4 protocols on that router, then -- then, you know,
5 eventually, the routing protocols find a new link, they
6 report the link state, they figure out the topology in
7 the network, and -- and that's generally how things get
8 discovered like that.

9 Q. And you said they report the link state.

10 How is the link state reported?

11 A. Well, their -- their method -- it depends what
12 routing protocols, I think. And -- but -- but links --
13 the states are reported typically as part of the -- the
14 protocol, protocols that are run, the routing protocols.

15 Q. Is the link state captured in data?

16 A. Well, I mean, it -- I mean, it -- what I'm
17 talking about here generally is, yeah, I mean, it's
18 not -- it -- the -- these routing calls -- protocols
19 figure it out. And they have information they store
20 and -- and report on -- on some of this information.

21 I -- I mean, I -- I mean, you know, bits in
22 a -- stored in digital computer are, you know, when --
23 and in this case I'm thinking about are -- are -- would
24 be -- would be considered data, I think.

25 Q. Right. So the link state is represented in

1 some form of information. Correct?

2 A. Sure. I wouldn't -- I wouldn't deny that.

3 Q. And when there's a change in the link state,
4 that information needs to be updated. Correct?

5 A. Sure.

6 Q. And determining a TELSP path requires
7 processing that information. Correct?

8 A. Well, I mean, it involves processing. I'm
9 not -- well, based on the knowledge that -- that there
10 is a new path and -- and kind of some of its parameters,
11 so I -- I suppose it involves using some of that
12 information about the -- about the new link.

13 Q. And in generally speaking, determining a link
14 between two network nodes requires processing link state
15 information. Correct?

16 A. Could you repeat that question, please?

17 Q. And generally, determining a link between two
18 nodes requires processing link state information.
19 Correct?

20 A. I mean, the first part of the sentence, your
21 question I can't quite parse. Determining a link
22 requires? Determining -- determining --

23 Q. Determining a link between two nodes requires
24 processing link state information. Correct?

25 ATTORNEY HUH: Objection. Form.

1 A. Yeah, I -- I mean, I'm still having trouble
2 parsing it. I mean, determining a link what? I think
3 it's -- it seems to be missing something that -- that
4 I -- I'm not sure what you're -- you're really asking.

5 BY ATTORNEY STAMATOPOULOS:

6 Q. Do you understand the phrase "a link between
7 two nodes," or am I -- am I speaking -- you know, am I
8 making an incomprehensible phrase here?

9 A. No, that -- that -- that, I get.

10 Q. Let me ask -- try to ask it in a slightly
11 different way.

12 Provisioning a link between two nodes requires
13 processing link state information, does it not?

14 A. I wouldn't think the fact that you're
15 provisioning a -- a -- a new link requires that. You --
16 that's just setting it up. But -- but --

17 Q. Well, let me give you -- let me try to take it
18 step by step.

19 So I have two nodes in a network, right?

20 A. Okay.

21 Q. I want to create a path between these two
22 nodes.

23 Do you still follow?

24 A. Okay.

25 Q. And there's a number of different alternatives

1 on the network of different paths that I can take to
2 connect these two nodes, right?

3 A. There's a number of what? Sorry, could you
4 repeat?

5 Q. Paths. A number of different paths.

6 A. There could be.

7 Q. How do I decide which of those paths to follow
8 for a given network?

9 A. I mean, generally, that's what -- what the --
10 the routing protocols do and they're designed to do is
11 that, you know, they're -- they're designed to do
12 exactly that.

13 So using -- using the routing protocols gives
14 you -- well, I mean, that's what they do. So how do you
15 do it? You run -- you run a routing protocol, and --
16 and -- and the routing protocols have that information
17 and -- and distribute information. And the routers make
18 decisions based on information received using these
19 protocols.

20 Q. And when you say "information," are you
21 referring to the link state information?

22 A. I -- that -- that -- that can be part of it,
23 but -- but I'd -- I'd -- I'd have to go back and look at
24 the protocol specs to see exactly what they're
25 reporting. But that, I think, is -- is a part.

1 Q. And when a reoptimization is performed for a
2 particular path, that requires rerunning the protocol,
3 right?

4 A. I mean, protocols are always running. It
5 doesn't make sense to say they're rerunning. I mean,
6 you know, the protocols are -- they -- they just --
7 they're -- they're -- they're always -- they're --
8 they're -- they're -- they're -- you know, once you
9 enable the protocol, it's just -- it's working all the
10 time. Well, I mean, it's not literally working all the
11 time, but there are regular reporting intervals and --
12 and things like that that the -- that the protocols
13 are -- are -- are designed to -- that just keep running.
14 So I -- it doesn't make sense to rerun the protocol.

15 Q. You said it's not literally rerunning.
16 What did you mean by that?

17 A. Well, I mean, as I said, you're not -- it
18 doesn't make sense to rerun something that's running,
19 you know, as -- all the time.

20 And again, I'm not -- when I say "running all
21 the time," it doesn't mean it's taking up 100 percent of
22 the processor. It's -- it's designed to run on -- on --
23 just be running and responding to events and reporting
24 things. And so it -- it doesn't make sense to me to
25 rerun that.

1 Q. Are there times when a protocol is taking up
2 more processing capacity in response to an event?

3 A. Sure. There -- there could be, depending --
4 yeah, I mean, I don't see why that's not going to
5 happen.

6 Q. And if there's a change to the link state
7 information, that would be one such event. Correct?

8 A. Sure. That -- that could be one such event.

9 Q. And so is it fair to say that if I have a
10 router that is constantly reoptimizing, I'm going to be
11 taking up more of its processing capacity in connection
12 with performing that reoptimizing?

13 ATTORNEY HUH: Objection. Form.

14 A. I mean, I think these networks are already
15 doing all this -- you know, a -- a lot of process --
16 it's not a lot. I -- I mean, it -- it's -- it
17 doesn't -- it's -- I -- I've not heard of cases today,
18 for example, where the -- the law -- there -- there
19 are -- there are cases where there are -- are -- I mean,
20 people design these protocols based on what they expect
21 to -- to get, and -- and they're engineered, I mean.

22 So there could be cases where -- where some
23 event occurs that -- that -- that the -- that the system
24 wasn't engineered to -- to -- to face, and -- and there
25 may be some problems caused.

1 But on, you know, standard operation based on
2 expected, you know, rates of -- of things happening in
3 the network and expected level -- level of -- of changes
4 that occur, you know, things are engineered to be able
5 to handle that capacity, typically.

6 So events can occur, and they can occur --
7 yeah, multiple events can occur. But I don't -- I don't
8 see why systems wouldn't generally be engineered to
9 handle what -- what -- the kind of ongoing use of the
10 routing protocols and the kind of events they can --
11 they can generate.

12 Q. Could you -- would -- would a person of
13 ordinary skill in the art as of the time of the Guichard
14 reference take into account the amount of network
15 overhead required to run a given protocol and deciding
16 between different protocols?

17 A. Well, I -- I -- I think people who design
18 routers would -- you know, if you sold a router that
19 says, you know, our routing protocol doesn't work, you
20 know, under many situations that you'd expect, who's --
21 who's going to buy that if they're going to run that
22 protocol?

23 I mean, you know, they -- they're engineered
24 to -- to -- to -- to do the kind of level of -- of
25 tracking state changes in the network that generally

1 occur, and so I -- I think that that's just the way --
2 that's what I expect.

3 If you buy a -- a router, that it's going to
4 handle the -- you know, and it's -- it's spec'd out for
5 a certain size it's going to be handled -- it's going to
6 be able to handle all the routing protocols that it says
7 it can handle, you know, expecting the kind of load or
8 probably even more for -- for -- on -- on the -- on --
9 on that -- that processor running the protocols than --
10 than is -- than would be expected, or even -- even at --
11 at -- at peak expectations.

12 Q. Now, Guichard talks about how reoptimization
13 is desirable because network states keep changing.
14 Fair?

15 A. Well, I mean, that's just what happens in the
16 network generally, even if you didn't have these label
17 path -- switch paths.

18 ATTORNEY HUH: Hey, sorry to interrupt, but
19 when we have the time, let's take a break, please.

20 ATTORNEY STAMATOPOULOS: Let me ask a couple
21 more questions, then we can take a break.

22 BY ATTORNEY STAMATOPOULOS:

23 Q. So we discussed how protection and restoration
24 are two different categories of recovery mechanisms.

25 Do you recall that?

1 A. Well, I remember having that discussion. I --
2 I -- I didn't necessarily think or agree that they were
3 disjointed categories.

4 Q. Fair.

5 Do you agree that protection mechanisms are
6 usually faster than restoration mechanisms but also
7 require more network overhead because extra state is
8 required?

9 A. Well, I think I disagreed with the -- the
10 premise that they -- that you're implying that they are
11 disjoint now.

12 You know, you can restore a path by using a --
13 a protection path that you've -- you've set up, and --
14 and -- and I don't -- I -- I don't know if you are using
15 "restore" in a -- in a certain way that you could show
16 me what -- what -- why you think it's implying in the
17 question that it's -- it's -- can include just using --
18 you know, restoring the path by using a -- a -- a
19 protection path.

20 Q. Well, I'm talking about protection being a
21 method of -- of recovery where a path is precomputed,
22 and restoration being a method of recovery where the
23 path is provisioned after the failure.

24 Do you follow so far?

25 A. I -- I do, but I -- I -- what I -- yeah, I

1 don't know if you could -- I -- and I -- I don't
2 necessarily agree that restoration is -- is only that.
3 I think that was the issue that I -- that I -- that I
4 raised earlier.

5 I mean, certainly one method of restoring a
6 path is to -- is to calculate a new path after the
7 failure. But another way to restore a path is to use a
8 path that you've already got set up. So I'm -- I'm not
9 sure why -- use -- use of the phrase "generally" should
10 exclude the other.

11 Q. Well, you do agree that there's some instances
12 or some recovery mechanisms where a path is not
13 precomputed. Correct? A backup path is not
14 precomputed, I should say.

15 ATTORNEY HUH: Objection. Form.

16 A. In -- in -- where? In -- like, what are you
17 talking about? What network? Like, whose network?

18 Q. In an MPLS network.

19 A. I think it depends on whoever's setting up the
20 network, what they want to do.

21 Q. So it's possible to set up an MPLS network
22 when the backup path is determined after failure and not
23 precomputed. Correct?

24 A. I -- I think that if they want to do -- to do
25 that, that could be possible.

1 Q. And there's also networks where recovery is
2 accomplished through protection paths that are
3 precomputed. Correct?

4 ATTORNEY HUH: Objection. Form.

5 A. You mean in -- well, I -- that's not the -- I
6 mean, some people buy entirely redundant links the whole
7 way as well, so that's -- it might not be the only way,
8 but -- but -- but that --

9 Q. But do you --

10 A. -- but -- yeah, sorry. That was the end.

11 ATTORNEY HUH: Hey, George, let's take a break
12 now.

13 ATTORNEY STAMATOPOULOS: Okay.

14 BY ATTORNEY STAMATOPOULOS:

15 Q. One question -- one question I just want to
16 ask. And this is not -- this is something I ask in --
17 in Zoom depositions.

18 You're -- Dr. Houh, you're not communicating
19 with anyone? You don't have any devices open on your
20 computer, correct, during the deposition?

21 A. I -- no, I -- I don't have any -- I closed my
22 browser and I don't have anything else on the computer.

23 ATTORNEY STAMATOPOULOS: All right, terrific.
24 Thank you so much. Yes, we can take a break. How much
25 time would you like?

1 ATTORNEY HUH: Let's take 10 minutes, please.

2 ATTORNEY STAMATOPOULOS: Great.

3 THE REPORTER: We're off the record for a
4 break.

5 (Recess taken.)

6 BY ATTORNEY STAMATOPOULOS:

7 Q. So before we went on a break we were
8 discussing the Guichard reference, Dr. Houh.

9 Now, the excerpt that you have relied upon
10 from Guichard, it discusses reoptimization, right?

11 Would it be easier if I shared it on my
12 screen? You are -- I think you're on mute, sir.

13 A. I mean, sure, you could -- you -- if -- I
14 think it would be somewhat helpful.

15 Q. Okay. Happy to do it. I understand you also
16 have them front of you, but I'm happy to.

17 So Guichard discusses reoptimization?

18 A. I mean, it -- it -- it uses a form of that
19 word in that -- that subsection heading.

20 Q. And what does Guichard say about
21 reoptimization? Let me withdraw that question.

22 Guichard is titled Reoptimizing a Traffic
23 Engineering LSP. Correct?

24 And I'm showing the exhibit on my screen.

25 ATTORNEY HUH: Objection. Form.

1 A. I mean, the title of Guichard as a whole is
2 Definitive MPLS Network Designs.

3 BY ATTORNEY STAMATOPOULOS:

4 Q. Right. The section that you are relying upon
5 is titled Reoptimizing a Traffic Engineering LSP.
6 Correct?

7 Let the record show that it's 11:03 by my
8 time. I'm sharing the exhibit on the screen.

9 ATTORNEY HUH: Counsel, the transcript has a
10 timestamp on it.

11 A. In my declaration I am citing to passages
12 within this section, but it's -- it's capturing what
13 people -- what -- you know.

14 But I'm not relying on the fact that it's
15 within a chapter. I'm not relying on the -- the -- I
16 haven't cited the title of the subsection anywhere. But
17 this is a general discussion within this section,
18 subsection or whatever level of section it -- it is.

19 BY ATTORNEY STAMATOPOULOS:

20 Q. Is what I'm showing on my screen the entirety
21 of the excerpt upon which you've relied in your
22 declaration?

23 A. I mean, I believe that's right, but we can
24 check my declaration. I -- I don't believe I've cited
25 anything not provided in the exhibit to start with.

1 Q. Right. So this is the -- this is the exhibit
2 that you've attached to your declaration, from page 1 to
3 page 5. Correct?

4 A. Yes. The -- the exhibit as a whole is five
5 pages.

6 Q. Do you know if the broader Guichard reference
7 beyond just this excerpt discusses protection mechanisms
8 in which the backup paths are precomputed?

9 A. I mean, I don't -- I wouldn't -- I don't think
10 I recall that now one way or the other, if I -- if I --
11 I don't remember what I remembered, if I flipped through
12 it, what I saw.

13 Q. So to be clear, you don't recall if Guichard
14 discusses protection mechanisms in which protection
15 paths are precomputed. Correct?

16 ATTORNEY HUH: Objection. Form.

17 A. I mean, I -- I'm not -- I -- I think I
18 mentioned before I may have looked this -- at this and
19 flipped through it, because I -- I -- I -- there have
20 been cases where -- I know there have been cases where I
21 have been provided references like this and I happen to
22 have the -- the whole book. I just don't remember if
23 this was that or not or -- so I -- I'm not -- I can't
24 specifically remember this particular book.

25 I know it's happened before, and it -- when I

1 do find that I do have the book, I will flip through it,
2 look at the table of contents, look at appropriate
3 sections. I -- I just don't remember if I did that one
4 way or the other for -- in this instance.

5 BY ATTORNEY STAMATOPOULOS:

6 Q. If Guichard contained a section in which
7 protection paths -- withdrawn.

8 If Guichard contained a section discussing
9 protection mechanisms in which backup paths are
10 precomputed, would you consider that section relevant to
11 the opinions in your declaration?

12 A. I would have to look to see what it says, but
13 what -- what -- I think I -- I -- this -- I believe what
14 I cited was relevant to my declaration that is contained
15 within these pages. But I'd have to look at any other
16 materials before I could answer that question.

17 Q. And fair to say that given that you don't
18 remember if Guichard discusses protection mechanisms in
19 which a backup path is precomputed, you agree with me
20 that the excerpt that you have cited in your declaration
21 does not contain any discussion of precomputation of
22 backup paths. Correct?

23 ATTORNEY HUH: Objection. Form.

24 A. I mean, in my analysis and my declaration,
25 what I'm -- I'm mainly relying on for -- for the --

1 the -- having the backup paths already is -- is the
2 Doshi reference.

3 And I do cite to Guichard for something, some
4 things, but I don't think I -- I -- you know, if you
5 could show me, I -- I don't recall relying on Guichard
6 for the particular precomputation that you're asking
7 about now. But, I mean we can -- we can look through my
8 declaration. That -- that's just not what I recall.
9 But my declaration says what it says.

10 BY ATTORNEY STAMATOPOULOS:

11 Q. Yeah, I'm not asking about your declaration.
12 I agree with you that your declaration does not contain
13 any reference to Guichard in connection with
14 precomputation of paths. I'm asking a slightly
15 different question.

16 The excerpt that you have relied upon that I'm
17 showing on the screen, you can see it, and you -- I
18 think you have it in front of you as well.

19 Do you have it in front of you?

20 A. Not open to that page, but -- but now it is.

21 Q. You can open it to whichever page you want,
22 and you can flip through it, and you can acquaint
23 yourself or reacquaint yourself with it if you need to.

24 My question is this: The excerpt of Guichard
25 that you have included as an exhibit to your

1 declaration, that excerpt does not discuss
2 precomputation of protection paths. Correct?

3 A. I mean, I searched for the word "protect" or
4 "PROT," I think, some root form of the word "protect"
5 within this five-page document. And -- and just
6 scanning through it, I didn't see that.

7 But I'm not relying on that aspect of the --
8 I'm relying on the combination of Doshi with Guichard.
9 And if you look around Paragraphs 116 through -- like
10 over on 121, I discuss the issue that it would have been
11 obvious for someone to use the event-driven
12 reoptimization when implementing Doshi's MPLS
13 architecture, for example.

14 So -- so I've given reasons that a POSITA
15 would combine these references in my declaration, but
16 I'm not relying on anything from Guichard that's
17 disclosing precomputed protection paths --

18 Q. Okay, thank you.

19 A. -- in my analysis. Sorry.

20 Q. Okay. Thank you. I appreciate that.

21 And Doshi does disclose precomputed protection
22 paths. Correct?

23 A. Doshi is about generally a method for
24 determining primary and restoration paths for a new
25 service in a mesh network. And -- and it's -- it's

1 about the idea that the items are paired up. And Doshi
2 is the main reference that I'm using to -- to show -- to
3 show that the prior art renders obvious -- well, it's
4 one of the references that -- that renders obvious the
5 claim elements.

6 And I know you're using some sort of shorthand
7 here, but the -- the -- the actual -- Doshi discloses
8 the -- the claim elements in the way that I just -- that
9 I analyze in my declaration.

10 Q. Do you have Doshi in front of you?

11 A. Yes.

12 Q. Can you go to Paragraph 46?

13 Are you there?

14 A. Yes.

15 Q. Do you see where the first sentence of that
16 paragraph reads: Unless otherwise clear from the
17 context, the process of restoration is synonymous in
18 this specification with the process of protection?

19 A. Yes.

20 Q. Fair to say that Doshi is directed to systems
21 that relate to protection mechanisms?

22 A. Well, I mean, it's using "restoration" and --
23 and "protection" in a synonymous way in this
24 specification here. So, I mean, this supports what I
25 was saying earlier, that -- that -- you -- you were

1 trying to equate restoration to the -- only to the
2 process of calculating paths after the fact.

3 But -- but Doshi is about, you know, having
4 already these pairs identified, and so -- which is what
5 I was saying, that -- that you can restore to a path
6 that is already set up.

7 And -- and -- and that -- that's kind of why I
8 pushed -- you know, was disagreeing with some of the
9 premise of some of your questions when you used the word
10 "restoration." But -- but I -- I see that. It's using
11 "restoration" synonymous with "protection."

12 Q. And then if you go later on in the same
13 paragraph in Doshi, the left-hand column, second line
14 from the bottom, it reads: Depending on the
15 implementation, such process may involve either
16 precomputation or real time computation of alternative
17 paths.

18 Do you see that?

19 A. I -- yes. And that was consistent with what I
20 was saying earlier as well.

21 Q. And what was that?

22 A. That that restoration could include
23 calculating something after a failure, but it shouldn't
24 exclude precomputing paths and switching over to paths
25 that are already set up, which -- which is kind of a --

1 what I thought you were implying, that -- and I -- I
2 think I used the word that are not -- not necessarily
3 disjoint, right? And -- and I think this is just saying
4 it's consistent with what I was saying there.

5 Q. Right.

6 And then Doshi says in the sentence following
7 the one I just read you: Precomputation generally
8 exhibits shorter recovery times but may be less optimal
9 than real time computation, which benefits from the
10 ability to take into account the most current state of
11 the network demands and resources.

12 Do you see that?

13 A. Yes.

14 Q. Do you agree with that assessment by Doshi?

15 A. Well, if in the combination, for example,
16 you're continuously -- of -- of -- of Doshi and
17 Guichard, as I analyzed it, using event-driven
18 reoptimization, then I -- I think in the combination,
19 that -- that -- that wouldn't necessarily be the case.

20 This is Doshi alone here. And absent any
21 event-driven optimization of the paths, you wouldn't --
22 it -- it -- it could be possible that -- that -- that
23 the -- the current precomputed path may not be the --
24 the best path.

25 But I'm relying on the combination of Doshi

1 and Guichard about using, for one -- one of the things
2 is using kind of event-driven reoptimization.

3 Q. Then later on in the same paragraph, it says:
4 Preallocation generally exhibits shorter recovery times
5 but may be less desirable than real time allocation, as
6 the former requires the use of bandwidth even in the
7 absence of a fault for which it is reserved, while the
8 latter leaves the bandwidth available for opportunistic
9 services that do not have a guaranteed quality of
10 service.

11 Do you see that?

12 A. Yes, yes.

13 Q. Is that relevant to your opinions at all in
14 connection with Doshi and Guichard?

15 A. Well, I don't recall if I cited this
16 particular passage, but -- but, I mean, I considered
17 these references as a whole.

18 Q. Do you have any particular reaction to what I
19 just read you from Doshi?

20 A. So I would -- where did you start reading
21 again, and where did you stop reading?

22 Q. Preallocation generally exhibits shorter
23 recovery times but may be less desirable than real time
24 allocation, as the former requires the use of bandwidth
25 even in the absence of a fault for which it is reserved,

1 while the latter leaves the bandwidth available for
2 opportunistic services that do not have a guaranteed
3 quality of service.

4 ATTORNEY HUH: Objection. Form.

5 THE WITNESS: And -- and what was the
6 question?

7 BY ATTORNEY STAMATOPOULOS:

8 Q. The question is: Do you have a reaction to
9 that passage?

10 ATTORNEY HUH: Objection. Form.

11 A. I mean, I don't think I've said anything about
12 that passage in my -- in my declaration.

13 BY ATTORNEY STAMATOPOULOS:

14 Q. Does Doshi teach preallocation?

15 A. I mean, Doshi, in the -- in the sentence
16 that's just prior to the sentence you read there, or the
17 passage you read, it says: Also, depending on the
18 implementation, such process may involve either
19 preallocation or real time allocation of bandwidth on
20 alternative paths. So I think it's teaching both
21 preallocation and real time allocation to a POSITA.

22 Q. And preallocation is different than
23 precomputation. Correct?

24 A. Well, this is talking about, once you have the
25 paths, allocating bandwidth along the paths. So -- so

1 if you are referring to what precomputation, it's
2 talking about precomputation of -- that's at the bottom
3 of 46 -- either precomputation -- computation or real
4 time computation of alternative paths. So it's --
5 it's -- it's referring to a different part of the
6 process.

7 Q. The restoration paths computed by Doshi, are
8 those precomputed or computed in real time?

9 A. I mean, part of what's discussed, for example,
10 in Figure 11 is -- is calculating the metrics along
11 various paths that are there. So in that sense, you
12 know -- just let me look at the description first to
13 that figure again, please.

14 If what you're referring to in your question
15 is the computation required to set up the paths, Doshi
16 is actually describing using the paths that are -- the
17 existing paths in its -- in its calculations it performs
18 in Figure 11. And -- and that -- so -- so in that
19 case -- in that case those -- that computation has
20 occurred to -- to have the paths set up that it's --
21 like, for example, in Figure 1, L1, L2, L3, L4, L5, L6,
22 and L7, and it uses those paths in the computation in
23 the figure. So that computation, if you're referring to
24 the computation required to set up the path has -- has
25 occurred in the situation in Doshi where then you're --

1 you're performing the steps of the flow chart in
2 Figure 11.

3 Q. You said "the computation to set up a path."
4 What do you mean by that?

5 A. Well, you were referring to an after the --
6 after-failure process of setting up a path in -- in what
7 you were talking about, so I was kind of like using that
8 as -- as -- as -- as the -- it takes some computation
9 effort after a failure to set up a new path.

10 And -- and you were asking about that process
11 before. So in the context of that -- that kind of
12 questioning, the -- the path -- the paths in Doshi that
13 are being analyzed in Figure 11 are the -- these paths
14 that are -- are setup already.

15 So -- so in the -- in the sense of the
16 computation that you were referring to earlier, that's
17 already done at the point where that flow chart in -- in
18 Figure 11 is -- is -- is being performed.

19 Q. All right. Let me ask you a different
20 question. Different context. New context.

21 In Doshi, Figure 11, there is a selection at
22 either step 1120 or at step 1122 of a pair -- of a pair
23 of paths. Correct?

24 A. Well, the -- within those boxes is just the
25 shorthand -- well, just short description, select low L

1 pair or -- that's box 1120 -- or box 1122, select low K
2 pair.

3 Q. And the word "pair" is referring to a primary
4 and a restoration node. Correct?

5 And that's shown in box 1116.

6 A. Yeah, I -- I -- I'd agree that that's what's
7 shown there. And also in 1108 is talking about the K
8 pairs where 1116 is -- is talking about the L pairs.

9 Q. And the word -- again, the word "pair" is
10 referring to a primary and a restoration path, right?

11 A. Well, the -- the boxes use the phrase "select
12 the primary/restoration path pair," and that's how 1108
13 and 1116 start out, or the text in those boxes start
14 out.

15 Q. What is your understanding -- withdrawn.

16 In the context of Figure 11, restoration path
17 refers to a backup path that becomes active upon a
18 network failure. Correct?

19 Let me withdraw that question.

20 Let me take you to your declaration,
21 Paragraph 39. Are you there?

22 A. Did you say Paragraph 39?

23 Q. 39, three nine.

24 A. Okay.

25 Q. Paragraph 39, you state that: Applicants then

1 argued that the prior art does not teach the amended
2 claim because it only addresses a failover scenario and
3 not reselecting the path pair.

4 Do you see that?

5 A. Yes.

6 Q. What is the import, if any, of that aspect of
7 a prosecution history, to your opinions?

8 ATTORNEY HUH: Objection. Form.

9 A. I mean, it's providing context to the POSITA
10 as to what happened -- what happened during prosecution.

11 BY ATTORNEY STAMATOPOULOS:

12 Q. Providing context to the POSITA as to what
13 happened during prosecution?

14 A. That's right. It's part of -- it's part of
15 what a POSITA considers when considering how they -- how
16 claim terms' plain and ordinary meaning is to be
17 interpreted.

18 Q. Which claim terms is this statement relevant
19 to?

20 ATTORNEY STAMATOPOULOS: I think you've
21 noticed there are very, very long pauses between
22 questions and answers. And what is a good way -- I
23 mean, I think these are pretty straightforward
24 questions. What is a good way to help the witness speed
25 things up?

1 ATTORNEY HUH: Counsel, Dr. Houh is entitled
2 to consider the question. You've asked him about what
3 claim terms this is relevant to. He's entitled to
4 consider that and answer it as he deems fit.

5 ATTORNEY STAMATOPOULOS: So what -- but what
6 is the sort of upper boundary to the time that Dr. Houh,
7 in your view, is entitled to spend in considering any
8 one of my questions?

9 ATTORNEY HUH: What I would say is if there's
10 something actionable to you, after deposition, you can
11 take it up with the Board and go from there.

12 ATTORNEY STAMATOPOULOS: Okay.

13 A. So this discussion was in the context of an
14 amendment that the patent owner, or patentee at that
15 time, made to -- at -- at -- at least this appears in
16 what -- what I'm calling claim element 1.4 where it's
17 re -- reselection -- sorry, reselecting said entity
18 pair.

19 And what -- what was added in -- in this
20 amendment in -- in -- in the Office action reply that
21 I'm referring to here is -- are the -- is the phrase:
22 After reselecting said entity pair from the group
23 consisting of said entity pair and the replacement
24 entity pair comprising at least one entity distinct from
25 the entities of said entity pair.

1 And so that's -- that's what -- that's what
2 I'm referring to here. But the -- but the word of the
3 amendment is -- is what -- the additional phrase added
4 in amendment is what's being referred to here, and
5 that's just simply to state that -- that that additional
6 phrase was added to -- to the claim itself -- and I see
7 that in the issue claim as well -- to clarify
8 reselecting said entity pair.

9 And I -- I understand that these kind of
10 arguments are typically made to get around some -- some
11 existing prior art or -- or -- or to make a
12 clarification. But -- but that's -- that is the
13 context, and -- and that's the phrase from at least
14 Claim 1 that's being clarified.

15 BY ATTORNEY STAMATOPOULOS:

16 Q. Okay. Let's turn to Paragraph 50 of your
17 declaration.

18 A. Okay.

19 Q. First sentence, you state that: Like the '821
20 patent, Doshi recognized deficiencies in path, and then
21 you quote, restoration and recovery schemes in the prior
22 art.

23 Do you see that?

24 A. Yes.

25 Q. The part about Doshi recognizing deficiencies

1 like the '821 patent, that's not quoted from the
2 references. Correct?

3 That's your words?

4 Dr. Houh, I'm just asking you about a sentence
5 that appears in -- that you've written in your
6 declaration that doesn't -- it's not in quotations. It
7 just says "like the '821 patent, Doshi recognized
8 deficiencies in path."

9 And that phrase right there, that's your
10 phrase. Correct?

11 ATTORNEY HUH: Objection. Form.

12 A. Well, I mean -- I mean if it came from -- I --
13 I don't see why it would have come from any of the
14 references, Doshi either referring to itself or the --
15 the patent referring to Doshi. So yeah, I mean, I've
16 not quoted those -- those initial words in that
17 sentence.

18 BY ATTORNEY STAMATOPOULOS:

19 Q. Right. So can you please tell me what
20 deficiencies the two -- the -- Doshi and the '821 patent
21 recognize?

22 ATTORNEY HUH: Counsel, just to be on notice
23 that your email that was drafted was showing on the
24 display.

25 ATTORNEY STAMATOPOULOS: Yeah, I -- I realize

1 that. That was inadvertent. It was also shown on a
2 display before I transmitted it, right?

3 ATTORNEY HUH: I'm sorry? I don't know what
4 happened. I saw it pop up for a second.

5 ATTORNEY STAMATOPOULOS: Okay. Did you read
6 the contents?

7 ATTORNEY HUH: I've -- I scanned what you
8 said.

9 ATTORNEY STAMATOPOULOS: Okay.

10 ATTORNEY HUH: Everybody saw it.

11 ATTORNEY STAMATOPOULOS: I don't know about
12 that, but I understand that you saw what I wrote,
13 apparently.

14 THE WITNESS: I don't -- I don't remember
15 seeing anything. I don't think I was looking at the
16 screen.

17 ATTORNEY STAMATOPOULOS: Okay.

18 A. Well, so the '821 patent talks about a
19 previous -- a -- what's available may not -- existing
20 protection mechanisms, or MPLS-TP linear protection
21 mechanisms -- mechanisms, may not meet operator
22 availability requirements, since they may not protect
23 against one or several failures affecting both the
24 working and the -- and the protection entity.

25 And -- and -- and also, that I saw somewhere

1 that it doesn't -- may not do it in -- efficiently. Let
2 me see where I saw that. Oh, well, I mean, it's just
3 saying that it might not meet the requirements. And it
4 talks about sub 50 millisecond recovery above, for
5 example. Yeah, at line -- column 1, line 53: Traffic
6 recovery is expected to occur within 50 milliseconds of
7 fault detection.

8 And -- and then the -- in Paragraph 8 of
9 Doshi, it talks about how many of the restoration and
10 recovery schemes in the prior art fail to provide a
11 compact representation of the relevant information,
12 methods to utilize data in path calculations in
13 consideration of multiple cost criteria in a way that
14 benefit from the sharing of -- of protection link
15 resources and efficient distributed mechanisms needed
16 for making that data available where and when it is
17 needed.

18 And that's with respect to the process of --
19 of restoration and recovery. Oh, yeah. Oh, it -- here,
20 actually, it's -- it's the Doshi that has more
21 explicit -- it -- it -- it's about it's important to the
22 efficient -- well -- well, I guess I'll read the
23 beginning of 8: For both optical layer networking
24 applications and data networking applications,
25 distribution of a topology information and, in

1 particular, restoration recovery and sharing information
2 is important to the efficient and timely recovery of
3 services.

4 So I think they're both concerned with, for
5 example, the -- the, you know, timely recovery of -- of
6 services upon a failure. So that's -- that's one of the
7 reasons why they're -- they're like each other.

8 And we were looking at another passage before
9 about precomputation versus computing at the time, you
10 know, requires additional -- well, we were looking at
11 that. That's -- that's an additional reason, for -- for
12 example, that, you know, some things take up time at --
13 that you may be able to do ahead of time.

14 ATTORNEY STAMATOPOULOS: All right. So just
15 so -- just for the record, the email that I was
16 composing that was shown on Zoom, that was inadvertent.
17 It was not my intention for anybody to see that email.
18 I understand the witness didn't see that email.

19 What I would suggest, Greg, is that we go on a
20 brief break. If you want it to be on the record, it can
21 be on the record; if you want it to be off the record,
22 it can be off the record, outside of the presence of the
23 witness, because I wouldn't -- I do think it makes sense
24 to -- to clear the air and set certain parameters.

25 It's up to you whether you want to go on this

1 break or not, but I feel that it -- it would be a good
2 thing. So let me know how you want to proceed. In any
3 event, it's almost 12 o'clock, so I'd suggest we break
4 for lunch anyway soon.

5 ATTORNEY HUH: So, you know, what you
6 presented on the screen was visible to everybody, and
7 what we do with that, we'll decide. For right now, I
8 would -- I would recommend just proceeding with the
9 deposition. We could take a break, and you can continue
10 deposing Dr. Henry.

11 ATTORNEY STAMATOPOULOS: Dr. Houh, did you see
12 my email?

13 THE WITNESS: No. I don't -- I wasn't -- I
14 wasn't aware that anything got shared. I was looking
15 down at my -- whatever documents I have in front of me.

16 ATTORNEY STAMATOPOULOS: Okay, thank you.

17 I think it would make sense to take a break.
18 We can come back. When -- how much time do you think
19 you'd need for lunch, Dr. Houh?

20 THE WITNESS: Oh, 45 minutes like yesterday
21 was a good -- we did -- I think we did 50 yesterday.

22 ATTORNEY STAMATOPOULOS: Why don't we come
23 back at 12:45.

24 THE WITNESS: All right. Thank you.

25 ATTORNEY STAMATOPOULOS: Before we go off the

1 record, just to be clear, Greg, you don't want to
2 discuss anything about this?

3 ATTORNEY HUH: We'll deal with this issue at
4 some other time perhaps.

5 ATTORNEY STAMATOPOULOS: Okay. Fair enough.
6 Thank you.

7 (A recess was taken for lunch.)

8 BY ATTORNEY STAMATOPOULOS:

9 Q. Dr. Houh, in Paragraph 8, Doshi states that:
10 Many of the restoration and recovery schemes in the
11 prior art failed to provide compact representation of
12 the relevant information, methods to utilize the data in
13 path calculations in consideration of multiple cost
14 criteria in a way that benefit from sharing of
15 protection link resources and efficient distributed
16 mechanisms for making the data available where and when
17 it is needed.

18 Do you see that?

19 A. Yes.

20 Q. What does it mean to provide compact
21 representation of relevant information?

22 A. I mean, it means what it says it means.
23 What -- what -- what's the -- what's not understandable
24 about it?

25 Q. Well, what information is relevant in the

1 context of what Doshi is discussing here?

2 A. Well, one example in Doshi about what it -- it
3 is talking about is -- is in, for example, Paragraph 45
4 where it talks about sharing information enables
5 computation of more efficient and primary and secondary
6 paths, and this suggests that when the node is -- that
7 is responsible for computing primary and secondary paths
8 is aware of the sharing information, and in parentheses
9 (for a distributed implementation, the information is
10 distributed across the nodes of the network), it will be
11 able to compute more efficient paths. Thus, for
12 distributed implementation, it is desirable to
13 distribute the sharing information at each node across a
14 network.

15 Usually the distribution of sharing
16 information across a network is a costly operation;
17 therefore, it is highly useful to abstract the most
18 useful information and represent it in a compact form
19 for distribution.

20 So I think it's referring to this kind of
21 information as being discussed here as an example of --
22 of the information -- of the relevant information and --

23 Q. I -- I don't think you're speaking into the
24 microphone, Dr. Houh.

25 A. Oh. And that's an example of the relevant --

1 some -- some of the relevant information described in --
2 in Paragraph 8.

3 Q. So in Paragraph 45 that you just mentioned in
4 your answer, it talks about sharing information that
5 enables computation of more efficient primary and
6 secondary paths.

7 Do you see that?

8 A. Yes.

9 Q. What is a secondary path? Let me withdraw
10 that question.

11 Is an example of a secondary -- withdrawn.

12 Is a protection path an example of a -- of a
13 secondary path?

14 A. I think if you look at it in the context of
15 the preceding couple of paragraphs, for example,
16 starting at 40 and going down to the -- 44 as well, it
17 talks about primary paths as carrying traffic, and it
18 talks about restoration paths. So I think in that -- in
19 that context, a restoration path would be an example of
20 a -- a secondary path in that case in this context.

21 Q. And a restoration path in Doshi is also
22 referred to as a protection path. Correct?

23 If you look at Paragraph 50 of your
24 declaration -- let me rephrase the question.

25 In your declaration, you state: Note that

1 Doshi's restoration path is also referred to as a
2 protection path.

3 A. Yes. That's what I say.

4 Q. What are the factors that Doshi considers in
5 determining a primary path?

6 A. I think on -- one example's given in -- in the
7 specification of Doshi are, for example, what's
8 described in Figure 11 where it considers a set of -- of
9 primary restoration path pairs and calculates the --
10 there's some costs that are calculated, and there's
11 various examples of different costs there.

12 And then a -- a -- a pair -- a pair, either a
13 K pair, a low K pair or a low L pair is selected at some
14 point. And that would be a pair of -- of
15 primary/restoration path pair.

16 And so there are a number of factors that go
17 into that, including that -- that which is described in
18 Figure 11, the algorithm there.

19 Q. And what is the set of paths that Doshi makes
20 this selection from?

21 A. Doshi talks in a number of places about the --
22 what they call candidate pairs. And with respect to
23 Figure 11, it talks about the K candidate pairs and the
24 L candidate pairs. And elsewhere, it does talk about,
25 for example, Paragraph 14, that if there's a -- a new

1 service in a mesh network that there are candidate path
2 pairs for the new service that are considered, each --
3 each pair comprising a candidate pair primary path and a
4 candidate -- candidate restoration path for the new
5 service.

6 Q. And what set of paths is this set of candidate
7 path pairs made up from?

8 ATTORNEY HUH: Objection. Form.

9 A. If you look at Paragraph 51 of my declaration,
10 I refer to Paragraph 48 of Doshi and also a figure that
11 shows a number of existing paths in -- in a -- in an
12 example net -- network. And these -- these paths that
13 are there are labeled L1 through I think L7.

14 Q. In Doshi, are those paths precomputed?

15 A. If -- if you mean are they there already and
16 set up, yes. I mean, that's what the figure's showing.
17 The figure is showing that these are the existing --
18 those are the paths in the -- in the network.

19 Q. And are the pairs precomputed?

20 A. Well, I mean, they talk about candidate pairs,
21 so all the candidate pairs are candidates and they're
22 already candidates.

23 Q. What about the pairs that are eventually --
24 what about the -- withdrawn.

25 What about the pair that is eventually

1 selected in Figure 11 of Doshi?

2 Is that precomputed prior to the occurrence of
3 a failure?

4 ATTORNEY HUH: Objection. Form.

5 A. Well, I mean, the -- the pair -- the -- the
6 selection is made of a low K -- of a low -- low K pair
7 or low L pair, and so those are -- are candidate pairs
8 that already are candidates of existing paths.

9 So those are -- those are already paths that
10 are available to be considered as a candidate in the
11 pair, and then to be able to be selected as -- as a low
12 K pair through -- through the process of the example
13 algorithm shown in Figure 11.

14 BY ATTORNEY STAMATOPOULOS:

15 Q. So the designation of a path as a protection
16 path is made before failure. Correct?

17 A. Well, they're -- they're selected as primary
18 and restoration paths as part of the candidate pair,
19 so -- so the paths are -- are existing at the -- at the
20 point that the -- the -- you know, for example, sorry,
21 steps 1120 and 1122 in -- in Figure 11.

22 Q. And the path that is ultimately selected in
23 Doshi -- withdrawn.

24 The pair that is ultimately selected in Doshi
25 at step 1108 -- 1118 may or may not be a disjointed pair.

1 Correct?

2 A. I -- I -- it doesn't say the selection is made
3 at -- at step 1118.

4 Q. What step is the selection made in?

5 A. The boxes that say select are -- are 1120 and
6 1122.

7 Q. Okay. And there's -- in 1118, it sets forth a
8 logical condition for making that selection. Correct?

9 A. Sure. There's a -- a logical question --
10 there's a -- something being evaluated in 118, yes.

11 Q. What is being evaluated?

12 A. It's whether the low K sum is less than or
13 equal to the low L sum.

14 Q. And if the low L sum is not less or equal
15 to -- sorry. Withdrawn.

16 If the low K sum is not less or equal to the
17 low L sum, then the low L pair is selected. Correct?

18 A. As a result of that, the answer being no to
19 that equation at 118, the -- the low L pair is selected.

20 Q. Okay. And if the answer to the question is
21 yes, then the low K pair is selected.

22 A. And that would be in step 1122, indicated in
23 the flow chart.

24 Q. Right. And the low K pair is not necessarily
25 a disjointed pair. Correct?

1 A. So if you look at Paragraph 55 of Doshi, and
2 there are examples where the paths are disjointed. For
3 example, it -- it talks about Figure 5, I think, as
4 showing a disjointed protection -- primary protection
5 paths.

6 But in Figure 55 in the middle, it says --
7 well, about six lines down: Though the protection paths
8 of this example are strictly disjointed from the paths
9 they protect, this need not be the case in all
10 implementations of the present invention.

11 So I think Doshi is contemplating situations
12 where the -- the paths are -- are strictly disjointed and
13 some where they're -- they're not.

14 Q. In Paragraph 50 of your declaration, you state
15 that: The determination of the primary and protection
16 path pair considers several factors, including link
17 utilization, utilization threshold, administrative
18 weight, and sharing degree.

19 Do you see that?

20 A. Yes.

21 Q. What is sharing degree?

22 Actually, let me withdraw that question.

23 Why, in your view, is sharing degree a factor
24 that Doshi considers in determining a primary and a
25 restoration path?

1 ATTORNEY HUH: Objection. Scope.

2 ATTORNEY STAMATOPOULOS: What's the basis for
3 the objection?

4 ATTORNEY HUH: This is -- testimony does
5 not -- does not explain, in his view, why Doshi also
6 considers a sharing degree. He states that it does
7 consider it.

8 ATTORNEY STAMATOPOULOS: Okay.

9 BY ATTORNEY STAMATOPOULOS:

10 Q. You can answer.

11 A. If you look at Paragraph 132 of Doshi, Doshi
12 gives a reason that the sharing degree metric is --
13 is -- is used, because it says that this metric provides
14 a network planner with an idea of the restoration
15 headroom on a link with respect to the proposed primary
16 path. The higher the sharing degree intuitively, the
17 better the choice of the primary path for the new
18 service, since a larger sharing degree for a primary
19 path would allow the future -- allow future demands to
20 be added along that path without the need to reserve
21 additional restoration bandwidth.

22 Q. Doshi considers both a sharing case and a
23 no-sharing case for its protection paths. Correct?

24 A. If you look at Paragraphs 126, 129, the
25 sections underneath those section headers are -- are

1 talking about a no-sharing case and a sharing case.

2 Q. Do you know what a path computation algorithm
3 is?

4 A. Well, if you look at Paragraph 130, it uses
5 that -- that phrase in Paragraph 130. So what it's
6 describing that an algorithm can be used -- designed to
7 compute for each possible primary path the lowest cost
8 restoration path by utilizing the sharing information.
9 Then, from the set of all primary and restoration paths,
10 the pair that requires the least amount of additional
11 capacity can be chosen. This path computation algorithm
12 using the sharing information can give considerably
13 better paths than the algorithm using no-sharing
14 information.

15 So it's describing this example of an
16 algorithm discussed in 130 as an -- an example path
17 computation algorithm.

18 Q. Right. But what -- a path computation
19 algorithm is just an algorithm that's used to compute
20 path pairs.

21 Is that fair?

22 A. Well, it -- it -- this example says a little
23 more than -- than that. It's an -- it's describing an
24 algorithm that can be designed to compute for each
25 possible primary path the lowest cost restoration path

1 by utilizing the sharing information.

2 So it's -- it's computing for each possible
3 primary path the lowest cost restoration path, and
4 that's what's being described in -- in this example.

5 Q. Where is that computation performed?

6 A. I -- I addressed this issue. I -- I think if
7 you look at -- if you look around Paragraphs 245 to 247
8 of my declaration, in that, Doshi talks about the --
9 the -- Doshi discloses these flow charts, such as in
10 Figure 11, for selecting an LSP pair from the plurality
11 of MPLS LSPs in that it would have been obvious to
12 implement Doshi's flow chart logic with software or a
13 combination of hardware and software to perform the
14 calculation and selection techniques Doshi discloses.

15 And Doshi dis -- oh, I think there should be a
16 period there after "techniques." But it's a small typo.
17 Doshi discloses a series of modules for -- for
18 performing its calculation and selection techniques.

19 And -- and those are in Doshi from
20 Paragraph 270 to 181. And it calls out a whole bunch of
21 different modules there. And that it would have been
22 obvious to implement those modules in, for example,
23 software or a combination of software and hardware,
24 since it was well known that such an implementation
25 would allow for execution of instructions to control

1 functionality.

2 Q. Can you turn to Paragraph 89 of Doshi?

3 A. Okay.

4 Q. What's your understanding -- or, actually, let
5 me rephrase that.

6 How did Paragraph 89 of Doshi inform your
7 opinions in your declaration, if at all?

8 A. I mean, as part of the overall context, I'm --
9 of -- of -- of what Doshi's teaching, and it has --
10 provides several alternatives, such as it's desirable to
11 distribute changes in the link state or sharing
12 information to other nodes, but it's not necessary to do
13 so.

14 And I think if you are referring to the
15 dissemination of this information, that it says can be
16 quite expensive in terms of bandwidth and processing.
17 It's -- it also says it's not necessary to do that.

18 So, I -- I -- I mean, this is simply a part of
19 the context of Doshi, which is giving multiple options
20 about sharing information.

21 Q. And it's saying that it's not necessary to
22 share information about link state, right?

23 A. Or sharing information. But yes, it does say
24 it's not necessary to distribute the changes in the link
25 state.

1 Q. And it says that this information --
2 disseminating this information could be expensive,
3 right?

4 A. Well, in the -- it says disseminating this
5 information for any possible change is quite expensive
6 in terms of bandwidth and processing required. But it
7 also says that it's not necessary.

8 Q. And in Paragraph 90, it says: It is highly
9 desirable to address the size of the information itself.
10 Do you see that?

11 A. Yes. Yeah, I think we may have looked at this
12 paragraph earlier, but I -- I do see that.

13 Q. And when it says "to address the size of the
14 information itself," that refers to, among other things,
15 link state information? In the same paragraph.

16 A. Well, I mean, link state information can be
17 part of it, but it's -- it's saying that it's not
18 necessarily -- it -- it says -- it -- it talks about
19 reducing the size of the sharing information by
20 either -- or representing the information in a compact
21 form, or by only disseminating the most critical
22 information, or by using a combination of both.

23 So it -- it's not really saying anything
24 specifically about link state information there. It's
25 just simply giving a number of options about how to

1 reduce the size of the information shared.

2 Q. And why do you -- why is it that Doshi wants
3 to reduce the size of the information shared?

4 A. Well, I mean, the paragraph above talks about
5 how it can -- disseminating information can be expensive
6 in terms of bandwidth and processing required.

7 But still, this says it's not necessary to
8 share the information, or it can be reduced to just the
9 most critical information. I mean, there's a lot of
10 options being provided by Doshi.

11 Q. Well, in that particular paragraph, it's not
12 giving sharing information as an option. It's saying
13 specifically that it's not necessary, right?

14 ATTORNEY HUH: Objection. Form.

15 THE WITNESS: You're referring to Paragraph
16 89?

17 BY ATTORNEY STAMATOPOULOS:

18 Q. I'm referring to Paragraphs 89 and 90.

19 A. I mean, it -- it -- it does say that
20 distributed -- distributing the changes in link state or
21 sharing information to other nodes in the network is
22 desirable, though not necessary.

23 And then, you know, in the instance where you
24 do, it describes options for compacting the information
25 so that it's less expensive in terms of the bandwidth

1 used. And I think that's -- if you read those in
2 context together, that's one takeaway from -- for those
3 two paragraphs.

4 Q. And -- and specifically, it says: For more
5 optimal computation of primary and restoration paths in
6 distributed -- in the distributed implementation, it
7 is -- it is desirable, though not necessary, to
8 distribute the changes in the link state or sharing
9 information to other nodes in the network. Correct?

10 A. I -- I think you read that correctly.

11 Q. And so what Doshi teaches is that sharing that
12 information is desirable for optimal computation.
13 Correct?

14 ATTORNEY HUH: Objection. Form.

15 A. It also says that it's not necessary, even for
16 optimal computation, I mean, that's --

17 BY ATTORNEY STAMATOPOULOS:

18 Q. Right.

19 A. -- what it's saying.

20 Q. Right.

21 But what I'm asking is to the extent that it
22 is desirable, it is desirable in the context of optimal
23 primary and restoration path computation. Correct?

24 A. I -- I mean, I'm just -- you know, I think
25 we -- if you look at what it says, it says: For more

1 optimal computation of primary and restoration paths in
2 the distributed implementation, it is desirable, though
3 not necessary, to distribute the changes.

4 So I think it's saying that you can perform
5 optimal computation without it being necessary to
6 distribute the changes. Though it's desirable to, it --
7 it says it's not necessary to.

8 Q. In what instances is it desirable to
9 distribute the changes in the link states for sharing
10 information?

11 A. In this section that Paragraphs 89 and 90
12 in -- are in, where, if you look at the heading, it --
13 it -- it starts at Paragraph 79, Connection, Routing and
14 Service Setup Process, I don't see -- I don't see any
15 explicit description of -- of -- of why -- why -- why
16 they're saying what they're saying there.

17 Q. So Doshi is silent as to the instances in
18 which distributing the changes in the link state or
19 sharing information is desirable.

20 Is that your testimony?

21 ATTORNEY HUH: Objection. Form.

22 A. I mean, Doshi is saying what it's saying right
23 there. You know, it's not going into detail with
24 respect to the question you're asking within that --
25 that section headed by Paragraph 79.

1 BY ATTORNEY STAMATOPOULOS:

2 Q. Well, I'm asking what your interpretation is
3 of Doshi. I know -- I know that Doshi's saying what
4 it's saying. I'm asking what your opinion is based on
5 what is on Doshi.

6 And it sounds like your view is that Doshi is
7 silent as to the instances in which distributing the
8 changes in the link state or sharing information is
9 desirable.

10 Do I have that right?

11 ATTORNEY HUH: Objection. Form. Scope.

12 A. In the section heading starting at 79, in that
13 section itself I didn't see an explicit description
14 of -- of the question you're asking about. And I don't
15 recall discussing this issue in my declaration itself
16 with respect to my analysis for the claims. So, I mean,
17 it's just something I'd want to take some time to think
18 about, what the reasons might be in the context of this
19 particular section.

20 BY ATTORNEY STAMATOPOULOS:

21 Q. Are you -- do you possess the qualifications
22 of a person of ordinary skill in the art in the context
23 of the '821 patent?

24 A. Yes. I say that, that I would have at least
25 possessed those qualifications, as I've laid out.

1 Q. And, in fact, you possess currently
2 qualifications in addition to those which would be
3 required for somebody to qualify as a -- as a POSITA.
4 Correct?

5 A. Sure. I -- I would -- I would say that. But
6 just to make it clear, I -- I conduct my analysis from
7 the point of view of a POSITA.

8 Q. Do you have Exhibit 1009 to your declaration
9 with you?

10 A. I don't have a printed copy but I have an
11 electronic copy.

12 Q. Okay. Can you pull it up in front of you?

13 A. Okay.

14 Q. Are you familiar with this document?

15 A. Yes. Well, I -- I reviewed it.

16 Q. And it's titled Traffic Engineering with MPLS
17 Design, Configure, and Manage MPLS-TE to Optimize
18 Network Performance. Correct?

19 A. That's -- it does say that on the first page.

20 Q. Does Exhibit 1009 describe the use of
21 protection paths?

22 A. In this excerpt from the book that -- that's
23 in Exhibit 1009, I don't see it talking about --
24 explicitly about protection paths.

25 Q. You can -- you can close that.

1 What's the relevance, if any, of Exhibit 1009
2 to the opinions set forth in the declaration?

3 A. I cite to it in Paragraph 65 of my
4 declaration, which is talking about the reasonable
5 expectation of success for combining Doshi and Guichard.

6 And this is -- is evidence that skilled
7 artisans had -- had reoptimized other systems. And this
8 is talking about the reoptimization, a -- a process
9 that's described in -- in -- in Exhibit 1009, as
10 evidence that -- as part of the evidence -- there's --
11 there's more citations there -- as -- as why a POSITA
12 would have had a reasonable expectation of success in
13 combining Doshi with Guichard.

14 Q. Do you have anything to add beyond what's
15 already in your declaration with respect to this
16 exhibit?

17 ATTORNEY HUH: Objection. Scope.

18 A. I mean, I've cited what I've cited. That's
19 what's in my declaration.

20 BY ATTORNEY STAMATOPOULOS:

21 Q. So nothing to add?

22 A. I mean, at this moment, I'm -- I wouldn't. I
23 mean, I may -- I -- there may be some other things in
24 the future that come up.

25 Q. Can you turn to Exhibit 1010 of -- sorry. Can

1 you turn to Exhibit 1010 that was cited in your
2 declaration?

3 A. Okay. I have an electronic copy but I don't
4 have a printed copy. Okay.

5 Q. Exhibit 1010 is titled Fast Network
6 Reoptimization Schemes for MPLS and Optical Networks.
7 Correct?

8 A. Yes.

9 Q. Who selected this reference for inclusion in
10 your declaration?

11 A. I don't have a explicit recollection, but I --
12 it could have been me that -- that found supporting
13 documents. But I -- I just don't know for sure one way
14 or the other.

15 Q. But it's possible that you selected this?

16 A. Yes.

17 Q. Now, does this document discuss protection
18 paths?

19 A. Well, I'm using the search feature. I didn't
20 find anything. I found words that started with "PROT,"
21 but those are "protocol." And assuming the rest of the
22 search index is correct, I was unable to find any -- the
23 word "protection" using the search feature.

24 Q. Do you recall from your own analysis of this
25 document -- well, let me withdraw that.

1 Did you analyze this document?

2 A. I mean, I did -- I did review this document.

3 Q. You did not?

4 A. I did. I said I -- I did review this
5 document.

6 Q. Approximately how much time did you spend
7 reviewing this document?

8 A. I -- I don't know, probably -- it'd probably
9 take me at least 20 minutes to look through this
10 document.

11 Q. Okay. It's a 17-page document.

12 A. That's what I have.

13 Q. Do you recall from your analysis this document
14 discussing protection paths at any point?

15 A. I mean, I have -- I don't have a photographic
16 memory so I -- I wouldn't be able to recall thinking
17 back about when I first reviewed it.

18 Q. So as you sit here today, you don't recall.
19 Correct?

20 A. As I said, I didn't find -- I didn't find a --
21 the word when I searched it. But no, I -- I don't -- I
22 don't have a photographic memory so I'm not able to
23 search documents in my head, documents that I reviewed
24 probably, I'm -- I'm -- some time ago.

25 Q. Did you look at this document in preparation

1 for your deposition today?

2 A. No.

3 Q. You didn't think it was important?

4 ATTORNEY HUH: Objection. Form.

5 A. I didn't look at it.

6 BY ATTORNEY STAMATOPOULOS:

7 Q. Why not?

8 A. I -- I -- I wanted to review the main things,
9 which are the -- the -- my declaration, and the main
10 references that were used for the challenge grounds.
11 And -- and then I probably ran out of time.

12 Q. So this was lower on your priority list.
13 Fair?

14 ATTORNEY HUH: Objection. Form.

15 A. I didn't review it. I don't know where I
16 would have put it. But I -- as I said, I didn't review
17 it since I first saw it, I think.

18 BY ATTORNEY STAMATOPOULOS:

19 Q. Can you go to Exhibit 1023 of your
20 declaration.

21 Are you there?

22 A. Yes.

23 Q. Who identified this document for inclusion in
24 your declaration?

25 A. I don't think I did, but I can't be totally

1 sure.

2 Q. And the heading on this document is
3 Multiprotocol Label Switching (MPLS) Traffic
4 Engineering?

5 A. Yeah, that's on page 1.

6 Q. What is this document?

7 A. I think it's part of some documentation about
8 Cisco IOS.

9 Q. And what is Cisco IOS?

10 A. That refers to the operating system on --
11 which runs on Cisco routers.

12 Q. And under Feature Overview, it states at the
13 very last indented paragraph on the first page: MPLS
14 traffic engineering gracefully recovers to link or node
15 failures that change the topology of the backbone by
16 adapting to the new set of constraints.

17 Do you see that?

18 A. Yes.

19 Q. What does this document describe?

20 A. Well, what I cited to in this document is on
21 page 34 where it describes to control the frequency at
22 which tunnels with established LSPs are checked for
23 better LSPs, use the MPLS traffic ENG reoptimized timers
24 frequency command.

25 Q. Does this document describe the use of

1 protection paths?

2 A. I didn't find that term, "protection," when I
3 did a search.

4 Q. Do you recall finding anything relating to the
5 use of protection paths when you analyzed this document,
6 as you sit here today?

7 A. Not as I sit here today.

8 ATTORNEY HUH: Henry, if you need a break at
9 any time, just let us know, please.

10 THE WITNESS: Sure.

11 BY ATTORNEY STAMATOPOULOS:

12 Q. I'd like to ask you now to go to Exhibit 1034
13 to your declaration.

14 A. Okay.

15 Q. Does this document describe the use of
16 protection paths?

17 A. It does appear to, yes.

18 Q. Can you point me to the spot where it
19 discusses protection paths?

20 A. Well, if you look at Figure 5, it uses the
21 word "protection path" in the figure in various boxes.
22 But if you look at the specification, it uses a slightly
23 different phrase "protecting path." And it uses the
24 phrase "protecting path" in -- in numerous places
25 throughout the specification.

1 Q. Okay. Now, this document, does it describe
2 anywhere reoptimizing protection paths?

3 A. If you look at Paragraphs 27 to 33, which I
4 cited to in my declaration, it talks about how in, for
5 example, in 27 a number of LSPs are established during a
6 GMPLS tunnel setup.

7 And then it uses the -- other places the
8 phrase "protecting LSP," for example, in -- in
9 Paragraph 21. So I think taking all in context, this --
10 a person -- and -- and then it talks about
11 reoptimization, how a reoptimization operation is
12 triggered, for example, in the case where there is a
13 change in topology or when an LSP needs to be rerouted
14 due to a failure. And -- and that the reoptimization
15 operation uses an optimization that treats the two LSPs
16 as a set, and where the LSP set includes a working path
17 and a protecting path. And I think -- I think it
18 would -- I think, you know, it is -- it is talking about
19 reoptimizing the protection paths, protection LSP paths
20 as well.

21 Q. So point me again to the spot in the claims
22 where you say that the -- there's discussion of a
23 reoptimization of the protection path.

24 A. I think that description was for all the --
25 all the -- the -- the pass -- the paragraph passages and

1 Claim 19. Claim 19 does talk, however, about a -- a
2 protection module configured to dynamically identify --
3 sorry, that's not it.

4 It's the -- the previous element, the first
5 element: A processor able to create two or more paths
6 within the optical network and group two or more of said
7 paths in a bundle, said bundle comprising at least one
8 working path and at least one protecting path, each
9 extending from an ingress router to an egress router.

10 So there are these paths already set up. And
11 I think the reoptimization citation, the -- the cited
12 passages, they -- they come from the other paragraphs
13 that are cited there.

14 Q. You mean in the specification?

15 A. Yes.

16 Q. Paragraph 27?

17 A. Well, I can hunt those down if you want me,
18 but, I mean, I --

19 Q. Well, I'm just asking what you've cited in
20 your declaration.

21 A. Yeah. I cited to Paragraphs 27 to 33 in
22 Claim 19, and then I -- I kind of provide a summary
23 of -- of those citations, which -- which is what I was
24 describing earlier.

25 Q. Which you've combined.

1 A. Yeah, I guess I -- I -- they are combined
2 there.

3 Q. Right. So just to be clear, Claim 19 does not
4 mention reoptimization. It's the other paragraphs that,
5 in your view, provide the context for Claim 19.

6 A. Well, or additional details. But I think
7 Claim 19 does discuss is it the optimization that treats
8 the two LSPs as a set, or -- or that the LSP set
9 includes a working path and a protecting path towards
10 the end of that -- the series of quoted passages.

11 Q. Does Claim 19 mention the word
12 "reoptimization" or "optimization"?

13 A. I don't see "optimization" or "reoptimization"
14 in Claim 19, but I see other claims that -- that -- that
15 talk about optimization.

16 Q. Understood.

17 Let's go to Paragraph 27, which is a paragraph
18 that you have cited in your declaration. Correct?

19 A. Yes.

20 Q. Do you see where it says eight lines from the
21 top of that paragraph: The LSPs in a bundle are
22 established between the same source and destination
23 address nodes, and based on configuration or enforced
24 SLA they have a certain degree of diversity and
25 optimality?

1 Do you see that?

2 A. Yeah. You inverted the word "addressed"
3 before "nodes" somewhere, which is not in Paragraph 27;
4 but otherwise, I do see that.

5 Q. Okay. I apologize for that.

6 Then it says: These LSPs may be reoptimized
7 or rerouted due to topology changes or failures in the
8 network.

9 Do you see that?

10 A. Yes.

11 Q. So the LSPs that may be reoptimized are the
12 LSPs referred to in the preceding sentence. Correct?

13 A. They're the ones in the bundle, which I think
14 Claim 19 claims can be -- one can be a protection path
15 and the other, the primary -- I don't remember the exact
16 words used, but --

17 Q. I understand that that's your view. I'm just
18 asking for this particular sentence, these LSPs, the
19 reference to these LSPs are the LSPs in a bundle.
20 Correct?

21 ATTORNEY HUH: Objection. Form.

22 A. I mean, that's the immediately preceding use
23 of the term "LSP," but there are also a number of LSPs
24 introduced at the beginning of that paragraph.

25 BY ATTORNEY STAMATOPOULOS:

1 Q. Okay. Now, later on in that paragraph -- so
2 this paragraph discusses in this part reoptimization.
3 Correct?

4 A. Yeah, sure.

5 Q. Later -- and -- and it's fair to say that for
6 reoptimization to occur, there needs to be somebody
7 state change in the network. Correct?

8 A. Well, some of the examples given are due to
9 topology changes or failures in the network here.

10 Q. And later on, after reoptimization is
11 discussed in Paragraph 27, but also in Paragraph 27, it
12 says the data protection mechanism -- apologies.
13 Withdrawn.

14 Later on in the same paragraph, after
15 reoptimization is discussed, it says: The selected data
16 plane protection mechanism may also change due to
17 configuration or policy changes.

18 Do you see that?

19 A. Yes.

20 Q. And fair to say that the selected data plane
21 protection mechanism would include any protection --
22 (Reporter clarification.)

23 THE REPORTER: I didn't hear the last word.

24 ATTORNEY STAMATOPOULOS: I'll repeat the
25 question. Let me ask a different question.

1 BY ATTORNEY STAMATOPOULOS:

2 Q. Fair to say that the selected data plane
3 protection mechanism would encompass any protection
4 paths?

5 A. I mean, I see that in -- in the -- the
6 preceding sentence talks about some data plane
7 protection mechanisms such as, for example, link
8 bundling and SONET APS protection. And so I think this
9 is just saying, well, you can change that base to
10 configuration or policy changes.

11 Q. So in the sentence that we were just looking
12 at, which reads: The selected data plane protection
13 mechanism also may change due to configuration or policy
14 changes, do you see that sentence?

15 A. Yes.

16 Q. In that sentence, the phrase "the selected
17 data plane protection mechanism," does that, in your
18 opinion, include any protection paths discussed in this
19 reference?

20 A. And if you look at -- if you look at the
21 previous sentence, that -- an example data plane
22 protection mechanism is link bundling of GMP -- GMPLS
23 tunnel interfaces. And if you look at what the bundles
24 are, they are -- they are label-switched paths in a
25 bundle established between the same source and

1 destination nodes, and -- and they can be reoptimized.
2 And we see in other parts of -- of -- of this reference
3 how the bundles may include a -- a -- a -- a working
4 path and a protection path.

5 And so, I mean, it -- it is talking about
6 potentially reoptimizing the label-switched paths due to
7 events as an example of things that can be driven, event
8 driven, and about reoptimizing the label-switched paths,
9 which some of which are protection paths.

10 Q. Where does it say that the bundles -- so just
11 to back up for one second, so this reference says that
12 the bundles can be reoptimized. Fair?

13 A. Yes.

14 Q. Where does it say that the bundles can include
15 protection paths?

16 A. Claim 19, the first element says that there
17 can be a -- a group of two or more paths within a bundle
18 and that said bundle comprising at least one working
19 path and at least one protecting path, each extending
20 from an ingress router to an egress router.

21 So that -- that matches the description that
22 we're looking at in Paragraph 27.

23 Q. And the reason you say that Claim 19 matches
24 Paragraph 27 is based on what?

25 A. The overall context of this reference. The

1 fact that Paragraph 27 is talking about bundles. And I
2 think they talked about bundles being -- I'm not sure
3 here. Oh, yeah. The LSPs in a bundle are established
4 between the same source and destination nodes. That
5 matches up with the description of the bundle in
6 Claim 19. In --

7 Q. To be clear, Claim 10 --

8 A. -- overall context, read together, that these
9 bundles, as -- as it's claimed, bundle can include a
10 working path and a protection path.

11 Q. Claim 19 doesn't specifically say that the
12 protection path can be reoptimized. Correct?

13 A. Paragraph 27 talks about reoptimizing all the
14 label-switched paths, including the label-switched paths
15 in the bundle.

16 And as it says, these label-switched paths,
17 which in -- in the preceding sentence are the
18 label-switched paths in the bundle, and it talks about a
19 number of label-switched paths at the very outset of
20 Paragraph 27.

21 Q. And then Paragraph 27 also says that the
22 selected data plane protection mechanism also may
23 change. Correct?

24 A. Yeah, I mean, that's adding more things
25 about -- you could change this protection mechanism.

1 But it's already saying that one protection mechanism
2 is -- an example given is link bundling of GMPLS tunnel
3 interfaces, and that's one protection mechanism. So now
4 you have -- it's saying that's a protection mechanism,
5 and it's talking about bundles. And -- and Claim 19
6 talks about bundles have -- being -- comprising a
7 working path, at least one -- and then at least one
8 protection path. So I think overall in the context,
9 these -- these bundles are -- they're label-switched
10 paths. They -- they comprise protection paths, you
11 know, as --

12 Q. Yeah. My question is --

13 A. -- as claimed in --

14 Q. My question is --

15 ATTORNEY HUH: Counsel, please let him finish.
16 He wasn't finished.

17 BY ATTORNEY STAMATOPOULOS:

18 Q. Oh, you weren't finished?

19 A. Yeah. And Paragraph 27 talks about
20 reoptimizing label-switched paths in a bundle, and --
21 in -- in general. So I think the overall context, you
22 know, we're looking at, and -- and I -- supports that.

23 Q. I guess my question is this, then. If
24 Paragraph 27 says that the LSPs may be reoptimized, and
25 those LSPs include the protection paths, why is it that

1 later on, Paragraph 27 specifies that the selected data
2 plane protection mechanism also may change?

3 Why do you think that is?

4 A. Well, so you've reconfigured the network so
5 there's -- there -- it becomes only SONET links. Then
6 you might switch to the -- the SONET APS protection for
7 GP -- GMPLS tunnel interfaces.

8 It says that the -- the policies can change
9 due to configuration or policy changes. So, you know,
10 maybe your policy is, well, we're not going to use some
11 sort of protection mechanism. I mean, it says what it
12 says, but it -- it says it could change. But it already
13 discloses that it's using a protection scheme they call
14 link bundling and give an example of, which is described
15 pretty clearly, I think, in other portions of the spec
16 and in the whole context here.

17 Q. And link bundling includes the protection
18 paths?

19 A. Claim 19 says that a -- a bundle may
20 include -- would -- would -- includes a working path
21 and -- and a protection path, so that -- that -- that
22 makes it -- that pretty much makes it clear what bundles
23 being described in the specification can comprise.

24 Q. Is there any other part other than Claim 19
25 that describes that a bundle can include a protection

1 path?

2 A. I mean, there's several places I see in the
3 specification. For example, Paragraph 29, which I also
4 cite to in my declaration, talks about Figure 2. And it
5 starts off saying: Figure 2 is a flow chart
6 illustrating one example of a process of the present
7 invention for maintaining and using dynamic bundles for
8 network protection.

9 And then it -- it says that, you know, after
10 step 24, there are bundle of N optical connections at
11 the two ends of the routers using L -- an AL2 bundling
12 technique that is supported, for example, by routers.
13 Well, it goes on. But that's talking about this bundle
14 used for network protection.

15 And so I think that -- it's not saying it as
16 clearly as Paragraph 27, but I -- I think it's pretty
17 clearly talking about bundles for network protection.
18 And there's a few other places that -- that refer to
19 this type of bundling used for network protection.

20 Q. Did you analyze the differences and
21 similarities, if any, between the protection paths
22 discussed in this reference and the protection path
23 discussed in the '821 patent?

24 A. So the reason I cited to this document was
25 to -- to support the -- that a POSITA had a reasonable

1 expectation of success in combining, I think, Doshi and
2 Guichard.

3 And -- and now, so -- so I didn't use this as
4 a -- as a primary reference in -- in -- in -- in my --
5 in the challenges. So I -- I don't know if I went onto
6 that level of analysis. But, I mean, it seems pretty
7 clear that these bundles have working paths and
8 protection paths and they're -- they're -- they're both
9 label-switched paths that are already, you know,
10 configured to be used in the bundle. And -- and it
11 talks about reoptimizing -- reoptimizing the
12 label-switched paths based on events.

13 So because this is a reference that kind of
14 shows aspects of the combination, it -- it's evidence
15 that a POSITA would be successful in making that
16 combination of Doshi and Guichard.

17 Q. So you -- you have not included any opinions
18 in your declaration discussing the differences and
19 similarities, if any, between the protection paths
20 discussed in this reference and the '821 patent.
21 Correct?

22 ATTORNEY HUH: Objection. Form.

23 A. I mean, I -- I -- I don't know what you think
24 is different about -- about these but, know -- you know,
25 but the reason I cited this section is about showing

1 that it has a -- there's a reasonable chance of success.
2 And, you know, and using protection paths, which are
3 label-switched paths, which are -- which are the same
4 type of -- of, you know, pair -- well, bundle may be
5 more than a pair, but that's similar to what's already
6 disclosed in Doshi with respect to the primary and
7 restoration paths.

8 And that there's reoptimization done on a --
9 on a regular basis, which is what I talk about from
10 Guichard, if you look at the various parts of my
11 declaration, which I'll let speak for -- for itself
12 here.

13 But the -- but this -- this shows something
14 that is -- is very much like the combination, and that's
15 why a person of ordinary skill would have had a
16 reasonable chance of success, expectation of success in
17 making that combination that I've -- I've made in one of
18 the challenges.

19 BY ATTORNEY STAMATOPOULOS:

20 Q. Do you have anything you want to add to your
21 declaration or your opinions with respect to this
22 reference?

23 A. I mean, not -- not at the moment. I cited to
24 it in my declaration, and as I sit here right now, I --
25 I'm, you know, I'm not -- I'm not offering additional

1 written opinions at the moment.

2 ATTORNEY STAMATOPOULOS: I think we can
3 probably -- we have been going for about an hour and a
4 half. Shall we take a break?

5 THE WITNESS: Sounds good to me.

6 ATTORNEY STAMATOPOULOS: Okay. Should we
7 reconvene in, let's say, 15 minutes? Is that good?

8 THE WITNESS: Sure.

9 ATTORNEY STAMATOPOULOS: Greg, are you
10 available for a very quick call?

11 ATTORNEY HUH: Let's do a call after this
12 deposition.

13 ATTORNEY STAMATOPOULOS: I'd prefer that we do
14 it before the deposition, because this is an issue that
15 I think needs to be addressed now to ensure that nothing
16 needs to be added to the record, so --

17 ATTORNEY HUH: Yeah, so we're not going to
18 discuss the email issue, and -- and --

19 ATTORNEY STAMATOPOULOS: No, I think we have
20 to.

21 ATTORNEY HUH: That's not at issue right now
22 in deposition, so I would just ask that you continue
23 deposing Dr. Henry Houh on the record.

24 ATTORNEY STAMATOPOULOS: Okay, let me -- let
25 me then take --

1 ATTORNEY HUH: And anything that -- anything
2 that happens consequently after that, we can address
3 afterwards.

4 ATTORNEY STAMATOPOULOS: So let -- let me just
5 say that it is my --

6 THE REPORTER: So we're still on the record.
7 Do you want to stay on the record?

8 ATTORNEY STAMATOPOULOS: Let's go on. Let's
9 go on.

10 THE REPORTER: Go ahead. We're still on.

11 ATTORNEY STAMATOPOULOS: Let's make sure that
12 Dr. Houh is not on the --

13 THE WITNESS: Should -- should I leave and not
14 listen to this conversation?

15 ATTORNEY STAMATOPOULOS: I think that would be
16 preferable, Dr. Houh, yes.

17 THE WITNESS: All right, I'll --

18 ATTORNEY STAMATOPOULOS: Unless your counsel
19 thinks otherwise. But I think it would be preferable
20 that you leave. I don't want to instruct you one way or
21 the other.

22 ATTORNEY HUH: To be clear, I'm not going to
23 be discussing that issue right now. I have other things
24 to do, and I don't think it's appropriate right now to
25 do it during this time. So my focus is somewhere else

1 other than that issue. We can discuss it afterwards.

2 ATTORNEY STAMATOPOULOS: Okay. All right,
3 let's do that.

4 ATTORNEY HUH: Okay.

5 THE REPORTER: We're off the record for a
6 break.

7 (Recess taken.)

8 BY ATTORNEY STAMATOPOULOS:

9 Q. Dr. Houh, are you familiar with the term "make
10 a set before break a set"?

11 A. I think I've heard that before. I don't
12 recall where.

13 Q. What does it refer to?

14 A. I -- I mean, I -- I have -- I -- I'd like to
15 see the context if -- if -- if you're asking about its
16 use in something.

17 Q. Sure. Bear with me for a moment.

18 Do you have the Guichard reference?

19 A. Yes.

20 Q. Can you open it at page 81?

21 A. Okay.

22 Q. Can you turn to the first bulleted paragraph
23 that talks about nondisruptive reoptimization?

24 A. Okay.

25 Q. Do you see where it says "make-before-break

1 mechanism"?

2 A. Yes.

3 Q. With that context, are you able to tell me
4 what "make or break" refers to in the context of MPLS
5 networks?

6 A. Well, it -- I mean, this is just what Guichard
7 is saying here with respect to this -- this
8 nondisruptive optimization bullet. But it talks about
9 how -- about the ability to reoptimize an LSP along a
10 more optimal path without any traffic disruption.

11 So what it's talking about here is that the
12 head-end router shouldn't tear down the old or the
13 current LSP and then reestablish it, a new path.
14 Instead, it should first establish the new path. And
15 then as soon as the new path is set up, then you can
16 take the old one down because the -- the -- the -- the
17 old one is still working, it's just that it's -- it's
18 saying here that you could reoptimize it along a better
19 path but that you shouldn't do it by tearing the old
20 path down right away and then setting up a new path, but
21 by -- by setting up a new path first and then -- and
22 then -- then -- and -- and then using it and then --
23 then tearing down the old path.

24 Q. And that's --

25 A. That's just what it's saying in the context

1 of -- of this nondisruptive optimization bullet.

2 Q. And the reason you'd want to make the new path
3 before breaking the old is because if you broke down the
4 old before making the new, you would disrupt traffic.
5 Correct?

6 A. Yeah. I mean, if you had traffic to -- to
7 send while -- while you just tore down the -- the path,
8 even though it wasn't optimal but working, that wouldn't
9 be very good. You -- you would disrupt potential
10 communications for a period of time.

11 Q. Isn't the new path already set up and ready to
12 take over in any event, in any event in Guichard? I
13 guess let me rephrase the question.

14 Why does it say you have to make the new path?

15 Is the new path not already provisioned?

16 A. I mean, Guichard I use in my declaration to
17 support the -- the -- the kind of events and things for
18 reoptimization of paths, which still can be done on an
19 existing path with -- without disruption, as Guichard's
20 talking about here.

21 It's the combination of Doshi and Guichard
22 that's -- that's the challenge here.

23 So in -- in this -- this -- you know, I'm not
24 relying on any preestablished paths from Guichard for my
25 analysis and -- and in the challenges in my declaration.

1 Q. Yeah. I'm more trying to ascertain -- I'm
2 not -- to be clear, I'm not asking about any specific
3 limitations here, I'm just trying to establish the
4 meaning of this make-or-break mechanism and what it
5 would mean to a person of ordinary skill in the art.

6 ATTORNEY HUH: Objection. Form.

7 ATTORNEY STAMATOPOULOS: Let me put a
8 question. Yeah, I think that's fair. Let me put a
9 question.

10 BY ATTORNEY STAMATOPOULOS:

11 Q. So Guichard says: This is known as the
12 make-before-break mechanism. And "make-before-break" is
13 italicized.

14 Do you have an understanding as to whether
15 this "make-before-break" phrase was a term of art?

16 A. I mean, it seems like common sense to me.
17 Yeah, I -- I don't recognize it as something people -- I
18 heard all the time in my networking group with people
19 talking about this, so I -- I -- I haven't -- haven't
20 considered whether -- whether -- that -- that particular
21 phrase.

22 But it's pretty clear what it's describing, so
23 I don't think you need -- we need to consider the term
24 itself. I -- I think we can just look at what it's
25 saying, which is set up a new path that may be better,

1 but don't tear down the old path and disrupt traffic
2 until you set up a new path and you can seamlessly
3 switch over to it.

4 I think that's the concept being talked about
5 in this bullet of nondisruptive optimization. And I
6 don't think it's particularly earthshattering. It's
7 pretty much common sense.

8 Q. Okay. In Doshi, there are restoration paths
9 discussed. Correct? I mean, I -- I do want to make
10 this a little bit faster, so I can show you a spot in
11 Doshi, all right?

12 Do you have Doshi in front of you?

13 A. Yes.

14 Q. So, for example, in the abstract, Doshi says:
15 For each of a plurality of candidate primary/restoration
16 paths for the new service generating a path cost for
17 each candidate pair.

18 Do you see that?

19 A. Yes.

20 Q. So Doshi discusses this concept of a
21 restoration path. Yes?

22 A. In the context where restoration is -- can
23 include these pre-setup protection paths, which -- which
24 I think you may have seen earlier that Doshi's referring
25 to interchangeably, if I remember correctly.

1 Q. Yes.

2 A. Yeah.

3 Q. So these protection paths are precomputed.
4 Correct? Or in some instances in Doshi -- let me
5 rephrase the question.

6 In some instances, Doshi discusses precomputed
7 protection paths, right?

8 A. Sure.

9 Q. Those precomputed protection paths do not
10 require a make-or-break mechanism. Correct? Sorry, let
11 me rephrase it.

12 These precomputed protection paths would not
13 require applying a make-before-break mechanism because
14 they're already there. Correct?

15 ATTORNEY HUH: Objection. Form.

16 A. Well, I -- I mean, if you're going to
17 reoptimize the protection path while there's traffic on
18 it, then -- then someone would want to do so by setting
19 up a new protection path and then switching over to it.

20 But Doshi -- Doshi's talking about how you --
21 you pick among the -- the candidate protection path
22 pairs. The path pairs are -- are set up, but the point
23 is it can be -- both -- both paths in the pair can be
24 continuously reoptimized, you know, under changing
25 network conditions, which are -- you know, happen in a

1 network.

2 So if that -- if some change impacts a -- a
3 primary path in a way that -- that doesn't affect the --
4 the -- the connectivity but maybe affects the bandwidth,
5 then -- then you could reoptimize that path in a way
6 such as described in -- in Guichard.

7 But if -- if the -- if the primary path fails,
8 then sure, you -- you would just simply start using the
9 protection path as a result of detecting that failure.

10 I think you're -- these issues are kind of
11 orthogonal with -- with respect to the fact that there's
12 a restore -- protection and restoration path and a
13 primary path versus reoptimizing. And -- and you can
14 reoptimize existing paths. And -- and, you know, the
15 combination is what I lay out in my declaration, and
16 I'll let that speak for itself. I mean, if you have
17 questions about the combination, I'd be happy to look at
18 them.

19 Q. Let me ask you this. If a protection path is
20 torn down before a new protection path is set up, would
21 there be traffic disruption?

22 A. I mean, if the protection path is not used at
23 the moment, then there would be no traffic dis --
24 disrupt if the protection path is not used for any
25 traffic.

1 But -- but in the case where you're
2 actually -- you have thrown away the path or, you know,
3 taken down the path, and there's a failure in the
4 primary path, there's -- there may be a window of time
5 where you -- you've already thrown out the protection
6 path.

7 But -- but why would you do that? I mean,
8 this -- you know, with -- with -- with any path, even if
9 it's a protection path with zero, because you reduce the
10 risk that there's -- that you can't respond in a failure
11 if you tear it down first before setting up a new one.

12 So, I mean, again, I'm not sure why, you know,
13 this isn't just common sense to start with. But -- but
14 Guichard actually explicitly talks about how to optimize
15 a -- a path that's being used without disruption to the
16 traffic.

17 And, you know, a path that's not being used,
18 you still have the chance that it becomes used during
19 the time if you don't do it in the way that is
20 explicitly outlined in -- in -- in Guichard.

21 I mean, it might be a small chance, but
22 it's -- it's -- it's still a chance, so there's no
23 reason to not -- there's -- there's -- doesn't seem to
24 be much reason that I can see, certainly nothing that it
25 says in the Guichard reference, to not do it that way.

1 Q. You said there might be a small chance, but
2 it's still a chance, important of evaluating
3 probabilities in the context of restoration?

4 ATTORNEY HUH: Objection. Scope.

5 THE WITNESS: Are you talking about what the
6 claims --

7 ATTORNEY STAMATOPOULOS: What's the basis for
8 that objection?

9 ATTORNEY HUH: I'm sorry?

10 ATTORNEY STAMATOPOULOS: What's the basis for
11 that objection?

12 ATTORNEY HUH: What's the basis for the scope
13 objection?

14 ATTORNEY STAMATOPOULOS: Yeah, your scope
15 objection, yes. What's your basis?

16 ATTORNEY HUH: Because Dr. Houh is not
17 describing or contemplating in the context of Guichard
18 the probabilities of the failure in Guichard, and is
19 therefore --

20 ATTORNEY STAMATOPOULOS: I -- but you do
21 understand that the patent specifically has a limitation
22 that relates to the probability of failure, right,
23 counsel?

24 ATTORNEY HUH: Right. But you were relying on
25 the context of Guichard.

1 ATTORNEY STAMATOPOULOS: I was asking a
2 question that had nothing to do with Guichard, actually.
3 And your scope objections are very close -- come very
4 close to coaching the witness, and I would advise you to
5 be cautious.

6 ATTORNEY HUH: Counsel, I would advise you to
7 be cautious on -- on advising my client on how to
8 answer, on how timely to answer or not answer.

9 ATTORNEY STAMATOPOULOS: I -- I'm not advising
10 your client to do anything. I'm speaking to you.

11 ATTORNEY HUH: No, you are -- you are speaking
12 to me on the record, effectively trying to inform the
13 client, our -- my expert, Dr. Houh, to -- to answer
14 questions in an untimely way. So I would -- I would ask
15 that you allow him to answer and -- and not -- not tell
16 him how to answer and how much time to answer.

17 ATTORNEY STAMATOPOULOS: Counsel, I think the
18 record shows how -- how amenable I have been to Dr. Houh
19 taking his time in formulating his responses and
20 articulating his responses, even when very clearly his
21 responses have been nonresponsive to my questions. So
22 to the extent that you have an issue, I would invite you
23 to raise that with the Board as well as any other issue
24 that you may have in mind. With that, unless you have
25 something to add, I'll ask the court reporter to repeat

1 my last question. And you can restate your objection if
2 that is how you wish to proceed.

3 ATTORNEY HUH: Counsel, ask your questions.
4 Stop instructing my -- my expert how to answer and how
5 fast to answer.

6 (The reporter read from the record.)

7 ATTORNEY HUH: Objection. Scope. This is
8 precisely in the context of Guichard.

9 ATTORNEY STAMATOPOULOS: Let me ask you a
10 different question, Dr. Houh, to make it -- just to make
11 it very clear.

12 BY ATTORNEY STAMATOPOULOS:

13 Q. In your view, irrespective of Guichard, is it
14 important to evaluate the probability of failures in a
15 MPLS network?

16 A. I mean, it may depend for what purpose.

17 Q. For what purpose would it be important to
18 evaluate the probability of failure?

19 A. So in Doshi, Doshi talks about various factors
20 to use in determining the primary and protection path.
21 And I -- I -- I talk about this at least in Paragraph 50
22 of my declaration.

23 And it talks about using things like link
24 utilization, utilization threshold, administrative
25 weight, and sharing degree. But another factor

1 considered is whether the primary and protection paths
2 are disjoint.

3 And they explain that Doshi explains -- or
4 Doshi explains that the benefit of disjoint paths is
5 that a failure affecting one of them will not affect the
6 other. So these are with respect to kind of correlated
7 failures versus independent failures about a concurrent
8 failure of -- of -- of paths that share a lot of
9 common -- they're not entirely disjoint.

10 And in that way, it -- it's -- it is
11 determining -- determining, you know, the -- the -- the
12 level of -- of -- of failure probability based on the --
13 this disjointness.

14 Q. So it's your opinion that Doshi teaches
15 calculating a probability of failure?

16 ATTORNEY HUH: Objection. Form.

17 A. So it is my opinion that Doshi is disclosing
18 determining a probability of concurrent failure. And if
19 you look at my declaration, that -- starting around
20 Paragraph 249 and 250 and 251, at least there, because
21 Doshi explains that the probability of recurrence of
22 more than one failure during the time interval required
23 to repair a failure is very insignificant, and -- and
24 that Doshi recognizes that when two paths are disjoint,
25 for example, by being both node and link disjoint, then

1 a failure affecting one of them will not affect the
2 other. And thus, it would take two distinct failures,
3 one affecting each paths for both paths to fail
4 concurrently. And that matches up really well with the
5 disclosure in the '821 patent itself.

6 If you look at column 6, line 16, it says:
7 The probability of multiple failures affecting two
8 entities such that the second failure occurs before the
9 entity pair reselection process triggered by the first
10 failure was completed, may be considered low enough to
11 be disregarded.

12 So in -- in -- in one case, the -- the, you
13 know, that's like what the patent says, is that the
14 probability of concurrent failures, the -- the patent
15 says is low enough to be discarded. And Doshi actually
16 makes a determination of the probability by considering
17 the level of disjointness, that is, how many common
18 elements there are on each of the paths, common nodes
19 and links.

20 So my opinion is about the determination, not
21 with respect to the word you used in your question. But
22 it is my opinion that Doshi discloses determining a -- a
23 probability of concurrent failure.

24 BY ATTORNEY STAMATOPOULOS:

25 Q. And how does Doshi disclose determining that

1 probability?

2 A. It's because Doshi does consider and has
3 knowledge of -- of the disjointedness between the paths.

4 If you look at Paragraph 40 of Doshi, yeah,
5 it's like the sixth or seventh line from the end of
6 Paragraph 40: To understand sharing, realize that if
7 two primary paths carrying traffic are -- are routed
8 disjointly, then a failure affecting one of them will
9 not affect the other.

10 Q. Isn't it true that that's not really a
11 calculation of a probability of failure?

12 A. It's a determination, as required by the
13 claims. And the claim doesn't use the word
14 "calculation"; it uses the word "determining." Like,
15 what's the exact word? "Determine." It's logic
16 configured -- 14.4: Logic configured to determine a
17 probability of concurrent failure.

18 And by showing that the -- it -- the -- the --
19 knowing the level of disjointedness, for example,
20 there -- it's completely disjoint, it determines that
21 the -- the level of probability of failure is -- is low,
22 or very insignificant, as -- as Doshi says.

23 And again, that matches exactly what --
24 what -- what -- and, in fact -- and, in fact, earlier,
25 in -- in Paragraph 40, it talks about how the

1 probability of occurrence of more than one failure
2 during the time interval required to repair a failure
3 is -- is very insignificant; and therefore, most of the
4 time it is sufficient to cover just a single network
5 failure.

6 And Doshi pretty much maps exactly to what --
7 what the '821 patent says at column 6, line 16, which
8 is: The probability of multiple failures affecting two
9 entities such that the second failure occurs before the
10 entity pair reselection process triggered by the first
11 failure was completed may be considered low enough to be
12 disregarded, so --

13 Q. Well, don't you -- oh, sorry.

14 A. So they're -- they're determining here that
15 this probability is -- is low enough to be not even
16 calculated. I mean, it's -- it's -- it's -- it's
17 disregarded.

18 Q. The teaching that it should be disregarded, in
19 your view, amounts to determining that probability.

20 A. Well, the -- Doshi's teaching about -- about
21 actually figuring out the level of disjointedness
22 between two paths, if a -- if a -- if a path is -- is --
23 if two paths are -- are completely disjoint, then --
24 then -- then -- then the -- the -- the probability --
25 the probability of occurrence of -- of more than one

1 failure that -- that affects each disjoint paths sim --
2 or in a -- in a short amount of time is -- is very
3 insignificant. So that -- that dis -- level of
4 determining the disjointedness is determining a -- a
5 probability of concurrent failure because if it's very
6 disjoint, you -- it's -- Doshi is determining that the
7 probability is very insignificant.

8 But it -- the more -- the less disjoint the
9 paths become, it's -- the higher the probability it --
10 it would determine to be a higher probability the -- the
11 more dis -- the less disjoint two paths become.

12 Q. Where is --

13 A. So it's determining that by virtue of
14 determining and -- and by virtue of -- of -- of having
15 knowledge and -- and -- and figuring out the level of
16 disjointedness between paths.

17 Q. Where does Doshi teach determining the level
18 of disjointedness?

19 A. So it's several places in my -- in my
20 declaration. For example, if you talk about -- sorry,
21 if you look at Paragraph 97, Doshi's cost determination
22 takes into account whether the paths are disjoint where
23 disjoint paths would be understood as lowering the
24 probability of simultaneous failure. And that's
25 described in Doshi from 146 to 156.

1 Q. Let me ask you a question about that.
2 Here, it says -- we're on Paragraph 97?

3 A. Yeah, I didn't finish, but --

4 Q. Oh, you didn't finish?

5 Do you want to go to a different paragraph, or
6 should we stick to 97 momentarily?

7 A. Well, I was sticking with my Paragraph 97.
8 But it actually says in step 1 dot -- or 1110 of
9 Figure 11 to calculate L disjoint total -- oh, sorry,
10 lowest total cost pairs of paths.

11 And so it -- it -- it -- it -- it's clear that
12 the disjointedness is part of the overall set of
13 calculations that are -- are performed in the -- in the
14 algorithm described in Figure 11.

15 Q. That takes into account whether paths are
16 disjoint or not, right?

17 ATTORNEY HUH: Objection. Form.

18 A. I mean, they -- what -- I mean, what I say is
19 that a POSITA would have understood that Doshi's cost
20 determination, which considers a myriad of factors such
21 as link utilization, sharing degree, and path
22 disjointedness -- disjointedness, represents the overall
23 cost for each candidate pair.

24 BY ATTORNEY STAMATOPOULOS:

25 Q. Doshi doesn't teach calculating precisely what

1 the level of disjointedness is, does it?

2 A. So the calculation that Doshi makes
3 substantially minimizes the probability of concurrent
4 failure, and that's the calculation that they make.

5 And I -- I -- and I describe this in 149 of my
6 declaration. And I also point out that Doshi's
7 selection of disjoint paths is consistent with exemplary
8 concurrent failure minimize -- minimization described in
9 the patent itself, recognizing that a pair having
10 multiple spans or -- and/or nodes in common may be more
11 likely to simultaneously fail than a pair having no
12 spans or nodes in common.

13 Q. And that is the basis for your opinion that
14 Doshi calculates -- or, sorry. Let me rephrase the
15 question.

16 This is the basis for your opinion that Doshi
17 determines the probability of concurrent failure?

18 ATTORNEY HUH: Objection. Form.

19 A. I mean, that's part of it. I don't think
20 that's the entirety. It's the whole discussion that I
21 have in not only section -- for my analysis of 14.4, but
22 I refer to 1.2 and 5.1, which I also think refers to the
23 analysis for 1.3.

24 BY ATTORNEY STAMATOPOULOS:

25 Q. Prior to today's deposition, have you

1 encountered in your analysis of the '821 patent the term
2 "make-before-break"?

3 A. I mean, I -- I don't -- I don't recall. But I
4 don't -- I don't remember it as a common term that I
5 heard used all the time in -- in kind of a -- a --
6 backup plans. And I've designed systems with -- with
7 hot backups before in my professional work, but I don't
8 recall hearing that phrase there either.

9 But -- but I -- it -- I mean, we -- we see it
10 in Guichard, but I haven't really gone to look in the
11 literature for that one way or the other.

12 Q. Yeah. Now, you cited Paragraphs 27 through 34
13 of Exhibit 1034 in your report, right?

14 A. I think you said 27 through 34. In
15 Paragraph 65, I -- I cite Paragraphs 27 through 33,
16 Exhibit 1034. Maybe -- maybe the 34 I remember from you
17 saying Exhibit 1034. But it is -- if you look in
18 Paragraph 65, that's -- that's where I cite to
19 Exhibit 1034.

20 Q. Understood.

21 Can you pull up Exhibit 1035?

22 A. Okay.

23 Q. This is one of the exhibits that you cite in
24 your declaration?

25 A. I think that's correct, yes.

1 Q. Does this exhibit anywhere discuss protection
2 paths?

3 A. I didn't find the word "protect" or any
4 variant of that in -- in my search of -- of
5 Exhibit 1035.

6 Q. Why would a person of ordinary skill in the
7 art want to reoptimize a protection path?

8 A. I mean, as I discuss in my declaration in a
9 few places, the network state can change. And -- and it
10 changes and can keep changing, and that's what Guichard
11 is saying.

12 And that it would have been understood that
13 the network may change such that -- such that the new
14 nodes with new LSPs may be added, and so to -- to have
15 the -- and Guichard talks about reoptimizing
16 label-switched paths. And it's still beneficial to have
17 a better protection path as well.

18 And -- and Doshi talks about all the metrics
19 used to calculate the low K or low -- low L metrics that
20 are used to compute those -- to -- in -- in the
21 calculations.

22 And -- and -- and -- and Guichard teaches that
23 the network state keeps changing, so you -- you want to
24 be able to use the new paths or -- or a -- you know, if
25 an event is the failure of a node and it affects the

1 protection path, that's certainly one reason you'd want
2 to get a new protection path.

3 But even if there's a better one available,
4 that's good reason to optimize the set of -- of
5 label-switched paths.

6 Q. The computation of reoptimization, does it
7 involve any costs?

8 A. Sure. I mean, computation takes some time,
9 and there is some cost. But, you know, especially in
10 the example where the -- an event is that -- something
11 that impacts the protection path and -- and causes it to
12 fail, it -- you know, it seems that -- that there,
13 the -- and in many other cases, the cost is still -- may
14 be worth, you know, having -- doing that reoptimization,
15 but certainly in the case where an event is -- causes a
16 protection path to fail.

17 Q. Does the prior art teach that the cost of
18 reoptimization outweighs the cost of failure to
19 reoptimize with respect to protection paths?

20 ATTORNEY HUH: Objection. Form.

21 A. Well, I mean, if your protection path fails,
22 it, I mean, it seems that what's the point of having a
23 protection path if it's not a protection path?

24 And so it -- clearly, in that kind of event,
25 you know, a reoptimization of the protection path would

1 be worth what -- what -- what the cost is. And -- and,
2 you know, these are things like Guichard teaches about,
3 you know, reoptimization based on these events. It's
4 not saying -- it's not -- you know, that's -- that's --
5 it -- it's kind of what these things would be designed
6 to do is to -- to -- to -- to do these calculations
7 when -- when events warrant, like Guichard is teaching.

8 BY ATTORNEY STAMATOPOULOS:

9 Q. Where does the prior art teach that the cost
10 of reoptimization outweighs the cost of failing to
11 reoptimize a protection path?

12 A. Well, so in the '821 patent itself in the
13 specification, I don't see any disclosure -- and I could
14 be wrong if -- if -- if you know of such a disclosure --
15 in the '821. I'd be happy to take a look. But I don't
16 see any disclosure about adding in the cost of
17 computation for actually making a -- a -- the
18 calculations that it's doing.

19 So in that sense, the '821 patent doesn't say
20 anything one way or the other about it. And I think
21 whatever knowledge a person of ordinary skill in the art
22 has with respect to the question you asked would be
23 applied to all the other references as well.

24 So I -- I think they have the same level of --
25 these other references have at -- if -- if -- if my

1 memory serves me correctly and my quick scan of the '821
2 was right, that they have the same level of disclosure
3 with respect to that question as the '821 patent does.

4 ATTORNEY STAMATOPOULOS: Would the court
5 reporter please read my last question to the witness
6 again?

7 (The reporter read from the record.)

8 THE WITNESS: So what I answered -- you want
9 me to -- are you asking the same question again?

10 BY ATTORNEY STAMATOPOULOS:

11 Q. Yes.

12 A. So what I said was that the -- the '821 patent
13 isn't -- isn't -- I -- I didn't see in my scan or search
14 just now, doesn't talk about the issue you're asking
15 about. And so you're leaving that kind of question up
16 to the knowledge of a POSITA. And based on the same
17 level of disclosure, in the prior art at least, because
18 I'm not -- I don't recall off the top of my head the
19 prior art references discussing that directly either,
20 it's the same level of disclosure with respect to your
21 question as in the '821 specification.

22 So whatever knowledge a person of ordinary
23 skill in the art has to address your question is the
24 same knowledge that we applied to the prior art to
25 address your question.

1 Q. Let me ask you this. Did you need to consult
2 with your declaration at all in order to answer my
3 question?

4 A. I mean, I -- I could take a look. I'm not
5 sure if you're referring to something -- if you're
6 referring to something in my declaration, I'd be happy
7 to take a look.

8 Q. I'm not. I'm just asking if you feel the need
9 to look at your declaration in order to answer my
10 question. Do you?

11 A. I mean, I answered it. I -- the way I did.

12 Q. Okay. I'm -- no issue here.

13 Are you familiar with the concept of
14 heuristics in the context of MPLS networks?

15 A. I mean, I'm not sure what you're referring to
16 specifically.

17 Q. Let me ask you this. You hold a Ph.D.
18 Correct?

19 A. Yes.

20 Q. You hold a Ph.D. in electrical engineering?

21 A. It's electrical engineering and computer
22 science.

23 Q. You're familiar with the context of -- with
24 the concept of heuristics in general outside of the
25 context of MPLS networks. Correct?

1 A. I mean, I -- somewhat. I mean, I don't -- you
2 know, my -- I didn't do my Ph.D. on heuristics, but --

3 Q. Fair enough.

4 What is your understanding of the concept of
5 heuristics outside of the context of this patent?

6 ATTORNEY HUH: Objection. Scope.

7 A. I mean, I searched my -- my declaration just
8 now. I didn't see any mention of that word, so I --
9 I -- but I'm not sure I'd get it exactly right if I went
10 off the top of my head.

11 Q. Fair enough.

12 Let me ask you this. In analyzing all the
13 prior art that you have cited in your declaration, have
14 you at all encountered the concept of heuristics?

15 A. I mean, I certainly wasn't thinking about the
16 concept of heuristics when I reviewed the references, I
17 don't think, so I -- I -- I -- it would be hard to --
18 like, even if a reference disclosed the concept without
19 using the word, I wouldn't remember that one way or the
20 other.

21 Q. I understand.

22 Now, would -- do you recall the Xu reference
23 in your declaration?

24 A. Yes. I think it -- is it Exhibit 25?

25 Q. It is indeed Exhibit, yes, 1025.

1 Would you like to open the Xu reference if you
2 have it in front of you?

3 A. Okay, let's see. I have a printed copy too.
4 Okay.

5 Q. And you discuss Xu in your declaration, among
6 other places, in Paragraph 224. Correct?

7 A. Yes, among other places.

8 Q. And you say that in Xu, network management
9 software (NMS) is responsible for selecting the
10 end-to-end paths and considers a set of modeled failure
11 states when making selection decisions. Correct?

12 A. I do say that in Paragraph 224.

13 Q. Can you explain to me what modeled failure
14 states are?

15 A. Well, for example, in Xu in Paragraph 6 it
16 talks about -- about a set of modeled failure states and
17 how detectable failure state 0 can correspond to a
18 subset of that set of modeled failure states.

19 And so it's saying here in this section that
20 there are these detectable failure states that are
21 part -- that are a part of a larger set of -- of modeled
22 failure states, so they include all -- all the, you
23 know, detectable failure states, at least.

24 Q. Is path selection in Xu done based on the
25 static configuration of paths?

1 A. I mean, Xu does talk about static sets of
2 paths or multiple static paths, but I'm not depending
3 upon that disclosure of Xu in my -- in the combination.

4 The combination does depend, though, on the --
5 Xu's probability determination, and -- and that's --
6 that's the part of Xu that I focus on.

7 Q. The probability determination of Xu is for
8 failures of a set of static paths. Correct?

9 A. Well, they're failures in a path. Whether
10 they're -- you know, that -- that's still -- I do talk
11 about how the -- Xu does address the problem of
12 selecting paths with an MPLS network. And Xu's
13 generally describing MPLS networks, just like the '821
14 patent and Doshi do.

15 ATTORNEY STAMATOPOULOS: Could the court
16 reporter please repeat my question?

17 (The reporter read from the record.)

18 THE WITNESS: You're reasking the same
19 question?

20 ATTORNEY STAMATOPOULOS: That's right.

21 BY ATTORNEY STAMATOPOULOS:

22 Q. Do you understand it?

23 A. Yeah. I'll give the same answer. You can
24 just look at the answer I gave.

25 Q. Okay. Do you need to consult with your

1 declaration at all in connection with answering my
2 question?

3 ATTORNEY HUH: Objection. Form.

4 BY ATTORNEY STAMATOPOULOS:

5 Q. I'm just making sure that you've had every
6 opportunity to consult with your declaration.

7 A. I -- I looked at my declaration while I was in
8 the process of answering that question.

9 Q. Great.

10 ATTORNEY STAMATOPOULOS: I'll note that your
11 answer was nonresponsive, but that's okay.

12 ATTORNEY HUH: Objection. Form.

13 ATTORNEY STAMATOPOULOS: Wasn't a question.

14 ATTORNEY HUH: That's right.

15 Objection, form.

16 ATTORNEY STAMATOPOULOS: I'm just noting it
17 for the record that I think that the response is -- it's
18 my objection, actually. I'm objecting that the
19 witness's answer is nonresponsive.

20 ATTORNEY HUH: You're making speaking
21 objections.

22 ATTORNEY STAMATOPOULOS: Okay.

23 BY ATTORNEY STAMATOPOULOS:

24 Q. Xu uses heuristics, right?

25 A. Xu does talk about heuristics.

1 Q. And what does Xu say about heuristics?

2 A. So Xu talks, for example, in Paragraph 57,
3 that some algorithms for three scenarios to be solved by
4 the NMS are discussed and that several of the
5 optimization problems are NP-hard and resolved with
6 heuristics that achieve nearly optimal performance in
7 practice. So that's -- that's one thing that Xu says
8 about heuristics.

9 Q. What's your understanding of that paragraph?

10 A. My understanding is that -- that there are
11 some problems that are very hard to -- difficult,
12 NP-hard, which is a class of -- of -- of problems that
13 may take long -- long, extended times to solve, for
14 example, that are instead resolved with heuristics that
15 are presented later, so -- and we can look at those,
16 what's presented later, but that's one thing it's saying
17 about Xu's use of heuristics.

18 Q. In particular, Xu says that there are
19 optimization problems that are NP-hard. Correct?

20 A. Yes. It refers to the appendix for these --
21 these problems. I think there were two listed in the
22 appendix.

23 Q. Well, the appendix really discusses that the
24 problems are NP-hard, right?

25 A. Well, the -- in the appendix, they -- they

1 present a proof or -- or show why -- why they believe
2 that two -- two problems are NP-hard.

3 Q. What are these problems?

4 A. I believe the ones they refer to are failure
5 state distinguishing and bounded path load balancing.

6 Q. And what is failure state distinguishing?

7 A. Well, the -- in a -- in a directed graph, G ,
8 consisting of V, E -- I think that probably stands for
9 vertices and edges -- a source and destination vertices,
10 U, V , is a subset of V , and two sets, S, S' , are a
11 subset of E . So you have two vertices within a subset
12 of vertices and two sets within the sets of paths --
13 sets of paths S and S' that are -- that are the
14 edges.

15 And the question that is -- that they're
16 saying NP-hard is is there a simple directed path P from
17 U to V that contains edges from one and only one of the
18 sets S and S' ?

19 Q. Is it your understanding that this problem
20 applies to the determination of different paths in an
21 MPLS network?

22 ATTORNEY HUH: Objection. Form.

23 A. I -- I mean, I think you have to set up the
24 instance correctly. Certainly, there are -- a -- a
25 network would contain vertices, U, V , and those -- those

1 would -- would be like the nodes in an MPLS network.

2 But the -- the -- the question about the two
3 sets, S and S prime, we -- those are -- I mean, I don't
4 think -- in an MPLS network, you divide up your set
5 of -- of edges or -- or links into these two sets that
6 it's describing here. And then the question is whether
7 or not -- is there a -- a simple directed path P from U
8 to V that contains edges from one and only one of the
9 sets S and S prime, so -- so that I'm not sure in what
10 situations that -- that I see that occurring in -- in
11 the references we have been talking about because
12 there's no discussion about two sets that are divided up
13 in some way that are both a subset of all the edges.

14 And the actual -- you know, if you are looking
15 at a set of all the links, if that's both S and S prime,
16 then there never can be a set that only includes one of
17 the sets -- the edges from one of the set and not the
18 other.

19 And so I don't know what division of S and S
20 prime would -- would apply to an MPLS network because I
21 don't -- I'm not really -- I don't understand why you
22 would divide up the set of edges in this way set up in
23 this instance in the question -- in the instance of
24 the -- in Paragraph 99.

25 Q. Let me ask you this. Is it fair to say that

1 Xu discusses certain ways in which the complexity of
2 determining failure states can be reduced through the
3 use of heuristics?

4 A. Sorry, what was the question again?

5 ATTORNEY STAMATOPOULOS: Could the court
6 reporter repeat it?

7 (The reporter read from the record.)

8 A. I mean, it -- it describes some of the
9 optimization problems that are NP-hard, and with Xu,
10 if -- if you look at Paragraph 57, that some of these
11 problems are hard and are resolved with heuristics.

12 But if I look at the first one, again, the
13 instance it's setting up is that there are two sets of
14 edges in -- that are the subset of all the edges in a
15 directed graph. And there's a degenerate case where S
16 is all the edges and S prime is none of the edges.

17 In that case, every directed path from U to V
18 is in only one set and not the other. So obviously,
19 this NP-hard problem is -- they're not describing
20 this -- the degenerate case but some intermediate case
21 where there's some different division where one set is
22 not an empty set.

23 And so in that case, I don't see that any of
24 these networks where the prior art are divided up in
25 this way where this kind of NP-hard problem is -- the --

1 I don't -- I haven't seen anywhere where -- where
2 there's some discussion about trying to solve this
3 particular problem as laid out in the instance.

4 The instance is -- is -- is the situation in
5 which the question is -- is to be asked, and it's the
6 question in the context of the instance. But I don't
7 see how this instance applies. No one's -- no one's
8 talked about dividing the set of edges in a network into
9 S and S prime and trying to find a path where all the
10 edges are in one set and not the other. So I -- I don't
11 understand how -- how this applies to the references we
12 have been looking at.

13 Q. Well, let me -- let me ask you this. Is it
14 fair to say that in a given network, you could have a
15 large number of different failure scenarios?

16 ATTORNEY HUH: Objection. Form.

17 A. I mean, depending on the time frame and what
18 you mean by large or what's not large, I mean -- and how
19 big the network is and how many components in it, I
20 mean, I think -- I don't know what you're --

21 BY ATTORNEY STAMATOPOULOS:

22 Q. Let's say I have 100 -- I want to make the
23 hypothetical more concrete, okay?

24 Let's say I have 100 nodes in my network, and
25 each node can connect to -- well, let's make it more

1 specific.

2 I have 100 nodes in my network, and each node
3 can connect and does connect to three other nodes.

4 Good so far?

5 A. Okay.

6 Q. In that type of network where each node and
7 each link has a probability of failure, independent
8 probability of failure between 0.5 and 1 percent.

9 Good so far?

10 A. Well, I -- I -- it's hard to --

11 Q. Do you follow?

12 A. It's hard to make any -- well, all right, I
13 mean, I'm good so far, but all right.

14 Q. I have a -- I have a question. And if you
15 don't understand the hypothetical, I'm happy to reframe
16 it.

17 In that -- in that scenario, is it fair to say
18 where I have 100 nodes and at least three connections
19 that correspond to each node, is it fair to say that
20 there are at least 30 failure scenarios?

21 ATTORNEY HUH: Objection. Scope.

22 A. What -- what would you consider a failure
23 scenario? Like, one link fails or a node fails? Is
24 that what you consider a --

25 BY ATTORNEY STAMATOPOULOS:

1 Q. Sure.

2 A. -- a failure?

3 Q. Yes.

4 A. And you -- you -- you mean -- are different
5 scenarios -- you know, different links fail, are -- you
6 consider different failure scenarios?

7 Q. If different links fail, that might be a
8 different failure scenario, yes.

9 A. Well, I -- I mean, sure, I -- I would say in
10 that case, you know, in this hypothetical there would be
11 at least 30 failure scenarios.

12 I mean, there's 100 nodes, and I -- I think,
13 if my numbers are correct and I've done this correctly,
14 which I'd want to double-check, I think there are 150 --
15 150 links that can fail also.

16 Q. Right. So is it fair to say that the number
17 of failure scenarios is, at the very least,
18 proportionate to the number of nodes and links in a
19 network?

20 A. I -- I mean, to first order, one might say
21 that.

22 Q. So in large networks, if the network is
23 large --

24 A. Yeah, actually, I -- I -- I take -- I take
25 that back, I'm sorry, because -- well, for single --

1 single event failures, I -- I still think it's -- the --
2 the correct way to do this isn't to sum up and -- and --
3 failure probabilities. It's to actually calculate the
4 odds that the network stays up, given the probability of
5 failures of a number of events. So -- so no, I -- I
6 would say it's not proportional. That's not the right
7 way to think about it.

8 Q. Well, when we're talking about failure
9 scenarios, we're talking about different paths in the
10 network failing. Fair?

11 ATTORNEY HUH: Objection. Scope. Form.

12 A. Different links or nodes failing. And if
13 there's 100 -- so, for example, if there's a 1 percent
14 of failure and there's 150 -- 250 things that can fail,
15 you don't just multiply that to get the failure -- the
16 possible failure rate.

17 The right way to do it is to calculate the
18 chance that over a period of time, you know, that each
19 node stays up and multiply all those together and
20 then -- and subtract that from one, and that would be
21 the overall failure rate.

22 So it's -- it's not proportional. It's --
23 it's, you know, one minus pi over all nodes, assuming
24 they're independent, in the independent case, of one
25 minus the failure rate of each node.

1 Q. Let me ask a simpler question to make things a
2 lot simpler for everyone.

3 Is it fair to say that the higher the number
4 of nodes in a network, the higher the number of possible
5 failure scenarios?

6 A. Sure. I think that's somewhat fair.

7 Q. Okay. Is it fair to say that after a failure,
8 the ingress router would need to learn which links
9 failed?

10 ATTORNEY HUH: Objection. Form. Scope.

11 A. I mean, the network -- it's -- it's part of
12 what routing protocols do, you know, that underlie the
13 network. That -- that's -- that's how a lot of the
14 information gets distributed.

15 BY ATTORNEY STAMATOPOULOS:

16 Q. And is it fair to say that after a failure,
17 the ingress router would also need to identify the
18 failure scenario?

19 ATTORNEY HUH: Objection. Form. Scope.

20 A. I don't think it needs to identify the exact
21 fail -- like, I don't think it cares which node fails as
22 long as some metric on -- on an outbound link has -- has
23 changed to -- to reflect that.

24 I -- I mean, if it's the immediately adjacent
25 router, we'll find out pretty quickly, or -- or if the

1 link has failed that it's directly connected to. But
2 other than that, I think it -- it doesn't necessarily
3 need to know which link in the network failed, just that
4 some path -- the metrics have -- have changed in a way
5 that reflect some failure along that path.

6 BY ATTORNEY STAMATOPOULOS:

7 Q. And if you grow your network, doesn't making
8 those determinations increase the complexity of the
9 network elements?

10 A. I mean, even in the -- even around the
11 year 2000, you know, these -- these routing protocols
12 have worked to -- to -- to distribute the -- this
13 information around the network, so -- but yes, I mean,
14 sure. The more network elements there are, the more
15 routers, there's -- there's more -- there could be more
16 chatter on the network.

17 But it's also a bigger network, and I -- I
18 just -- it's been a while since I've gone back to look
19 at exactly how -- how all the routing protocols work,
20 but -- but, you know, the people who have designed the
21 protocols are aware of things like this and they know
22 how to -- they -- they've designed it in a way that --
23 that the changes throughout the network based on, you
24 know, the -- the predicted failure rate wouldn't have an
25 impact in terms of distributing the required data using

1 these protocols. So I -- I don't see what the real
2 issue is here.

3 Q. Could this type of complexity that we just
4 discussed prompt a person of ordinary skill in the art
5 to use heuristics?

6 A. I -- I don't think what's existing would use
7 what -- what I think -- I mean, these routing protocols
8 do their work without having to -- they do their work in
9 a predictable fashion even in -- you know, deployed
10 across a big network like the internet, which I -- may,
11 you know, be the -- the biggest network.

12 But if you're -- with respect to Xu, I mean, I
13 know it says Failure State Distinguishing is the title,
14 but it's set up in a very particular way where the
15 instance it's in, I'm not sure how it -- I don't see
16 what it applies to in -- in MPLS network.

17 You know, it -- it breaks down the edges into
18 two sets of edges, and the question it asks is very
19 particular. It's is -- is the path from U to V
20 containing only edges from one set and none from the
21 other? And I -- I don't -- you know, I -- I don't know
22 why you'd be asking that question.

23 Q. So are you saying that -- and I just want to
24 make sure that -- and I'm not trying to put words in
25 your mouth, but are you saying that Xu doesn't apply to

1 MPLS networks?

2 A. No. What I'm saying is that I don't see how
3 this particular use of heuristics instead of using --
4 you know, doing the actual work, this NP-hard problem --
5 what I'm saying is I -- I'm not sure -- I see this
6 applying to the prior art in a way that would require
7 the use of heuristics for it because I don't see the --
8 the instance set up this way where there are two
9 different sets.

10 Q. Let me ask you this. The part of Xu,
11 Paragraph 57 where we discussed heuristics, that's under
12 a broader heading that's shown in Paragraph 52.
13 Correct? Or, sorry, Paragraph 55.

14 A. Sure. I see a heading in 55.

15 Q. Okay.

16 A. That looks like a heading to me.

17 Q. Yeah. And the heading is Optimizing the Paths
18 and Splitting Ratios. Correct?

19 A. I mean, that's what it says in 55.

20 Q. And where -- where does that section end?

21 A. I think Paragraph 58 appears to start a new
22 section or subsection or whatever you call it.

23 Q. And this Paragraph 58 reads: Optimal solution
24 per network failure state, right?

25 A. That's what Paragraph 58 says.

1 Q. And does this Paragraph 58, Optimal solution
2 per network failure state, does it refer to the problem
3 in the previous section that is -- that has the heading
4 in Paragraph 55?

5 I can actually point you somewhere if -- if
6 you'd like. The first line in Paragraph 59 reads: The
7 ideal solution would compute the optimal paths and
8 splitting ratios separately for each failure state.

9 Do you see that?

10 A. Yes.

11 Q. And then the heading in 55 is Optimizing the
12 Paths and Splitting Ratios. Correct?

13 A. Yes.

14 Q. Fair to say that Paragraph 58 then is a
15 section that discusses an optimal solution to the
16 problem described in the preceding paragraph starting
17 from Paragraph 55?

18 A. I think that could be a fair reading.

19 Q. Okay. And then in Paragraph 62, it says:
20 Yet, the optimal solution is still interesting for two
21 reasons.

22 Do you see that?

23 A. Yes.

24 Q. And that optimal solution is the same optimal
25 solution that is in the heading of Paragraph 58, right?

1 A. Sure.

2 Q. And so we're still talking about the same
3 NP-hard optimization problems for which heuristics are
4 used when we reach Paragraph 62. Fair?

5 A. I wouldn't say that that's a fair reading
6 because it -- it talks about optimization problems,
7 and -- and only -- only several of them -- doesn't say
8 all of the optimizations are NP-hard. And I think -- in
9 fact, I think it identifies later another problem.
10 Well, let's see if it's within this section.

11 Q. Well --

12 ATTORNEY HUH: Counsel, let him answer.

13 ATTORNEY STAMATOPOULOS: Okay.

14 A. I think it -- it talks about a state-dependent
15 splitting per detectable failure becoming NP-hard, or a
16 problem becoming NP-hard down in Paragraph 65, but I --
17 I -- I don't see that -- let me just take a look, but I
18 don't see that being described here in this optimization
19 problem or solution.

20 Q. Well, let me ask you this.

21 ATTORNEY HUH: Counsel, I don't believe he's
22 done.

23 ATTORNEY STAMATOPOULOS: I think he's finished
24 his -- I think -- unless you have -- have you finished?

25 Should I ask him every time he finishes an

1 answer if he's finished?

2 ATTORNEY HUH: Why don't you just pause and
3 let him finish? He's reading.

4 A. I think in -- in this section it does talk
5 about that -- that this may become an -- an NP-hard
6 problem under certain circumstances.

7 BY ATTORNEY STAMATOPOULOS:

8 Q. Do you agree with me, Dr. Houh, that the
9 optimal solution described in the section starting in
10 Paragraph 58 is not feasible?

11 ATTORNEY HUH: Objection. Form.

12 After this, I believe we need to take a break.
13 We've gone almost two hours.

14 A. I wouldn't agree that this is unfeasible. I
15 mean, there -- there's a certain very specific set of
16 conditions described here under which it's talking about
17 that it's difficult to obtain a solution with a tighter
18 bound, as shown in the appendix.

19 And it -- it's -- it's -- one -- one -- one
20 thing it says is that when the number of allowed paths
21 is bounded by a constant J . And, you know, I -- I don't
22 see how these -- I mean, what I'm relying on for Xu is
23 the -- is the -- the -- what I cite to in my
24 declaration. I -- I don't -- I mean, I can look to see
25 if I've cited to these portions for this algorithm, but

1 I'm -- I'm not sure that's the case.

2 So but no, I -- I -- I don't agree it's --
3 it's -- it's an infeasible algorithm.

4 ATTORNEY HUH: Okay. Let's take a 10-minute
5 break.

6 THE WITNESS: I mean, I'd like a break now
7 too.

8 ATTORNEY STAMATOPOULOS: Yeah, let's take a
9 break, actually. Greg, I'm going to ask you on the
10 record for one last time to discuss with me the issue
11 that occurred earlier as well as something else that has
12 come up. And I understand that your -- your focus is
13 elsewhere based on what you said earlier, but I want to
14 extend the invitation to discuss one more time before
15 the deposition is over. So if you would like to reach
16 me, I can give you my number and I'm --

17 ATTORNEY HUH: Not necessary. We'll discuss
18 afterwards. Thank you.

19 ATTORNEY STAMATOPOULOS: All right.

20 THE REPORTER: We're off the record for a
21 break.

22 (Recess taken.)

23 BY ATTORNEY STAMATOPOULOS:

24 Q. Dr. Houh, the Xu reference is titled Method of
25 Simple and Efficient Failure-Resilient Load Balancing.

1 Is that correct?

2 A. Yes.

3 Q. And is it fair to say that Xu was directed to
4 a number of different algorithms that, at a high level,
5 address problems that occur in networks?

6 A. I mean, I think it talks about -- it certainly
7 talks about some optimization problems and -- and -- and
8 methods, but I don't think it's only directed to that
9 issue.

10 Q. Okay. But it is directed in part to that
11 issue, right?

12 A. Sure, in -- in part.

13 Q. And it provides certain algorithms in
14 connection with solving some of these optimization
15 problems, right?

16 A. I mean, I think there's some discussion of --
17 of approaches.

18 Q. And Xu suggests that it's possible -- rather
19 than employ an optimal solution, it's possible to just
20 use heuristics for simplicity, right?

21 A. Well, at least in Paragraph 57, it talks about
22 where certain problems are NP-hard, they can be with --
23 resolved with heuristics that achieve nearly optimal
24 performance in practice.

25 Q. And that's generally the case for the

1 algorithms that are discussed in Xu. Correct?

2 A. What is generally the case?

3 Q. That they -- that -- that it is possible to
4 solve the problems that those algorithms address well
5 enough through the use of heuristics.

6 A. Well, I mean, I wouldn't say generally in --
7 in that case, but it certainly discusses several
8 optimization problems with respect to two discussed in
9 the appendix that can be resolved with heuristics
10 that -- that achieve nearly optimal performance in
11 practice. I don't think it says that about all the
12 optimization problems.

13 Q. What optimization problems, in your view, does
14 Xu teach it is preferable to solve without the use of
15 heuristics?

16 A. Well, I mean, the -- the setup, you know, for
17 at least that problem we're looking at is -- was very
18 specific, and so that's the instance of one of the
19 problems it's saying is -- is NP-hard, that -- but
20 involves a very specific setup to the instance.

21 And then it also talks about how under only
22 some conditions in some of the problems that the
23 problems become NP-hard. So I would say that the rest
24 of them where it's not describing the problems are
25 NP-hard under the conditions that -- that they don't

1 become NP-hard that -- that Xu describes would be those
2 other instances.

3 Q. You said "the rest of them"?

4 A. The rest of them where it's described is not
5 meeting the conditions where the problems become
6 NP-hard.

7 Q. Can you point me to where in Xu those other
8 problems to which you referred as "the rest of them" are
9 set forth?

10 A. Sure. For example, at the bottom of
11 Paragraph 60, it is -- it says: It is difficult to
12 obtain a solution with a tighter bound, as it is proven
13 in the appendix that it is NP-hard to solve linear
14 programming 2 when the number of allowed paths is
15 bounded by a constant J.

16 So that's -- that's a condition that it's
17 saying occurs under this problem where the number of
18 allowed paths is bounded by a constant J. But if -- if
19 it's -- if the number of allowed paths is not bounded by
20 a constant J, it's not saying that the problem becomes
21 NP-hard, so --

22 Q. It's not --

23 A. -- in that setup to the problem, if it's not
24 the setup that it says it's NP-hard, then -- then it's
25 saying it's -- it -- it's -- there are conditions to the

1 setup of the problems in the -- in the -- in the
2 situation where -- where it's not saying it's NP-hard,
3 Xu is not saying it's NP-hard.

4 Q. To be clear, Xu is not discussing this other
5 problem that's not NP-hard. Correct? It's only
6 discussing the NP-hard problem.

7 A. It's describing a problem, and it says it
8 becomes -- it's -- it is shown that it's -- it's NP-hard
9 when -- under a certain condition. And this -- this
10 example in Paragraph 60 for this particular problem is
11 when the number of allowed paths is bounded by a
12 constant J. So I think it's -- it's -- it's saying that
13 that's the -- that's the situation, that it may become
14 NP-hard.

15 But if there's no bound to the number of
16 allowed paths, then I think it's saying that -- or if
17 the -- if -- yeah, I mean, if it's saying in the
18 situation where the number of allowed paths is not
19 bounded by a constant J, then it's -- it's not saying
20 that it's NP-hard.

21 So I think "the rest of them" refers to the
22 other situations as described in Xu where it's not being
23 described as an NP-hard problem. The problems as set
24 out, it's saying it only be -- are NP-hard under certain
25 conditions. So in the -- in the rest of them where the

1 conditions are met, it's not saying -- Xu is not saying
2 that the problem has become NP-hard.

3 Q. Does Xu teach the solutions to these other
4 problems?

5 A. Well, it's describing the approaches, and then
6 it's describing approaches under certain conditions, so
7 it is -- it is describing some of these.

8 And I think -- I think similarly, some -- some
9 of these algorithms I saw in the claims, I -- I think as
10 they were stated in this section, but I -- I would want
11 to compare that.

12 Q. You haven't compared that in your declaration,
13 right?

14 ATTORNEY HUH: Counsel, he's answering the
15 question.

16 ATTORNEY STAMATOPOULOS: What? I'm sorry,
17 what's the basis for this objection?

18 ATTORNEY HUH: He was looking to compare. He
19 was still evaluating the claims.

20 ATTORNEY STAMATOPOULOS: He said "I would need
21 to compare them." I'm sorry, it's a Zoom deposition.
22 I'm not able to glean always when your witness who, by
23 the way, has been taking --

24 ATTORNEY HUH: Objection.

25 ATTORNEY STAMATOPOULOS: -- inordinate amounts

1 of time to --

2 ATTORNEY HUH: Please stop. Counsel, please
3 stop and just ask the questions. Let him answer, and
4 then you can ask your question.

5 THE WITNESS: I don't recall the --
6 BY ATTORNEY STAMATOPOULOS:

7 Q. I'm sorry, doctor, I didn't mean to interrupt
8 you. I think that's pretty clear in general. But
9 please go ahead.

10 A. I -- I -- I don't believe I actually did this
11 comparison and wrote it up in my declaration. I was
12 talking -- I -- we can look at what I referred to, but
13 I -- I do include Xu as a -- as a reference to combine
14 with a -- a number of other references, such as Doshi
15 and Guichard in -- in ground 3.

16 I gave my reasons why they're -- a person of
17 ordinary skill would be motivated to make the
18 combination, and I refer specifically -- I talk about
19 specifically what that combination is. And I cite to
20 particular paragraphs for that.

21 I mean, we can talk about -- I -- I -- I don't
22 recall citing to these equations. We can look at it.
23 I -- maybe -- maybe I did, but I don't remember citing
24 to these. And I don't think I did a comparison as to
25 what was in the spec in my declaration as to what was

1 claimed.

2 Q. Okay, thank you.

3 How much time would you say you spent
4 preparing for this deposition?

5 A. I would say on the order of eight, eight
6 hours, plus or minus a few. Maybe eight to 10.
7 Probably not much less than eight, but --

8 Q. That involved meetings with counsel?

9 A. Yes, I -- that's included in that figure.

10 Q. And it involved reviewing these references?

11 A. Yes.

12 Q. And your declaration?

13 A. Yes.

14 Q. And you spent roughly 15 hours, I think you
15 testified earlier, in preparing your declaration.

16 Is that fair?

17 A. Yeah. I don't remember the exact -- I -- I --
18 I remember saying 15. It might have been a little more
19 than that. I don't think it was much -- well, I -- you
20 know, again, I -- that's the best that I could -- number
21 I could give, I think, give or take a few.

22 ATTORNEY STAMATOPOULOS: Thank you. I don't
23 have any further questions.

24 Greg, if you want to redirect, please go
25 ahead. Afterwards -- anyway, go ahead and do your

1 redirect.

2 ATTORNEY HUH: Let me take a five-minute break
3 and we'll come back shortly.

4 ATTORNEY STAMATOPOULOS: Okay.

5 (Recess taken.)

6 ATTORNEY HUH: No further questions from us.

7 ATTORNEY STAMATOPOULOS: All right. Thank
8 you, Dr. Houh.

9 THE WITNESS: Thank you, everyone.

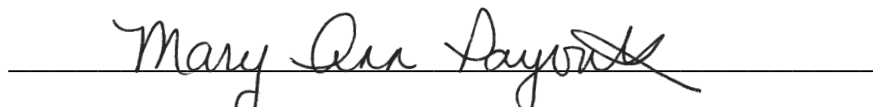
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11 (Deposition adjourned at 4:41 p.m.)
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REPORTER'S CERTIFICATE

I, MARY ANN PAYONK, shorthand reporter and Notary Public, CA CSR No. 13431, do hereby certify that the witness whose deposition is hereinbefore set forth was sworn by agreement of all parties, that the proceedings were reported stenographically by me, and that this transcript is a true, correct, and full record of the testimony given.

I further certify that I am not related to any of the parties to this action by blood or by marriage, and that I am in no way interested in the outcome of this matter.

IN WITNESS WHEREOF, I have hereunto set my hand this 19th day of November, 2023.


MARY ANN PAYONK, CSR #13431

INDEX TO WITNESSES

WITNESS	PAGE
---------	------

HENRY HOUH	
------------	--

Examination by Attorney Stamatopoulos	4
---------------------------------------	---

EXHIBITS

(No exhibits marked.)

ERRATA SHEET FOR TRANSCRIPT OF: Henry H. Houh, Ph.D.

CASE CAPTION: Cisco vs. Orckit

DEPOSITION DATE: November 15, 2023

Page	_____	Line	_____	Reason	_____
From	_____			to	_____

Page	_____	Line	_____	Reason	_____
From	_____			to	_____

Page	_____	Line	_____	Reason	_____
From	_____			to	_____

Page	_____	Line	_____	Reason	_____
From	_____			to	_____

Page	_____	Line	_____	Reason	_____
From	_____			to	_____

Page	_____	Line	_____	Reason	_____
From	_____			to	_____

Page	_____	Line	_____	Reason	_____
From	_____			to	_____

Page	_____	Line	_____	Reason	_____
From	_____			to	_____

Page	_____	Line	_____	Reason	_____
From	_____			to	_____

Page	_____	Line	_____	Reason	_____
From	_____			to	_____

Page	_____	Line	_____	Reason	_____
From	_____			to	_____

Page	_____	Line	_____	Reason	_____
From	_____			to	_____

Signature of Deponent

Date

1 I,

2 HENRY H. HOUH,

3 state that I have read the foregoing deposition and
4 declare under penalty of perjury:

5 That the foregoing is my deposition under
6 oath;

7 That I have read same and have made the
8 necessary corrections, additions or changes to my
9 answers that I deem necessary;

10 That my answers as indicated are true and
11 correct.

12
13 Executed at _____
14 this _____ day of _____, 2023.

15
16 _____
17 HENRY H. HOUH
18
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WORD INDEX					
< 0 >	0.5	145:8	78:25	104:6, 11	34 95:21
			1110 128:8	105:5 106:19,	130:12, 14, 16
< 1 >	1	31:7 53:2	1116 64:5, 8,	24	39 64:21, 22,
			13	1998 9:12	23, 25
< 2 >	2	107:4, 5	1118 78:25	19th 164:14	
			79:3, 7		
< 3 >	3	161:15	1120 63:22		
			64:1 78:21		
< 4 >	4	165:4	79:5		
			1122 63:22		
< 5 >	5	31:7 53:3	64:1 78:21		
			79:6, 22		
< 6 >	6	124:6	116 56:9		
			118 79:10, 19		
< 7 >	7	126:7	1199 1:25		
			12 72:3		
< 8 >	8	137:15	12 72:3		
			12:45 72:23		
< 9 >	9	158:14	121 56:10		
			126 81:24		
< 10 >	10	97:9	129 81:24		
			130 82:4, 5,		
< 11 >	11	164:14	16		
			132 81:11		
< 12 >	12	166:3	13431 2:11		
			4:3 164:3, 17		
< 13 >	13	167:14	13th 3:11		
			14 76:25		
< 14 >	14	168:14	14.4 125:16		
			129:21		
< 15 >	15	169:14	146 127:25		
			149 129:5		
< 16 >	16	170:14	15 1:18 2:4		
			28:20 110:7		
< 17 >	17	171:14	162:14, 18		
			166:3		
< 18 >	18	172:14	150 146:14,		
			15 147:14		
< 19 >	19	173:14	156 127:25		
			15-ish 28:19		
< 20 >	20	174:14	16 19:6		
			124:6 126:7		
< 21 >	21	175:14	17-page 93:11		
			181 83:20		
< 22 >	22	176:14	19 98:1, 22		
			99:3, 5, 7, 11,		
< 23 >	23	177:14	14 100:14		
			103:16, 23		
< 24 >	24	178:14			
< 25 >	25	179:14			
< 26 >	26	180:14			
< 27 >	27	181:14			
< 28 >	28	182:14			
< 29 >	29	183:14			
< 30 >	30	184:14			
< 31 >	31	185:14			
< 32 >	32	186:14			
< 33 >	33	187:14			
< 34 >	34	188:14			
< 35 >	35	189:14			
< 36 >	36	190:14			
< 37 >	37	191:14			
< 38 >	38	192:14			
< 39 >	39	193:14			
< 40 >	40	194:14			
< 41 >	41	195:14			
< 42 >	42	196:14			
< 43 >	43	197:14			
< 44 >	44	198:14			
< 45 >	45	199:14			
< 46 >	46	200:14			
< 47 >	47	201:14			
< 48 >	48	202:14			
< 49 >	49	203:14			
< 50 >	50	204:14			
< 51 >	51	205:14			
< 52 >	52	206:14			
< 53 >	53	207:14			
< 54 >	54	208:14			
< 55 >	55	209:14			
< 56 >	56	210:14			
< 57 >	57	211:14			
< 58 >	58	212:14			
< 59 >	59	213:14			
< 60 >	60	214:14			
< 61 >	61	215:14			
< 62 >	62	216:14			
< 63 >	63	217:14			
< 64 >	64	218:14			
< 65 >	65	219:14			
< 66 >	66	220:14			
< 67 >	67	221:14			
< 68 >	68	222:14			
< 69 >	69	223:14			
< 70 >	70	224:14			
< 71 >	71	225:14			
< 72 >	72	226:14			
< 73 >	73	227:14			
< 74 >	74	228:14			
< 75 >	75	229:14			
< 76 >	76	230:14			
< 77 >	77	231:14			
< 78 >	78	232:14			
< 79 >	79	233:14			
< 80 >	80	234:14			
< 81 >	81	235:14			
< 82 >	82	236:14			
< 83 >	83	237:14			
< 84 >	84	238:14			
< 85 >	85	239:14			
< 86 >	86	240:14			
< 87 >	87	241:14			
< 88 >	88	242:14			
< 89 >	89	243:14			
< 90 >	90	244:14			
< 91 >	91	245:14			
< 92 >	92	246:14			
< 93 >	93	247:14			
< 94 >	94	248:14			
< 95 >	95	249:14			
< 96 >	96	250:14			
< 97 >	97	251:14			
< 98 >	98	252:14			
< 99 >	99	253:14			
< 100 >	100	254:14			
< 101 >	101	255:14			
< 102 >	102	256:14			
< 103 >	103	257:14			
< 104 >	104	258:14			
< 105 >	105	259:14			
< 106 >	106	260:14			
< 107 >	107	261:14			
< 108 >	108	262:14			
< 109 >	109	263:14			
< 110 >	110	264:14			
< 111 >	111	265:14			
< 112 >	112	266:14			
< 113 >	113	267:14			
< 114 >	114	268:14			
< 115 >	115	269:14			
< 116 >	116	270:14			
< 117 >	117	271:14			
< 118 >	118	272:14			
< 119 >	119	273:14			
< 120 >	120	274:14			
< 121 >	121	275:14			
< 122 >	122	276:14			
< 123 >	123	277:14			
< 124 >	124	278:14			
< 125 >	125	279:14			
< 126 >	126	280:14			
< 127 >	127	281:14			
< 128 >	128	282:14			
< 129 >	129	283:14			
< 130 >	130	284:14			
< 131 >	131	285:14			
< 132 >	132	286:14			
< 133 >	133	287:14			
< 134 >	134	288:14			
< 135 >	135	289:14			
< 136 >	136	290:14			
< 137 >	137	291:14			
< 138 >	138	292:14			
< 139 >	139	293:14			
< 140 >	140	294:14			
< 141 >	141	295:14			
< 142 >	142	296:14			
< 143 >	143	297:14			
< 144 >	144	298:14			
< 145 >	145	299:14			
< 146 >	146	300:14			
< 147 >	147	301:14			
< 148 >	148	302:14			
< 149 >	149	303:14			
< 150 >	150	304:14			
< 151 >	151	305:14			
< 152 >	152	306:14			
< 153 >	153	307:14			
< 154 >	154	308:14			
< 155 >	155	309:14			
< 156 >	156	310:14			
< 157 >	157	311:14			
< 158 >	158	312:14			
< 159 >	159	313:14			
< 160 >	160	314:14			
< 161 >	161	315:14			
< 162 >	162	316:14			
< 163 >	163	317:14			
< 164 >	164				

65 91:3
130:15, 18
153:16

< 7 >
700 32:16
740 4:24
75024 3:6
79 88:13, 25
89:12

< 8 >
8 70:8, 23
73:9 75:2
8,830,821 1:12
800 3:16
8000 3:11
81 112:20
821 5:3, 12,
13 7:13
28:14 67:19
68:1, 7, 20
69:18 89:23
107:23
108:20 124:5
126:7 130:1
133:12, 15, 19
134:1, 3, 12,
21 138:13
89 84:2, 6
86:16, 18
88:11

< 9 >
9:30 2:5
90 85:8
86:18 88:11
97 9:13
127:21 128:2,
6, 7
99 142:24

< A >
a.m 2:5
ability 10:9
59:10 113:9

able 23:15
46:4 47:6
71:13 74:11
78:11 93:16,
22 98:5
113:3 131:24
160:22
absence 60:7,
25
absent 59:20
abstract
74:17 116:14
accomplished
12:16 50:2
account 46:14
59:10 127:22
128:15
achieve 140:6
156:23 157:10
acknowledge
2:13
acquaint 55:22
acronym 7:24
action 66:20
164:10
actionable
66:10
active 64:17
actual 57:7
142:14 151:4
adapting 95:16
add 21:5, 10,
21 22:1
91:14, 21
109:20 121:25
added 66:19
67:3, 6
81:20 110:16
131:14
adding 21:4
104:24 133:16
addition 6:24
20:13 90:2
additional
21:12 22:4,
6 29:25
37:9, 10

67:3, 5
71:10, 11
81:21 82:10
99:6 109:25
additionally
21:6
additions
167:8
address 4:16
15:6, 10, 14
16:8, 9, 10
17:22 85:9,
13 99:23
111:2 134:23,
25 138:11
156:5 157:4
address-based
14:10 15:20
20:13
addressed
83:6 100:2
110:15
addresses 9:4
15:7, 15
28:12 65:2
adjacent
148:24
adjourned
163:11
administered
2:15
administrative
80:17 122:24
advantage
21:15, 16
advise 121:4,
6
advising
121:7, 9
affect 18:14
20:2 23:11
118:3 123:5
124:1 125:9
after-failure
63:6
ago 93:24

agree 34:11
48:2, 5 49:2,
11 54:19
55:12 59:14
64:6 154:8,
14 155:2
agreement 2:9
164:5
ahead 23:8
71:13 111:10
161:9 162:25
air 71:24
AL2 107:11
algorithm
76:18 78:13
82:2, 6, 11,
13, 16, 17, 19,
24 128:14
154:25 155:3
algorithms
140:3 156:4,
13 157:1, 4
160:9
allocating
61:25
allocation
60:5, 24
61:19, 21
allow 20:14
81:19 83:25
121:15
allowed
154:20
158:14, 18, 19
159:11, 16, 18
alternative
16:2, 4
17:13 58:16
61:20 62:4
alternatives
42:25 84:10
amenable
121:18
amended 65:1
amendment
66:14, 20
67:3, 4

amount 9:1 17:1 23:10, 18 46:14 82:10 127:2 amounts 126:19 160:25 analysis 31:24 33:2 34:6 36:9, 10 54:24 56:19 89:16 90:6 92:24 93:13 108:6 114:25 129:21, 23 130:1 analyze 57:9 93:1 107:20 analyzed 26:7 59:17 63:13 96:5 analyzing 9:1 136:12 and/or 129:10 Ann 1:24 2:10 164:2, 17 Anniliese 3:20 answer 22:17, 18 23:3, 8 35:6, 8, 13, 15, 25 54:16 66:4 75:4 79:18, 20 81:10 121:8, 13, 15, 16 122:4, 5 135:2, 9 138:23, 24 139:11, 19 153:12 154:1 161:3 answered 134:8 135:11 answering 139:1, 8 160:14	answers 25:25 65:22 167:9, 10 anybody 37:7 71:17 anymore 37:11 anyone's 7:10 anyway 15:7 72:4 162:25 apologies 101:12 apologize 5:6 100:5 apparently 69:13 APPEAL 1:2 appear 37:2, 10 96:17 APPEARANCES 3:1 appears 66:15 68:5 151:21 appendix 140:20, 22, 23, 25 154:18 157:9 158:13 Applicants 64:25 applications 17:16 70:24 applied 24:6 133:23 134:24 applies 141:20 144:7, 11 150:16 apply 15:24 19:15 24:12, 20 26:8 142:20 150:25 applying 24:9 28:5 117:13 151:6 appreciate 56:20 approaches 156:17 160:5, 6	appropriate 40:3 54:2 111:24 approximately 6:9 93:6 APS 102:8 106:6 architecture 56:13 argued 65:1 arguments 67:10 arose 8:9, 10 art 5:19 6:3 29:14, 17, 21 30:3, 8 34:12 46:13 57:3 65:1 67:11, 22 70:10 73:11 89:22 115:5, 15 131:7 132:17 133:9, 21 134:17, 19, 23, 24 136:13 143:24 150:4 151:6 articulating 121:20 artisans 91:7 ascertain 115:1 aside 9:7 20:17 asked 4:22 7:5 23:1 66:2 133:22 144:5 asking 5:15, 18 20:16 42:4 55:6, 11, 14 63:10 68:4 87:21 88:24 89:2, 4, 14 98:19 100:18	112:15 115:2 121:1 134:9, 14 135:8 150:22 asks 150:18 aspect 9:15 56:7 65:6 aspects 108:14 asserted 29:19 assessment 59:14 assigned 5:2 assuming 92:21 147:23 attached 27:14, 16, 21 28:9 30:13 53:2 attaching 14:5 attempting 26:19 27:9 ATTORNEY 4:9 5:6, 9, 10 6:7 12:24 13:2 19:16 20:18, 21 21:14 22:9, 10, 20, 21, 23 23:1, 4, 5, 7 25:20 26:2 27:11, 15 32:1, 2, 22 35:4, 7, 12, 14, 16, 19, 21, 25 36:4 39:9, 17 41:25 42:5 45:13 47:18, 20, 22 49:15 50:4, 11, 13, 14, 23 51:1, 2, 6, 25 52:3, 9, 19 53:16 54:5, 23 55:10 61:4, 7, 10, 13 65:8, 11, 20
--	--	---	--

66:1, 5, 9, 12	148:10, 15, 19	balancing	best 59:24
67:15 68:11,	149:6 153:12,	141:5 155:25	162:20
18, 22, 25	13, 21, 23	bandwidth	better 12:13
69:3, 5, 7, 9,	154:2, 7, 11	23:16 60:6,	16:14 37:4,
10, 11, 17	155:4, 8, 17,	8, 24 61:1,	15, 16 81:17
71:14 72:5,	19, 23 160:14,	19, 25 81:21	82:13 95:23
11, 16, 22, 25	16, 18, 20, 24,	84:16 85:6	113:18
73:3, 5, 8	25 161:2, 6	86:6, 25	115:25
77:8 78:4,	162:22 163:2,	118:4	131:17 132:3
14 81:1, 2, 4,	4, 6, 7 165:4	base 15:4	beyond 53:7
8, 9 86:14,	attorneys	102:9	91:14
17 87:14, 17	2:12 28:24	based 8:18	big 144:19
88:21 89:1,	29:3, 23	9:4 10:12	150:10
11, 20 91:17,	31:22 32:12	15:6, 25	bigger 149:17
20 94:4, 6,	34:22 35:3	41:9 43:18	biggest 150:11
14, 18 96:8,	availability	45:20 46:1	bit 14:22, 23
11 100:21, 25	69:22	89:4 99:23	19:19 20:10
101:24 102:1	available	103:24	25:15 30:20
105:15, 17	37:5, 16	108:12	116:10
108:22	60:8 61:1	123:12 133:3	bits 14:20,
109:19 110:2,	69:19 70:16	134:16	21, 25 15:1,
6, 9, 11, 13,	73:16 78:10	137:24	13 40:21
17, 19, 21, 24	110:10 132:3	149:23 155:13	blood 164:10
111:1, 4, 8,	Avenue 3:16	basically	BlueBear 3:20
11, 15, 18, 22	aware 72:14	8:23 9:5	BOARD 1:2
112:2, 4, 8	74:8 149:21	basis 22:21	66:11 121:23
115:6, 7, 10		81:2 109:9	book 31:11,
117:15 120:4,	< B >	120:7, 10, 12,	13, 15, 23
7, 9, 10, 12,	back 19:7, 9,	15 129:13, 16	32:4, 7, 9, 12,
14, 16, 20, 24	11 20:19	160:17	13, 15 33:3,
121:1, 6, 9,	43:23 72:18,	Bear 112:17	6, 8, 15, 18,
11, 17 122:3,	23 93:17	becoming	24 53:22, 24
7, 9, 12	103:11	153:15, 16	54:1 90:22
123:16	146:25	beginning	books 13:18
124:24	149:18 163:3	70:23 100:24	31:18 32:18
128:17, 24	backbone 95:15	BEHALF 3:2, 8	33:16
129:18, 24	background	believe 8:9	bookshelf 32:8
132:20 133:8	7:11	30:5 52:23,	BOONE 3:4
134:4, 10	backhoes 10:2	24 54:13	bottom 31:7
136:6 138:15,	backup 49:13,	141:1, 4	58:14 62:2
20, 21 139:3,	22 53:8	153:21	158:10
4, 10, 12, 13,	54:9, 19, 22	154:12 161:10	bound 23:14
14, 16, 20, 22,	55:1 64:17	beneficial	154:18
23 141:22	130:6	131:16	158:12 159:15
143:5 144:16,	backups 130:7	benefit 70:14	boundary 24:8,
21 145:21, 25	balanced 23:22	73:14 123:4	14 25:6 66:6
147:11	balancer 27:5	benefits 59:9	

bounded 141:5 154:21 158:15, 18, 19 159:11, 19 box 64:1, 5 boxes 63:24 64:11, 13 79:5 96:21 break 4:18, 19 10:3 47:19, 21 50:11, 24 51:4, 7 71:20 72:1, 3, 9, 17 96:8 110:4 112:6, 10 113:4 154:12 155:5, 6, 9, 21 163:2 breaking 114:3 breaks 4:17 150:17 brief 71:20 bring 32:12 broader 53:6 151:12 broke 114:3 browser 26:22 50:22 build 21:1 bullet 113:8 114:1 116:5 bulleted 112:22 bunch 83:20 bundle 98:7 99:21 100:13, 19 102:25 103:17, 18 104:3, 5, 9, 15, 18 105:20 106:19, 25 107:10, 13 108:10 109:4 bundles 102:23 103:3, 10, 12, 14	104:1, 2, 9 105:5, 6, 9 106:22 107:7, 17 108:7 bundling 102:8, 22 105:2 106:14, 17 107:11, 19 buy 46:21 47:3 50:6 < C > CA 2:10 164:3 cable 10:3 calculate 49:6 128:9 131:19 147:3, 17 calculated 76:10 126:16 calculates 76:9 129:14 calculating 38:23 39:3, 13 58:2, 23 62:10 123:15 128:25 calculation 83:14, 18 125:11, 14 129:2, 4 calculations 62:17 70:12 73:13 128:13 131:21 133:6, 18 California 4:2 call 76:22 106:13 110:10, 11 151:22 called 4:5 14:1 16:21 calling 26:12 66:16	calls 40:18 83:20 candidate 76:22, 23, 24 77:1, 3, 4, 6, 20, 21 78:7, 10, 18 116:15, 17 117:21 128:23 candidates 77:21, 22 78:8 capability 13:8 capacity 45:2, 11 46:5 82:11 CAPTION 166:2 captured 11:9 40:15 captures 33:3 38:1 capturing 33:16 38:4 52:12 cares 148:21 CARMICHAEL 3:10 carrying 75:17 125:7 Case 1:11 5:1 9:7 10:23 11:1 15:21 19:18 23:25 24:13 29:19 30:1 31:21 34:17 40:23 59:19 62:19 75:20 80:9 81:22, 23 82:1 97:12 119:1 124:12 132:15 143:15, 17, 20, 23 146:10 147:24 155:1	156:25 157:2, 7 166:2 cases 9:6 34:3, 16 45:17, 19, 22 53:20 132:13 categories 11:3, 13, 15 12:12, 15 47:24 48:3 category 12:3, 23 caused 45:25 causes 132:11, 15 cautious 121:5, 7 certain 5:16 34:12 47:5 48:15 71:24 99:24 143:1 154:6, 15 156:13, 22 159:9, 24 160:6 Certainly 6:1 38:20 49:5 119:24 132:1, 15 136:15 141:24 156:6 157:7 CERTIFICATE 164:1 certify 164:3, 9 challenge 94:10 114:22 challenges 30:9 108:5 109:18 114:25 chance 109:1, 16 119:18, 21, 22 120:1, 2 147:18 change 38:9 41:3 45:6 85:5 95:15
---	---	--	---

97:13 101:7,
16 102:9, 13
104:23, 25
106:2, 8, 12
118:2 131:9,
13
changed
148:23 149:4
changes 17:19,
20 34:19, 25
37:10, 14
46:3, 25
84:11, 24
86:20 87:8
88:3, 6, 9, 18
89:8 100:7
101:9, 17
102:10, 14
106:9 131:10
149:23 167:8
changing
36:23 37:20
47:13 117:24
131:10, 23
chapter 52:15
chapters 33:12
characteristics
8:18 15:25
chart 63:1,
17 79:23
83:12 107:5
charts 83:9
chatter 149:16
cheaper 19:8
check 52:24
checked 95:22
choice 81:17
chosen 82:11
circumstances
154:6
CISCO 1:5
95:8, 9, 11
166:2
citation 98:11
citations
91:11 98:23

cite 32:23
55:3 91:3
107:4 130:15,
18, 23 154:23
161:19
cited 6:15,
20 7:2
30:12 52:16,
24 54:14, 20
60:15 91:18
92:1 95:20
97:4 98:11,
13, 19, 21
99:18 107:24
108:25
109:23
130:12
136:13 154:25
citing 52:11
161:22, 23
claim 57:5, 8
65:2, 16, 18
66:3, 16
67:6, 7, 14
98:1, 22
99:3, 5, 7, 11,
14 100:14
103:16, 23
104:6, 7, 11
105:5 106:19,
24 125:13
claimed 104:9
105:13 162:1
claims 89:16
97:21 99:14
100:14 120:6
125:13 160:9,
19
clarification
67:12 101:22
clarified
67:14
clarify 67:7
class 140:12
classification
16:3 25:4
classify 8:24

classifying
8:25 28:6, 8
clear 18:9
53:13 57:16
71:24 73:1
90:6 99:3
104:7 106:22
108:7 111:22
115:2, 22
122:11
128:11 159:4
161:8
clearer 30:20
clearly
106:15
107:16, 17
121:20 132:24
client 121:7,
10, 13
close 90:25
121:3, 4
closed 50:21
closest 17:7
clustered 15:8
coaching 121:4
Coleman 3:20
collaborative
29:4
column 58:13
70:5 124:6
126:7
combination
56:8 59:15,
18, 25 83:13,
23 85:22
108:14, 16
109:14, 17
114:21
118:15, 17
138:3, 4
161:18, 19
combine 56:15
161:13
combined
98:25 99:1

combining
91:5, 13
108:1
come 11:19
68:13 72:18,
22 91:24
98:12 121:3
155:12 163:3
comes 21:16
coming 21:24
command 95:24
commensurately
23:20
comment 25:16
comments 33:11
common 115:16
116:7 119:13
123:9 124:17,
18 129:10, 12
130:4
communicating
50:18
communications
35:15 114:10
compact 70:11
73:11, 20
74:18 85:20
compacting
86:24
compare
160:11, 18, 21
compared
160:12
comparison
161:11, 24
completed
124:10 126:11
completely
125:20 126:23
complex 15:11
complexity
143:1 149:8
150:3
component 9:24
components
9:25 22:5
144:19

composing 71:16	125:17 127:5 129:3, 8, 17	connectivity 118:4	contain 54:21 55:12 141:25
comprise 105:10 106:23	concurrently 8:10 25:19	consequently 111:2	contained 6:14 54:6, 8, 14
comprising 66:24 77:3 98:7 103:18 105:6	124:4 condition 79:8 158:16 159:9	consider 23:11 24:25 54:10 66:2, 4 81:7	containing 150:20
computation 20:3 58:16 59:9 62:3, 4, 15, 19, 22, 23, 24 63:3, 8, 16 74:5 75:5 82:2, 11, 17, 18 83:5 87:5, 12, 16, 23 88:1, 5 132:6, 8 133:17	conditions 117:25 154:16 157:22, 25 158:5, 25 159:25 160:1, 6	115:23 125:2 145:22, 24 146:6 considerably 82:12	contains 141:17 142:8
computationally 15:19	conduct 34:6 90:6	consideration 70:13 73:13	contemplating 80:11 120:17
compute 74:11 82:7, 19, 24 131:20 152:7	conducted 29:24	considerations 19:14	contents 35:2 54:2 69:6
computed 62:7, 8	configuration 99:23 101:17 102:10, 13 106:9 137:25	considered 40:24 60:16 77:2 78:10 115:20 123:1 124:10 126:11	context 9:16 10:15 12:16 26:7 34:11, 18 35:20 39:7 57:17 63:11, 20 64:16 65:9, 12 66:13 67:13 74:1 75:14, 19, 20 84:8, 19 87:2, 22 89:18, 22 97:9 99:5 103:25 104:8 105:8, 21 106:16 112:15 113:3, 4, 25 116:22 120:3, 17, 25 122:8 135:14, 23, 25 136:5 144:6
computer 40:22 50:20, 22 135:21	configure 9:8 90:17	considering 38:7 65:15 66:7 124:16	continue 8:23 72:9 110:22
computing 71:9 74:7 83:2	configured 98:2 108:10 125:16	considers 65:15 76:4, 8 80:16, 24 81:6, 22 128:20 137:10	continuously 59:16 117:24
conceive 25:17	confines 14:7	consistent 58:19 59:4 129:7	contradicted 33:15
concept 116:4, 20 135:13, 24 136:4, 14, 16, 18	congestion 38:8	consistently 16:23	control 83:25 95:21
concerned 71:4	connect 43:2 144:25 145:3	consisting 66:23 141:8	conversation 111:14
concerning 4:24	connected 27:19 149:1	constant 154:21 158:15, 18, 20 159:12, 19	copies 30:6
concrete 144:23	connection 4:23 5:1, 11 13:8, 12 28:14, 22 29:8, 18 45:11 55:13 60:14 88:13 139:1 156:14	constantly 45:10	
concurrent 123:7, 18 124:14, 23	connections 10:4 107:10 145:18	constraints 95:16	
		consult 135:1 138:25 139:6	

copy 90:10,
11 92:3, 4
137:3
core 8:20
9:14 24:13
CORPORATION
1:8 5:3
Corporation's
4:24
Correct 11:23
25:19 27:22
29:15 31:11
32:21 33:20
34:3, 14, 23
36:7 41:1, 4,
7, 15, 19, 24
45:7 49:13,
23 50:3, 20
51:23 52:6
53:3, 15
54:22 56:2,
22 61:23
63:23 64:4,
18 68:2, 10
75:22 78:16
79:1, 8, 17,
25 81:23
87:9, 13, 23
90:4, 18
92:7, 22
93:19 99:18
100:12, 20
101:3, 7
104:12, 23
108:21 114:5
116:9 117:4,
10, 14 130:25
135:18, 25
137:6, 11
138:8 140:19
146:13 147:2
151:13, 18
152:12 156:1
157:1 159:5
164:7 167:11
corrections
167:8

correctly
37:18 87:10
116:25 134:1
141:24 146:13
correlated
38:22 123:6
correspond
137:17 145:19
cost 20:10
22:4 70:13
73:13 82:7,
25 83:3
116:16
127:21
128:10, 19, 23
132:9, 13, 17,
18 133:1, 9,
10, 16
costly 74:16
costs 19:2
20:6 76:10,
11 132:7
counsel 2:9
22:22 35:9,
11, 12 52:9
66:1 68:22
105:15
111:18
120:23 121:6,
17 122:3
153:12, 21
160:14 161:2
162:8
couple 28:21
47:20 75:15
course 25:12
court 20:19
35:22 39:10
121:25 134:4
138:15 143:5
cover 126:4
create 14:15
17:21 42:21
98:5
Crescent 3:11
criteria
70:13 73:14

critical
85:21 86:9
CSR 2:10
164:3, 17
current 38:2,
4 59:10, 23
113:13
currently 90:1
cutting 13:6
CV 7:6

< D >
data 8:12, 13
40:15, 24
70:12, 16, 24
73:12, 16
101:12, 15, 20
102:2, 6, 12,
17, 21 104:22
106:1 149:25
DATE 166:3, 24
day 19:21
38:6 164:14
167:14
days 28:21
deal 73:3
decide 28:10
43:7 72:7
decided 31:20
deciding 46:15
decision 6:21
decisions
43:18 137:11
declaration
4:23, 25 5:1,
11 6:15, 18,
20 7:3
11:23 12:1,
4, 7 22:11,
14 28:13, 17,
23 29:1, 5, 8,
15, 22 30:4,
13, 17 31:3
32:21 33:20
34:22 52:11,
22, 24 53:2
54:11, 14, 20,

24 55:8, 9,
11, 12 56:1,
15 57:9
61:12 64:20
67:17 68:6
75:24, 25
77:9 80:14
83:8 84:7
89:15 90:8
91:2, 4, 15,
19 92:2, 10
94:9, 20, 24
96:13 97:4
98:20 99:18
107:4 108:18
109:11, 21, 24
114:16, 25
118:15
122:22
123:19
127:20 129:6
130:24 131:8
135:2, 6, 9
136:7, 13, 23
137:5 139:1,
6, 7 154:24
160:12
161:11, 25
162:12, 15
declarations
34:3, 10
declare 167:4
deem 167:9
deems 66:4
deficiencies
67:20, 25
68:8, 20
definitely
33:22
Definitive
30:24 52:2
degenerate
143:15, 20
degree 80:18,
21, 23 81:6,
12, 16, 18

99:24	122:25	153:18	154:9,	103:1	104:4	differences
128:21		16	158:4	141:9		16:12 107:20
demands	59:11	159:22,	23	detail	13:17	108:18
81:19		describes		22:13	88:23	different
deny	41:2	86:24	95:21	details	99:6	12:3 15:24,
depend	122:16	106:25	143:8	detect	37:3,	25 16:13
138:4		158:1		13	39:19, 22	20:11 24:24
depending		describing		detectable		26:9 28:7
24:22	45:3	62:16	82:6,	137:17, 20, 23		30:19 34:3
58:14	61:17	15, 23	98:24	153:15		42:11, 25
138:2	144:17	115:22		detecting		43:1, 5
depends	38:20,	120:17		118:9		46:16 47:24
21	40:11	138:13	142:6	detection	70:7	55:15 61:22
49:19		143:19		determination		62:5 63:19,
deployed	150:9	157:24	159:7	80:15	124:16,	20 76:11
Deponent		160:5, 6, 7		20	125:12	83:21 96:23
166:24		description		127:21		101:25
deposing		62:12	63:25	128:20	138:5,	108:24
72:10	110:23	88:15	89:13	7	141:20	122:10 128:5
DEPOSITION		97:24	103:21	determinations		141:20
1:16	2:7, 12,	104:5		149:8		143:21
14	5:22 6:6	design	10:12	determine		144:15 146:4,
11:22	29:9	45:20	46:17	8:19	125:15,	5, 6, 7, 8
50:20	66:10	90:17		16	127:10	147:9, 12
72:9	94:1	designation		determined		151:9 156:4
110:12, 14, 22		78:15		49:22		difficult
129:25		designed	10:9	determines		140:11
155:15		39:25	43:10,	24:16	125:20	154:17 158:11
160:21	162:4	11	44:13, 22	129:17		dig
163:11	164:4	82:6, 24		determining		10:3
166:3	167:3,	130:6	133:5	41:6, 13, 17,		digital
5		149:20, 22		21, 22, 23		40:22
depositions		Designs	30:24	42:2	56:24	directed
50:17		52:2		76:5	80:24	57:20 141:7,
describe		desirable		122:20		16 142:7
10:14	90:20	18:25	37:3,	123:11, 18		143:15, 17
95:19, 25		13	39:19	124:22, 25		156:3, 8, 10
96:15	97:1	47:13	60:5,	125:14		directly
129:5		23	74:12	126:14, 19		134:19 149:1
described		84:10	85:9	127:4, 6, 13,		dis
75:1	76:8,	86:22	87:7,	14, 17	143:2	83:15
17	83:4	12, 22	88:2,	device	9:24	118:23 127:3,
91:9	106:14,	6, 8, 19	89:9	21:4		11
23	118:6	destination		devices	10:1	disagreed
127:25		10:22	16:8,	24:16	25:7,	48:9
128:14	129:8	9	99:22	10, 18	50:19	disagreeing
152:16						58:8
						discarded
						124:15
						disclose
						56:21 124:25

disclosed 109:6 136:18 discloses 57:7 83:9, 14, 17 106:13 124:22 disclosing 56:17 123:17 disclosure 124:5 133:13, 14, 16 134:2, 17, 20 138:3 discovered 40:8 discuss 35:2 56:1, 10 73:2 92:17 99:7 110:18 112:1 131:1, 8 137:5 155:10, 14, 17 discussed 28:7, 8 29:17, 22 30:3 31:3 35:20 47:23 62:9 74:21 82:16 101:11, 15 102:18 107:22, 23 108:20 116:9 140:4 150:4 151:11 157:1, 8 discusses 51:10, 17 53:7, 14 54:18 96:19 101:2 116:20 117:6 140:23 143:1 152:15 157:7 discussing 36:12 51:8 54:8 74:1 89:15 93:14 108:18	111:23 134:19 159:4, 6 Discussion 5:8 36:9 39:15 48:1 52:17 54:21 66:13 97:22 129:20 142:12 144:2 156:16 discussions 28:24 disjoined 48:3 78:25 79:25 80:2, 4, 8, 12 disjoint 48:11 59:3 123:2, 4, 9, 24, 25 125:20 126:23 127:1, 6, 8, 11, 22, 23 128:9, 16 129:7 disjointedness 125:3, 19 126:21 127:4, 16, 18 128:12, 22 129:1 disjointly 125:8 disjointness 123:13 124:17 display 68:24 69:2 disregarded 124:11 126:12, 17, 18 disrupt 114:4, 9 116:1 118:24 disruption 113:10 114:19 118:21 119:15	disseminating 85:2, 4, 21 86:5 dissemination 84:15 distinct 66:24 124:2 distinguishing 141:5, 6 150:13 distribute 25:23 43:17 74:13 84:11, 24 87:8 88:3, 6, 9 149:12 distributed 27:3 70:15 73:15 74:9, 10, 12 86:20 87:6 88:2 148:14 distributing 86:20 88:18 89:7 149:25 distribution 70:25 74:15, 19 diversity 99:24 divide 142:4, 22 divided 142:12 143:24 dividing 144:8 division 142:19 143:21 doctor 161:7 document 30:20, 21 56:5 90:14 92:17, 25 93:1, 2, 5, 7, 10, 11, 13, 25 94:23 95:2, 6, 19, 20, 25	96:5, 15 97:1 107:24 documentation 95:7 documents 6:8, 9, 14, 17, 19, 21, 24 28:25 72:15 92:13 93:23 doing 16:16 18:10 35:1 45:15 132:14 133:18 151:4 Doshi 55:2 56:8, 21, 23 57:1, 7, 10, 20 58:3, 13 59:6, 14, 16, 20, 25 60:14, 19 61:14, 15 62:7, 15, 25 63:12, 21 67:20, 25 68:7, 14, 15, 20 70:9, 20 73:9 74:1, 2 75:21 76:4, 7, 19, 21 77:10, 14 78:1, 23, 24 80:1, 11, 24 81:5, 11, 22 83:8, 9, 14, 15, 17, 19 84:2, 6, 19 86:2, 10 87:11 88:17, 22 89:3, 5, 6 91:5, 13 108:1, 16 109:6 114:21 116:8, 11, 12, 14, 20 117:4, 6, 20 122:19 123:3, 4, 14, 17, 21, 24 124:15, 22, 25
--	---	---	--

125:2, 4, 22
126:6 127:6,
17, 25 128:25
129:2, 14, 16
131:18
138:14 161:14
Doshi's 56:12
76:1 83:12
84:9 89:3
116:24
117:20
126:20
127:21
128:19 129:6
dot 128:8
double-check
146:14
DR 1:16
4:10 7:5
23:9 28:13
39:18 50:18
51:8 66:1, 6
68:4 72:10,
11, 19 73:9
74:24 110:23
111:12, 16
112:9 120:16
121:13, 18
122:10 154:8
155:24 163:8
drafted 68:23
Drive 3:5, 11
driven 103:7,
8
due 97:14
100:7 101:8,
16 102:13
103:6 106:9
duly 4:5
dynamic 37:7,
17 107:7
dynamically
38:9 98:2

< E >
Earlier 24:1
26:3 36:11

49:4 57:25
58:20 63:16
85:12 98:24
116:24
125:24
155:11, 13
162:15
early 9:13
earth 25:9
earthshattering
116:6
easier 51:11
easily 27:4
economies
20:14
edge 8:16
14:5 16:3
17:5 24:1, 5,
8, 13, 17, 21,
23, 25 27:25
28:5, 9
edges 141:9,
14, 17 142:5,
8, 13, 17, 22
143:14, 16
144:8, 10
150:17, 18, 20
effectively
14:4 121:12
efficiencies
18:2, 4 20:1
22:3
efficiency
14:15 15:8
16:13 17:10,
15, 19, 25
18:22, 23
efficient
8:24 9:3
14:10, 12
15:17, 23
16:4 21:19
70:15, 22
71:2 73:15
74:5, 11
75:5 155:25

efficiently
25:23 70:1
effort 29:4
63:9
egress 26:17
98:9 103:20
eight 99:20
162:5, 6, 7
either 4:19
10:24 58:15
61:18 62:3
63:22 68:14
76:12 85:20
130:8 134:19
electrical
135:20, 21
electronic
30:6 90:11
92:3
element 32:25
36:7, 10
66:16 98:4,
5 103:16
elements 36:8
57:5, 8
124:18 149:9,
14
email 68:23
71:15, 17, 18
72:12 110:18
employ 156:19
empty 143:22
enable 44:9
enables 74:4
75:5
encompass
13:5 102:3
encompassed
8:8, 9
encountered
130:1 136:14
ends 107:11
end-to-end
137:10
enforced 99:23
ENG 95:23

engineered
45:21, 24
46:4, 8, 23
engineering
36:18 51:23
52:5 90:16
95:4, 14
135:20, 21
ensure 110:15
entirely 50:6
123:9
entirety
52:20 129:20
Entities 7:15
9:16 66:25
124:8 126:9
entitled 66:1,
3, 7
entity 66:17,
22, 23, 24, 25
67:8 69:24
124:9 126:10
entries 14:23
entry 14:25
15:2 26:9
equal 79:13,
14, 16
equate 58:1
equation 79:19
equations
161:22
ERRATA 166:1
errors 29:7
especially
19:7 132:9
ESQ 3:3, 9, 14
establish
113:14 115:3
established
95:22 97:5
99:22 102:25
104:3
evaluate
122:14, 18
evaluated
79:10, 11

evaluating 120:2 160:19 event 45:2, 7, 8, 23 72:3 103:7 114:12 131:25 132:10, 15, 24 147:1 event-driven 56:11 59:17, 21 60:2 events 38:21 44:23 46:6, 7, 10 103:7 108:12 114:17 133:3, 7 147:5 eventually 40:5 77:23, 25 Everybody 69:10 72:6 evidence 91:6, 10 108:14 exact 19:20 28:18 39:2 100:15 125:15 148:20 162:17 exactly 17:9, 12 20:4 43:12, 24 125:23 126:6 136:9 149:19 EXAMINATION 4:8 165:4 examined 4:6 14:18 example 11:2 18:3 26:14, 22 37:24 40:2 45:18 56:13 59:15 62:9, 21 70:5 71:5, 12 74:2, 3, 21, 25 75:11,	12, 15, 19 76:7, 25 77:12 78:12, 20 80:3, 8 82:15, 16, 22 83:4, 22 97:5, 8, 12 102:7, 21 103:7 105:2 106:14 107:3, 6, 12 116:14 123:25 125:19 127:20 132:10 137:15 140:2, 14 147:13 158:10 159:10 examples 26:20 76:11 80:2 101:8 example's 76:6 excerpt 30:14 31:10, 13, 20, 25 32:4 34:21, 25 35:2 36:7 51:9 52:21 53:7 54:20 55:16, 24 56:1 90:22 excerpts 34:19 exclude 49:10 58:24 Executed 167:13 execution 83:25 exemplary 129:7 Exhibit 31:5 51:24 52:8, 25 53:1, 4 55:25 90:8, 20, 23 91:1, 9, 16, 25 92:1, 5	94:19 96:12 130:13, 16, 17, 19, 21 131:1, 5 136:24, 25 exhibits 30:6 59:8 60:4, 22 130:23 165:6, 7 existence 37:3, 13 39:19, 22 existing 62:17 67:11 69:19 77:11, 17 78:8, 19 114:19 118:14 150:6 exited 26:10 expect 45:20 46:20 47:2 expectation 91:5, 12 108:1 109:16 expectations 47:11 expected 46:2, 3 47:10 70:6 expecting 47:7 expense 21:21 expensive 84:16 85:2, 5 86:5, 25 expert 121:13 122:4 explain 23:2 81:5 123:3 137:13 explains 123:3, 4, 21 explicit 70:21 88:15 89:13 92:11 explicitly 90:24 119:14, 20 extend 155:14	extended 140:13 extending 98:9 103:19 extent 35:5 87:21 121:22 extra 48:7 < F > face 45:24 fact 10:25 21:16 42:14 52:14 58:2 90:1 104:1 118:11 125:24 153:9 factor 80:23 122:25 factors 23:17 76:4, 16 80:16 122:19 128:20 fail 9:25 10:1, 5 11:7 36:23, 24 37:8 38:18 70:10 124:3 129:11 132:12, 16 146:5, 7, 15 147:14 148:21 failed 37:24 73:11 148:9 149:1, 3 failing 133:10 147:10, 12 failover 65:2 fails 10:17 118:7 132:21 145:23 148:21 failure 9:20, 22 11:2, 6, 19 12:21 13:13 48:23 49:7, 22 58:23 63:9
---	---	---	--

64:18 71:6	47:14 48:4	18, 23 77:10,	flip 33:12
78:3, 16	54:17 57:20	17 78:1, 13,	54:1 55:22
97:14 118:9	73:5 82:21	21 80:3, 6	flipped 32:10
119:3, 10	94:13 101:5,	83:10 96:20,	33:6, 18
120:18, 22	20 102:2	21 107:4, 5	53:11, 19
122:18 123:5,	103:12 115:8	128:9, 14	flipping 33:7
8, 12, 15, 18,	136:3, 11	162:9	Floor 3:11
22, 23 124:1,	142:25	figure's 77:16	flow 13:24
8, 10, 23	144:14	figuring	14:1 26:9,
125:8, 11, 17,	145:17, 19	10:21 14:4	13 28:5
21 126:1, 2,	146:16	126:21 127:15	63:1, 17
5, 9, 11	147:10 148:3,	find 10:17	79:23 83:9,
127:1, 5, 24	6, 7, 16	29:12 40:5	12 107:5
129:4, 8, 17	152:14, 18	54:1 92:20,	flows 26:14
131:25	153:4, 5	22 93:20	flow-switched
132:18	156:3 162:16	96:2 131:3	26:10 28:2,
137:10, 13, 16,	fairly 23:22	144:9 148:25	3, 11
17, 18, 20, 22,	familiar	finding 39:16	focus 111:25
23 141:4, 6	13:25 34:5	96:4	138:6 155:12
143:2 144:15	90:14 112:9	finish 105:15	folder 30:5
145:7, 8, 20,	135:13, 23	128:3, 4	follow 42:23
22 146:2, 6,	far 48:24	154:3	43:7 48:24
8, 11, 17	145:4, 9, 13	finished 4:20	145:11
147:3, 8, 14,	farm 27:5, 7	9:11 105:16,	following 59:6
15, 16, 21, 25	fashion 150:9	18 153:23, 24	follows 4:7
148:5, 7, 16,	Fast 92:5	154:1	foregoing
18 149:5, 24	122:5	finishes	167:3, 5
150:13	faster 18:17	153:25	Form 12:24
151:24 152:2,	20:6 21:24	first 4:1	19:16 20:21
8 153:15	48:6 116:10	21:7 37:19	27:11 32:1,
Failure-	fault 60:7,	41:20 57:15	22 41:1, 25
Resilient	25 70:7	62:12 67:19	45:13 49:15
155:25	feasible	90:19 93:17	50:4 51:18,
failures	154:10	94:17 95:13	25 53:16
10:10 69:23	feature 92:19,	98:4 103:16	54:23 56:4
95:15 100:7	23 95:12	112:22	61:4, 10
101:9 122:14	features 22:4,	113:14, 21	65:8 68:11
123:7 124:2,	6	119:11 124:9	74:18 77:8
7, 14 126:8	feel 4:18	126:10	78:4 85:21
138:8, 9	7:21 72:1	143:12	86:14 87:14
147:1, 5	135:8	146:20 152:6	88:21 89:11
fair 5:13, 17	figure 38:17	fit 66:4	94:4, 14
7:4 11:3, 8	40:6, 19	five 53:4	100:21
12:10 13:22	62:10, 13, 18,	five-minute	108:22 115:6
15:18 17:17	21, 23 63:2,	163:2	117:15
20:12 34:5	13, 18, 21	five-page	123:16
36:5 45:9	64:16 76:8,	31:10 56:5	128:17

129:18	general 9:19	58:12 66:11	guaranteed
132:20 139:3,	52:17 105:21	71:19, 25	60:9 61:2
12, 15 141:22	135:24 161:8	72:25 76:16	guess 20:9
144:16	Generally 8:4	94:19 96:12	70:22 99:1
147:11	9:21 10:6, 7,	99:17 111:8,	105:23 114:13
148:10, 19	10 19:19	9, 10 128:5	Guichard 31:2
154:11	23:24 37:16	161:9 162:24,	36:15, 17
format 30:14	40:7, 17	25	39:18 46:13
former 60:6,	41:13, 17	goes 23:19	47:12 51:8,
24	43:9 46:8,	107:13	10, 17, 20, 22
formulating	25 47:16	going 4:13	52:1 53:6,
121:19	49:9 56:23	7:9 10:23	13 54:6, 8,
forth 12:4	59:7 60:4,	25:3 26:23,	18 55:3, 5,
79:7 91:2	22 138:13	25 27:1	13, 24 56:8,
158:9 164:4	156:25 157:2,	32:9 38:5	16 59:17
found 92:12,	6	45:4, 10	60:1, 14
20	generate 46:11	46:21 47:3,	91:5, 13
frame 144:17	generating	5 75:16	108:2, 16
free 7:21	116:16	88:23 106:10	109:10
frequency	GEORGE 3:14	110:3, 17	112:18 113:6
95:21, 24	50:11	111:22	114:12, 16, 21,
front 7:18	give 4:1	117:16 155:9	24 115:11
30:2 51:16	6:11, 12	Good 4:10, 11	118:6 119:14,
55:18, 19	25:25 28:19	22:16 65:22,	20, 25 120:17,
57:10 72:15	42:17 82:12	24 72:1, 21	18, 25 121:2
90:12 116:12	106:14	110:5, 7	122:8, 13
137:2	138:23	114:9 132:4	130:10
full 164:7	155:16 162:21	145:4, 9, 13	131:10, 15, 22
function	given 26:24	GP 106:7	133:2, 7
14:12 20:15	43:8 46:15	gracefully	161:15
21:2, 11	54:17 56:14	95:14	Guichard's
functionality	76:6 101:8	graph 141:7	114:19
21:22 84:1	105:2 144:14	143:15	
functions 22:6	147:4 164:8	Great 5:21	< H >
further	gives 43:13	51:2 139:9	half 110:4
162:23 163:6	81:12	Greg 71:19	hand 164:14
164:9	giving 84:19	73:1 110:9	handle 21:18,
future 81:19	85:25 86:12	155:9 162:24	23 23:15, 20,
91:24	glean 160:22	GREGORY 3:3	21, 23 46:5,
	GMP 102:22	ground 4:12,	9 47:4, 6, 7
< G >	GMPLS 97:6	13 161:15	handled 47:5
gain 17:25	102:22 105:2	grounds 29:18	happen 45:5
18:22	106:7	30:3, 8 94:10	53:21 117:25
gained 22:3	go 17:5, 6	group 66:22	happened
34:8	20:11 23:8	98:6 103:17	53:25 65:10,
gateway 27:24	24:10 32:13	115:18	13 69:4
gears 20:9	43:23 57:12	grow 149:7	

happening 38:13 46:2 happens 38:12 47:15 111:2 happy 4:16 51:15, 16 118:17 133:15 135:6 145:15 hard 136:17 140:11 143:11 145:10, 12 hardware 9:23 83:13, 23 HAYNES 3:4 head 93:23 134:18 136:10 headed 88:25 head-end 113:12 header 8:19 headers 81:25 heading 36:19 51:19 88:12 89:12 95:2 151:12, 14, 16, 17 152:3, 11, 25 Headquarters 3:5 headroom 81:15 hear 37:18 101:23 heard 45:17 112:11 115:18 130:5 hearing 130:8 held 5:8 39:15 help 9:8 65:24 helpful 39:13 51:14 HENRY 1:16 2:7 4:4 36:1 72:10	96:8 110:23 165:3 166:1 167:2, 17 hereinbefore 164:4 hereunto 164:13 heuristics 135:14, 24 136:2, 5, 14, 16 139:24, 25 140:1, 6, 8, 14, 17 143:3, 11 150:5 151:3, 7, 11 153:3 156:20, 23 157:5, 9, 15 Hey 47:18 50:11 high 23:16 156:4 higher 23:23 81:16 127:9, 10 148:3, 4 highest 14:22 highly 37:2 39:19 74:17 85:8 history 65:7 hold 21:12 135:17, 20 holding 18:11 hot 130:7 HOUH 1:16 2:7 4:4, 10 7:5 23:9 28:13 39:18 50:18 51:8 66:1, 6 68:4 72:11, 19 73:9 74:24 110:23 111:12, 16 112:9 120:16 121:13, 18 122:10 154:8	155:24 163:8 165:3 166:1 167:2, 17 hour 110:3 hours 28:18, 20 154:13 162:6, 14 HUH 3:3 5:6, 9 12:24 19:16 20:21 22:9, 20, 23 23:4 25:20 27:11 32:1, 22 35:4, 14, 19, 25 41:25 45:13 47:18 49:15 50:4, 11 51:1, 25 52:9 53:16 54:23 61:4, 10 65:8 66:1, 9 68:11, 22 69:3, 7, 10 72:5 73:3 77:8 78:4 81:1, 4 86:14 87:14 88:21 89:11 91:17 94:4, 14 96:8 100:21 105:15 108:22 110:11, 17, 21 111:1, 22 112:4 115:6 117:15 120:4, 9, 12, 16, 24 121:6, 11 122:3, 7 123:16 128:17 129:18 132:20 136:6 139:3, 12, 14, 20 141:22	144:16 145:21 147:11 148:10, 19 153:12, 21 154:2, 11 155:4, 17 160:14, 18, 24 161:2 163:2, 6 hundreds 26:24 27:8 hunt 98:17 hypothetical 144:23 145:15 146:10 < I > idea 15:12 26:11 57:1 81:14 ideal 152:7 identified 58:4 94:23 identifies 153:9 identify 29:7 98:2 148:17, 20 illustrating 107:6 immediately 4:19 100:22 148:24 impact 149:25 impacts 118:2 132:11 implement 83:12, 22 implementation 58:15 61:18 74:9, 12 83:24 87:6 88:2 implementations 80:10
---	--	---	--

implementing 56:12	index 92:22 165:1	instance 54:4 86:23 141:24	interrupting 5:6
implying 48:10, 16 59:1	indicated 79:22 167:10	142:23 143:13 144:3, 4, 6, 7	interval 123:22 126:2
import 65:6	infeasible 155:3	150:15 151:8	intervals 44:11
important 32:20 70:21 71:2 94:3 120:2 122:14, 17	inform 84:6 121:12	157:18, 20	introduced 100:24
inadvertent 69:1 71:16	information 35:5, 17 40:19, 20 41:1, 4, 7, 12, 15, 18, 24	instances 49:11 88:8, 17 89:7 117:4, 6 158:2	introducing 36:22
in-cast 16:21 17:8 26:12, 15	42:13 43:16, 17, 18, 20, 21 45:7 70:11, 25 71:1	instruct 35:5 111:20	intuitively 81:16
include 9:15 33:19 48:17 58:22 101:21 102:18 103:3, 14 104:9 105:25 106:20, 25 116:23 137:22 161:13	73:12, 21, 25 74:4, 8, 9, 13, 16, 18, 21, 22 75:1, 4 82:8, 12, 14 83:1 84:12, 15, 20, 22, 23 85:1, 2, 5, 9, 14, 15, 16, 19, 20, 22, 24 86:1, 3, 5, 8, 9, 12, 21, 24 87:9, 12 88:10, 19 89:8 148:14 149:13	instructed 35:8	invention 5:25 6:4 33:5 80:10 107:7
included 31:24 55:25 108:17 162:9	instructions 83:25	instructing 35:13, 14 122:4	inverted 100:2
includes 11:4 38:8 97:16 99:9 106:17, 20 142:16	intention 71:17	instruction 35:11	invitation 155:14
including 76:17 80:16 104:14	interchangeably 116:25	interested 164:11	invite 121:22
inclusion 92:9 94:23	interest 152:20	interesting 152:20	involve 58:15 61:18 132:7
incomprehensible 42:8	interface 40:3	interfaces 102:23 105:3 106:7	involved 9:7 162:8, 10
increase 149:8	initial 68:16	intermediate 143:20	involves 11:5 12:21 41:8, 11 157:20
increased 17:10	inordinate 160:25	internet 10:11 150:10	IOS 95:8, 9
indented 95:13	input 8:25 23:16	interpretation 89:2	IP 3:10 9:4 14:10, 13 15:6, 7, 10, 15, 20 16:8, 10 20:13, 23 24:15 28:12
independent 38:21 123:7 145:7 147:24	inputs 23:22, 23	interpreted 65:17	IPR 4:24 34:2, 6
	insignificant 123:23 125:22 126:3 127:3, 7	interrupt 47:18 161:7	IPR2023-00402 1:11
			irrelevant 22:25
			irrespective 122:13
			issue 49:3 56:10 67:7 73:3 83:6 89:15 110:14, 18, 21 111:23

112:1 121:22, 23 134:14 135:12 150:2 155:10 156:9, 11 issues 118:10 italicized 115:13 it'd 93:8 items 57:1 its 20:15 27:24 41:10 45:11 62:17 81:23 83:18 112:15 < J > January 9:12 Job 1:25 < K > keep 36:23 44:13 47:13 131:10 keeps 37:20 131:23 KIM 3:15 kind 8:9, 10 9:1, 4 14:24 16:1, 20 17:3 24:7, 21 38:8 41:10 46:9, 10, 24 47:7 58:7, 25 60:2 63:7, 11 67:9 74:20 98:22 108:13 114:17 118:10 123:6 130:5 132:24 133:5 134:15 143:25 know 4:15, 18, 20 9:2, 19, 23, 24 10:2,	5, 9, 20 11:1, 19 12:7 13:4, 6, 16, 17 17:1, 21 18:2 19:1, 3, 4, 5, 22, 24 20:4, 5, 6, 25 21:17, 22, 24 22:12 23:11, 21 24:23, 24 25:10 26:22, 23 27:18, 19 28:18 29:2, 4 32:15, 17, 18 33:1, 4, 10, 14, 17, 21 34:9, 16 37:9, 22 38:2, 6, 7, 12, 13, 15, 16, 20 40:1, 4, 21, 22 42:7 43:11 44:6, 8, 19 45:15 46:1, 2, 4, 18, 19, 20, 23 47:4, 7 48:12, 14, 18 49:1 52:13 53:6, 20, 25 55:4 57:6 58:3, 8 62:12 69:3, 11 71:5, 10, 12 72:2, 5 78:20 82:2 86:23 87:24 88:23 89:3 92:13 93:8 94:15 96:9 97:18 105:11, 22 106:9 107:9 108:5, 9, 23, 24 109:2, 4, 25 114:23 117:24, 25	118:14 119:2, 8, 12, 17 123:11 124:13 131:24 132:9, 12, 14, 25 133:2, 3, 4, 14 136:2 137:23 138:10 142:14, 19 144:20 146:5, 10 147:18, 23 148:12 149:3, 11, 20, 21, 24 150:9, 11, 13, 17, 21 151:4 154:21 157:16 162:20 knowing 125:19 knowledge 33:4, 17 41:9 125:3 127:15 133:21 134:16, 22, 24 known 83:24 115:11 KOBRE 3:15 < L > L1 62:21 77:13 L2 62:21 L3 62:21 L4 62:21 L5 62:21 L6 62:21 L7 62:22 77:13 label 8:17, 19, 22 9:2 10:19 13:21 14:5, 7, 9, 14 15:12, 13, 18 16:22 17:14, 22 18:1, 4,	10, 18 19:4, 23, 25 20:12 21:5, 11 24:20 25:3 26:13 47:16 95:3 labeled 77:13 labeling 16:5 17:13 labels 15:25 17:1, 21 18:8 24:9 25:2, 23 26:8 28:5, 9 label-switched 8:11, 13 10:16 20:22, 24 24:14 25:1, 7 102:24 103:6, 8 104:14, 16, 18, 19 105:9, 20 108:9, 12 109:3 131:16 132:5 laid 89:25 144:3 large 15:5 144:15, 18 146:22, 23 larger 22:5 31:10 81:18 137:21 law 45:18 lawyer 34:7 lay 118:15 layer 16:10 70:23 learn 148:8 leave 111:13, 20 leaves 60:8 61:1 leaving 134:15 left 14:21 left-hand
---	---	--	--

58:13	105:2 106:14,	look 14:21	15:16 21:18
lengthy 32:19	17 122:23	25:24 31:18	lookups 18:12
level 13:17	123:25	32:8, 14	lot 9:5
22:13 46:3,	128:21 145:7,	33:24 34:16	10:4 19:8
24 52:18	23 148:22	43:23 54:2,	23:12 39:24
108:6 123:12	149:1, 3	12, 15 55:7	45:15, 16
124:17	links 10:8	56:9 62:12	86:9 123:8
125:19, 21	23:16 36:23	75:14, 23	148:2, 13
126:21 127:3,	37:23 38:16	77:9 80:1	lots 16:19
15, 17 129:1	40:12 50:6	81:11, 24	low 14:19
133:24 134:2,	106:5 124:19	82:4 83:7	63:25 64:1
17, 20 156:4	142:5, 15	87:25 88:12	76:13 78:6,
levels 38:8	146:5, 7, 15,	93:9, 25	7, 11 79:12,
license 4:2	18 147:12	94:5 96:20,	13, 14, 16, 17,
limitation	148:8	22 97:3	19, 21, 24
120:21	list 94:12	102:20, 23	124:10, 15
limitations	listed 6:20	109:10	125:21
115:3	29:1, 14	115:24	126:11, 15
limited 21:25	140:21	118:17	131:19
limits 25:13	listen 111:14	123:19 124:6	lower 94:12
line 4:20	literally	125:4 127:21	lowering
58:13 70:5	23:1 44:10,	130:10, 17	127:23
124:6 125:5	15	133:15 135:4,	lowest 14:22
126:7 152:6	literature	7, 9 138:24	82:7, 25
166:3, 6, 9,	13:12 30:12	140:15	83:3 128:10
12, 15, 18, 21	130:11	143:10, 12	LSP 36:18
linear 69:20	little 20:10	149:18	51:23 52:5
158:13	25:15 30:20	153:17	83:10 97:8,
lines 80:7	82:22 116:10	154:24	13, 16, 19
99:20	162:18	161:12, 22	99:8 100:23
link 9:20, 22	load 27:5	looked 17:4	113:9, 13
10:21 38:7	47:7 141:5	19:17, 18	LSPs 83:11
40:2, 5, 6, 9,	155:25	53:18 85:11	95:22, 23
10, 15, 25	locate 39:12	139:7	97:5, 15
41:3, 12, 13,	location 27:6,	looking 15:11	99:8, 21
14, 17, 18, 21,	7	22:11 26:21	100:6, 11, 12,
23, 24 42:2,	logic 83:12	69:15 71:8,	18, 19, 23
6, 12, 13, 15	125:15, 16	10 72:14	104:3 105:24,
43:21 45:6	logical 79:8,	102:11	25 131:14
70:14 73:15	9	103:22	lunch 72:4,
80:16 81:15	long 31:14	105:22	19 73:7
84:11, 22, 24	32:15 65:21	142:14	
85:15, 16, 24	140:13 148:22	144:12	< M >
86:20 87:8	longest 14:13,	157:17 160:18	main 36:10
88:9, 18	16, 20 15:1,	looks 151:16	57:2 94:8, 9
89:8 95:14	10	lookup 14:14	maintain 23:3
102:7, 22			

maintaining 107:7 make-before-break 112:25 115:12, 15 117:13 130:2 make-or-break 115:4 117:10 making 42:8 70:16 73:16 79:8 108:15 109:17 114:4 133:17 137:11 139:5, 20 149:7 Manage 90:17 managed 27:4 management 137:8 many-to-one 16:24 mapping 10:19 maps 126:6 marked 165:7 marriage 164:11 Mary 1:24 2:9 164:2, 17 match 14:13, 16, 19, 20, 23, 25 15:1, 10 matches 103:21, 23 104:5 124:4 125:23 materials 54:16 matter 16:17 17:15 164:12 matters 34:13 McBRIDE 3:9 mean 7:17 11:7, 8, 10, 17 12:8, 17 13:14 14:11 15:12, 21 16:2 17:9,	25 18:6, 16, 21 19:8, 12, 17, 18 20:4, 5, 22, 25 21:1 22:8, 12, 18, 19 23:16, 24 24:5, 6, 12, 22 25:8, 12, 21, 24 26:21 27:2, 3, 17, 18 29:10 30:16, 19 32:6, 16, 24 33:3, 9, 12 34:15 37:19 38:11, 17, 19 39:3, 5, 24 40:16, 17, 21 41:8, 20 42:1, 2 43:9, 14 44:4, 5, 10, 16, 17, 21 45:4, 14, 16, 19, 21 46:23 47:15 49:5 50:5, 6 51:13, 18 52:1, 23 53:9, 17 54:24 55:7 56:3 57:22, 24 60:16 61:11, 15 62:9 63:4 65:9, 23 68:12, 15 70:2 73:20, 22 77:15, 16, 20 78:5 84:8, 18 85:16 86:4, 9, 19 87:16, 24 88:22 89:16 91:18, 22, 23 93:2, 15 98:14, 18	100:22 102:5 103:5 104:24 106:11 107:2 108:6, 23 109:23 112:14 113:6 114:6, 16 115:5, 16 116:9 117:16 118:16, 22 119:7, 12, 21 122:16 126:16 128:18 129:19 130:3, 9 131:8 132:8, 21, 22 135:4, 11, 15 136:1, 7, 15 138:1 141:23 142:3 143:8 144:17, 18, 20 145:13 146:4, 9, 12, 20 148:11, 24 149:10, 13 150:7, 12 151:19 154:15, 22, 24 155:6 156:6, 16 157:6, 16 159:17 161:7, 21 meaning 5:16, 18 6:2 65:16 115:4 means 8:3 10:15 73:22 mechanism 101:12, 16, 21 102:3, 13, 17, 22 104:22, 25 105:1, 3, 4 106:2, 11 113:1 115:4, 12 117:10, 13	mechanisms 47:24 48:5, 6 49:12 53:7, 14 54:9, 18 57:21 69:20, 21 70:15 73:16 102:7 meet 69:21 70:3 meeting 158:5 meetings 162:8 memory 12:6 13:18 18:2, 5, 9, 14, 19, 24 19:1, 3, 7, 15, 19, 23 20:1, 5, 6, 7, 10, 14 21:3, 5, 6, 10, 12, 22 22:5 93:16, 22 134:1 memory's 19:8 mention 99:4, 11 136:8 mentioned 24:1 26:3 36:6 53:18 75:3 merge 26:13 mesh 56:25 77:1 met 6:7 160:1 Method 7:13 12:20 13:1, 5 17:11 40:11 48:21, 22 49:5 56:23 155:24 methods 8:25 11:19 16:5, 6, 13, 14 17:14 70:12 73:12 156:8
---	---	---	---

metric 81:12, 13 148:22 metrics 62:10 131:18, 19 149:4 microphone 74:24 mid 9:13 middle 80:6 millisecond 70:4 milliseconds 70:6 mind 121:24 mine 25:11 minerals 25:11 minimization 129:8 minimize 129:8 minimizes 129:3 minus 147:23, 25 162:6 minutes 51:1 72:20 93:9 110:7 missing 42:3 modeled 137:10, 13, 16, 18, 21 module 98:2 modules 83:17, 21, 22 moment 11:17 17:12 39:14 91:22 109:23 110:1 112:17 118:23 momentarily 128:6 money 19:2 morning 4:10, 11 motivated 161:17 mouth 150:25	MPLS 7:14, 24 8:2, 5, 11 9:7, 8, 17 10:15, 23, 24 12:16 13:12, 13, 15 14:3 21:4, 15 24:7 25:17 27:10, 22 28:2 30:24 31:18 49:18, 21 52:2 56:12 83:11 90:16 92:6 95:3, 13, 23 113:4 122:15 135:14, 25 138:12, 13 141:21 142:1, 4, 20 150:16 151:1 MPLS-only 21:1 MPLS-TE 90:17 MPLS-TP 69:20 Multiple 7:14 9:7 14:17 26:17 46:7 70:13 73:13 84:19 124:7 126:8 129:10 138:2 multiply 147:15, 19 Multiprotocol 95:3 mute 51:12 myriad 128:20 < N > nearly 140:6 156:23 157:10 necessarily 15:7 18:23 20:23 24:11 36:3 38:5 39:1 48:2 49:2 59:2,	19 79:24 85:18 149:2 necessary 18:12 84:12, 17, 21, 24 85:7 86:7, 13, 22 87:7, 15 88:3, 5, 7 155:17 167:8, 9 need 4:18 7:21 16:20 18:24 19:6, 23 35:23 55:23 72:19 80:9 81:20 96:8 115:23 135:1, 8 138:25 148:8, 17 149:3 154:12 160:20 needed 17:22 18:18 21:6 23:10 70:15, 17 73:17 needing 22:5 needs 41:4 97:13 101:6 110:15, 16 148:20 net 77:12 network 8:12, 14, 16, 21 9:2, 9 10:9, 21 12:15 14:5, 8 16:23 17:2, 5 18:14 24:2, 5, 8, 12, 13, 17, 18, 21, 23 25:1, 7, 17, 18 26:10, 18 27:10, 13, 14, 16, 22 28:2, 3, 5, 11 30:24 36:12, 23 37:2, 7,	17, 20, 21 38:4, 16, 24 39:3, 22 40:7 41:14 42:19 43:1, 8 46:3, 14, 25 47:13, 16 48:7 49:17, 18, 20, 21 52:2 56:25 59:11 64:18 74:10, 14, 16 77:1, 12, 18 81:14 86:21 87:9 90:18 92:5 98:6 100:8 101:7, 9 106:4 107:8, 14, 17, 19 117:25 118:1 122:15 126:4 131:9, 13, 23 137:8 138:12 141:21, 25 142:1, 4, 20 144:8, 14, 19, 24 145:2, 6 146:19, 22 147:4, 10 148:4, 11, 13 149:3, 7, 9, 13, 14, 16, 17, 23 150:10, 11, 16 151:24 152:2 networking 10:8 70:23, 24 115:18 networks 8:6 9:8 10:11 13:13 27:20 45:14 50:1 92:6 113:5 135:14, 25 138:13 143:24
--	--	--	---

146:22 151:1 156:5 never 142:16 New 3:17 10:17 36:24 37:9, 10 39:23 40:1, 2, 5 41:10, 12 42:15 49:6 56:24 63:9, 20 76:25 77:2, 4 81:17 95:16 113:13, 14, 15, 20, 21 114:2, 4, 11, 14, 15 115:25 116:2, 16 117:19 118:20 119:11 131:13, 14, 24 132:2 151:21 night 12:2, 8 nine 64:23 NMS 137:9 140:4 node 8:22 17:5 64:4 74:6, 13 95:14 123:25 131:25 144:25 145:2, 6, 19, 23 147:19, 25 148:21 nodes 18:13 36:24 37:23 38:16 41:14, 18, 23 42:7, 12, 19, 22 43:2 74:10 84:12 86:21 87:9 99:23 100:3 103:1 104:4 124:18 129:10, 12	131:14 142:1 144:24 145:2, 3, 18 146:12, 18 147:12, 23 148:4 nondisruptive 112:23 113:8 114:1 116:5 nonresponsive 121:21 139:11, 19 no-sharing 81:23 82:1, 13 Notary 2:10 164:3 Note 75:25 139:10 Notice 2:8 68:22 noticed 65:21 noting 139:16 November 1:18 2:4 164:14 166:3 NP-hard 140:5, 12, 19, 24 141:2, 16 143:9, 19, 25 151:4 153:3, 8, 15, 16 154:5 156:22 157:19, 23, 25 158:1, 6, 13, 21, 24 159:2, 3, 5, 6, 8, 14, 20, 23, 24 160:2 number 4:2 13:15 14:19 15:1 16:10 23:17 24:16 25:6 28:18, 25 29:14 31:18 34:2, 3 42:25 43:3, 5	76:16, 21 77:11 85:25 97:5 100:23 104:19 144:15 146:16, 18 147:5 148:3, 4 154:20 155:16 156:4 158:14, 17, 19 159:11, 15, 18 161:14 162:20 numbers 146:13 numerous 33:1 96:24 NY/10022 3:17 < 0 > oath 2:15 167:6 objecting 139:18 objection 2:14 12:24 19:16 20:21 22:9, 20, 22 23:3 25:20 27:11 32:1, 22 35:4 41:25 45:13 49:15 50:4 51:25 53:16 54:23 61:4, 10 65:8 68:11 77:8 78:4 81:1, 3 86:14 87:14 88:21 89:11 91:17 94:4, 14 100:21 108:22 115:6 117:15 120:4, 8, 11, 13, 15 122:1, 7 123:16 128:17 129:18	132:20 136:6 139:3, 12, 15, 18 141:22 144:16 145:21 147:11 148:10, 19 154:11 160:17, 24 objections 121:3 139:21 obtain 154:17 158:12 obvious 56:11 57:3, 4 83:11, 22 obviously 143:18 occasion 32:11 occur 46:4, 6, 7 47:1 70:6 101:6 156:5 occurred 62:20, 25 155:11 occurrence 78:2 126:1, 25 occurring 142:10 occurs 45:23 124:8 126:9 158:17 o'clock 72:3 odds 147:4 offering 109:25 offhand 32:17 OFFICE 1:1 66:20 Oh 28:24 31:12 32:13 70:2, 19 72:20 74:25 83:15 104:3 105:18
--	---	---	---

126:13 128:4,
9
Okay 5:9
6:14 8:5
12:10 23:5
28:22 31:20
36:14 42:20,
24 50:13
51:15 56:18,
20 64:24
66:12 67:16,
18 69:5, 9,
17 72:16
73:5 79:7,
20 81:8
84:3 90:12,
13 92:3, 4
93:11 96:14
97:1 100:5
101:1 110:6,
24 112:2, 4,
21, 24 116:8
130:22
135:12 137:3,
4 138:25
139:11, 22
144:23 145:5
148:7 151:15
152:19
153:13 155:4
156:10 162:2
163:4
old 113:12,
16, 17, 19, 23
114:3, 4
116:1
once 44:8
61:24
ones 7:2
26:21 100:13
141:4
one's 144:7
ongoing 46:9
open 50:19
55:20, 21
112:20 137:1

operate 24:17
25:7
operating
25:18 95:10
operation
21:19 46:1
74:16 97:11,
15
operational
5:7
operator 69:21
opinion 89:4
102:18
123:14, 17
124:20, 22
129:13, 16
opinions
54:11 60:13
65:7 84:7
91:2 108:17
109:21 110:1
opportunistic
60:8 61:2
opportunity
139:6
opposed 20:13
28:11
optical 70:23
92:6 98:6
107:10
optimal 37:1,
11 59:8
87:5, 12, 16,
22 88:1, 5
113:10 114:8
140:6 151:23
152:1, 7, 15,
20, 24 154:9
156:19, 23
157:10
optimality
99:25
optimization
59:21 97:15
99:7, 12, 13,
15 113:8
114:1 116:5

140:5, 19
143:9 153:3,
6, 18 156:7,
14 157:8, 12,
13
optimizations
153:8
Optimize
90:17 119:14
132:4
Optimizing
151:17 152:11
option 86:12
options 84:19
85:25 86:10,
24
ORCKIT 1:8
4:24 5:2, 12
166:2
order 14:22
135:2, 9
146:20 162:5
ordinary 5:19
6:2 46:13
65:16 89:22
109:15 115:5
131:6 133:21
134:22 150:4
161:17
original 22:24
orthogonal
118:11
outbound
148:22
outcome 164:12
outlined
119:20
outset 5:17
104:19
outside 6:17
22:24 71:22
135:24 136:5
outweighs
132:18 133:10
overall 21:10
84:8 103:25
104:8 105:8,

21 128:12, 22
147:21
overhead
46:15 48:7
Overview 95:12
Owner 1:9
3:8 66:14
owner's 6:22

< P >
p.m 163:11
packet 8:18,
20 16:1
23:11, 14, 18
28:6
packets 8:24,
25 10:22
13:21 21:18,
23, 24 22:7,
8, 16, 19
23:15, 21
24:10 28:9,
11
page 31:7
53:2, 3
55:20, 21
90:19 95:5,
13, 21 112:20
165:2 166:3,
6, 9, 12, 15,
18, 21
pages 32:17
53:5 54:15
pair 63:22
64:1, 2, 3, 9,
12 65:3
66:18, 22, 23,
24, 25 67:8
76:12, 13, 14,
15 77:3, 25
78:5, 6, 7, 11,
12, 18, 24, 25
79:17, 19, 21,
24, 25 80:16
82:10 83:10
109:4, 5
116:17

117:23 124:9	21, 23, 25	71:1 86:11	40:1 41:6,
126:10	152:1, 4, 6,	89:19 100:18	10 42:21
128:23 129:9,	14, 16, 17, 19,	115:20	44:2 47:17
11	25 153:4, 16	140:18 144:3	48:12, 13, 18,
paired 57:1	154:10	150:14, 19	19, 21, 23
pairs 58:4	156:21	151:3 159:10	49:6, 7, 8, 12,
64:8 76:9,	158:11 159:10	161:20	13, 22 54:19
22, 23, 24	Paragraphs	particularly	58:5 59:23,
77:2, 7, 19,	56:9 75:15	14:12 116:6	24 62:24
20, 21, 23	81:24 83:7	parties 164:5,	63:3, 6, 9, 12
78:7 82:20	86:18 87:3	10	64:10, 12, 16,
117:22 128:10	88:11 97:3	partly 14:13	17 65:3
Paragraph	98:12, 21	parts 103:2	67:20 68:8
57:12, 16	99:4 130:12,	109:10	70:12 73:13
58:13 60:3	15 161:20	pass 97:25	75:9, 12, 13,
64:21, 22, 25	parameters	passage 60:16	19, 20, 21, 22
67:16 70:8	41:10 71:24	61:9, 12, 17	76:1, 2, 5, 9,
73:9 74:3	parentheses	71:8	15 77:1, 3, 4,
75:2, 3, 23	74:8	passages	7 78:15, 16,
76:25 77:9,	parse 41:21	33:14 52:11	22 80:16, 25
10 80:1, 14	parsing 42:2	97:25 98:12	81:16, 17, 19,
81:11 82:4,	part 17:17,	99:10	20 82:2, 7, 8,
5 83:20	25 21:7, 20	PATENT 1:1, 2,	11, 16, 18, 20,
84:2, 6 85:8,	27:9, 13	9, 12 3:8	25 83:3
12, 15 86:4,	30:3 37:24	4:24 5:2, 3,	87:23 96:21,
11, 15 88:13,	40:13 41:20	12, 13 6:22	23, 24 97:16,
25 91:3	43:22, 25	7:13, 18, 21,	17, 23 98:8
95:13 97:9,	62:5, 9	23 28:14	99:9 100:14
25 98:16	65:14 67:25	66:14 67:20	103:4, 19
99:17, 21	78:18 84:8,	68:1, 7, 15,	104:10, 12
100:3, 24	18 85:17	20 69:18	105:7, 8
101:1, 2, 11,	91:10 95:7	89:23 107:23	106:20, 21
14 103:22, 24	101:2 106:24	108:20	107:1, 22
104:1, 13, 20,	128:12	120:21 124:5,	113:10, 13, 14,
21 105:19, 24	129:19	13, 14 126:7	15, 19, 20, 21,
106:1 107:3,	137:21 138:6	129:9 130:1	23 114:2, 7,
16 112:22	148:11	133:12, 19	11, 14, 15, 19
122:21	151:10	134:3, 12	115:25 116:1,
123:20 125:4,	156:10, 12	136:5 138:14	2, 16, 21
6, 25 127:21	participating	patentee 66:14	117:17, 19, 21,
128:2, 5, 7	2:12	Path 7:14	22 118:3, 5,
130:15, 18	particular	8:13 10:17,	7, 9, 12, 13,
137:6, 12, 15	8:18 10:16	24, 25 11:1,	19, 20, 22, 24
140:2, 9	20:2 34:21	5, 6 12:21	119:2, 3, 4, 6,
142:24	36:6 44:2	13:7 37:1, 4,	8, 9, 15, 17
143:10	53:24 55:6	11, 13, 15	122:20
151:11, 12, 13,	60:16, 18	39:19, 23	126:22

128:21 131:7, 17 132:1, 2, 11, 16, 21, 23, 25 133:11 137:24 138:9 141:5, 16 142:7 143:17 144:9 149:4, 5 150:19 paths 8:11 20:24 26:13 37:3, 10, 15 43:1, 5, 7 47:17 50:2 53:8, 15 54:7, 9, 22 55:1, 14 56:2, 17, 22, 24 58:2, 17, 24 59:21 61:20, 25 62:4, 7, 11, 15, 16, 17, 20, 22 63:12, 13, 23 74:6, 7, 11 75:6, 17, 18 76:19 77:6, 11, 12, 14, 18 78:8, 9, 18, 19 80:2, 5, 7, 8, 12 81:23 82:9, 13 87:5 88:1 90:21, 24 92:18 93:14 96:1, 5, 16, 19 97:2, 19 98:5, 7, 10 102:4, 18, 24 103:6, 8, 9, 15, 17 104:14, 16, 18, 19 105:10, 20, 25 106:18 107:21 108:7, 8, 9, 12, 19	109:2, 3, 7 114:18, 24 116:8, 16, 23 117:3, 7, 9, 12, 23 118:14 123:1, 4, 8, 24 124:3, 18 125:3, 7 126:22, 23 127:1, 9, 11, 16, 22, 23 128:10, 15 129:7 131:2, 16, 24 132:5, 19 137:10, 25 138:2, 8, 12 141:12, 13, 20 147:9 151:17 152:7, 12 154:20 158:14, 18, 19 159:11, 16, 18 pause 154:2 pauses 65:21 Payonk 1:24 2:10 164:2, 17 peak 47:11 penalty 167:4 people 12:18, 25 16:19 20:25 21:1 24:18 26:24 27:6, 8, 17 33:17 45:20 46:17 50:6 52:13 115:17, 18 149:20 percent 44:21 145:8 147:13 perfect 12:6 perform 15:20 20:2, 15 83:13 88:4 performance 18:15 90:18	140:6 156:24 157:10 performed 44:1 63:18 83:5 128:13 performing 33:25 45:12 63:1 83:18 performs 62:17 period 83:16 114:10 147:18 periods 38:7, 9 perjury 167:4 person 5:19 6:2 9:9 34:9 46:12 89:22 97:10 109:15 115:5 131:6 133:21 134:22 150:4 161:16 Petitioner 1:6 3:2 29:19 Ph.D 2:7 4:4 9:5 135:17, 20 136:2 166:1 photographic 93:15, 22 phrase 28:2 38:23 42:6, 8 49:9 64:11 66:21 67:3, 6, 13 68:9, 10 82:5 96:23, 24 97:8 102:16 115:15, 21 130:8 physical 9:24 25:12 physically 2:13 25:8	pi 147:23 pick 117:21 places 26:18 33:1 76:21 96:24 97:7 107:2, 18 127:19 131:9 137:6, 7 plain 65:16 plane 101:16, 20 102:2, 6, 12, 17, 21 104:22 106:2 planner 81:14 Plano 3:6 plans 130:6 please 7:21 20:19 22:15 41:16 47:19 51:1 62:13 68:19 96:9 105:15 134:5 138:16 161:2, 9 162:24 PLLC 3:10 plugs 40:2 plurality 83:10 116:15 plus 162:6 point 4:21 9:13 10:18 18:16 21:5, 20 26:11, 17 27:1, 2 63:17 76:14 78:20 90:7 93:14 96:18 97:21 117:22 129:6 132:22 152:5 158:7 points 10:5 26:9 point-to-point 16:16 policies 106:8
---	---	--	--

policy 101:17 102:10, 13 106:9, 10	preceding 75:15 100:12, 22 102:6 104:17 152:16	prepared 28:13 34:22	122:20 123:1 125:7
pop 8:22 69:4	precisely 122:8 128:25	preparing 28:17, 22 29:8 162:4, 15	primary/restorat ion 64:12 76:15 116:15
popping 14:6	precomputation 11:4 54:21 55:6, 14 56:2 58:16 59:7 61:23 62:1, 2, 3 71:9	prepending 8:17	prime 141:10, 13, 18 142:3, 9, 15, 20 143:16 144:9
port 16:10	precomputed 48:21 49:13, 14, 23 50:3 53:8, 15 54:10, 19 56:17, 21 59:23 62:8 77:14, 19 78:2 117:3, 6, 9, 12	presence 71:22	principal 11:3
portions 29:3 106:15 154:25	precomputing 58:24	present 2:13 3:19 80:10 107:6 141:1	principle 10:13
ports 22:1	predictable 150:9	presented 34:12 72:6 140:15, 16	printed 90:10 92:4 137:3
POSITA 6:3 56:14 61:21 65:9, 12, 15 90:3, 7 91:11 107:25 108:15 128:19 134:16	predicted 149:24	preset 11:1	printouts 30:7
position 35:16	preestablished 114:24	pre-setup 13:6 116:23	prior 29:14, 17, 21 30:2, 8 32:4 34:12 57:3 61:16 65:1 67:11, 21 70:10 73:11 78:2 129:25 132:17 133:9 134:17, 19, 24 136:13 143:24 151:6
possess 89:21 90:1	prefer 110:13	pretty 13:25 65:23 106:15, 22 107:16 108:6 115:22 116:7 126:6 148:25 161:8	priority 94:12
possessed 89:25	preferable 111:16, 19 157:14	previous 22:17, 18 23:2 39:10, 11 69:19 98:4 102:21 152:3	privileged 35:5, 15, 17
possible 11:11, 13 17:11 18:7 49:21, 25 59:22 82:7, 25 83:2 85:5 92:15 147:16 148:4 156:18, 19 157:3	prefix 14:13, 16, 19, 20 15:10	price 19:20	probabilities 120:3, 18 147:3
potential 114:9	preliminary 6:22	prices 19:19	probability 10:6 38:19 120:22 122:14, 18 123:12, 15, 18, 21 124:7, 14, 16, 23 125:1, 11, 17, 21 126:1, 8, 15, 19, 24, 25 127:5, 7, 9, 10, 24 129:3, 17 138:5, 7
potentially 103:6	premise 48:10 58:9	pricing 20:5	
power 10:1 23:13, 20	preparation 11:22 93:25	primary 56:24 64:3, 10 74:5, 7 75:5, 17 76:5, 9 77:3 78:17 80:4, 15, 24 81:15, 17, 18 82:7, 9, 25 83:3 87:5, 23 88:1 100:15 108:4 109:6 118:3, 7, 13 119:4	
practical 26:1	prepare 5:22 6:5		
practice 140:7 156:24 157:11			
Preallocation 60:4, 22 61:14, 19, 21, 22			

145:7, 8	107:6 124:9	23 58:11	44:4, 6, 12
147:4	126:10 139:8	69:20, 24	45:20 46:10,
Probably 6:12	processing	70:14 73:15	16 47:6, 9
9:12 28:19,	21:25 23:13,	75:12, 22	148:12
21 32:8, 10	18, 20 41:7,	76:2 78:15	149:11, 19, 21
47:8 93:8,	8, 14, 18, 24	80:4, 7, 15	150:1, 7
24 94:11	42:13 45:2,	81:23 90:21,	proven 158:12
110:3 141:8	11 84:16	24 92:17, 23	provide 70:10
162:7	85:6 86:6	93:14 96:1,	73:11, 20
problem	processor	2, 5, 16, 19,	98:22 99:5
138:11	23:14, 22	21 97:2, 19,	provided 4:23,
141:19	44:22 47:9	23 98:2	25 5:1, 11
143:19, 25	98:5	100:14	52:25 53:21
144:3 151:4	producing	101:12, 16, 21	86:10
152:2, 16	20:14	102:3, 7, 8,	provides
153:9, 16, 19	professional	12, 17, 18, 22	81:13 84:10
154:6 157:17	130:7	103:4, 9, 15	156:13
158:17, 20, 23	programming	104:10, 12, 22,	providing
159:5, 6, 7,	158:14	25 105:1, 3,	65:9, 12
10, 23 160:2	prompt 150:4	4, 8, 10, 25	provisioned
problems	proof 141:1	106:2, 6, 11,	48:23 114:15
45:25 140:5,	proportional	13, 17, 21, 25	provisioning
11, 12, 19, 21,	147:6, 22	107:8, 14, 17,	11:6 12:21
24 141:2, 3	proportionate	19, 21, 22	42:12, 15
143:9, 11	146:18	108:8, 19	Public 2:10
153:3, 6	proposed 81:15	109:2 116:23	164:3
156:5, 7, 15,	prosecution	117:3, 7, 9,	pull 90:12
22 157:4, 8,	65:7, 10, 13	12, 17, 19, 21	130:21
12, 13, 19, 22,	PROT 56:4	118:9, 12, 19,	purpose
23, 24 158:5,	92:20	20, 22, 24	122:16, 17
8 159:1, 23	protect 56:3,	119:5, 9	pursuant 2:8
160:4	4 69:22	122:20 123:1	pushed 58:8
proceed 72:2	80:9 131:3	131:1, 7, 17	put 19:3
122:2	protecting	132:1, 2, 11,	94:16 115:7,
proceeding	96:23, 24	16, 19, 21, 23,	8 150:24
72:8	97:8, 17	25 133:11	
proceedings	98:8 99:9	protocol	< Q >
164:6	103:19	10:11 40:14	qualifications
process 4:16	Protection	43:15, 24	89:21, 25
22:7, 8, 16,	7:15 9:16	44:2, 9, 14	90:2
19 45:15	12:12, 14	45:1 46:15,	qualify 90:3
57:17, 18	47:23 48:5,	19, 22 92:21	quality 60:9
58:2, 15	13, 19, 20	protocols	61:3
61:18 62:6	50:2 53:7,	25:23 39:25	quarter 19:24
63:6, 10	14 54:7, 9,	40:4, 5, 12,	question
70:18 78:12	18 56:2, 17,	14, 18 43:10,	11:10 12:13
88:14 91:8	21 57:18, 21,	13, 16, 19	13:10 20:10,

17, 19 21:7	quick 110:10	151:23 152:6	136:22 161:5,
22:15, 23	134:1	ready 114:11	22
23:8 30:18	quickly 20:15	real 5:7	received 8:21
35:8, 17, 18,	148:25	25:13 58:16	43:18
22 38:14	quite 32:19	59:9 60:5,	Recess 51:5
41:16, 21	41:21 84:16	23 61:19, 21	73:7 112:7
48:17 50:15	85:5	62:3, 8 150:1	155:22 163:5
51:21 54:16	quotations	realize 68:25	recognize
55:15, 24	68:6	125:6	31:2 68:21
61:6, 8	quote 30:16	really 25:21	115:17
62:14 63:20	67:21	37:14 38:2	recognized
64:19 66:2	quoted 68:1,	42:4 85:23	67:20 68:7
75:10, 24	16 99:10	124:4 125:10	recognizes
79:9, 20		130:10	123:24
80:22 88:24	< R >	140:23 142:21	recognizing
89:14 101:25	raise 121:23	reasking	67:25 129:9
105:12, 14, 23	raised 49:4	138:18	recollection
114:13 115:8,	ran 94:11	reason 19:1	31:14 92:11
9 117:5	rate 147:16,	71:11 81:12	recommend 72:8
121:2 122:1,	21, 25 149:24	103:23	reconfigured
10 124:21	rates 46:2	107:24	106:4
128:1 129:15	Ratios 151:18	108:25 114:2	reconvene
133:22 134:3,	152:8, 12	119:23, 24	110:7
5, 9, 15, 21,	reach 10:17	132:1, 4	record 5:8
23, 25 135:3,	27:6, 9, 17	166:3, 6, 9,	20:20 23:6
10 138:16, 19	153:4 155:15	12, 15, 18, 21	35:24 39:15
139:2, 8, 13	reacquaint	reasonable	51:3 52:7
141:15 142:2,	55:23	4:21 91:4,	71:15, 20, 21,
6, 23 143:4	reaction	12 107:25	22 73:1
144:5, 6	60:18 61:8	109:1, 16	110:16, 23
145:14 148:1	read 20:19,	reasons 56:14	111:6, 7
150:18, 22	20 35:24	71:7 89:18	112:5 121:12,
160:15 161:4	39:11 59:7	152:21 161:16	18 122:6
questioning	60:19 61:16,	recall 7:16	134:7 138:17
4:20 63:12	17 69:5	12:25 19:20	139:17 143:7
questions	70:22 87:1,	24:3 26:4	155:10, 20
4:15, 22	10 104:8	29:12 30:1,	164:7
5:16, 18 7:5,	122:6 134:5,	15 32:16	recover 10:10
10, 11 47:21	7 138:17	33:9, 21	36:24 37:8, 9
58:9 65:22,	143:7 167:3,	35:1 36:2	recovering
24 66:8	7	47:25 53:10,	10:25
118:17	reading 60:20,	13 55:5, 8	recovers 95:14
121:14, 21	21 152:18	60:15 89:15	Recovery 7:14
122:3 161:3	153:5 154:3	92:24 93:13,	9:15, 20
162:23 163:6	reads 57:16	16, 18 96:4	10:14, 21, 24
question's	58:14 102:12	112:12 130:3,	11:4, 19
21:8		8 134:18	12:15, 20, 23

13:13 36:12
47:24 48:21,
22 49:12
50:1 59:8
60:4, 23
67:21 70:4,
6, 10, 19
71:1, 2, 5
73:10
recurrence
123:21
redirect
162:24 163:1
reduce 86:1,
3 119:9
reduced 86:8
143:2
reduces 18:18
reducing 85:19
redundant 50:6
reestablish
113:13
refer 5:13
7:21 12:11,
14, 17, 22
32:25 36:8,
14 77:10
107:18
112:13
129:22 141:4
152:2 161:18
reference
31:3 32:20,
23 33:23
34:13 36:14
46:14 51:8
53:6 55:2,
13 57:2
92:9 100:19
102:19 103:2,
11, 25 107:22
108:4, 13, 20
109:22
112:18
119:25
136:18, 22

137:1 155:24
161:13
references
13:11 29:14,
18, 21, 25
30:3, 8, 17
34:14, 17
53:21 56:15
57:4 60:17
68:2, 14
94:10 133:23,
25 134:19
136:16
142:11
144:11
161:14 162:10
referred
13:23 36:9
67:4 75:22
76:1 100:12
158:8 161:12
referring
33:5 43:21
62:1, 5, 14,
23 63:5, 16
64:3, 10
66:21 67:2
68:14, 15
74:20 84:14
86:15, 18
116:24 135:5,
6, 15
refers 16:24
64:17 85:14
95:10 113:4
129:22
140:20 159:21
reflect
148:23 149:5
reframe 145:15
regarding
13:12
regular 44:11
109:9
relate 57:21
related 20:11

164:9
relates 120:22
relating 96:4
Relevance
22:9, 20 91:1
relevant
31:24 33:12,
19 54:10, 14
60:13 65:18
66:3 70:11
73:12, 21, 25
74:22, 25
75:1
relied 51:9
52:21 55:16
relying 52:4,
14, 15 54:25
55:5 56:7, 8,
16 59:25
114:24
120:24 154:22
remember 7:7
12:4, 8
13:14 17:9,
11 29:11
33:23 36:3,
11 38:25
39:2, 5, 7, 8
48:1 53:11,
22, 24 54:3,
18 69:14
100:15
116:25 130:4,
16 136:19
161:23
162:17, 18
remembered
53:11
REMOTELY 1:17
2:8, 15
renders 57:3,
4
reoptimization
44:1 47:12
51:10, 17, 21
56:12 59:18
60:2 91:8

92:6 97:11,
14, 23 98:11
99:4, 12, 13
101:2, 6, 10,
15 109:8
112:23
114:18 132:6,
14, 18, 25
133:3, 10
reoptimize
37:4, 14
113:9, 18
117:17 118:5,
14 131:7
132:19 133:11
reoptimized
91:7 95:23
100:6, 11
103:1, 12
104:12
105:24 117:24
reoptimizing
36:17, 21
45:10, 12
51:22 52:5
97:2, 19
103:6, 8
104:13
105:20
108:11
118:13 131:15
repair 123:23
126:2
repeat 35:22
41:16 43:4
101:24
121:25
138:16 143:6
rephrase
35:19, 23
75:24 84:5
114:13 117:5,
11 129:14
replace 20:23
replacement
66:23
reply 66:20

report 40:6,
9, 20 130:13
Reported 1:24
2:9 40:10,
13 164:6
Reporter 2:10,
13 4:1
20:19, 20
35:22, 24
39:10, 14, 16
51:3 101:22,
23 111:6, 10
112:5 121:25
122:6 134:5,
7 138:16, 17
143:6, 7
155:20 164:2
REPORTER'S
164:1
reporting
43:25 44:11,
23
represent
74:18
representation
70:11 73:11,
21
represented
40:25
representing
85:20
represents
128:22
require 48:7
117:10, 13
151:6
required
23:19 46:15
48:8 62:15,
24 85:6
86:6 90:3
123:22
125:12 126:2
149:25
requirements
69:22 70:3

requires 21:6,
11 35:5
41:6, 14, 18,
22, 23 42:12,
15 44:2
60:6, 24
71:10 82:10
rerouted
97:13 100:7
rerun 44:14,
18, 25
rerunning
44:2, 5, 15
reselecting
65:3 66:17,
22 67:8
reselection
66:17 124:9
126:10
reserve 81:20
reserved 60:7,
25
resolved
140:5, 14
143:11
156:23 157:9
resources
25:9 59:11
70:15 73:15
respect 10:8
11:7 15:10
19:14 70:18
76:22 81:15
88:24 89:16
91:15 109:6,
21 113:7
118:11 123:6
124:21
132:19
133:22 134:3,
20 150:12
157:8
respond 21:8
119:10
responding
44:23

response 6:22
39:10, 11
45:2 139:17
responses
121:19, 20, 21
responsible
74:7 137:9
rest 92:21
157:23 158:3,
4, 8 159:21,
25
restate 122:1
restoration
11:5 12:21
13:3, 9, 11
47:23 48:6,
22 49:2
56:24 57:17,
22 58:1, 10,
11, 22 62:7
64:4, 10, 16
67:21 70:9,
19 71:1
73:10 75:18,
19, 21 76:1,
9 77:4
78:18 80:25
81:14, 21
82:8, 9, 25
83:3 87:5,
23 88:1
109:7 116:8,
21, 22 118:12
120:3
restore 48:12,
15 49:7
58:5 118:12
restoring
13:7 48:18
49:5
result 79:18
118:9
review 6:10
12:7 31:23
32:4 93:2, 4
94:8, 15, 16

reviewed 6:7,
19 13:15
28:25 90:15
93:17, 23
136:16
reviewing
93:7 162:10
right 5:4
7:1, 17, 20
11:13, 21
12:5, 10
13:1 14:21
21:15 25:14
28:14 29:19
30:25 34:24
36:18 39:14
40:25 42:19
43:2 44:3
50:23 51:10
52:4, 23
53:1 59:3, 5
63:19 64:10
65:14 68:9,
19 69:2
71:14 72:7,
24 79:24
82:18 84:22
85:3 86:13
87:18, 20
88:22 89:10
99:3 109:24
110:21
111:17, 23, 24
112:2 113:20
116:11 117:7
120:22, 24
128:16
130:13 134:2
136:9 138:20
139:14, 24
140:24
145:12, 13
146:16 147:6,
17 151:24
152:25
155:19

156:11, 15, 20	run 40:14	16, 17, 19, 24	schemes 67:21
160:13 163:7	43:15 44:22	160:1 162:18	70:10 73:10
risk 119:10	46:15, 21	says 31:6, 7	92:6
room 2:14	running 40:3	36:20 39:18	science 135:22
root 56:4	44:4, 13, 18,	46:19 47:6	Scope 22:9,
rooted 26:16	20, 23 47:9	54:12 55:9	20, 24 25:20
roughly 162:14	runs 95:11	59:6 60:3	35:4 81:1
route 8:20		61:17 68:7	89:11 91:17
13:21 15:3,	< S >	73:22 80:6	120:4, 12, 14
5 23:11	Salinas-Harwell	81:13 82:22	121:3 122:7
28:10	3:21	84:15, 17	136:6 145:21
routed 125:7	save 17:1	85:1, 4, 7, 8,	147:11
router 15:19	19:2	13, 18 86:7	148:10, 19
17:7 18:9,	saved 9:1	87:4, 15, 25	screen 30:22
20 19:3	saves 21:10	88:7 99:20	51:12, 24
20:3, 15, 22	saving 17:25	100:6 101:12,	52:8, 20
21:17, 25	18:14 20:1	15 103:11, 16	55:17 69:16
22:1 27:23,	saw 53:12	104:16, 21	72:6
25 40:4	69:4, 10, 12,	105:24 106:8,	seamlessly
45:10 46:18	25 70:2	11, 12, 19	116:2
47:3 98:9	94:17 160:9	107:9 112:25	search 29:24
103:20	saying 5:24	115:11	92:19, 22, 23
113:12 148:8,	21:9, 11	116:14	93:23 96:3
17, 25	27:12 31:12	119:25 124:6,	131:4 134:13
routers 15:3	37:6 57:25	13, 15 125:22	searched 56:3
18:13 25:3	58:5, 20	126:7 128:2,	93:21 136:7
43:17 46:18	59:3, 4 70:3	8 140:7, 18	second 5:2,
95:11 107:11,	84:21 85:17,	150:13	12 12:22
12 149:15	23 86:12	151:19, 25	21:18, 23
routing 9:1,	87:19 88:4,	152:19	22:8, 17
3 14:11, 13,	16, 22 89:3,	154:20	38:10, 12, 13,
23 15:1, 10,	4 102:9	157:11	18 58:13
20 17:20	105:1, 4	158:11, 24	69:4 103:11
20:13, 23	107:5, 15	159:7	124:8 126:9
21:2, 4	113:7, 18, 25	scan 33:11	secondary
23:14 24:15	115:25	134:1, 13	74:5, 7 75:6,
39:25 40:3,	130:17	scanned 69:7	9, 11, 13, 20
5, 12, 14, 18	131:11 133:4	scanning 56:6	section 52:4,
43:10, 13, 15,	137:19	scenario 65:2	12, 17, 18
16 46:10, 19	140:16	145:17, 23	54:6, 8, 10
47:6 88:13	141:16	146:8 148:18	81:25 88:11,
148:12	150:23, 25	scenarios	25 89:12, 13,
149:11, 19	151:2, 5	140:3 144:15	19 108:25
150:7	157:19	145:20 146:5,	129:21
rules 4:12, 13	158:17, 20, 25	6, 11, 17	137:19
	159:2, 3, 12,	147:9 148:5	151:20, 22
		scheme 106:13	152:3, 15

153:10 154:4,
9 160:10
sections 54:3
81:25
see 7:25
14:25 22:11
29:10 30:21
31:8, 12
33:19 35:23
39:20 43:24
45:4 46:8
54:12 55:17
56:6 57:15
58:10, 18
59:12 60:11
65:4 67:6,
23 68:13
70:2 71:17,
18 72:11
73:18 75:7
80:19 85:10,
12 88:14
89:13 90:23
95:17 99:13,
14, 20 100:1,
4, 9 101:18
102:5, 14
103:2 107:2
112:15, 25
116:18
119:24 130:9
133:13, 16
134:13 136:8
137:3 142:10
143:23 144:7
150:1, 15
151:2, 5, 7,
14 152:9, 22
153:10, 17, 18
154:22, 24
seeing 29:11
69:15
seeks 35:17
seen 12:17,
18 13:9, 11,
18 116:24
144:1

select 63:25
64:1, 11 79:5
selected
29:21, 23
76:13 78:1,
11, 17, 22, 24
79:17, 19, 21
92:9, 15
101:15, 20
102:2, 12, 16
104:22 106:1
selecting
83:10 137:9
138:12
selection
63:21 76:20
78:6 79:2, 4,
8 83:14, 18
129:7 137:11,
24
send 114:7
sense 16:25
44:5, 14, 18,
24 62:11
63:15 71:23
72:17 115:16
116:7 119:13
133:19
sentence
37:20 41:20
57:15 59:6
61:15, 16
67:19 68:4,
17 100:12, 18
102:6, 11, 14,
16, 21 104:17
separately
152:8
series 83:17
99:10
server 16:15,
18, 19 17:7
26:16, 19
27:5, 7, 9, 13,
16, 17, 21, 24
servers 27:19
serves 134:1

service 56:25
60:10 61:3
77:1, 2, 5
81:18 88:14
116:16
services 60:9
61:2 71:3, 6
set 12:3
16:20 20:17
24:18 25:3,
4 36:24
48:13 49:8,
21 58:6, 25
62:15, 20, 24
63:3, 9
71:24 76:8,
19 77:6, 16
82:9 91:2
95:16 97:16
98:10 99:8
112:10
113:15
114:11
115:25 116:2
117:22
118:20
128:12 132:4
137:10, 16, 18,
21 138:8
141:23 142:4,
15, 16, 17, 22
143:18, 21, 22
144:8, 10
150:14, 20
151:8 154:15
158:9 159:23
164:4, 13
sets 79:7
138:1 141:10,
12, 13, 18
142:3, 5, 9,
12, 17 143:13
150:18 151:9
setting 10:25
26:12 42:16
49:19 63:6
113:20, 21

117:18
119:11 143:13
setup 17:14
21:9 33:16
63:14 88:14
97:6 157:16,
20 158:23, 24
159:1
seven 6:11
seventh 125:5
share 84:22
86:8 123:8
shared 51:11
72:14 86:1, 3
sharing 30:20,
22 52:8
70:14 71:1
73:14 74:4,
8, 13, 15
75:4 80:18,
21, 23 81:6,
12, 16, 18, 22
82:1, 8, 12
83:1 84:11,
20, 23 85:19
86:12, 21
87:8, 11
88:9, 19
89:8 122:25
125:6 128:21
SHEET 166:1
shift 20:9
short 38:9
63:25 127:2
shorter 38:6
59:8 60:4, 22
Shorthand
2:10 57:6
63:25 164:2
shortly 163:3
show 48:15
52:7 55:5
57:2, 3
116:10 141:1
showing 51:24
52:20 55:17
68:23 77:16,

17 80:4	sitting 11:20	25 153:19	21:5, 11
108:25 125:18	12:4 13:1	154:9, 17	25:11
shown 64:5, 7	situation	156:19 158:12	spans 129:10,
69:1 71:16	16:24 62:25	Solutions	12
78:13 151:12	144:4 159:2,	3:20 160:3	speak 109:11
154:18 159:8	13, 18	solve 140:13	118:16
shows 77:11	situations	144:2 157:4,	speaking
108:14	16:15 46:20	14 158:13	10:10 41:13
109:13 121:18	80:11 142:10	solved 140:3	42:7 74:23
sic 33:11	159:22	solving 156:14	121:10, 11
side 6:12	Six 6:11	somebody 90:3	139:20
8:21 14:6	80:7	101:6	spec 106:15
24:14, 15	sixth 125:5	somewhat	161:25
Signature	size 15:13,	51:14 136:1	spec'd 47:4
166:24	14 17:21	148:6	specific
signed 29:5	18:18 19:5,	SONET 102:8	34:17 115:2
significant	22, 25 20:7	106:5, 6	145:1 154:15
19:7, 24	47:5 85:9,	soon 72:4	157:18, 20
silent 88:17	13, 19 86:1, 3	113:15	specifically
89:7	sized 25:22	Sorry 5:1	19:17 33:21
sim 127:1	sizes 26:1	20:16, 19	53:24 85:24
similar 109:5	skill 5:19	43:3 47:18	86:13 87:4
similarities	6:3 46:13	50:10 56:19	104:11
107:21 108:19	89:22 109:15	66:17 69:3	120:21
similarly	115:5 131:6	78:20 79:15	135:16
160:8	133:21	91:25 98:3	161:18, 19
simple 141:16	134:23 150:4	117:10 120:9	specification
142:7 155:25	161:17	126:13	57:18, 24
simpler 15:19	skilled 91:6	127:20 128:9	76:7 96:22,
148:1, 2	SLA 99:24	129:14 143:4	25 98:14
simplicity	slightly	146:25	106:23 107:3
156:20	12:13 20:11	151:13	133:13 134:21
simply 37:6	42:10 55:14	160:16, 21	specifies
67:5 84:18	96:22	161:7	106:1
85:25 118:8	slower 20:7	sort 57:6	specs 43:24
simultaneous	small 21:5,	66:6 106:11	speed 18:23
127:24	11 83:16	sounds 7:17	23:23 65:24
simultaneously	119:21 120:1	11:8 89:6	spend 66:7
129:11	smaller 15:14	110:5	93:6
single 126:4	18:1, 4, 7	source 16:7	spent 28:16
146:25 147:1	software	99:22 102:25	33:7 162:3,
Sir 4:22	83:12, 13, 23	104:4 141:9	14
6:5 51:12	137:9	space 15:14	Splitting
sit 93:18	sold 46:18	17:22, 25	151:18 152:8,
96:6, 7	solution	18:1, 4, 18	12 153:15
109:24	151:23 152:1,	19:4, 23, 25	
	7, 15, 20, 24,		

spot 39:12 96:18 97:21 116:10 STAMATOPOULOS 3:14 4:9 5:10 13:2 20:18 21:14 22:10, 21 23:1, 5, 7 26:2 27:15 32:2 35:7, 12, 16, 21 36:4 39:9, 17 42:5 47:20, 22 50:13, 14, 23 51:2, 6 52:3, 19 54:5 55:10 61:7, 13 65:11, 20 66:5, 12 67:15 68:18, 25 69:5, 9, 11, 17 71:14 72:11, 16, 22, 25 73:5, 8 78:14 81:2, 8, 9 86:17 87:17 89:1, 20 91:20 94:6, 18 96:11 100:25 101:24 102:1 105:17 109:19 110:2, 6, 9, 13, 19, 24 111:4, 8, 11, 15, 18 112:2, 8 115:7, 10 120:7, 10, 14, 20 121:1, 9, 17 122:9, 12 124:24 128:24 129:24 133:8 134:4, 10	138:15, 20, 21 139:4, 10, 13, 16, 22, 23 143:5 144:21 145:25 148:15 149:6 153:13, 23 154:7 155:8, 19, 23 160:16, 20, 25 161:6 162:22 163:4, 7 165:4 stand 29:6 standard 24:15 46:1 stands 141:8 start 4:2 5:21 11:12 52:25 60:20 64:13 118:8 119:13 151:21 started 92:20 starting 9:12 14:22 75:16 89:12 123:19 152:16 154:9 starts 88:13 107:5 state 37:20, 21, 23, 25 38:4, 7, 24 39:3 40:6, 9, 10, 15, 25 41:3, 14, 18, 24 42:13 43:21 45:6 46:25 48:7 59:10 64:25 67:5, 19 75:25 80:14 84:11, 22, 25 85:15, 16, 24 86:20 87:8 88:18 89:8 101:7 131:9, 23 137:17 141:5, 6	150:13 151:24 152:2, 8 167:3 stated 160:10 state-dependent 153:14 statement 65:18 STATES 1:1 36:23 40:13 47:13 73:9 81:6 88:9 95:12 137:11, 14, 16, 18, 20, 22, 23 143:2 static 137:25 138:1, 2, 8 statistical 38:19 statistics 10:7 stay 111:7 stays 147:4, 19 stenographer 3:21 stenographically 2:9 164:6 step 42:18 63:22 78:25 79:3, 4, 22 107:10 128:8 STEPHEN 3:9 steps 63:1 78:21 stick 128:6 sticking 128:7 stop 60:21 122:4 161:2, 3 store 40:19 stored 40:22 straightforward 65:23 streaming 16:16	strictly 80:8, 12 studied 8:7, 11, 15, 23 9:19 11:23, 25 13:20 15:24 16:1, 2 17:3 20:5 study 10:6 studying 15:22 sub 70:4 submits 34:10 submitted 29:5 34:2 subsection 36:19 51:19 52:16, 18 151:22 subset 137:18 141:10, 11 142:13 143:14 substance 34:13 substantial 16:12 substantially 129:3 subtract 147:20 success 91:5, 12 108:1 109:1, 16 successful 108:15 sufficient 126:4 suggest 71:19 72:3 suggests 74:6 156:18 Suite 3:5 sum 79:12, 13, 14, 16, 17 147:2 summary 17:17 98:22
---	---	--	---

supplement 5:24 support 22:5, 6 107:25 114:17 supported 107:12 Supporting 7:14 92:12 supports 57:24 105:22 suppose 41:11 Sure 5:14, 20 7:22 11:14 31:16, 18, 23 32:7 36:16 41:2, 5 42:4 45:3, 8 49:9 51:13 79:9 90:5 92:13 95:1 96:10 101:4 104:2 110:8 111:11 112:17 117:8 118:8 119:12 132:8 135:5, 15 136:9 139:5 142:9 146:1, 9 148:6 149:14 150:15, 24 151:5, 14 153:1 155:1 156:12 158:10 surprise 37:7 surprised 33:14 swear 4:3 switch 8:20 13:21 14:7 28:10 47:17 106:6 116:3 switches 21:1 switching 9:3 13:24 14:1, 9, 10, 14 15:19 18:10	20:12 24:9, 20 58:24 95:3 117:19 sworn 4:6 164:5 synonymous 57:17, 23 58:11 system 45:23 95:10 SYSTEMS 1:5 46:8 57:20 91:7 130:6 < T > table 14:14, 23 15:1, 12, 16 18:7 33:11 54:2 tables 14:17 15:5 18:12 20:23 21:13 take 4:19 6:12 28:19 32:14 42:17 43:1 46:14 47:19, 21 50:11, 24 51:1 59:10 64:20 66:11 71:12 72:9, 17 89:17 93:9 110:4, 25 113:16 114:12 124:2 133:15 135:4, 7 140:13 146:24 153:17 154:12 155:4, 8 162:21 163:2 takeaway 87:2 TAKEN 1:17 2:7 51:5 73:7 112:7	119:3 155:22 163:5 takes 20:2 23:12 63:8 127:22 128:15 132:8 talk 9:18 26:19 38:3 76:24 77:20 98:1 99:15 109:9 122:21 127:20 134:14 138:1, 10 139:25 154:4 161:18, 21 talked 17:14 104:2 116:4 144:8 talking 16:18, 19 24:7, 23, 25 37:12, 22 40:17 48:20 49:17 61:24 62:2 63:7 64:7, 8 74:3 82:1 90:23 91:4, 8 97:18 103:5 104:1 105:5 107:13, 17 113:11 114:20 115:19 117:20 120:5 142:11 147:8, 9 153:2 154:16 161:12 talks 36:17 47:12 69:18 70:4, 9 74:4 75:4, 17, 18 76:21, 23 80:3 83:8 85:18 86:4 97:4, 10 102:6 104:13,	18 105:6, 19 107:4 108:11 112:23 113:8 119:14 122:19, 23 125:25 131:15, 18 137:16 140:2 153:6, 14 156:6, 7, 21 157:21 TCP 16:11 teach 34:14 61:14 65:1 127:17 128:25 132:17 133:9 157:14 160:3 teaches 87:11 123:14 131:22 133:2 teaching 61:20 84:9 126:18, 20 133:7 teachings 34:12 tear 113:12 116:1 119:11 tearing 113:19, 23 technique 107:12 techniques 13:25 24:20 83:14, 16, 18 tell 68:19 113:3 121:15 TELSP 37:1, 4 41:6 TELSPs 36:24 term 6:2 7:24 12:14, 19, 25 13:3 14:2, 3 24:1 26:3 38:3 96:2 100:23
---	--	---	--

112:9 115:15, 23 130:1, 4 terms 5:16, 19 18:5, 11 20:1, 14 34:17 65:16, 18 66:3 84:16 85:6 86:6, 25 149:25 terrific 50:23 testified 4:6 162:15 testimony 17:18 22:24 81:4 88:20 164:8 text 64:13 textbooks 13:15 Thank 6:1 50:24 56:18, 20 72:16, 24 73:6 155:18 162:2, 22 163:7, 9 thesis 8:8, 16, 23 9:5, 10, 14, 15 13:20, 24 14:2, 4 15:23 16:21 19:13 26:8 27:12 28:1, 4, 8 thing 9:19 16:1 37:8, 17 72:2 140:7, 16 154:20 things 10:7 13:16, 21 17:22 23:23 25:11, 13, 22 26:1, 13 27:3 30:16 33:10 37:8,	9, 15, 16 38:11, 18, 21 40:7 44:12, 24 46:2, 4 55:4 60:1 65:25 71:12 85:14 91:23 94:8 103:7 104:24 111:23 114:17 122:23 133:2, 5 147:14 148:1 149:21 think 7:1 10:5 11:8, 10, 16 12:17 13:4 14:3 16:21 17:4, 19 21:7 25:14, 24 28:25 29:23, 24 31:16, 17, 21 32:7, 24 33:1, 3, 13 34:15, 16, 24 36:22 38:15 39:12 40:12, 24 42:2, 14 43:25 45:14 46:17 47:1 48:2, 9, 16 49:3, 19, 24 51:12, 14 53:9, 17 54:13 55:4, 18 56:4 59:2, 3, 18 61:11, 20 65:20, 23 69:15 71:4, 23 72:17, 18, 21 74:20, 23 75:14, 18 76:6 77:13 80:3, 11 83:6, 15	84:14 85:11 87:1, 10, 24 88:4 89:17 94:3, 17, 25 95:7 97:9, 17, 18, 24 98:11 99:6 100:13 102:8 104:2 105:8, 21 106:3, 15 107:15, 16 108:1, 23 110:2, 15, 19 111:15, 19, 24 112:11 115:8, 23, 24 116:4, 6, 24 118:10 121:17 129:19, 22 130:14, 25 133:20, 24 136:17, 24 139:17 140:21 141:8, 23 142:4 144:20 146:12, 14 147:1, 7 148:6, 20, 21 149:2 150:6, 7 151:21 152:18 153:8, 9, 14, 23, 24 154:4 156:6, 8, 16 157:11 159:12, 16, 21 160:8, 9 161:8, 24 162:14, 19, 21 thinking 40:23 93:16 136:15 thinks 111:19 Third 3:16 thought 11:20 17:11 25:21 59:1	thousands 25:18 26:24 27:8 three 64:23 140:3 145:3, 18 threshold 80:17 122:24 thrown 119:2, 5 Tiffany 3:21 tighter 154:17 158:12 time 5:7, 25 6:3 7:11 8:11 9:1, 10 11:25 13:23 19:8, 11, 12, 20 20:2, 6 26:12, 24 27:4 28:16 33:4, 7, 17 34:8 38:7, 9 44:10, 11, 19, 21 46:13 47:19 50:25 52:8 58:16 59:9 60:5, 23 61:19, 21 62:4, 8 66:6, 15 71:9, 12, 13 72:18 73:4 89:17 93:6, 24 94:11 96:9 111:25 114:10 115:18 119:4, 19 121:16, 19 123:22 126:2, 4 127:2 130:5 132:8 144:17 147:18 153:25 155:10, 14 161:1 162:3
---	--	--	---

timely 71:2, 5 121:8 timers 95:23 times 4:17 5:15 19:6 33:22, 25 45:1 59:8 60:4, 23 140:13 timestamp 52:10 tire 4:13 title 7:23 52:1, 16 150:13 titled 7:13 30:24 51:22 52:5 90:16 92:5 155:24 today 4:14 5:22 6:6 12:5 19:8 20:6 27:2, 3 29:9 45:17 93:18 94:1 96:6, 7 today's 129:25 tomorrow 38:5 top 99:21 134:18 136:10 topic 20:11 32:18 topology 40:6 70:25 95:15 97:13 100:7 101:9 tore 114:7 torn 36:25 118:20 total 128:9, 10 totally 32:7 94:25 Towers 3:11 tracking 46:25 TRADEMARK 1:1	traffic 36:17 51:22 52:5 70:5 75:17 90:16 95:3, 14, 23 113:10 114:4, 6 116:1 117:17 118:21, 23, 25 119:16 125:7 training 3:21 transcript 52:9 164:7 166:1 transmitted 69:2 Transport 7:14 treats 97:15 99:7 tree 16:22 26:12, 15, 16 trees 17:8 TRIAL 1:2 triggered 97:12 124:9 126:10 trouble 42:1 true 125:10 164:7 167:10 trust 15:4 try 4:19 42:10, 17 trying 27:6 58:1 115:1, 3 121:12 144:2, 9 150:24 tunnel 97:6 102:23 105:2 106:7 tunnels 95:22 turn 67:16 84:2 91:25 92:1 112:22 two 6:25 7:2 11:3, 9, 11, 13 12:11 38:17 41:14,	17, 23 42:7, 12, 19, 21 43:2 47:24 68:20 87:3 97:15 98:5, 6 99:8 103:17 107:11 123:24 124:2, 7 125:7 126:8, 22, 23 127:11 140:21 141:2, 10, 11, 12 142:2, 5, 12 143:13 150:18 151:8 152:20 154:13 157:8 TX 3:6 type 10:18 107:19 109:4 145:6 150:3 types 16:3 25:10 typically 15:21 38:8 40:13 46:5 67:10 typo 83:16 typos 29:11 Tyson's 3:12 < U > U,V 141:10, 25 U.S 1:12 UDP 16:11 ultimately 78:22, 24 unable 92:22 underlie 148:12 underneath 81:25 understand 42:6 51:15 67:9 69:12	71:18 100:17 120:21 125:6 136:21 138:22 142:21 144:11 145:15 155:12 understandable 73:23 understanding 8:2 34:8 64:15 84:4 115:14 136:4 140:9, 10 141:19 Understood 29:13 99:16 127:23 128:19 130:20 131:12 unfeasible 154:14 UNITED 1:1 untimely 121:14 updated 41:4 upper 25:6 66:6 use 9:16 13:1 14:25 15:5, 15 16:15 17:1 27:24 28:1, 5 38:2 46:9 49:7, 9 56:11 60:6, 24 64:11 90:20 95:23, 25 96:5, 15 100:22 106:10 108:3 112:16 114:16 122:20 125:13 131:24 140:17 143:3
--	---	---	--

150:5, 6	99:5 100:17	119:19, 25	57:3, 22
151:3, 7	122:13	121:14	58:20 59:15
156:20 157:5,	126:19 157:13	123:10	60:15 61:24
14	virtue 127:13,	130:11	63:5, 24, 25
useful 74:17,	14	133:20	64:11 67:7
18	visible 72:6	135:11	68:12 69:18
user 26:18	vs 166:2	136:19	70:2, 22
users 26:19,		142:13, 22	71:10 73:25
20	< W >	143:25 147:2,	74:2 75:16
uses 14:13,	want 7:10	7, 17 149:4,	77:20 78:5,
14, 16 24:7	15:7 20:9	22 150:14	17 80:7
51:18 62:22	24:18, 19	151:6, 8	82:4, 22
82:4 96:20,	25:24 42:21	160:23 164:11	83:24 85:4,
22, 23 97:7,	49:20, 24	ways 10:4	16 86:4, 11
15 125:14	50:15 55:21	11:18 15:24	89:2 90:15
139:24	71:20, 21, 25	28:7, 8 143:1	92:19, 25
usually 29:12	72:2 73:1	web 26:22	95:20 96:20
48:6 74:15	89:17 98:17	website 26:23,	97:20 98:17,
utilization	109:20 111:7,	25	19 99:6
80:17 122:24	20 114:2	weight 80:18	101:8 102:9
128:21	116:9 117:18	122:25	106:4, 10
utilize 70:12	128:5 131:7,	well 8:17, 24	107:13 109:4
73:12	23 132:1	9:9, 23	113:6 117:16
utilizing	134:8 144:22	10:16 11:12	121:23 124:4
82:8 83:1	146:14	12:6, 12	126:13, 20
	150:23	16:2, 7, 14	128:7 131:17
< V >	155:13	17:4, 19	132:21
V,E 141:8	160:10 162:24	18:16 19:1	133:12, 23
VA 3:12	wanted 23:5	20:4, 16, 22	137:15 138:9
validity 34:6	94:8	21:16 23:10	140:23, 25
variant 131:4	wants 86:2	24:6 26:7,	141:7 144:13,
various 4:17	warrant 133:7	21 27:1, 2,	25 145:10, 12
5:15 8:24	waste 7:10	12, 17 28:4	146:9, 25
10:5 29:18	way 8:24	29:25 32:3,	147:8 153:10,
62:11 76:11	10:17 12:11,	23, 24 34:7,	11, 20 155:11
96:21 109:10	13, 14, 22	20 35:10	156:21 157:4,
122:19	17:6 19:2	36:19 37:22	6, 16 160:5
versus 71:9	21:8, 9 28:6	38:11, 22	162:19
118:13 123:7	36:2 42:11	39:5, 24	went 4:12
vertices	47:1 48:15	40:11, 16	32:8 51:7
141:9, 11, 12,	49:7 50:7	41:8, 9	108:5 136:9
25	53:10 54:4	42:17 43:14	We're 51:3
VIDEOCONFERENCE	57:8, 23	44:10, 17	103:22
1:17 2:8	65:22, 24	46:17 47:15	105:22
view 66:7	70:13 73:14	48:1, 9, 20	106:10
80:23 81:5	92:13 111:20	49:11 50:5,	110:17 111:6,
89:6 90:7	118:3, 5	7 55:18	10 112:5

128:2 147:8,
9 153:2
155:20 157:17
We've 154:13
whatnot 25:24
WHEREOF 164:13
whichever
55:21
whoever's
49:19
window 119:4
wish 122:2
withdraw
12:12 13:10
25:15 51:21
64:19 75:9
80:22 92:25
withdrawn
30:10, 11
34:1, 20
54:7 64:15
75:11 77:24
78:23 79:15
101:13
witness 4:3,
5 35:6, 10
39:11 61:5
65:24 69:14
71:18, 23
72:13, 20, 24
86:15 96:10
110:5, 8
111:13, 17
120:5 121:4
134:5, 8
138:18 155:6
160:22 161:5
163:9 164:4,
13 165:2
WITNESSES
165:1
witness's
139:19
word 51:19
56:3, 4 58:9
59:2 64:3, 9
67:2 92:23

93:21 96:21
99:11 100:2
101:23
124:21
125:13, 14, 15
131:3 136:8,
19
words 5:16
23:2 39:2
68:3, 16
92:20 100:16
150:24
work 23:10,
12 46:19
130:7 149:19
150:8 151:4
worked 8:5
9:8 149:12
working 9:8
44:9, 10
69:24 97:16
98:8 99:9
103:3, 18
104:10 105:7
106:20 108:7
113:17 114:8
worth 132:14
133:1
write 9:10
19:13
writes 34:9
writing 9:12,
14 19:13
written 29:2,
3 68:5 110:1
wrong 133:14
wrote 8:8
69:12 161:11

< X >
Xu 136:22
137:1, 5, 8,
15, 24 138:1,
3, 6, 7, 11
139:24, 25
140:1, 2, 7,
18 143:1, 9

150:12, 25
151:10
154:22
155:24 156:3,
18 157:1, 14
158:1, 7
159:3, 4, 22
160:1, 3
161:13
Xu's 138:5,
12 140:17

< Y >
yeah 5:23
6:19 7:17
11:8 12:25
22:12 25:8,
12 28:21
31:6 33:9
34:15, 24
37:19 38:18
40:17 42:1
45:4 46:7
48:25 50:10
55:11 64:6
68:15, 25
70:5, 19
85:11 95:5
98:21 99:1
100:2 101:4
104:3, 24
105:12, 19
110:17 114:6
115:1, 8, 17
117:2 120:14
125:4 128:3
130:12
138:23
146:24
151:17 155:8
159:17 162:17
year 149:11
Yesterday
4:12, 17, 22
7:5 72:20, 21
York 3:17

< Z >
zero 119:9
Zoom 50:17
71:16 160:21