1
IN THE UNITED STATES DISTRICT COURT
2 FOR THE DISTRICT OF DELAWARE
3
- - -
4
MICROCHIP TECHNOLOGY : C.A. No. 17-1194
5 INCORPORATED, :
:
6 Plaintiff, :
:
7 vs. :
:
8 APTIV SERVICES US, LLC, :
:
9 Defendant. :
10 - - -
11 TRANSCRIPT OF PROCEEDINGS
12 TESTIMONY
13 - - -
14 Date: Thursday, April 7, 2022
15 Time: 9 o'clock a.m.
16 Place: J. Caleb Boggs Federal Building
844 N. King Street
17 Courtroom 6B
Wilmington, Delaware 19801
18
19 Before: HONORABLE JOSHUA D. WOLSON, JUDGE
20
Reporter: Rose A. Tamburri, RPR, CM, CRR
21 Notary Public of Delaware
22 - - -
VERITEXT LEGAL SOLUTIONS
23 MID-ATLANTIC REGION
1801 Market Street, Suite 1800
24 Philadelphia, Pennsylvania 19103

A P P E A R A N C E S:

SHAW KELLER LLP
BY: JOHN W. SHAW, ESQUIRE
ANDREW E. RUSSELL, ESQUIRE
I.M. Pei Building
1105 N. Market Street
12th Floor
Wilmington, Delaware 19801
(302) 298-0700
jshaw@shawkeller.com
arussell@shawkeller.com
and
SLAYDEN, GRUBERT & BEARD
BY: BRUCE SLAYDEN, ESQUIRE
BRIAN BANNER, ESQUIRE
Frost Bank Tower
401 Congress Avenue
#1650
Austin, Texas 78701
(512) 402-3550
bslayden@sgbfirm.com
bbanner@sgbfirm.com

Representing the Plaintiff

1 A P P E A R A N C E S (Cont'd)
2
POTTER, ANDERSON & CORROON
3 BY: PHILIP A. ROVNER, ESQUIRE
1313 N. Market Street
4 Hercules Plaza, 6th Floor
P.O. Box 951
5 Wilmington, Delaware 19899
(302) 984-6114
6 provner@potteranderson.com
7 and
8 DURIE TANGRI
BY: DARALYN J. DURIE, ESQUIRE
9 ERIC C. WIENER, ESQUIRE
TIMOTHY C. SAULSBURY, ESQUIRE
10 217 Leidesdorff Street
San Francisco, california 94111
11 (415) 362-6666
ddurie@durietangri.com
12 eweiner@durietangri.com
tsaulsbury@durietangri.com
13
14 Representing the Defendant
15
16
17
18
19
20
21
22
23
24

1 I N D E X
2

WITNESS PAGE
3
MARK BOHM
4
DIRECT EXAMINATION BY:
5 MR. BANNER 12
6 CROSS-EXAMINATION BY:
MR. SAULSBURY 128
7
REDIRECT EXAMINATION BY: 190
8 MR. BANNER
9
10 MITCHEL OBOLSKY
11 DIRECT EXAMINATION BY:
MR. SLAYDEN 194
12
CROSS-EXAMINATION BY:
13 MS. DURIE 282
14
15
16
17
18
19
20
21
22
23
24

1 E X H I B I T S
2

NO.	MARKED	ADMITTED
349	27	28
359	27	28
350	27	28
1	36	36
241	39	39
3	79	79
25	93	94
292	114	115
26	118	119
67	121	122
371	133	134
24	150	151
268	175	176
9	177	178
288	181	186
287	186	186
245	231	231
45	262	262
46	263	263
48	264	264
88	265	265

1 E X H I B I T S, (Cont'd)
2

246	266	266
66	271	271
36	274	274
41	277	278
238	286	286
252	290	290
248	301	301
62	304	304
58	307	307

08:13:41

1 (Whereupon, the Court commenced 08:13:41
2 proceedings at 9 o'clock a.m.) 08:13:45
3 THE COURT CLERK: All rise. The 08:13:59
4 Honorable Joshua D. Wolson presiding. 08:14:03
5 THE COURT: Good morning, 08:56:14
6 everybody. 08:56:15
7 MR. BANNER: Good morning. 08:56:15
8 MR. SAULSBURY: Good morning. 08:56:15
9 MR. SLAYDEN: Good morning. 08:56:15
10 MS. DURIE: Good morning. 08:56:17
11 THE COURT: Have a seat, please. 08:56:17
12 All right. 08:56:21
13 Well, the jurors are all here on 08:56:22
14 time, so that's positive. I did not get 08:56:25
15 anything from all of you in terms of any 08:56:31
16 issues related to this morning. Is that where 08:56:34
17 we stand; is that right? 08:56:38
18 MR. SLAYDEN: Yes, Your Honor. 08:56:40
19 MS. DURIE: Yes. 08:56:42
20 THE COURT: Okay. 08:56:43
21 And then I guess the only other 08:56:47
22 thing is -- I'm getting a lot of feedback. 08:56:50
23 There we go. Okay. Hope that 08:56:53
24 will be better. 08:56:55

1 The only other housekeeping 08:56:55
2 question I think I had was I thought we had 08:56:56
3 talked about getting revised proposed jury 08:56:59
4 instructions; is that right? Can someone tell 08:57:04
5 me? I thought we talked about that at the 08:57:10
6 final pretrial. 08:57:12
7 MR. BANNER: Yes, Your Honor, we 08:57:12
8 did talk about that. I don't know that we are 08:57:14
9 quite there yet. 08:57:15
10 THE COURT: Okay. 08:57:16
11 What's the timing on that then? 08:57:17
12 MR. BANNER: I think we can 08:57:19
13 probably get them done today. 08:57:20
14 THE COURT: Yes. I'd like to, if 08:57:22
15 possible, look at it because my goal would be 08:57:24
16 to get you a draft of my proposed instructions 08:57:26
17 tomorrow so you can play with them over the 08:57:30
18 weekend. Depending how things break and given 08:57:33
19 where we were yesterday, I'm thinking that 08:57:37
20 maybe we'll try to do a charge conference sort 08:57:39
21 of the last portion of Monday and that way we 08:57:43
22 can let our juror go and pick up her kids and 08:57:46
23 not lose her. 08:57:49
24 MS. DURIE: Perfect. 08:57:51

1 THE COURT: So if you can get it 08:57:52
2 to me today, that would be good. We made some 08:57:52
3 progress but... all right. 08:57:55
4 And then we're going to call Mr. 08:57:59
5 Bohm first this morning; right? 08:58:01
6 MR. BANNER: Yes, Your Honor. 08:58:04
7 THE COURT: All right. Just so I 08:58:05
8 know. 08:58:06
9 And I take it you're handling that 08:58:08
10 examination; is that right? 08:58:11
11 MR. BANNER: Yes, Your Honor. 08:58:12
12 MR. SAULSBURY: Hello, Your Honor, 08:58:13
13 I'm Mr. Saulsbury. 08:58:16
14 THE COURT: Great. So we know who 08:58:18
15 is handling it. 08:58:19
16 Then if there's nothing else, why 08:58:20
17 don't we get the jury in. 08:58:22
18 (Whereupon, the jury entered the 08:58:24
19 courtroom.) 08:58:28
20 THE COURT: Good morning, 09:00:31
21 everybody. Welcome back. 09:00:33
22 Let me start out by saying to you 09:00:35
23 we appreciate you being so prompt. I know the 09:00:38
24 mornings can be tough sometimes, but it is 09:00:42

1 good to get going on time and have a 09:00:46
2 relatively easy day. 09:00:48
3 Just to give you a quick preview 09:00:49
4 of what I'm envisioning for the day, we're 09:00:51
5 going to get started in just a second with the 09:00:53
6 first witness. I tend to take a break 09:00:57
7 somewhere in the range of 10:30, something 09:01:00
8 like 10 minutes, 15 minutes, and then we'll 09:01:05
9 take a lunch break. 09:01:08
10 We'll come back from the lunch 09:01:09
11 break, we'll have another session, and 09:01:11
12 probably will wrap up at that point, because 09:01:15
13 as I said, I have somewhere to be later in the 09:01:17
14 afternoon today. That will typically be our 09:01:20
15 trial day, you know, with some days like 09:01:23
16 tomorrow, we will have an afternoon break as 09:01:26
17 well. 09:01:28
18 That said, as we're sitting here, 09:01:28
19 if any of you need to break for some reason, 09:01:31
20 if something is happening, just get my 09:01:33
21 attention or someone's attention and we'll 09:01:35
22 work it out as soon as we can. I'll try not 09:01:37
23 to interrupt right in the middle of a line of 09:01:39
24 questioning, but if we're not coming up on a 09:01:42

1 break and you need one, we'll take one. Okay. 09:01:44
2 So with that... 09:01:47
3 MR. BANNER: Yeah, if I could call 09:01:50
4 the first witness, Mr. Mark Bohm. 09:01:51
5 THE COURT CLERK: Please state and 09:02:31
6 spell your name for the record. 09:02:32
7
8 MR. BOHN: Mark Bohm, M-A-R-K
9 B-O-H-M.
10 - - -
11 ...MARK BOHM, after having first
12 been duly sworn and/or affirmed, testified as
13 follows...
14 - - - 09:02:39
15 MR. BANNER: Your Honor, may I 09:02:39
16 approach? 09:02:40
17 THE COURT: Yes, please. 09:02:41
18 MR. BANNER: Good morning, members 09:03:38
19 of the jury. My name is Brian Banner and I'm 09:03:39
20 here with plaintiff, Microchip, and I'm one of 09:03:41
21 the people who is going to be helping with 09:03:43
22 this case and presenting our first witness, 09:03:44
23 Mr. Bohm. 09:03:47
24 - - - 09:03:08

1 DIRECT EXAMINATION 09:03:08
2 - - - 09:03:29
3 BY MR. BANNER: 09:03:29
4 Q. Good morning, Mr. Bohm. 09:03:50
5 A. Good morning. 09:03:50
6 Q. Could you please introduce yourself 09:03:51
7 to the jury. 09:03:53
8 A. Yes. My name is Mark Bohm. I was a 09:03:54
9 technical fellow with Microchip Technology and 09:03:57
10 I'm also one of the inventors on the patents 09:04:00
11 that are part of this case here this week. 09:04:04
12 MR. BANNER: Can everybody hear? 09:04:08
13 THE WITNESS: The seat doesn't 09:04:14
14 move. 09:04:18
15 (Brief pause.) 09:04:20
16 THE WITNESS: Shall I repeat that? 09:04:23
17 BY MR. BANNER: 09:04:25
18 Q. Can you tell us a little bit about 09:04:26
19 yourself personally. 09:04:27
20 A. Well, I live just a little south of 09:04:28
21 Austin, Texas in a town called Village of Bear 09:04:31
22 Creek.. I live in the same house that I have 09:04:34
23 with my wife for, I think we've been there 09:04:36
24 about 24 years now. We raised two children in 09:04:40

that home. 09:04:44
My children are grown and have 09:04:45
moved on. My son is a law enforcement officer 09:04:46
with the Texas Department of Public Safety and 09:04:49
my daughter is an ICU nurse in a children's 09:04:52
hospital. 09:04:57
Q. And what do you like to do in your 09:04:57
spare time? 09:04:59
A. Well, I still enjoy solving problems, 09:05:00
so I have little remodeling projects around 09:05:03
our house. We've also purchased a small piece 09:05:06
of an old cattle ranch that had been over 09:05:09
grade and we've been slowly reverting it back 09:05:14
to wildlife purposes by introducing native 09:05:17
plants and things like that, so I've been 09:05:21
staying busy. 09:05:24
Q. And are you currently employed by 09:05:24
Microchip? 09:05:26
A. No, I am not. 09:05:27
Q. And when did that end? 09:05:28
A. So I -- I retired in 2020, December 09:05:30
of 2020, the very end of the year. 09:05:33
Q. Okay. 09:05:35
So are there other things you do 09:05:36

1 that distract you during your retirement? 09:05:37
2 A. Well, there's one other item. Around 09:05:39
3 the same time that I retired, the small city 09:05:42
4 that I live in, Village of Bear Creek, I 09:05:44
5 volunteered to be the mayor of there and I was 09:05:46
6 doing that for about a year-and-a-half now. 09:05:50
7 Thankfully, it's a volunteer position, so it 09:05:53
8 doesn't take a lot of time, but it does occupy 09:05:56
9 me from time to time. 09:05:59
10 Q. So you retired and you're here in 09:06:00
11 Delaware. Can you explain to the jury why? 09:06:03
12 A. Yes. So this case started a long 09:06:04
13 time ago and we had expected that it would 09:06:08
14 complete before my plans for retirement had 09:06:11
15 come, but with COVID, a lot of things got 09:06:14
16 delayed and this case was one of those. 09:06:18
17 So Microchip had asked if I would 09:06:20
18 still be willing to be part of this trial, and 09:06:22
19 I agreed, so we set up a consulting agreement 09:06:24
20 for the purposes of just this trial. 09:06:28
21 Q. So you're working as a consultant for 09:06:30
22 Microchip currently? 09:06:33
23 A. Yes. Currently, I am a consultant. 09:06:34
24 Q. And how much -- did you and Microchip 09:06:36

1 determine how much you would get paid for your 09:06:38
2 consulting work? 09:06:40
3 A. Well, we took what was my full annual 09:06:41
4 compensation, including benefits and 09:06:44
5 everything, and divided it into an hourly 09:06:46
6 number of $188 an hour, and that's the number 09:06:48
7 that's in the consulting agreement. 09:06:51
8 Q. And does that mean your compensation 09:06:53
9 for consulting in this case is equivalent to 09:06:55
10 about what you made when you were working for 09:06:58
11 Microchip? 09:07:00
12 A. Yes. As close as we could make it, 09:07:00
13 yes. 09:07:03
14 Q. Does your compensation depend in any 09:07:03
15 way on your testimony or the outcome of this 09:07:05
16 case? 09:07:07
17 A. No, not at all. The compensation is 09:07:07
18 just based on hours. 09:07:10
19 Q. Can you tell the jury a little bit 09:07:12
20 about Microchip? 09:07:13
21 A. So Microchip is one of the top 25 09:07:16
22 semiconductor companies in the world. They 09:07:21
23 have a number of high-tech products, and many 09:07:24
24 of them include microcontrollers. And 09:07:27

1 microcontrollers are in many things that are 09:07:31
2 in our daily lives, from computers to cars to 09:07:33
3 even satellites, to help deliver our -- our 09:07:39
4 evening news. 09:07:43
5 If we just, maybe just focus on 09:07:45
6 the cars, since that is part of what we're 09:07:47
7 talking about in this trial, most cars, even 09:07:50
8 an entry level car today, probably has at 09:07:54
9 least a dozen microcontrollers in it of some 09:07:57
10 sort, and the more complicated cars like the 09:08:00
11 Tesla, for example, could have hundreds of 09:08:03
12 computers and microcontrollers in them. 09:08:07
13 And for the purposes of what we're 09:08:10
14 going to focus on, which would be the 09:08:12
15 dashboard and the head unit of the car, the 09:08:15
16 connectivity that many of us see when we're 09:08:20
17 using that car is -- is, many times, provided 09:08:22
18 by a microcontroller-based product from 09:08:25
19 Microchip. 09:08:28
20 Q. What type of work did you do while 09:08:29
21 you were still working for Microchip? 09:08:32
22 A. Well, I was a senior member of the 09:08:34
23 technical staff and we worked in the USB and 09:08:38
24 networking division and produced products for 09:08:47

Microchip, so I had a technical role, and I 09:08:50
also had a staff leadership role in the 09:08:53
division. 09:08:59
Q. I'd like to talk to you a little bit 09:08:59
about your career before Microchip. 09:09:01
Can you tell the jury a little bit 09:09:02
about your early educational and work 09:09:04
background? 09:09:07
A. Certainly. Certainly. 09:09:07
Well, for that, I'd probably have 09:09:10
to go way back, so when I graduated from high 09:09:11
school, I entered the United States Air Force 09:09:15
and did a four-year term, and while in the Air 09:09:17
Force, I started going to college at night. I 09:09:20
was based at Fairchild Air Force Base in 09:09:25
Washington state, so my early schooling 09:09:27
started there, and my normal day job, if you 09:09:30
will, that I started was we -- there was a 09:09:35
precision measuring equipment lab on the base 09:09:37
which, civilian term for that position would 09:09:41
be metrology, which would be science of 09:09:46
measurement, so that was what I did in the day 09:09:49
and at night, I began going to college. 09:09:51
After I got out of the Air Force, 09:09:53

I worked for a few different companies in the 09:09:55
aerospace industry and continued to pursue an 09:09:57
engineering degree at night, which I 09:10:00
completed, I believe it was 1995, and 09:10:03
graduated with a bachelor's degree in 09:10:07
electrical and electronic engineering from 09:10:09
California State University. 09:10:11
Q. What did you do after that? 09:10:13
A. Well, upon graduation, I accepted a 09:10:15
position for a company in Austin, Texas, and 09:10:19
that was Cirrus Logic. I worked at Cirrus for 09:10:23
a few years, transitioned to a similar 09:10:26
position at Motorola Semiconductor, and then 09:10:30
around 2000, I took a position with a company 09:10:33
by the name of Standard Microsystems, which we 09:10:38
also call SMSC for short. 09:10:41
Q. Why did you join SMSC? 09:10:44
A. Well, I wanted to pursue a career 09:10:47
change within engineering where I would take 09:10:52
on a position as a system architect, and SMSC 09:10:54
had a design center in Austin where they were 09:11:01
doing some cutting-edge design and they had an 09:11:03
opening for a system architect, so I became 09:11:06
aware of that, pursued it and took that job. 09:11:08

Q. And what did your role as a system 09:11:11
architect at SMSC entail? 09:11:14
A. So initially I was working on 09:11:16
companion chips to Intel CPUs. 09:11:19
Q. And how long did that last? 09:11:22
A. That lasted a little over a year, 09:11:24
probably almost two years, and then we 09:11:26
transitioned to working on USB 2.0 hubs. 09:11:29
Q. How long did your work on USB hubs 09:11:34
last? 09:11:38
A. Well, I've actually done many hubs 09:11:38
over the years. That lasted pretty much right 09:11:42
up until I retired from Microchip in 2020. 09:11:44
Q. Okay. 09:11:48
Can you explain to the jury how 09:11:48
you went from SMSC to Microchip? 09:11:49
A. Yes. Yes. In 2012, Microchip 09:11:52
acquired SMSC, and as part of that 09:11:56
acquisition, I transitioned and became a 09:12:00
Microchip employee at that time. 09:12:03
Q. So during this time you were working 09:12:05
on USB hubs; is that correct? 09:12:07
A. Yes, that is correct. 09:12:10
Q. Okay. 09:12:11

Can you give us -- the jury a 09:12:11
little bit of USB background to help 09:12:13
understand your work on USB hubs? 09:12:16
A. Certainly. Certainly. 09:12:18
So I guess we'll start with the 09:12:19
letters, themselves; USB stands for Universal 09:12:21
Serial Bus. I think that was covered a little 09:12:26
bit in the opening yesterday. 09:12:27
And, you know, as was also 09:12:29
mentioned, you know, it's cables that we 09:12:31
commonly use; that's what many of us think of 09:12:34
when we think of USB. 09:12:36
But USB is quite more than that. 09:12:38
It's also -- I mean, it's a standard bus that 09:12:40
has a lot of definitions of what everything 09:12:43
that plugs into it, what the behavior needs to 09:12:48
be of that device. There's protocols, there's 09:12:51
signaling levels, there's a lot of things 09:12:53
involved, and so that is an international 09:12:56
standard that we -- that we base our hub 09:13:00
products on. 09:13:03
And then within that standard, 09:13:04
there is a definition for what a hub must be, 09:13:06
along with what host and any other device 09:13:08

1 would be. 09:13:10
2 Q. When did you start all of this work 09:13:12
3 on USB hubs? 09:13:14
4 A. So that would have been 2001-2002 09:13:16
5 timeframe, if I recall. 09:13:19
6 Q. And was there something significant 09:13:20
7 about that time? 09:13:23
8 A. Well, the USB 2.0 version of the spec 09:13:24
9 had released, I think it was about a year or 09:13:28
10 two prior to when we started on doing the hub. 09:13:32
11 So that was kind of the driving activity. 09:13:35
12 SMSC did not have a USB 2.0 hub program at the 09:13:39
13 time and I felt like it was a growing market 09:13:43
14 and opportunity, and so it looked like a good 09:13:45
15 device to create, so we started on it. 09:13:47
16 Q. Okay. 09:13:49
17 You used the term, "USB spec." 09:13:50
18 Can you explain what you mean when you're 09:13:53
19 talking about the USB spec? 09:13:54
20 A. Oh, yeah. I'm sorry. I am used to a 09:13:55
21 lot of lingo that we used at our offices to 09:14:01
22 try not to spell everything out all the time. 09:14:03
23 So instead of spelling out the 09:14:07
24 term specification, we would shorten it to be 09:14:09

1 spec, and instead of USB 2 spec or USB 2.0 09:14:11
2 spec, specification, which would be more the 09:14:17
3 full name, we would just typically refer to it 09:14:20
4 as either the USB spec or USB 2 spec. And I 09:14:22
5 may kind of use either going forward, I 09:14:27
6 suppose. 09:14:30
7 Q. Were you involved in any part of the 09:14:32
8 USB specification? 09:14:34
9 A. Not the USB 2 spec, but yes, I had 09:14:35
10 actually helped do some contributions for some 09:14:41
11 of the other specs, USB 3 spec, USB 4 spec, 09:14:46
12 USB high-speed inter-chip spec and several 09:14:50
13 others. I don't remember all of them. 09:14:53
14 And then as part of that standards 09:14:57
15 process, there are lots of companies that get 09:14:59
16 involved on all of those different 09:15:00
17 specifications, each with different experts 09:15:02
18 that are participating and contributing the 09:15:05
19 knowledge that they have to make sure that the 09:15:07
20 industry gets the best specification that we 09:15:10
21 can. 09:15:12
22 Q. So tell us a little bit more about 09:15:13
23 the USB hub that you started at SMSC. 09:15:16
24 You said you started that in 09:15:21

2001-2002; is that correct? 09:15:23

A. Um-hmm. 09:15:25

Q. And then what kind of project did you 09:15:25

first work on? 09:15:28

A. Well, initially the first USB 2 hub 09:15:28

that we did was about fairly standard a 09:15:33

product, I would say. It matched the USB 09:15:37

specification; it was kind of very similar to 09:15:40

what you would expect if you were just 09:15:45

following the straight specification. 09:15:47

And then as we began to sell that 09:15:48

device and began to interact with quite a few 09:15:52

more customers. We learned that customers had 09:15:54

a lot of needs that went outside of the USB 09:15:57

2.0 specification. They wanted to 09:16:01

differentiate their products in the 09:16:02

marketplace, and there were some features they 09:16:04

wanted us to add that wouldn't violate the 09:16:06

specification, it would kind of add to it. It 09:16:09

would give them some custom enhancements. 09:16:13

And so going forward, as we would, 09:16:15

you know, work to find a good business case 09:16:18

and make sure that we had a good team ready to 09:16:21

go and be able to meet their actual delivery 09:16:26

1 schedules, we would then create those 09:16:28
2 projects. 09:16:30
3 Q. I want to take a little bit of a step 09:16:31
4 back, because I know we heard some of the 09:16:33
5 underlying technologies in the opening 09:16:36
6 yesterday, but did you prepare a demonstrative 09:16:38
7 to help explain the USB hub and kind of the 09:16:41
8 USB system? 09:16:44
9 A. Yes, I did. 09:16:45
10 MR. BANNER: Mr. Ferrer, can we 09:16:49
11 put Slide 1 up on the screen. 09:16:50
12 BY MR. BANNER: 09:16:52
13 Q. Can you tell us what this 09:16:53
14 demonstrative shows? 09:16:55
15 A. So this is a tower computer, kind of 09:16:55
16 similar to what you would have seen around the 09:16:58
17 timeframe that we came up with our invention 09:17:00
18 in the mid 2000s. And on this particular 09:17:02
19 computer, there are two USB ports on the front 09:17:05
20 panel and then those, of course, would be 09:17:08
21 driven by what we call the USB host 09:17:10
22 controller, which is the master device inside 09:17:13
23 the computer. 09:17:15
24 MR. BANNER: Next slide. 09:17:21

THE WITNESS: And in this 09:17:22
particular example, we just have three 09:17:23
devices, and if you want to plug the three 09:17:25
devices each with the cable and the plug on it 09:17:27
into the computer, you know, we don't have 09:17:31
enough ports, and so you can go to the next 09:17:33
slide and you see that we have a bit of a 09:17:35
problem. 09:17:38
So then we bring up the next 09:17:39
slide, that problem was already a foreseen 09:17:42
issue in the USB specifications, and that is 09:17:45
what we would refer to as a standard USB 09:17:50
four-port hub. It has four ports on the front 09:17:55
panel, and typically off the rear of it, there 09:17:58
would be a cable that you would plug into the 09:18:00
device that contained the host controller. 09:18:03
And this enables you, in the 09:18:06
particular example we have here, to use one 09:18:09
port up, but to give yourself another 09:18:11
additional four ports, and then you can plug 09:18:14
in three devices and still you will have two, 09:18:18
three ports available for any other products 09:18:22
you want to put in. 09:18:24
BY MR. BANNER: 09:18:25

Q. Is the USB hub that you designed at 09:18:25
SMSC, is that similar to the hub we see here 09:18:29
in this demonstrative? 09:18:31
A. Well, SMSC and Microchip were both 09:18:32
semiconductor companies, and so I think a 09:18:35
little of this was shown yesterday in some of 09:18:38
the opening arguments, but we actually built 09:18:40
the chip, and the chip or the semiconductor 09:18:42
device would be inside that box. 09:18:45
So our customers would normally 09:18:48
make that box and sell it, but our chip would 09:18:50
be inside, and the chip would have all the 09:18:53
brains of everything that you needed to make 09:18:55
it a spec compliant hub to work in the 09:18:58
industry. 09:19:02
Q. What does a USB hub chip look like? 09:19:03
A. Well, I think we brought some 09:19:06
demonstratives of that as well. 09:19:09
MR. BANNER: Your Honor, may I 09:19:11
approach? 09:19:31
THE COURT: Yes. 09:19:32
THE WITNESS: Okay. You see, I 09:19:42
put my glasses on because these things get a 09:19:47
little small. 09:19:49

1 (Whereupon, Trial Exhibits 349, 09:19:49
2 359 and 350 were introduced.) 09:19:50
3 BY MR. BANNER: 09:19:50
4 Q. Mr. Bohm, can you just describe what 09:19:50
5 I've handed you, Exhibits 349, 359 and 350? 09:19:52
6 A. Ah, yes, of course. 09:19:56
7 So Exhibit 349, these are some 09:19:59
8 chips. I believe these are the Sandia device 09:20:02
9 4916, if I recall. 09:20:07
10 We also have Exhibit 359 is -- a 09:20:11
11 break out box is what we call it, which is 09:20:16
12 basically a hub in the automotive industry 09:20:20
13 where this would be in your car dashboard or 09:20:22
14 center console or somewhere, usually 09:20:25
15 convenient, so that you can plug in your 09:20:28
16 phone. 09:20:30
17 And then Exhibit 350 is the 09:20:30
18 circuit board that would go inside of this 09:20:36
19 break out box. So these are effectively the 09:20:39
20 same thing, just one with the plastic 09:20:41
21 enclosure, one where the -- excuse me -- 09:20:42
22 plastic enclosure has been removed. 09:20:47
23 MR. BANNER: Your Honor, I'd move 09:20:49
24 to admit Exhibits 349 and 359 and 350. 09:20:50

1 MR. SAULSBURY: No objection. 09:20:54
2 THE COURT: All right. Admitted. 09:20:55
3 BY MR. BANNER: 09:20:56
4 Q. Mr. Bohm, going back to the Sandia, 09:20:57
5 the question I asked before I brought those up 09:20:59
6 is what does a hub chip look like. Can you 09:21:01
7 kind of show that to the jury? 09:21:04
8 A. I can. We have a couple of them 09:21:05
9 here. They're all based on the exact same 09:21:07
10 semiconductor die, that's the actual chip that 09:21:10
11 goes inside. This is the largest variant that 09:21:14
12 we have, and I'm showing you the bottom 09:21:17
13 because it's -- the other side is just pure 09:21:19
14 black, it's the part you would see if you 09:21:22
15 actually looked at the circuit board. It is 09:21:23
16 just a plastic lid really over it. 09:21:26
17 But on the bottom, there are a 09:21:28
18 bunch of pins that get attached to the wires 09:21:30
19 that are on the circuit board, so there's 09:21:34
20 electrical connectivity so the hub can 09:21:37
21 function. 09:21:40
22 And -- 09:21:40
23 Q. Sorry to interrupt, did you have a 09:21:42
24 circuit board there as well? 09:21:43

A. I do. I'll hold it up in just a 09:21:44
minute. But here is the smaller chip so you 09:21:47
can get an idea of the actual device, itself, 09:21:51
is even smaller. It fits within this package, 09:21:54
and it's really just a matter of how many pins 09:21:57
you have to bring out for which size package 09:22:01
that we put it in. 09:22:03
And then I believe you wanted me 09:22:04
to hold this up? 09:22:07
Q. Exhibit 350, yes. 09:22:10
A. So in this case, the first chip that 09:22:11
I held up would be located right here on the 09:22:13
circuit board and it would provide the USB 09:22:17
connectivity to the connectors on the front 09:22:21
that you would be plugging your phone or a 09:22:23
pendrive or something into, and then the car, 09:22:27
itself, would connect through a cable on the 09:22:29
back of the break out box up to the head unit, 09:22:32
and so those would typically not be cables 09:22:35
that you would see or have access to. 09:22:38
Q. You used the term -- you said head 09:22:40
unit, and I think we saw some of that in the 09:22:42
opening yesterday, but can you explain what 09:22:44
the connection is to the head unit? 09:22:46

A. Oh, certainly. 09:22:48
So a head unit is really just an 09:22:49
automotive term to describe the computer that 09:22:52
is in the dashboard of a car, and it's a 09:22:55
computer with a screen, not that different 09:22:58
than your laptop or a tablet computer or 09:23:00
something like that. It's just specially 09:23:03
formatted and made for use in an automobile. 09:23:07
And typically you don't have a 09:23:10
keyboard like you might on your laptop, they 09:23:11
only have a touchscreen or some other type of 09:23:14
convenient pointing device. 09:23:16
Q. Mr. Bohm, does Exhibit 359, I believe 09:23:19
you called it a break out box; is that 09:23:23
correct? 09:23:27
A. Yes. I guess I didn't really explain 09:23:27
that term either, did I? 09:23:29
Q. Okay. 09:23:32
A. Sorry. 09:23:32
So in the automotive industry, 09:23:34
just like they have a special name for the 09:23:35
computer that is the entertainment center, 09:23:38
which is the head end unit, they have a name 09:23:41
for the hub as a break out box, and so we just 09:23:44

1 refer to it as a break out box or honestly, we 09:23:50
2 usually just use shorthand and call it a BOB, 09:23:53
3 a B-O-B. 09:23:57
4 Q. Thank you, Mr. Bohm. 09:23:58
5 I want to -- you can put those 09:24:00
6 down and I want to talk a little bit more 09:24:02
7 about your work at SMSC. 09:24:04
8 A. Okay. 09:24:06
9 Q. How did you get involved in designing 09:24:06
10 the USB hub chip at SMSC? 09:24:08
11 A. Well, again, as I had I think, 09:24:11
12 mentioned before, we recognized that SMSC, 09:24:14
13 with the updated standards to the USB 2.0 09:24:18
14 spec. 09:24:22
15 Now, there had been hubs and stuff 09:24:23
16 in the USB 1 spec, but the USB 2 spec was a 09:24:25
17 pretty big speed performance enhancement for 09:24:29
18 USB, and it really helped to accelerate the 09:24:32
19 adoption of USB throughout the industry, and 09:24:36
20 so that was the catalyst that drove the 09:24:40
21 thinking behind SMSC starting on a hub 09:24:43
22 program. 09:24:46
23 Q. Were there any challenges you faced 09:24:48
24 by designing a USB hub chip? 09:24:49

A. Yes, there absolutely were. You 09:24:52
know, in the -- in spec, of course, you know, 09:24:54
there's a lot of definitions involving the 09:24:56
rules you have to follow and everything that 09:25:00
the hub chip itself must do, but out in the 09:25:03
industry, as you have a number of different 09:25:06
companies inventing different products, not 09:25:09
everybody reads the specification exactly the 09:25:11
same way. They may interpret one piece of it 09:25:13
or another slightly differently. 09:25:16
And so when they come out with 09:25:17
their products, you know, while they usually 09:25:18
work together pretty well, there's almost 09:25:22
always a little, what we would refer to as 09:25:24
corner cases, where something didn't really 09:25:26
work as you had expected. 09:25:28
And a hub is expected to just 09:25:30
expand the number of ports that are available, 09:25:34
but then make no other changes. So if you 09:25:36
have a product that works perfect when you 09:25:39
plug it directly into a host port, you would 09:25:42
expect that product to work exactly the same 09:25:45
way when you plug it into a hub port. 09:25:48
And we hadn't realized, when we 09:25:51

1 started developing our hubs, that while that 09:25:53
2 sounds like an easy issue, that's actually a 09:25:55
3 lot more challenging than we ever really 09:25:58
4 imagined. We had to create a pretty 09:26:00
5 sophisticated interoperability environment, 09:26:02
6 simulation environments, you know, a lot of 09:26:05
7 work to be able to go through and figure out 09:26:09
8 when another device didn't operate quite the 09:26:12
9 same through our hub as it did when directly 09:26:15
10 put into the host, why was that. 09:26:18
11 And in some cases, we actually had 09:26:20
12 to make minor adaptive changes to our hub that 09:26:23
13 actually slightly violated what the spec said 09:26:28
14 our hub had to do, but in order for our hub to 09:26:30
15 work with some of these devices out in the 09:26:33
16 marketplace, we just had to make these little 09:26:36
17 tweaks and then we could work very compliantly 09:26:39
18 with all these other products and make sure 09:26:43
19 that we didn't have any ill side effects with 09:26:44
20 anything else. 09:26:47
21 Q. How many hubs did you design? 09:26:48
22 A. I actually don't have a memorized 09:26:52
23 number, but somewhere -- 15, 20 is a very safe 09:26:54
24 estimate. 09:26:59

Q. In your work designing hub chips, has 09:26:59
there been any particular emphasis or focus 09:27:02
for you? 09:27:05
A. Well, I think I touched on it 09:27:05
earlier, that we always would strive to have a 09:27:08
solid business case. And then next in line, 09:27:11
we worked very closely with our customers to 09:27:14
always understand what their needs were that 09:27:17
would be outside of the USB spec; the extra 09:27:21
features that, you know, they were going to 09:27:23
demand in order to ensure that their product 09:27:24
could win in the market segments that they 09:27:27
sold in. 09:27:30
Q. Can you give us some examples of -- 09:27:31
you mentioned kind of going outside the USB 09:27:34
spec. Can you give us some examples of where 09:27:37
you sought out while you were working on the 09:27:41
hub? 09:27:43
A. Certainly. One would be on the 09:27:43
product that's still in front of me here, the 09:27:46
Sandia device, Exhibit 349. One of the 09:27:48
non-standard features is the multi-host device 09:27:51
controller that is the discussion of some of 09:27:55
the patents in this case. 09:27:58

Q. And why do you consider that to be a 09:27:59
non-standard? 09:28:00
A. Well, the USB specification, itself, 09:28:01
is written so that there's a single host 09:28:03
controller that's in charge of the USB bus 09:28:07
that all the devices connect into. And so all 09:28:12
the devices are designed to only be talking to 09:28:16
a single host computer, and multi-host device 09:28:19
controller idea is one that allows a device to 09:28:24
talk to more than one host. And so that's why 09:28:27
it is outside of the USB specification, 09:28:30
itself. 09:28:33
Q. Is the Sandia project the only time 09:28:35
you have encountered a non-standard USB device 09:28:37
that could talk to two USB hosts at the same 09:28:41
time? 09:28:43
A. No, no. We actually had enabled a 09:28:43
feature on our prior family of products that 09:28:47
internally we called the Athens products where 09:28:50
we could connect two different hosts, but it 09:28:53
was more of a switching-based product where we 09:28:56
could allow a device to connect to one host or 09:29:00
the other, but it did not have simultaneous 09:29:03
connectivity, not the same way that we enabled 09:29:07

in the Sandia chip. 09:29:09

Q. Mr. Bohm, could you turn to your 09:29:11

witness binder and look at Exhibit 1 in your 09:29:13

witness binder, please. 09:29:17

A. Let me make a little room here, put 09:29:18

aside these exhibits, I think. 09:29:26

And where did you -- 09:29:35

Q. Exhibit 1, please. 09:29:36

A. Exhibit 1? 09:29:37

Q. Yes. 09:29:40

A. Okay. 09:29:41

(Whereupon, Trial Exhibit 1 was 09:29:41

introduced.) 09:29:41

BY MR. BANNER: 09:29:42

Q. Do you recognize this document? 09:29:42

A. Yes. This is what we refer to as the 09:29:45

'243 Patent. 09:29:48

MR. BANNER: Your Honor, I move to 09:29:52

admit Exhibit 1 into evidence. 09:29:53

MR. SAULSBURY: No objection. 09:29:56

THE COURT: All right. It will be 09:29:56

admitted. 09:29:57

BY MR. BANNER: 09:30:01

Q. Mr. Bohm, you called it the '243 09:30:02

1 Patent. Can you describe why you called it 09:30:06
2 that? 09:30:08
3 A. Yes. In the upper right corner is 09:30:08
4 the patent number, and we just refer to it by 09:30:10
5 the last three digits, which would be '243. 09:30:14
6 Q. And are you listed as an inventor on 09:30:19
7 this patent? 09:30:23
8 A. Yes, I am. Under the inventor 09:30:23
9 section, I am listed along with my 09:30:26
10 co-inventor, Atish Ghosh. 09:30:30
11 Q. And when was the application that led 09:30:31
12 to the patent filed? 09:30:33
13 A. If you look lower in the same left 09:30:36
14 column, the filed date is June 21, 2006. 09:30:38
15 Q. So between the two inventors, you and 09:30:42
16 Mr. Ghosh, who was the first person who came 09:30:46
17 up with the idea in this patent? 09:30:49
18 A. Well, to be honest, it's long enough 09:30:51
19 ago and we were both very deeply involved in 09:30:54
20 the inventions, so neither of us can honestly 09:30:59
21 remember who had the first portion of the idea 09:31:03
22 and exactly who contributed which piece. So 09:31:05
23 we pretty much feel that it was a full 09:31:07
24 co-development between the two of us. 09:31:10

Q. Did you and Mr. Ghosh have the same 09:31:11
level of seniority at the time you came up 09:31:13
with this idea? 09:31:16
A. At the time, we did. We were 09:31:16
co-workers. And I don't remember exactly 09:31:18
when, but it was sometime afterwards, I was 09:31:20
promoted and became the department manager and 09:31:23
I managed Atish. 09:31:25
Q. And what led you -- sorry, excuse me. 09:31:28
What led you and Mr. Ghosh to come 09:31:30
up with the idea of the '243 Patent? 09:31:33
A. Well, we had been working on a 09:31:35
preceding product that we had called the 09:31:37
switching hub, which is very similar to the 09:31:41
device I mentioned a few minutes ago where, 09:31:43
again, it had the ability to switch devices 09:31:45
from one host to another, and we became very 09:31:48
keenly aware of many deficiencies in that 09:31:53
design that we felt we wanted to find a 09:31:56
solution for. And so that led us to the 09:31:59
innovations that are contained in the '243 and 09:32:03
other patents. 09:32:07
Q. Mr. Bohm, can you please turn in your 09:32:08
exhibit binder to Exhibit 241. 09:32:11

A. I'm sorry, did you say 241? 09:32:16
Q. 241, yes, sir. 09:32:19
A. Okay. Okay. 09:32:21
(Whereupon, Trial Exhibit 241 was 09:32:21
introduced.) 09:32:21
BY MR. BANNER: 09:32:35
Q. Do you recognize this document? 09:32:35
A. Yes. This is a paper that I had 09:32:37
written titled The SMSC Switching Hub. I 09:32:41
created it in the fall of 2005, and it was for 09:32:48
an internal technical gathering of SMSC 09:32:52
engineers. 09:32:56
MR. BANNER: Your Honor, I move to 09:32:57
admit Exhibit 241 into evidence. 09:32:58
MR. SAULSBURY: No objection. 09:33:00
THE COURT: All right. Admitted. 09:33:01
MR. BANNER: Can you put 241 up on 09:33:03
the screen, please. 09:33:05
BY MR. BANNER: 09:33:06
Q. So, Mr. Bohm, does this paper have 09:33:07
anything to do with the '243 Patent? 09:33:09
A. A little bit in two ways. So this is 09:33:12
referring to the product that I had mentioned 09:33:16
that Mr. Ghosh and I were working on, we were 09:33:18

1 recognizing some deficiencies of, and some of 09:33:22
2 those deficiencies are talked about in this 09:33:25
3 paper. 09:33:27
4 But we do also, just briefly, 09:33:28
5 introduce the concept that we realized there 09:33:30
6 is another way to do this, and so we did 09:33:33
7 comment on it in this paper. 09:33:36
8 MR. BANNER: Mr. Ferrer, can we go 09:33:39
9 to Figure 2 on page 3. 09:33:41
10 BY MR. BANNER: 09:33:46
11 Q. So, Mr. Bohm, can you explain what 09:33:47
12 we're seeing here in Figure 2 of Exhibit 241? 09:33:49
13 A. Certainly. Yes. 09:33:53
14 So this is what we refer to as a 09:33:54
15 simple USB switch, as the figure is titled. 09:33:58
16 The darker box, I think it's coming in as 09:34:03
17 purple on the large screen, is the USB 2.0 09:34:07
18 hub, pretty much a standard four-port USB hub, 09:34:11
19 and above it is a switch and that switch 09:34:14
20 enables you to connect to either the host 09:34:17
21 computer on the left or the host computer on 09:34:21
22 the right, and both of those are at the top of 09:34:24
23 the diagram. 09:34:27
24 Q. So are both of the computers in the 09:34:27

1 diagram, are they both connected to the 09:34:30
2 switch -- is that a cable? What is that black 09:34:33
3 thing? 09:34:36
4 A. Yes. So the black lines would 09:34:37
5 represent a cable, and yes, both hosts would 09:34:39
6 be simultaneously connected to the product at 09:34:42
7 all times. Yes. 09:34:46
8 Q. Are the hosts actually connected to 09:34:47
9 the devices, the printer and the camera at the 09:34:50
10 bottom of the screen, at the same time? 09:34:53
11 A. No, they are not. No. 09:34:55
12 So the way this kind of a device 09:34:57
13 works, even though physically the cables are 09:34:58
14 attached electrically, the switch chooses 09:35:00
15 which of those two devices shown, one is a 09:35:05
16 printer and one is a digital camera in that 09:35:09
17 particular example. You either get the hub 09:35:11
18 and those two devices connected to the host on 09:35:15
19 the left in a USB fully connected and usable 09:35:17
20 state or a host on the right, but only one 09:35:24
21 host or the other actually has ownership of 09:35:27
22 the devices at any one time due to the switch. 09:35:31
23 MR. BANNER: Mr. Ferrer, if we 09:35:37
24 could turn to one page back on page 2 of 09:35:38

Exhibit 241, Section 2, towards the bottom. 09:35:41
BY MR. BANNER: 09:35:45
Q. There's a paragraph there, Mr. Bohm, 09:35:45
that starts with, "Each USB device is designed 09:35:47
to be enumerated by 1 and only 1 host 09:35:51
controller." 09:35:53
Do you see that? 09:35:54
A. Yes. 09:35:55
Q. Can you explain what that sentence 09:35:56
means and how it relates to the switches that 09:35:58
you just discussed, if at all? 09:36:00
A. Certainly. 09:36:04
So, you know, probably first and 09:36:05
foremost, I should explain the word 09:36:08
"enumerated." So that's a term out of the USB 09:36:10
specification. 09:36:14
I won't necessarily go into all 09:36:15
the rules associated with it, but when you 09:36:17
plug something into a USB host, it doesn't 09:36:20
know anything about what you just plugged in. 09:36:23
It could be a mouse, it could be a printer, it 09:36:26
could be anything. 09:36:28
So there's a series of steps that 09:36:30
the host has to go through to figure out what 09:36:32

1 got plugged in and how to use it. And the 09:36:34
2 first of those series of steps in the spec is 09:36:37
3 referred to as enumeration. 09:36:41
4 And so what this -- so what this 09:36:43
5 sentence is indicating is, as I had described 09:36:49
6 previously, that all of the USB devices that 09:36:54
7 we were aware of at the time had always been 09:36:57
8 designed to be only enumerated by one host. 09:36:59
9 There was no way to have another host plug 09:37:03
10 into it and also enumerated at the same time, 09:37:05
11 because the device is enumerated by the single 09:37:09
12 host that it's attached to. 09:37:12
13 Q. Does that concept relate at all to 09:37:14
14 your '243 Patent? 09:37:16
15 A. Yes, it does, because that's one of 09:37:17
16 the things here that we determined is, you 09:37:21
17 know, we needed to make a change to the way 09:37:23
18 the devices, themselves, operated in order to 09:37:25
19 get around that restriction. So that actually 09:37:28
20 did lead to the development of the '243 09:37:32
21 Patent. 09:37:35
22 Q. And does this paper that you wrote in 09:37:35
23 2005 describe that? 09:37:38
24 A. Yes. If I remember right, it's near 09:37:42

1 the end. I think that's page 6. 09:37:45
2 MR. BANNER: Mr. Ferrer, can we go 09:37:50
3 to page 6. 09:37:51
4 THE WITNESS: If I'm recalling 09:37:52
5 right. 09:37:54
6 BY MR. BANNER: 09:37:55
7 Q. And where on this page are you? 09:37:56
8 A. So the very last paragraph of 09:37:58
9 Section 5, just before Section 6. Yes. 09:38:01
10 That's correct. That's the one. 09:38:04
11 Q. Okay. 09:38:05
12 Do you want to explain? 09:38:06
13 A. Yes. So when it starts off saying, 09:38:07
14 "This device," it's talking about a device 09:38:11
15 that we think we need to make in the future. 09:38:12
16 So it's referring to the idea of a 09:38:15
17 device that is modified so that it can be 09:38:16
18 enumerated by two or more hosts 09:38:20
19 simultaneously. 09:38:24
20 And I guess I can just read the 09:38:25
21 sentence. "This device may be possible within 09:38:27
22 a single-chip solution, because the hub 09:38:30
23 controls device routing, and it can be built 09:38:32
24 to route the same device to multiple hosts 09:38:35

(simultaneously). In this way, a USB device 09:38:40
could be accessed by more than one host 09:38:42
(without having to switch it). The device 09:38:43
itself would need to support being configured 09:38:46
and accessed by multiple hosts, and would 09:38:48
therefore be a custom device." 09:38:53
And by custom device, I would kind 09:38:55
of count that into it's outside of the USB 09:38:58
specification. 09:39:01
Q. All right. Thank you, Mr. Bohm. 09:39:03
MR. BANNER: Mr. Ferrer, could we 09:39:05
go back to Exhibit 1, the '243 Patent. 09:39:07
BY MR. BANNER: 09:39:11
Q. Mr. Bohm, can you tell the jury what 09:39:11
the title of your '243 Patent is? 09:39:13
A. Absolutely. It's in that upper left 09:39:16
column, Item 54 is "MULTI-HOST USB DEVICE 09:39:20
CONTROLLER." 09:39:28
Q. And why did you give that name to 09:39:28
your patent? 09:39:30
A. We chose that name because we thought 09:39:30
it was very descriptive of the idea and what 09:39:32
the patent contained. 09:39:35
Q. All right. 09:39:38

1 Is there a place where the legal 09:39:39
2 definition of the inventions are set forth in 09:39:41
3 the patent? 09:39:44
4 A. Yes. That is the Claim section. 09:39:45
5 That's an interesting section. It's where the 09:39:50
6 lawyers take your idea and put a lot of legal 09:39:52
7 words around it, but it takes many of us a 09:39:54
8 little while to kind of stare at them and 09:39:59
9 figure them all out. 09:40:00
10 Q. Well, I apologize on behalf of the 09:40:01
11 lawyers who do that. 09:40:04
12 Let's look at Figure 1 of your 09:40:05
13 patent. 09:40:07
14 MR. BANNER: And that's on page 3, 09:40:07
15 Mr. Ferrer. 09:40:09
16 BY MR. BANNER: 09:40:09
17 Q. Mr. Bohm, can you explain what is 09:40:11
18 seen here in Figure 1 of the patent? 09:40:13
19 A. Just a second while I flip back to 09:40:18
20 it. 09:40:21
21 So Figure 1 is a very simple block 09:40:23
22 diagram. The USB multi-host controller, the 09:40:27
23 device that we entitled Patent, is right in 09:40:32
24 the center in that box, 108, and of course 09:40:35

it's assumed to be contained in some other 09:40:38
product, and that's the 106. 09:40:41
And then there is a host on the 09:40:44
left side called Host 1 that has a designation 09:40:46
of 102 and a second host on the right side 09:40:49
with a designation of 104. 09:40:53
Q. Let's move to Figure 2 which is 09:40:58
directly below this. 09:41:01
Mr. Bohm, can you tell us what 09:41:04
we're seeing in this figure of your patent? 09:41:06
A. Yes. So this is a little bit of an 09:41:08
expanded diagram showing several different use 09:41:12
cases. In this case, there's just two hosts 09:41:15
shown, but it could work for more than that. 09:41:18
The hosts are, again, on the left 09:41:21
and the right, but this time, the picture, 09:41:23
there is a tower computer, along the left at 09:41:27
123 and the one on the right is 122. 09:41:31
And we have several devices, a 09:41:35
printer with a number 120 on the top, we have 09:41:37
a monitor kind of right in the middle at 124. 09:41:43
And you'll notice for each of these products, 09:41:48
they each have a black line going to them that 09:41:51
then leads to one host or the other. 09:41:54

1 And that is showing that without 09:41:56
2 any switching devices or anything, that we can 09:41:58
3 just direct attach these upgraded peripherals 09:42:01
4 that have the ability to be enumerated by 09:42:06
5 multiple hosts directly to those multi-hosts 09:42:08
6 and respective functions. 09:42:13
7 Q. Can you give an example of why 09:42:14
8 someone would use one monitor and connect it 09:42:17
9 up to two different computers? 09:42:20
10 A. Well, one that would come to mind 09:42:22
11 would be some data center kind of solution 09:42:25
12 where you've got, you know, many different 09:42:29
13 computers that are doing some network routing 09:42:32
14 or something in your company's environment. 09:42:35
15 And most of those computers don't have a 09:42:39
16 dedicated keyboard and a mouse with them or a 09:42:41
17 monitor; you know, it's just a rack of 09:42:45
18 computers stacked on top of one another. 09:42:48
19 So classically, that has been done 09:42:50
20 with what we've called KVM switches, keyboard 09:42:52
21 video monitor switches, where you can just 09:42:57
22 switch between the different computers and 09:43:00
23 choose which one would get a single access to 09:43:01
24 the single monitor keyboard and mouse kind of 09:43:04

alongside the unit. 09:43:08

And we were just trying to picture 09:43:09

here that in certain applications, you would 09:43:11

be able to solve that problem where you 09:43:13

wouldn't have to have a switch and you could 09:43:15

just connect it and access the computers 09:43:17

directly. 09:43:21

Q. So is there a switch in Figure 2 of 09:43:22

your patent, a KVM switch that you are talking 09:43:25

about? 09:43:29

A. We do talk about one as a prior art 09:43:29

item, yes. 09:43:31

Q. Okay. 09:43:32

Is it shown in Figure 2? 09:43:33

A. No, it is not. 09:43:34

Q. Okay. 09:43:35

And why is that? 09:43:36

A. Because our solution does not require 09:43:37

the switches. Again, that was part of what 09:43:41

drove the invention, itself, was we wanted to 09:43:44

eliminate the need for them at all. 09:43:48

MR. BANNER: Mr. Ferrer, if we 09:43:53

could go to Figure 3 of the '243 Patent. 09:43:54

BY MR. BANNER: 09:43:57

Q. Mr. Bohm, can you explain this figure 09:43:58
that is displaying here? 09:44:02
A. Yes. I know this was also talked 09:44:04
about a little bit in the opening, but it 09:44:06
seems worth going through again. 09:44:09
So at the top, we have connections 09:44:13
to the first and second host. Those are the 09:44:17
little arrows on the top of the diagram. The 09:44:20
first box as you come in is Box 302, 304. 09:44:24
Those are the USB electronics to enable 09:44:30
connectivity to the ports, themselves. 09:44:33
And then as we move downward, 09:44:35
Box 306 and 308, we refer to those as the USB 09:44:38
endpoint and status blocks. That's where 09:44:43
those controllers are doing a lot of 09:44:46
communication to the device. These are the 09:44:48
memory locations that the host is generally 09:44:50
dialoguing directly with, and there's a lot of 09:44:54
other status and required functions per the 09:44:57
USB spec that needs to occur in those blocks. 09:45:03
And because this particular 09:45:06
example has two hosts shown at the top, we 09:45:08
have duplicated all of these so that the 09:45:12
device is able to satisfy all the requirements 09:45:14

of each host separately from one another. 09:45:17

Q. Mr. Bohm, let me break that down a 09:45:20

little bit and let's talk about the two boxes 09:45:22

at the top, 302 and 304, and they are labeled 09:45:25

Upstream Port. 09:45:29

Do you see that? 09:45:30

A. Yes. 09:45:31

Q. Can you just explain what a port is 09:45:31

in this context? 09:45:33

A. Certainly. 09:45:35

So, now, perhaps the easiest way, 09:45:36

thinking back to the -- one of the first 09:45:38

diagrams on the hub, a little square box where 09:45:41

you had the connection point for doing the 09:45:44

actual device attached, where you're going to 09:45:47

plug a product in. 09:45:52

In our part here, these are the 09:45:54

actual electronics that live behind that port 09:45:57

that you see. So from a user's standpoint, 09:46:01

you don't see these, these are buried in the 09:46:04

chip, but they would directly connect to those 09:46:07

ports that you see on the front of your 09:46:09

computer. 09:46:12

Q. Thank you. 09:46:12

1 And then on the two boxes below 09:46:13
2 the port, they are labeled 306, 308 and have 09:46:15
3 the words, "USB Endpoint & Status," under 09:46:20
4 that. Can you explain what an endpoint is? 09:46:26
5 A. Yes. That is a USB 09:46:28
6 specification-defined term. 09:46:32
7 An endpoint, I think I touched on 09:46:34
8 it a little, but an endpoint is, you know, the 09:46:36
9 memory location inside of the device that the 09:46:40
10 host, when it's doing its communications with 09:46:43
11 the device, the host will either deliver data 09:46:46
12 down into that location or it will pull data 09:46:49
13 out of that location, depending on what the 09:46:53
14 host is doing with the device at the time. 09:46:56
15 So they're referred to as endpoint 09:46:59
16 and status registers so that the host knows, 09:47:01
17 you know, the state of the product, as well as 09:47:05
18 getting access to the data. 09:47:09
19 Q. Did you make up the term or invent 09:47:11
20 the term "endpoint"? 09:47:13
21 A. No, no, no, not at all. Again, that 09:47:14
22 is right out of the USB specification, itself. 09:47:18
23 And honestly, I think any USB product I've 09:47:21
24 seen from anyone anywhere in the world, they 09:47:24

almost always refer to it as USB endpoint. 09:47:27
Q. And then what's in Box 108 below the 09:47:29
endpoint and status? 09:47:32
A. So here is where we, you know, we 09:47:33
kind of get into the specifics of the '243 09:47:37
Patent, itself, beyond just the duplicating of 09:47:41
the items up above. 09:47:45
This is where, you know, we have 09:47:47
to have some control logic that is aware of 09:47:48
the two different hosts and it has to keep the 09:47:54
data straight between the two of them. 09:47:56
So this is a USB multi-device 09:48:00
controller that we built for whatever product 09:48:04
that you're going to put in it. 09:48:06
Q. What about Box 312 at the bottom? 09:48:07
A. And 312 is referring to the device or 09:48:10
function, and in this case, really probably 09:48:14
the easiest way to think of it is, is whatever 09:48:16
the product was that you bought. So if you 09:48:18
bought a mouse, whatever makes that mouse a 09:48:20
mouse, that's the device or function. 09:48:22
If you buy a printer, you know, 09:48:24
the intelligence that takes the data and turns 09:48:26
it into words on the page, again, that would 09:48:31

be the device or function. 09:48:33
So this would obviously vary a 09:48:35
lot, depending on what the actual product was 09:48:37
that you bought. 09:48:40
Q. Are there any more figures in your 09:48:42
patent, Mr. Bohm? 09:48:44
A. No, I believe that's all. 09:48:45
Q. Okay. 09:48:47
MR. BANNER: Mr. Ferrer, can we 09:48:48
please look at the next page, page 5 of the 09:48:50
patent. 09:48:53
BY MR. BANNER: 09:48:57
Q. And, Mr. Bohm, do you see at the top 09:48:58
left there's a section called "BACKGROUND OF 09:48:59
THE INVENTION"? 09:49:02
A. Yes. 09:49:02
Q. Can you tell us, you know, what that 09:49:03
section is about? 09:49:05
A. Well, the background generally 09:49:07
introduces what general category the patent 09:49:11
fits in, and then it goes on to describe 09:49:15
what's referred to as related art, and we just 09:49:17
call it prior art. 09:49:22
Q. And can you explain what prior art 09:49:23

is? 09:49:25
A. So this would be the items that we 09:49:25
were aware of that might have some similar 09:49:27
capabilities to some aspects of what is 09:49:31
disclosed in the patent, but also don't 09:49:34
actually perform the function that we believe 09:49:39
we are inventing. 09:49:43
And so, you know, we have a 09:49:45
responsibility as inventors to provide 09:49:47
knowledge of anything that we had knowledge 09:49:50
of, and so this is the section where we do 09:49:53
that. 09:49:56
Q. Does this section discuss any 09:49:56
specific types of devices that you knew about 09:49:58
at the time of your invention? 09:50:00
A. Well, the switching devices that we 09:50:02
had talked about, off the top of my head, I'm 09:50:05
almost positive that is in here. 09:50:08
MR. BANNER: Mr. Ferrer, can you 09:50:10
please go down to the bottom of column 1, 09:50:13
line 54, and start with the words, "In 09:50:16
general." And highlight that sentence. 09:50:20
BY MR. BANNER: 09:50:23
Q. Mr. Bohm, would you mind, can you 09:50:23

1 explain what this sentence is talking about 09:50:25
2 here? 09:50:28
3 A. So this is, you know, pretty similar 09:50:30
4 to what I think I had said awhile ago. So -- 09:50:35
5 and I can just read it. "In general, the USB 09:50:39
6 specification is structured so that every 09:50:41
7 device is configured and accessed by a single 09:50:43
8 host controller." 09:50:45
9 Again, USB specification mandates 09:50:47
10 that there is one host in any USB system, and 09:50:50
11 so the devices that are meant to work with 09:50:54
12 that host are designed, you know, in that way, 09:50:56
13 they are meant to be accessed by a single 09:51:02
14 host. 09:51:04
15 MR. BANNER: And, Mr. Ferrer, 09:51:05
16 line 58, there is a sentence starting with 09:51:09
17 "There also exist," and can you just highlight 09:51:21
18 that at the end. 09:51:24
19 BY MR. BANNER: 09:51:26
20 Q. Starting at the top, Mr. Bohm, would 09:51:27
21 you mind reading what we see here? 09:51:28
22 A. Yes. That would be fine. Excuse me, 09:51:30
23 I have a little bit of a frog in my throat 09:51:34
24 this morning. 09:51:36

1 So, "There are several switching 09:51:38
2 devices that currently allow a device to be 09:51:40
3 switched between multiple USB Host 09:51:42
4 controllers, but the device can generally be 09:51:44
5 configured and accessed by only a single host 09:51:47
6 at any given time. There also exist 09:51:50
7 stand-alone USB switches that provide the 09:51:53
8 capability of switching a device between 09:51:55
9 upstream USB Host Controllers. These 09:51:58
10 solutions, however, fail to permit 09:52:00
11 simultaneous access to the USB device that is 09:52:03
12 downstream of the hub or switch. The USB 09:52:06
13 device is typically accessed by one single 09:52:09
14 host at a time, and when access to the USB 09:52:12
15 device is switched, the device must be 09:52:23
16 re-configured, thereby losing internal state 09:52:26
17 information." 09:52:31
18 Q. Mr. Bohm, thank you. 09:52:31
19 Is your invention in the '243 09:52:32
20 Patent about these stand-alone switches 09:52:34
21 discussed here? 09:52:36
22 A. No, no. This is -- again, this is 09:52:37
23 the prior art section, so we are disclosing, 09:52:39
24 you know, the items that were available at 09:52:42

this time and how the market used those items 09:52:46
at this time. 09:52:49
Q. Does your patent explain how your 09:52:51
invention is different from these types of 09:52:54
switches? 09:52:57
A. Yes. Yes. It does in the next 09:52:57
section. And then, of course, as mentioned 09:53:03
before, the Claim section actually outlines 09:53:07
the legal definition of exactly what the 09:53:10
patent is. 09:53:12
Q. Okay. 09:53:13
MR. BANNER: So the next section, 09:53:14
"SUMMARY OF THE INVENTION," Mr. Ferrer, could 09:53:17
you put that up in the first two sentences 09:53:20
there. 09:53:22
BY MR. BANNER: 09:53:23
Q. Is this where you talk about the 09:53:23
difference between your invention and the 09:53:25
switches that you mentioned in the previous 09:53:27
section? 09:53:28
A. Yes. 09:53:29
Q. Would you mind reading that for us? 09:53:29
A. No, I'd be happy to. 09:53:31
"In one set of embodiments, a 09:53:33

single USB device may be shared across 09:53:36
multiple USB hosts without needing to be 09:53:39
re-configured or re-enumerated each and every 09:53:42
time the upstream hosts alternate accessing 09:53:45
the USB device. Since each host has 09:53:48
simultaneously enumerated the device, there 09:53:50
may be no need to detach and reconfigure the 09:53:52
device on the fly." 09:53:55
Q. All right. 09:53:57
That's a lot of words and probably 09:53:57
a lot of lawyer words, but can you explain 09:53:59
embodiment, just, you know, the first word 09:54:02
there; what's your understanding of what that 09:54:05
means, embodiment? 09:54:07
A. Yes, so my understanding of 09:54:08
embodiment, it's very simple, is it's an 09:54:10
example; so a set of examples is how I 09:54:14
generally interpret it. 09:54:17
Q. Okay. 09:54:18
So when you're talking here and it 09:54:18
says there may be, you know, no need to 09:54:20
reconfigure or re-enumerate, what are you 09:54:23
explaining there? 09:54:26
A. So what we're explaining here, I'll 09:54:27

try not to dive too deeply into the USB 09:54:29
specifications, but every time a host sees a 09:54:32
new device attach, there's an expectation that 09:54:35
that device is in basically a clean state. 09:54:39
So if you have a switching device 09:54:43
and you're going to switch from one host to 09:54:45
the other, the act of disconnecting from one 09:54:47
host and reconnecting to another basically 09:54:50
cleans the device of the previous 09:54:54
configuration that it had, so it's kind of 09:54:57
starting fresh again so that the new host can 09:55:00
enumerate it, as we had talked about before, 09:55:04
you know, discover it and actually then enable 09:55:06
it. 09:55:09
And so there's some time spent 09:55:09
obviously by the host, you know, doing that. 09:55:12
So there's a natural delay that, depending on 09:55:14
the device, you may actually detect. 09:55:17
Q. Does your patent describe any other 09:55:19
examples of real-world USB devices that might 09:55:21
use your invention? 09:55:24
A. Yeah. I think just right below this, 09:55:26
we go into, I think, the Ethernet controller 09:55:29
example. 09:55:35

1 MR. BANNER: Okay. Mr. Ferrer, if 09:55:36
2 you could highlight the sentence starting 09:55:39
3 around -- yeah. 09:55:42
4 BY MR. BANNER: 09:55:44
5 Q. Mr. Bohm, is this what you're 09:55:45
6 referring to, the Ethernet controller example? 09:55:47
7 A. Yes. 09:55:50
8 Q. And can you explain what your patent 09:55:50
9 describes here? 09:55:52
10 A. You want me to read it? 09:55:53
11 Q. Up to you. 09:55:56
12 A. Okay. Well, I'm fine not reading any 09:55:56
13 more than I need to, I guess. 09:56:01
14 So Ethernet controller, without 09:56:04
15 trying to spend too much time going into a lot 09:56:09
16 of different standards, Ethernet is a standard 09:56:11
17 that allows connectivity to a network, 09:56:15
18 typically a corporate network, but some of us 09:56:17
19 actually have them in our homes. 09:56:20
20 And most of us nowadays are 09:56:22
21 probably more familiar with this being called 09:56:23
22 WiFi, that's the wireless version. This is 09:56:25
23 referring to the wired version. 09:56:28
24 And the Ethernet controller back 09:56:31

in these days was a fairly costly item. In 09:56:37
order to share it, we needed to use a switch. 09:56:39
And since both the Ethernet controller, 09:56:42
itself, and the switch are, again, very 09:56:45
costly, we felt that this would be a great 09:56:48
place to utilize our invention so that we 09:56:50
could have a multi-host device controller 09:56:54
which could then access a single, very costly 09:56:57
gigabit Ethernet controller and share it among 09:57:00
multiple -- excuse me, multiple devices. 09:57:03
Q. And does your patent discuss any 09:57:07
advantage to using your invention for that 09:57:09
type of Ethernet controller? 09:57:11
A. I believe it does. I think -- yes, 09:57:12
it's already highlighted. I think it was 09:57:16
mentioning the cost savings by not having the 09:57:19
switch. 09:57:24
So the -- an Ethernet switch, 09:57:25
itself, is a fairly complex device, actually U 09:57:28
and G, the other part of my job was doing 09:57:32
Ethernet devices, so we had those devices as 09:57:34
well. And we could get rid of the switch and, 09:57:38
of course, save the power and it was more 09:57:41
compact. 09:57:44

Q. And was that Ethernet switch in 09:57:44
existing devices, was that an external switch, 09:57:47
kind of like a KVM switch? 09:57:50
A. Typically, yes, it would be a 09:57:52
stand-alone external switch. And again, they 09:57:54
are a very complex device that allows some 09:57:57
very complex routing, so they were also fairly 09:57:59
costly. So the ability to get rid of that 09:58:02
switch and to share an expense and pick up an 09:58:05
Ethernet controller, we felt, was a win/win. 09:58:08
Q. All right. 09:58:11
MR. BANNER: Let's look at page 6, 09:58:12
Mr. Ferrer, if we can go look at the bottom, 09:58:15
column 3, and the section that starts with 09:58:19
"DETAILED DESCRIPTION OF THE PREFERRED 09:58:22
EMBODIMENTS." 09:58:24
BY MR. BANNER: 09:58:26
Q. Do you see that, Mr. Bohm? 09:58:27
A. Yes, I do. 09:58:29
Q. And again, what is an embodiment? 09:58:30
A. So again, it is an example. 09:58:36
Q. And is there somewhere in your patent 09:58:39
where you make that clear, that it's just an 09:58:41
example? 09:58:43

A. Yes. Actually, I think it's in the 09:58:45
paragraph right before the Claim section 09:58:47
begins. 09:58:50
Q. Okay. 09:58:50
MR. BANNER: Mr. Ferrer, can you 09:58:52
please highlight the two sentences of the last 09:58:53
paragraph before the claims begin, in column 4 09:58:57
and 5. 09:59:01
THE WITNESS: It starts with 09:59:01
"Although." 09:59:05
BY MR. BANNER: 09:59:05
Q. Mr. Bohm, do you want to read those 09:59:06
sentences? 09:59:07
A. Sure. 09:59:08
"Although the embodiments above 09:59:09
have been described in considerable detail, 09:59:11
other versions are possible. Numerous 09:59:14
variations and modifications will become 09:59:16
apparent to those skilled in the art once the 09:59:19
above disclosure is fully appreciated. It is 09:59:21
intended that the following claims be 09:59:26
interpreted to embrace all such variations and 09:59:28
modifications. Note the section headings" -- 09:59:31
do you want me to stop there? 09:59:39

1 Q. Sure, that's great. 09:59:39
2 And can you explain to the jury 09:59:41
3 why you put those sentences in your patent? 09:59:42
4 A. Well, yes, absolutely. 09:59:44
5 So we knew it would be impossible 09:59:46
6 to come up with every possible variation of 09:59:49
7 the way that this patent could be implemented, 09:59:53
8 so we implemented -- or, excuse me, we 09:59:55
9 described in the embodiments, you know, 09:59:59
10 several that we thought showcase some 10:00:01
11 different use cases, and then this paragraph 10:00:03
12 was added, which is kind of a normal thing for 10:00:06
13 many patents, indicating that, you know, 10:00:10
14 really the ideas apply beyond the examples 10:00:13
15 that we were able to provide. 10:00:16
16 Q. We started looking at the section of 10:00:19
17 your patent called DETAILED DESCRIPTION OF THE 10:00:21
18 PREFERRED EMBODIMENTS and that begins at 10:00:26
19 column 3 towards the bottom. 10:00:28
20 MR. BANNER: Mr. Ferrer, please 10:00:30
21 highlight the first sentence there in that 10:00:31
22 section. 10:00:33
23 BY MR. BANNER: 10:00:34
24 Q. Mr. Bohm, sorry to make you read so 10:00:34

much, but could you read that for us and 10:00:37
explain what we are seeing here? 10:00:38
A. That's fine. 10:00:40
"In one set of embodiments, a 10:00:43
multi-host USB device may provide maximum 10:00:46
flexibility and a simple means by which to 10:00:48
cheaply share devices with multiple hosts, by 10:00:52
providing a separate configuration and access 10:00:55
interface with each upstream host." 10:01:01
Q. So are separate configuration and 10:01:03
access interface for each upstream host a part 10:01:05
of your invention? 10:01:11
A. Yes. 10:01:12
Q. And what is a configuration and 10:01:12
access interface? 10:01:13
A. So that would be the block that we 10:01:14
were talking about just generically, the 10:01:19
endpoint and status registers along with 10:01:22
everything associated with them. 10:01:25
Q. Is that on Figure 3 of your patent? 10:01:26
Is that what you're referring to? 10:01:29
A. Yes, Figure 3. 10:01:30
MR. BANNER: Mr. Ferrer, can we go 10:01:31
back to Figure 3, please. 10:01:36

BY MR. BANNER: 10:01:38

Q. Mr. Bohm, where are the separate 10:01:38

configurations at in Figure 3? 10:01:44

A. Basically starting at the top and 10:01:45

come in on the port so you can actually attach 10:01:47

all the way down through the USB endpoint and 10:01:49

status registers. 10:01:52

Q. Okay. 10:01:53

And what makes them separate? 10:01:54

A. From a host standpoint, when the host 10:01:57

comes down and enables the device, it will 10:02:02

assign an address to the device, and then 10:02:05

every host will assign unique addresses to 10:02:09

every device that it enumerates. 10:02:14

So if you have five things plugged 10:02:17

into your computer, all five will have a 10:02:19

different address assigned to it that the host 10:02:22

will then use whenever it knows it needs to 10:02:25

access that specific device. 10:02:28

Q. How does Figure 3 differ from just a 10:02:31

regular device? 10:02:34

A. So a regular device, if -- I know I 10:02:35

can't do it up on the big screen, but if you 10:02:39

were just to effectively hold your hand kind 10:02:41

of over one side or the other and you would 10:02:44
just have the single port at the top with the 10:02:46
single blocks below it coming on down to the 10:02:48
device or function, that would be, you know, a 10:02:53
pretty basic high level diagram of a standard 10:02:55
USB device. 10:02:58
And what makes this different is 10:03:00
we have the two ports and then we've 10:03:02
duplicated that so that if Host 1 has five 10:03:04
devices and it's assigning the addresses it 10:03:08
needs to to address the left side of the 10:03:11
device, the second host on the right side 10:03:15
would do its own address assignment to the 10:03:17
portion of the device that it is talking to. 10:03:20
So there was not -- in most 10:03:22
situations, they would not be the same address 10:03:25
and one would always be different. 10:03:27
Q. All right. Let me make sure I 10:03:29
understand. 10:03:30
MR. BANNER: So, Mr. Ferrer, can 10:03:31
we highlight 302, the box at the top, down to 10:03:33
306 on the left, the whole left-hand side of 10:03:36
that figure, just drag it all the way down. 10:03:38
There you go. Okay. 10:03:45

BY MR. BANNER: 10:03:46
Q. Mr. Bohm, is that what you were 10:03:47
putting your hand over when you were talking 10:03:48
about the separate accessing configuration 10:03:50
interfaces? 10:03:53
A. Yes. I kind of forgot you could 10:03:53
highlight it and I probably should have asked 10:03:56
for that. 10:03:58
Q. Yes, feel free to ask, too. 10:03:58
A. Okay. Yes. 10:04:00
So if we were to effectively erase 10:04:02
what's highlighted in yellow and then you just 10:04:05
add everything on the right side, that would 10:04:08
effectively be a standard USB device. You 10:04:11
would simplify, obviously, the multi-device 10:04:14
controller would not be required, but 10:04:18
everything else would be a standard device. 10:04:20
Q. So part of your invention, the 10:04:22
package you just read about, providing 10:04:25
separate configuration and access interface 10:04:27
for each upstream port or host -- let me 10:04:30
rephrase that. Sorry. 10:04:33
So the patent passage we just read 10:04:34
about providing separate configuration and 10:04:40

1 access interface for each upstream host, is 10:04:42
2 the portion highlighted there between Box 302 10:04:46
3 and 306, is that one of the separate 10:04:49
4 configuration and access interfaces? 10:04:52
5 A. Yes. 10:04:54
6 Q. And what's the other configuration 10:04:55
7 and access interface shown here? 10:04:57
8 A. It would be the one that's not 10:05:00
9 highlighted. 10:05:03
10 Q. Okay. 10:05:03
11 So on the right side? 10:05:04
12 A. To the right side, yes. And now it's 10:05:06
13 highlighted. 10:05:08
14 Q. Great. 10:05:09
15 And that's Box 304 and 308 and 10:05:10
16 everything in between it? 10:05:13
17 A. Yes. 10:05:14
18 Q. Great. 10:05:15
19 MR. BANNER: So, Mr. Ferrer, if we 10:05:17
20 could go back to column 3 in the patent, the 10:05:19
21 last two lines at the bottom and the first 10:05:24
22 line of column 4. 10:05:28
23 BY MR. BANNER: 10:05:35
24 Q. Mr. Bohm, would you mind reading that 10:05:36

1 sentence and explaining what that means. 10:05:38
2 A. So, "Multi-host device 106 may be 10:05:44
3 addressed separately by each host, and may 10:05:48
4 respond to each host within USB specified 10:05:51
5 limits." 10:05:54
6 Q. And what are you describing here in 10:05:57
7 the patent? 10:05:58
8 A. Well, I promised not to go into the 10:05:59
9 USB spec in gory detail, but as I mentioned 10:06:01
10 before, there's a lot of rules in the USB spec 10:06:05
11 about what a device must do, and many of those 10:06:08
12 rules deal with certain time intervals. It 10:06:12
13 must do something in a certain set amount of 10:06:15
14 time or it must do something else. These 10:06:18
15 kinds of things. 10:06:21
16 So that is what we're referring to 10:06:23
17 here. 10:06:24
18 Q. And what does the patent mean when it 10:06:25
19 says each host can address the multi-host 10:06:28
20 device separately? 10:06:31
21 A. So this is what I was referring to 10:06:32
22 earlier where each host would come in and do 10:06:33
23 its own separate discovery and enablement of 10:06:36
24 the portion of the device that it sees. It 10:06:40

1 would give it its own unique address and then 10:06:43
2 it would use that address to communicate with 10:06:46
3 the device going forward. 10:06:49
4 Q. And why does the device need to have 10:06:51
5 an address? 10:06:55
6 A. Well, in, I guess, the simplest way 10:06:56
7 to describe it, a new device on USB, before 10:06:59
8 you plug it in, it's always at address zero. 10:07:03
9 Everything, where it's plugged in everything 10:07:09
10 is at address zero. And so the USB host, if 10:07:11
11 it had a whole lot of things that had the same 10:07:14
12 exact address of zero, it would really have a 10:07:17
13 hard time functioning. It would be like if 10:07:19
14 all of the houses on your street had the exact 10:07:22
15 same number on the mailbox, you know, the 10:07:24
16 postman would have a hard time getting the 10:07:27
17 mail to you. 10:07:29
18 So in the USB system, everything 10:07:29
19 gets a unique address, just like in your home, 10:07:32
20 so that the host can make sure that the right 10:07:35
21 communication is occurring to the specific 10:07:39
22 device it knows it has to reach. 10:07:43
23 Q. So addressing multi-host -- when it 10:07:44
24 says the "Multi-host device may be addressed 10:07:49

separately by each host," how many addresses 10:07:51
could it be? 10:07:54
A. Well, there's a limit in USB spec, 10:07:56
and I'm forgetting it right now. There's like 10:08:00
200 and something. I don't recall the number. 10:08:03
Q. Okay. 10:08:06
How about in your multi-host 10:08:06
device, Figure 3; how many addresses would you 10:08:09
expect to see? 10:08:11
A. Oh, I guess I misunderstood your 10:08:12
question. 10:08:14
Q. Probably a bad question. Sorry. 10:08:14
A. No, that's okay. 10:08:16
So the host -- the host would give 10:08:17
the device one address number. It would give 10:08:19
it a specific number. And then again, that 10:08:23
specific number is the one that it would use 10:08:26
to communicate with that device from then on. 10:08:28
Q. So Figure 3 of your patent is 10:08:32
connected to two hosts; how many addresses 10:08:34
would we see if two hosts are connected? 10:08:36
A. We would then see two addresses. 10:08:39
Q. Would they be the same address? 10:08:41
A. More than likely not, although 10:08:43

there's nothing that would prevent that. If 10:08:45
it was the very first device ever plugged in 10:08:47
on that particular host at that particular 10:08:50
time, just due to randomness, they might end 10:08:54
up being the same. It would be just pure 10:08:57
coincidence. But more often than not, they 10:08:59
would be different. 10:09:02
Q. All right. So let's look at -- 10:09:03
MR. BANNER: On this page, Mr. 10:09:06
Ferrer, kind of towards the bottom. 10:09:08
BY MR. BANNER: 10:09:11
Q. What comes after the DETAILED 10:09:11
DESCRIPTION OF THE PREFERRED EMBODIMENTS, Mr. 10:09:13
Bohm? 10:09:16
A. So that's where the claims start. 10:09:16
Q. Okay. 10:09:20
And this is labeled No. 1; is that 10:09:21
the first claim? 10:09:25
A. Yes. 10:09:25
Q. And then it goes a couple pages. 10:09:26
Do you know how many claims you 10:09:29
have in this patent here? 10:09:29
A. I think there are 25, if I recall. 10:09:30
Q. Okay. 10:09:33

A. That ends in column 8 on page 8. 10:09:34
Q. Okay. 10:09:37
Let's go to the last -- yeah, 10:09:40
that's claim 25 right now, Mr. Bohm? 10:09:44
A. Yes. 10:09:47
Q. So that's the last one; right? 10:09:48
A. Yes. 10:09:51
Q. Okay. 10:09:52
MR. BANNER: If we could go to the 10:09:54
last page of Exhibit 1, Mr. Ferrer. Sorry, 10:09:54
page 9, go to page 9. 10:10:01
BY MR. BANNER: 10:10:03
Q. Mr. Bohm, what's on this page? 10:10:04
A. I'm sorry, we're on page 9? 10:10:05
Q. Page 9, yeah, sorry. 10:10:09
A. So page 9 is a Certificate of 10:10:11
Correction. 10:10:14
Q. And what is this in your patent for? 10:10:15
A. So there were a couple of, I guess 10:10:18
typos, for lack of a better word, and so these 10:10:21
were some minor corrections just to make some 10:10:24
clarifications to the language. 10:10:27
MR. BANNER: All right. Mr. 10:10:30
Ferrer, can we go to the last page of the 10:10:32

1 patent, please? Blow that up. 10:10:35
2 BY MR. BANNER: 10:10:39
3 Q. Mr. Bohm, do you see the title, 10:10:39
4 "INTER PARTES REVIEW CERTIFICATE"? 10:10:44
5 A. Yes. 10:10:44
6 Q. What is an Inter Partes Review? 10:10:45
7 A. Well, I think this was introduced in 10:10:48
8 the opening, but this was that legal process 10:10:51
9 that went through a couple of different Court 10:10:53
10 procedures to -- to figure out if all the 10:10:56
11 claims in the patent were valid, and this 10:11:00
12 defines that, gives the date that it occurred, 10:11:06
13 which was in February of 2021. 10:11:08
14 And really happy to report we 10:11:10
15 still have lots of claims that are valid in 10:11:13
16 this patent. There were a few that were 10:11:16
17 certainly cancelled. And I have been led to 10:11:20
18 believe by others that having this many claims 10:11:22
19 survive is actually something to celebrate; 10:11:25
20 it's a great thing. 10:11:29
21 Q. In your mind, Mr. Bohm, what were the 10:11:30
22 benefits of the invention you and your 10:11:32
23 colleague made that you patented? 10:11:34
24 A. Well, in addition to more 10:11:38

1 straightforward to use, people didn't need to 10:11:40
2 think about, you know, where a particular 10:11:42
3 switch might be set. The real fit was the 10:11:44
4 ability for the device to be seamlessly 10:11:48
5 shared. You didn't have to rethink at all. 10:11:51
6 If you wanted to print to a 10:11:53
7 printer from two different computers, you 10:11:54
8 didn't have to worry about, you know, who had 10:11:56
9 control at any one time; it was just there and 10:11:59
10 you could print to it. 10:12:01
11 Q. How did your invention result in the 10:12:03
12 patent application being filed? 10:12:06
13 A. So within SMSC, there was a defined 10:12:07
14 process for inventions where we would fill out 10:12:12
15 what was called a disclosure, and we would 10:12:16
16 submit it. There was a review process that 10:12:18
17 was through one of our senior managers, and if 10:12:23
18 they deemed your idea patentable, and there 10:12:24
19 was also kind of a business component that -- 10:12:29
20 SMSC was a very small company, so they also 10:12:31
21 had to see if your idea was patentable that 10:12:37
22 would relate to an SMSC product that would 10:12:40
23 kind of make sense to the business to get a 10:12:43
24 return on investment because patents are kind 10:12:45

of expensive to create and maintain. 10:12:47

Q. Were you personally involved in that 10:12:50

process? 10:12:51

A. I was from the standpoint, obviously, 10:12:52

of co-inventing the idea, we co-wrote the 10:12:56

disclosure. To be honest, we actually, both 10:12:59

myself and my co-inventor, had to have 10:13:02

multiple meetings with our business unit 10:13:04

manager because he wasn't originally sold on 10:13:07

the idea that this could really mesh in with 10:13:09

SMSC's business. He thought it was a good 10:13:12

idea, but he wasn't sure he wanted to pay for 10:13:14

it, I guess would be the better way to say it. 10:13:17

And so we -- we eventually 10:13:21

convinced him and he agreed to fund it, so 10:13:23

then the patent process moved forward. 10:13:26

Q. Did you submit any prior art to the 10:13:28

patent office as far as applying for your 10:13:31

patent? 10:13:35

A. Well, whatever we had submitted, we 10:13:35

would have given to the patent attorney and it 10:13:37

would have been included in the submission, 10:13:38

yes. 10:13:40

Q. All right. 10:13:40

1 I'm going to change gears a little 10:13:40
2 bit and we're going to go to Exhibit 3 in your 10:13:42
3 binder, Mr. Bohm, a separate binder, the big 10:13:46
4 one. 10:13:49
5 A. Oh, that big one. Okay. I was just 10:13:49
6 realizing I wasn't seeing Tab 3 here. Okay. 10:13:52
7 Q. Could you open it up and look at the 10:14:12
8 first page, please, and let me know if you 10:14:14
9 recognize the document? 10:14:16
10 A. Yes. This is the file wrapper for 10:14:21
11 the '243 Patent. 10:14:25
12 (Whereupon, Trial Exhibit 3 was 10:14:25
13 introduced.) 10:14:27
14 MR. BANNER: Your Honor, I move to 10:14:27
15 admit Exhibit 3 into evidence. 10:14:28
16 MR. SAULSBURY: No objection. 10:14:30
17 THE COURT: All right. It's 10:14:32
18 received. 10:14:33
19 MR. BANNER: Mr. Ferrer, can you 10:14:34
20 please put it up on the screen for us. 10:14:35
21 BY MR. BANNER: 10:14:37
22 Q. Mr. Bohm, can you explain what you 10:14:38
23 mean by file wrapper? 10:14:39
24 A. So as I understand it, when the 10:14:41

1 patent is filed, all the documentation that is 10:14:44
2 submitted, along with all of the 10:14:47
3 correspondence going back and forth, even the 10:14:50
4 Court action that we referred to a few minutes 10:14:54
5 ago, all of that is contained in a complete 10:14:56
6 file wrapper for the patent, which is quite 10:15:00
7 weighty. 10:15:02
8 Q. Mr. Bohm, it looks like it's over 10:15:04
9 1500 pages, if you look at the bottom. 10:15:07
10 Do you know why there are so many 10:15:09
11 pages in it? 10:15:11
12 A. Well, the majority of them, I recall 10:15:11
13 there being something in the order of 10:15:15
14 1300 pages before the Court actions were 10:15:18
15 dealing with the question you had earlier 10:15:22
16 regarding prior art, so a substantial portion 10:15:23
17 of these pages are the prior art submission. 10:15:26
18 MR. BANNER: Mr. Ferrer, can you 10:15:32
19 please pull up page 20 of Exhibit 3. 10:15:33
20 BY MR. BANNER: 10:15:35
21 Q. And, Mr. Bohm, please tell the jury 10:15:36
22 what we're seeing here on this page. 10:15:38
23 A. That was page 20? 10:15:40
24 Q. Page 20, yes. 10:15:41

A. So this is, I recall, a mandatory 10:15:48
part of the patent's submission. This is 10:15:52
where we sign our names and date that we are 10:15:54
agreeing with the declaration statement above. 10:15:59
Q. And did you sign this page before it 10:16:04
was submitted to the patent office? 10:16:05
A. Yes, I did. 10:16:07
Q. And is that your signature there in 10:16:08
the middle? 10:16:11
A. Yes, in the middle. 10:16:11
Q. So do you understand that when you 10:16:12
signed this, you were confirming that all of 10:16:14
the statements in the patent application were 10:16:16
true? 10:16:18
A. Yes. 10:16:18
Q. And sitting here today, do you have 10:16:18
that same belief; that all the statements in 10:16:20
your patent application were true at the time 10:16:22
you signed it? 10:16:24
A. Yes, I do. 10:16:25
Q. All right. Thank you. 10:16:26
MR. BANNER: Mr. Ferrer, could you 10:16:28
pull up page 1544 of this exhibit. 10:16:30
BY MR. BANNER: 10:16:35

Q. Mr. Bohm, can you explain what this 10:16:36
is that we're seeing on this page? 10:16:39
A. It's probably easier for me to look 10:16:41
on the screen as well. That's a lot of pages. 10:16:43
Yes. I believe this is the 10:16:48
summary page from the IPR, so it was those 10:16:51
court procedures I was mentioning earlier. 10:16:58
MR. BANNER: All right. And if we 10:17:00
go to the next page, Mr. Ferrer. 10:17:01
BY MR. BANNER: 10:17:03
Q. Do you have an understanding as to 10:17:06
what this means? 10:17:08
A. Yes. So this would be that final 10:17:09
appeal, and this is where they affirmed the 10:17:12
results of the previous Court, that all of the 10:17:17
claims that I pointed to earlier were still 10:17:20
valid as found by the Court. 10:17:23
MR. BANNER: All right. I think 10:17:29
we can put Exhibit 3 away right now. And 10:17:30
we'll get your other exhibit binder back and 10:17:34
we're going to go through a couple more there. 10:17:38
THE WITNESS: Okay. 10:17:52
BY MR. BANNER: 10:17:53
Q. So you're at SMSC, you apply for the 10:17:54

1 patent. 10:17:59
2 After you applied for that '243 10:17:59
3 Patent, did SMSC then make a multi-host device 10:18:02
4 product? 10:18:07
5 A. No, not immediately. As I mentioned, 10:18:07
6 we had a little bit of a struggle, you know, 10:18:10
7 convincing our managers we even had a good 10:18:12
8 business case to fund the patent, and as we 10:18:15
9 went on to try to fund the device, we weren't 10:18:17
10 able to find quite enough of a convincing case 10:18:21
11 to move forward and actually put an entire 10:18:23
12 development team on it. So we sidelined it 10:18:26
13 for a little while. 10:18:29
14 Q. Were you ever able to make a business 10:18:30
15 case for developing a multi-host device 10:18:33
16 product? 10:18:35
17 A. Not at SMSC, but after the Microchip 10:18:36
18 acquisition in 2012, my team's market 10:18:39
19 responsibilities grew and we also got 10:18:46
20 responsibilities for automotive, and through 10:18:49
21 that, we were able to find a convincing 10:18:51
22 business case to move forward on. 10:18:54
23 Q. So were you able to use your 10:18:58
24 multi-host device controller technology for an 10:19:01

1 automotive application? 10:19:03
2 A. Yes, specifically for the CarPlay 10:19:04
3 application. 10:19:07
4 Q. Okay. 10:19:09
5 Can you explain a little bit about 10:19:09
6 how that came about and what you mean by the 10:19:11
7 CarPlay application? 10:19:13
8 A. So the timeframe, as I recall, was 10:19:15
9 shortly after the acquisition, so it would be 10:19:20
10 early 2013, we began to hear that the 10:19:24
11 automotive market had interest in enabling 10:19:27
12 CarPlay. And so we had a product that was 10:19:30
13 useful in the CarPlay in some scenarios, but 10:19:33
14 not all, so that's where we began to look at 10:19:38
15 the multi-host device controller patent to be 10:19:41
16 able to enable some additional features. 10:19:42
17 Q. What did you know about CarPlay at 10:19:44
18 that time in 2013? 10:19:47
19 A. So we obviously, like most, were 10:19:49
20 involved in a lot of different standards 10:19:53
21 activities and we keep an eye on the market. 10:19:55
22 So we heard some of the early announcements, 10:19:57
23 and a lot of rumors flying around as far as 10:20:00
24 what it was exactly. It took a little while 10:20:02

before there was more of a proper release with 10:20:04
some real details, but we -- we had an 10:20:07
opportunity to speak with some OEMs and figure 10:20:10
out how they were going to use it. 10:20:13
Q. At a very high level, what was the 10:20:15
CarPlay feature that you were talking about at 10:20:17
that time? 10:20:21
A. So the main feature and the one that 10:20:21
really focused a lot of attention on the 10:20:26
CarPlay was that Apple wanted to be the host 10:20:29
in the system and take over the head unit from 10:20:31
the carmaker, which was pretty groundbreaking. 10:20:34
Carmakers have never allowed anyone to take 10:20:38
over their head unit before. 10:20:40
Q. So when you're talking about Apple, 10:20:41
you're talking about the company, Apple? 10:20:43
A. Yes. 10:20:46
Q. And CarPlay, is that an Apple thing? 10:20:46
A. Yes. So Apple announced that they 10:20:50
were going to release, you know, a 10:20:54
CarPlay-enabled upgrade to their iPhone 10:20:57
devices, and I believe they trademarked it, so 10:21:00
it is an Apple trade name, yes. 10:21:03
Q. Okay. 10:21:04

1 And so according to CarPlay, your 10:21:05
2 understanding at the time was that CarPlay 10:21:07
3 required that Apple's iPhone would be the USB 10:21:10
4 host of the system? 10:21:13
5 A. Yes. 10:21:14
6 Q. Did Microchip have a USB hub that 10:21:14
7 would support CarPlay at that time? 10:21:17
8 A. Yes, we did. We had two different 10:21:18
9 ways that our hub would support CarPlay in the 10:21:24
10 car application. 10:21:27
11 Q. And that solution that you had, did 10:21:27
12 it have a name? 10:21:31
13 A. So the internal programming for that 10:21:32
14 product was Athens. 10:21:34
15 Q. Athens, like the city? 10:21:36
16 A. Like, yes, like Athens, Greece, yeah. 10:21:38
17 Q. Is Athens a hub chip? 10:21:43
18 A. Yes. Athens is a hub chip that has 10:21:47
19 some other patented technology that had 10:21:50
20 enabled switching of the ports, but it also, 10:21:54
21 because of that, it could be connected to 10:21:56
22 hosts. 10:21:58
23 So in a car, you had a host in the 10:21:59
24 head unit, and then with the iPhone, you have 10:22:02

a USB host in the phone. So Athens did have 10:22:04
the ability to link between the two hosts. 10:22:08
Q. With Athens, would the two hosts be 10:22:12
connected at the same time? 10:22:16
A. Not in host mode. 10:22:19
Q. Okay. 10:22:22
Is Athens a little chip like the 10:22:23
physical Sandia chip you showed the jury 10:22:27
earlier? 10:22:29
A. Yes, very -- very similar. If we 10:22:29
were to have an exhibit, it would be fairly 10:22:32
hard to distinguish the difference. 10:22:35
Q. Okay. 10:22:36
Was there anything specific about 10:22:37
CarPlay and the CarPlay requirements that led 10:22:40
to using Athens' hub chip as a solution for 10:22:42
CarPlay? 10:22:46
A. Well, the Apple phone, itself, is not 10:22:46
always in host mode. Initially, it's in what 10:22:51
we refer to as device mode. You connect and 10:22:55
it's a device and then there's a mechanism 10:22:59
that occurs, in-band messaging, to flip it to 10:23:02
a host mode, so you have to have the ability 10:23:05
to detect that and change roles. 10:23:07

Q. What Athens-based CarPlay solution 10:23:10
did Microchip offer at the time? 10:23:13
A. So we had to -- we had one that was 10:23:14
referred to as a single upstream; and to 10:23:17
simply define that, that's one cable 10:23:21
effectively between the break out box and the 10:23:24
head unit. 10:23:26
And then the second solution we 10:23:29
called dual upstream, or we had a shorthand 10:23:31
for it called DUST, dual upstream, and that's 10:23:34
where you have two cables between the break 10:23:38
out box and the head unit. 10:23:42
Q. Did Microchip have any other CarPlay 10:23:46
solutions in mind around the time when you 10:23:48
were looking into the CarPlay issue in 2013? 10:23:51
A. Yes, yes. In that timeframe, 10:23:55
especially once we began to engage with the 10:23:57
carmakers, we were recognizing a third 10:24:00
scenario, which would be a single upstream, 10:24:03
but with the multi-host device controller so 10:24:06
that we could actually maintain connectivity 10:24:09
of two hosts simultaneously. Athens did not 10:24:12
have that capability. 10:24:15
Q. So what was your understanding as to 10:24:17

1 why a multi-host device controller would be 10:24:19
2 suitable for that application? 10:24:24
3 A. So we -- again, we were out talking 10:24:26
4 to the customers and discovered that the 10:24:29
5 carmakers did not want to allow Apple to just, 10:24:31
6 in all circumstances, completely take over the 10:24:35
7 head unit. They also wanted to maintain 10:24:38
8 control. So they wanted their USB host to 10:24:40
9 remain a host, as well as allowing the Apple 10:24:43
10 iPhone to go to the host mode to enable 10:24:48
11 CarPlay. 10:24:50
12 And that created the very special 10:24:52
13 circumstances that we had to have a system 10:24:56
14 with two active hosts in it. And since I was 10:24:57
15 keenly aware of the patent that we had never 10:25:02
16 been able to do anything with, it became 10:25:05
17 pretty apparent to myself and my colleagues 10:25:08
18 that this was a great opportunity to use our 10:25:11
19 '243 and other patents. 10:25:15
20 Q. Did Microchip then, having this 10:25:17
21 realization, propose a solution? 10:25:19
22 A. Eventually. It was a little slow 10:25:22
23 moving forward, principally because, you know, 10:25:26
24 even though we knew the solution would work, 10:25:29

1 you know, I, in particular, had a concern that 10:25:31
2 Apple may not actually certify a solution that 10:25:34
3 put a device between their phone and the head 10:25:39
4 unit that they said they wanted to take over 10:25:42
5 because we are putting our device in the 10:25:45
6 middle. 10:25:47
7 That's not what the CarPlay spec 10:25:47
8 was really trying to achieve, and so we did 10:25:49
9 have to take a fair amount of time to work 10:25:53
10 through those details with customers, and even 10:25:57
11 Apple, to better understand if they would 10:26:00
12 tolerate a solution in the middle like that, 10:26:03
13 and similarly with carmakers, themselves, to 10:26:06
14 make sure that they wanted to support a 10:26:08
15 solution like that. 10:26:10
16 Q. Did you -- were you personally 10:26:11
17 involved in those conversations? 10:26:13
18 A. Some of them, not all. 10:26:14
19 Q. And what work did you do on this 10:26:16
20 subject? 10:26:21
21 A. Sorry, could you repeat the question? 10:26:21
22 I missed part of it. 10:26:24
23 Q. What work did you do to investigate 10:26:25
24 the carmakers' requirements and Apple's 10:26:29

1 requirements? 10:26:34
2 A. So the team that I was part of, the 10:26:34
3 team that I ran was the architecture team, and 10:26:37
4 as part of our responsibility, we interfaced 10:26:41
5 quite regularly with our marketing team who 10:26:44
6 actually dealt with the customers. 10:26:47
7 And so I did do some engagements 10:26:51
8 with customers, themselves, but it was mostly 10:26:55
9 with marketing and also at that sort of -- I 10:26:58
10 would call it the standards level, trying to 10:27:02
11 get access to the Apple specs themselves, 10:27:04
12 working through the contract details, and then 10:27:06
13 actually being able to add some dialogue with 10:27:09
14 some people at Apple. 10:27:12
15 Q. And what, if anything, came out of 10:27:14
16 your investigation? 10:27:16
17 A. So ultimately at the end, really two 10:27:17
18 things. So we were able to validate that the 10:27:20
19 automakers would support the solution that 10:27:23
20 we're talking about, and secondly, we also 10:27:26
21 were able to validate that Apple would accept 10:27:29
22 the solution in the middle. So my personal 10:27:32
23 hesitancy and concerns were actually allayed 10:27:36
24 with that revelation. So that was kind of the 10:27:39

first section. 10:27:41

And then the second was after 10:27:43

going through this process and realizing that 10:27:45

this was a great opportunity for the 10:27:50

multi-host device controller patent, we also 10:27:52

learned of our competitor, Aptiv, offering a 10:27:54

very similar-sounding solution. 10:27:59

And since we weren't aware of 10:28:02

another way to do this, we thought it then 10:28:03

very likely that Aptiv might be utilizing our 10:28:05

same patented technology in their solution. 10:28:08

Q. All right. 10:28:10

So you mentioned two things, and 10:28:11

let's start with the first one and we'll come 10:28:13

back to that second point regarding the 10:28:15

defendant, Aptiv. 10:28:18

A. Okay. 10:28:19

Q. But I do want to talk about the 10:28:19

product first. 10:28:21

So once you realized the carmakers 10:28:24

and Apple would accept this multi-host device 10:28:26

idea, what happened on the business product 10:28:30

side? 10:28:30

A. So once we -- you know, once we had a 10:28:33

1 comfort level that this product would be done 10:28:36
2 because we couldn't get certifications and 10:28:42
3 stuff, we began to put some people on it to do 10:28:44
4 some of the initial work for figuring out at 10:28:47
5 the top level what this device would need to 10:28:49
6 look like on the marketing side. 10:28:52
7 They also got very busy working on 10:28:55
8 the business case justification, which is, of 10:28:57
9 course, the key things that I mentioned 10:28:59
10 before. 10:29:01
11 Q. Mr. Bohm, would you please turn to 10:29:02
12 Exhibit 25 in your binder. 10:29:05
13 A. Okay. 10:29:16
14 (Whereupon, Trial Exhibit 25 was 10:29:16
15 introduced.) 10:29:16
16 BY MR. BANNER: 10:29:17
17 Q. Do you recognize this document? 10:29:17
18 A. Yes, I do. 10:29:20
19 Q. And what is it? 10:29:21
20 A. So this is the Product Business Plan 10:29:23
21 for Sandia. 10:29:26
22 MR. BANNER: Your Honor, I move to 10:29:28
23 admit Exhibit 25 into evidence. 10:29:30
24 MR. SAULSBURY: Subject to the 10:29:45

1 limiting instruction, Your Honor. 10:29:46
2 THE COURT: Okay. So it will come 10:29:48
3 in and... 10:29:52
4 (Brief pause.) 10:30:33
5 THE COURT: I'm sorry, was your 10:30:48
6 instruction on the last exhibit; is that 10:30:52
7 correct? 10:30:57
8 MR. SAULSBURY: The proposed 10:30:57
9 instruction was -- 10:31:00
10 THE COURT REPORTER: I'm sorry, I 10:31:00
11 can't hear. 10:31:07
12 THE COURT: You need to make sure 10:31:07
13 you're speaking into a microphone, and then 10:31:08
14 secondly, I thought you had sent a proposed 10:31:11
15 instruction. I just want to make sure I'm 10:31:16
16 looking at it; is that right? 10:31:20
17 MR. SAULSBURY: I believe so, yes, 10:31:21
18 Your Honor. 10:31:23
19 THE COURT: Okay. Hold on one 10:31:24
20 second. 10:31:26
21 I see. Okay. All right. 10:31:33
22 I'll -- so I'll admit the exhibit, 10:31:39
23 Exhibit 25. And, ladies and gentlemen, as we 10:31:44
24 talk about this exhibit, you're going to see 10:31:47

1 and hear statements that are -- discuss the 10:31:49
2 scope of or at least some discussion about the 10:31:59
3 scope of Microchip's patent. 10:32:01
4 Those statements are things that 10:32:05
5 are not admitted; you should not take them as 10:32:08
6 true, okay? You should take them just for the 10:32:11
7 fact that they were being discussed at the 10:32:13
8 time, and that's the reason they are being 10:32:15
9 admitted. 10:32:20
10 With that, Mr. Banner, you can 10:32:21
11 proceed. 10:32:23
12 MR. BANNER: Thank you, Your 10:32:23
13 Honor. 10:32:24
14 BY MR. BANNER: 10:32:24
15 Q. Mr. Bohm, have you previously 10:32:25
16 reviewed -- 10:32:26
17 MR. BANNER: Can we get it on the 10:32:27
18 screen, please? Thank you. 10:32:28
19 BY MR. BANNER: 10:32:28
20 Q. Mr. Bohm, have you previously 10:32:30
21 reviewed this document? 10:32:32
22 A. Yes, I have. 10:32:33
23 Q. In what capacity? 10:32:35
24 A. Well, both as the manager of the 10:32:40

1 architecture team, I would have the 10:32:42
2 responsibility of reviewing it, and I was also 10:32:44
3 senior staff, so I would have sign-off 10:32:47
4 responsibility on it. 10:32:51
5 Q. Can you describe for the jury what 10:32:52
6 this Sandia business plan was used for at 10:32:53
7 Microchip? 10:32:57
8 A. Certainly, yes. 10:32:57
9 So a business plan is the actual 10:32:58
10 document that contains the business 10:33:02
11 justification for doing a product. It usually 10:33:06
12 talks about the competitors in the field, it 10:33:09
13 would talk about the customers, it would talk 10:33:12
14 about key features, previous generation 10:33:14
15 products that this product might replace or 10:33:18
16 incorporate. 10:33:20
17 And then, of course, it would get 10:33:22
18 into quite a bit of financial information 10:33:24
19 about the cost of doing the project and what 10:33:26
20 the expected return on investment would be. 10:33:30
21 And then I think also, like, some critical key 10:33:33
22 dates. 10:33:37
23 There may be more I'm forgetting, 10:33:37
24 but that's what comes to mind. 10:33:39

Q. Thank you. 10:33:40
And what is the date that we see 10:33:41
here on this exhibit? 10:33:43
A. So for this particular revision, 10:33:46
second revision, it was August 18th of 2015. 10:33:47
Q. Is that the date when your team 10:33:50
started architecting the Sandia? 10:33:52
A. No, we had started prior to this. 10:33:55
Q. Okay. 10:33:57
And who was in charge of the team 10:33:57
who did the Sandia architect work? 10:33:58
A. It was myself. 10:34:01
Q. Were there other teams at Microchip 10:34:02
involved in designing and developing Sandia? 10:34:05
A. Over the course of the development of 10:34:09
the chip, itself, yes, there were many 10:34:12
different teams within Microchip. 10:34:14
Q. And what were those? 10:34:16
A. I mean, I don't remember them all, 10:34:18
but certainly the main early ones would be 10:34:20
architecture, marketing would have done this 10:34:24
plan, we had the implementation and 10:34:27
development teams, we also had some product 10:34:29
test teams and ultimately, the production 10:34:32

teams that would have run the product through 10:34:35
the sampling and get it to the package team 10:34:40
itself. 10:34:44
Q. So let me make sure I understand. 10:34:44
So you were part of the 10:34:46
architecture team; is that correct? 10:34:47
A. Correct. 10:34:49
Q. And that's a different team or the 10:34:49
same team as, say, sales and marketing? 10:34:51
A. No, it was definitely a different 10:34:53
team, yes. 10:34:55
Q. And then is sales and marketing two 10:34:55
teams or one team? 10:34:58
A. Sales was separate; marketing was in 10:34:59
our division. Sales was more at the corporate 10:35:03
level kind of function. 10:35:06
Q. Okay. 10:35:07
And what does the sales team do? 10:35:08
A. The sales team would interact 10:35:11
directly with customers to actually sell 10:35:13
products and do all the sales fulfillment. 10:35:17
Q. And would the -- would the sales team 10:35:21
interact with your architecture team? 10:35:25
A. No, not generally. They would 10:35:27

typically interact with the marketing team and 10:35:29
then if, you know, if marketing needed help 10:35:32
for something with sales, then we would help 10:35:36
marketing where we needed to. 10:35:39
Q. Okay. 10:35:42
And what was the -- what was the 10:35:42
architecture team's role in designing Sandia? 10:35:46
That's your team. 10:35:51
A. So our role would be defining, at the 10:35:51
top level, what are all the features and 10:35:55
functions we know this device needs to be, you 10:35:58
know, what are some of the key milestones 10:36:01
date-wise that we have to hit. We'll be 10:36:05
pulling some of that stuff, for instance, out 10:36:07
of the business plan. 10:36:09
You know, power consumption, is 10:36:12
there a limit to the size of the package 10:36:15
because of the customer requirement for the 10:36:18
size of their product; things like that we 10:36:20
would include in that early definition. 10:36:22
Q. Would you have been gathering 10:36:26
information on features or customer 10:36:28
requirements as part of your work in the 10:36:31
architecture of the Sandia device? 10:36:33

A. Some of what we would do in 10:36:35
architecture would be to gather some feature 10:36:38
requirements and stuff. Sometimes we would 10:36:42
even need to be on visits to the customer. 10:36:46
Many times we would get a lot of that 10:36:48
information from marketing directly, so we 10:36:50
wouldn't always have to go out and get it on 10:36:52
our own. 10:36:54
And then in addition to, you know, 10:36:55
some competitive information that we may find, 10:36:57
we'd also be looking at what's going on in the 10:37:00
industry specification-wise that we may need 10:37:03
to do some updates to certain elements in our 10:37:05
design, make sure we're supporting whatever 10:37:08
the latest standards would be and things of 10:37:11
that nature. 10:37:13
Q. By gathering information, features or 10:37:14
customer requirements, was your team 10:37:18
attempting to make similar products to your 10:37:20
competitors? 10:37:22
A. No, we would never do that. We 10:37:23
always try to make a better product than 10:37:25
anything that our competitors are offering. 10:37:28
Additionally, it doesn't really do 10:37:30

us much good to come out with the same part a 10:37:31
competitor has two years or so after they've 10:37:34
already got it. We have to make sure ours did 10:37:36
more and adhered to all the standards. 10:37:41
Q. Is the Sandia project a single USB 10:37:44
chip? 10:37:47
A. Well, the die, itself, is, but it 10:37:49
actually supports three separate products. 10:37:53
Q. And are all those three products 10:37:56
CarPlay capable? 10:37:58
A. Yes, they are. 10:38:00
Q. What three CarPlay configurations are 10:38:01
available on Sandia? 10:38:07
A. So the two that I mentioned 10:38:08
previously regarding Athens, where we had a 10:38:09
single upstream that enabled CarPlay, but did 10:38:13
not enable two hosts to simultaneously 10:38:19
communicate, a dual upstream, and then the 10:38:22
third would be the multi-host variant which 10:38:26
was added with Sandia. 10:38:29
Q. Let's turn to page 7 of Exhibit 25. 10:38:31
MR. BANNER: Mr. Ferrer, can you 10:38:35
go there. And please zoom in on that part at 10:38:36
the top. 10:38:40

BY MR. BANNER: 10:38:41
Q. Mr. Bohm, does this graphic describe 10:38:43
the three-hub chip configuration found on 10:38:45
Sandia? 10:38:49
A. It does on the right side, the boxes 10:38:49
in red. On the left, the boxes in green, 10:38:51
that's actually Athens. That's the previous 10:38:54
generation product. 10:38:56
Q. Okay. I want to talk through those, 10:38:57
the Sandia in the red boxes. 10:39:00
MR. BANNER: Can we start with the 10:39:02
red box on the bottom and blow that one up, 10:39:03
Mr. Ferrer. 10:39:05
BY MR. BANNER: 10:39:05
Q. Which configuration of Sandia are we 10:39:09
looking at here, Mr. Bohm? 10:39:13
A. So this would be the single upstream. 10:39:15
This is the one that allows what we refer to 10:39:18
as FlexConnect, which is the ability to 10:39:21
reverse the cords which would enable CarPlay 10:39:24
to take over the host along with some IO 10:39:27
bridging, and all ports would be supported 10:39:33
with CarPlay. 10:39:35
Q. Okay. 10:39:36

1 MR. BANNER: Can we go to the next 10:39:37
2 one up, Mr. Ferrer, in the middle, the red 10:39:38
3 box. 10:39:43
4 Actually -- sorry, let's go back 10:39:47
5 to the first one. 10:39:50
6 BY MR. BANNER: 10:39:52
7 Q. Mr. Bohm, you mentioned that with 10:39:53
8 this FlexConnect, CarPlay would work on all 10:39:55
9 ports; is that correct? 10:40:01
10 A. Yes. 10:40:02
11 Q. So if somebody had used this version 10:40:03
12 for CarPlay and plugged into an iPhone from 10:40:08
13 one port, would the other ports in the hub 10:40:11
14 still function normally? 10:40:16
15 A. So the term you're referring to is 10:40:17
16 what we've been calling persistent, and the 10:40:18
17 answer is no. So you'd have CarPlay on all 10:40:22
18 ports, but for other products that would be 10:40:24
19 plugged into those ports once the CarPlay 10:40:27
20 session occurred, the other ports would revert 10:40:30
21 to just charge whatever the device was, but it 10:40:34
22 wouldn't actually allow a useful connection 10:40:37
23 between the head unit and the device. 10:40:40
24 Q. Okay. 10:40:42

1 MR. BANNER: Mr. Ferrer, go to the 10:40:43
2 next box. 10:40:45
3 BY MR. BANNER: 10:40:47
4 Q. And which version of Sandia is this, 10:40:48
5 Mr. Bohm? 10:40:51
6 A. So this is the dual upstream version, 10:40:51
7 or DUST, as I had referred to it earlier, and 10:40:54
8 in this version, very similar to the previous 10:40:57
9 one, it enables CarPlay on all of the 10:41:01
10 downstream ports, but because of the two 10:41:04
11 connections upstream, there is a dedicated 10:41:07
12 connection to the head unit host that enables 10:41:11
13 the persistence that we just talked about. 10:41:14
14 And this version and the one that 10:41:18
15 we just talked about are also supported on the 10:41:20
16 previous generation, the Athens product; the 10:41:24
17 difference there being that for Athens, we had 10:41:27
18 to use some external switches with it and 10:41:29
19 Sandia, all of those were integrated. So it 10:41:33
20 was an enhancement on what was available with 10:41:36
21 Athens. 10:41:39
22 Q. All right. 10:41:40
23 MR. BANNER: So the third box, if 10:41:42
24 we could go to the third box at the top, Mr. 10:41:43

Ferrer. 10:41:45
BY MR. BANNER: 10:41:45
Q. Mr. Bohm, what Sandia version is 10:41:46
this? 10:41:49
A. So this is the version that the 10:41:49
multi-host device controller is enabled in, 10:41:53
and this enables that whole persistence that 10:41:56
we just talked about, and it enables CarPlay 10:42:00
on all ports as we've discussed, and it also 10:42:03
enables the two separate hosts, the head unit 10:42:05
host and the iPhone host, to both be active 10:42:09
hosts at the same time and enumerate the 10:42:13
device. 10:42:16
Q. Thank you, Mr. Bohm. 10:42:17
MR. BANNER: Now, Mr. Ferrer, 10:42:18
there's another figure kind of down towards 10:42:20
the bottom of this page. 10:42:22
BY MR. BANNER: 10:42:25
Q. Briefly, Mr. Bohm, can you describe 10:42:26
what we're seeing in this picture? 10:42:27
A. So this figure is going back to 10:42:29
Athens, the product I had mentioned before, so 10:42:33
this would be the previous generation device. 10:42:36
So the business plan, you know, it 10:42:39

1 talked some about, all right, what are we 10:42:40
2 already selling into the marketplace, so 10:42:42
3 that's why this would be in here. 10:42:44
4 Q. So would the Sandia product replace 10:42:46
5 this solution, the Athens solution? 10:42:49
6 A. Yes. So in this case, we see Sandia, 10:42:51
7 the chip at the top, with the port going up to 10:42:55
8 the head end unit. 10:42:59
9 Q. I'm sorry, did you say that's the 10:43:01
10 Sandia? 10:43:02
11 A. Did I say Sandia? 10:43:02
12 Q. You might have. 10:43:04
13 A. That was an eventful slip. This is 10:43:04
14 Athens, the Athens device, that would be at 10:43:10
15 the top. 10:43:15
16 Q. Okay. 10:43:15
17 A. And in the middle box, the USB3740, 10:43:15
18 those are the switches I referred to earlier, 10:43:19
19 and then the bottom box is a port charging 10:43:21
20 device, so this is what enables different 10:43:25
21 kinds of phones or devices to be charged. Not 10:43:28
22 everything just uses straight standard USB 10:43:32
23 power; there are some very unique charging 10:43:37
24 things in the world. So that chip handles all 10:43:38

of that. 10:43:41

Q. So this is -- this is the Athens 10:43:42

solution that was available before Sandia; is 10:43:44

that correct? 10:43:46

A. This is the Athens solution available 10:43:46

before Sandia, and in this case, Sandia would 10:43:49

integrate those two USB3740s. So the 10:43:52

Sandia-based solution would remove the 10:43:57

necessity of having those switches and reduce 10:44:00

the cost a little bit and simplify our 10:44:02

customers' design. 10:44:05

Q. So in this Athens solution, what is 10:44:07

the purpose of the switches, the USB3740 10:44:11

switches? 10:44:17

A. So the built-in capability on the hub 10:44:17

to do the port reversing, or the FlexConnect 10:44:20

as the marketers labeled it, was only enabled 10:44:25

on one of the hub's ports, just how we 10:44:28

happened to design it at the time based on 10:44:31

what the customer feedback was a year or so 10:44:33

prior. 10:44:36

So in this case, there are two 10:44:37

ports shown down at the bottom, and so what 10:44:39

the switches do is there's a clever little 10:44:42

1 detection scheme that they would just allow 10:44:44
2 the Apple iPhone to make sure it's routed over 10:44:47
3 to go through the port on the hub that 10:44:50
4 actually enables that CarPlay switch. 10:44:52
5 Q. Could you use Athens to support 10:44:56
6 CarPlay if those switches were removed? 10:44:58
7 A. Yes, you can. You would just -- you 10:45:01
8 would have CarPlay on just that one port then, 10:45:03
9 the port that it's enabled natively in the 10:45:07
10 device. 10:45:12
11 MR. BANNER: Mr. Ferrer, can we go 10:45:12
12 to page 8. 10:45:13
13 THE COURT: Mr. Banner, if you get 10:45:23
14 a little bit -- I don't know how much you have 10:45:26
15 left, but we should pause to take a break. 10:45:28
16 MR. BANNER: Sure. We can pause 10:45:32
17 and take a break right now. 10:45:33
18 THE COURT: Okay. 10:45:35
19 Why don't we take 10 minutes and 10:45:35
20 we'll come back. 10:45:37
21 (Whereupon, a 15-minute recess was 10:45:43
22 taken at 10:45 a.m.) 10:45:47
23 THE COURT CLERK: All rise. 10:58:26
24 THE COURT: Have a seat, please. 10:58:36

1 Just one housekeeping matter 10:58:37
2 before we bring the jury back in. I am told 10:58:39
3 that our court reporter is having a little 10:58:41
4 trouble hearing everyone, so Mr. Banner, pull 10:58:43
5 that microphone up a little closer to you and, 10:58:46
6 Mr. Bohm, whatever you can do to either, I 10:58:49
7 think either try to move -- maybe if you can 10:58:53
8 move it closer and just make a conscious 10:59:00
9 effort to speak into it, that will help 10:59:04
10 everyone out. 10:59:05
11 (Whereupon, the jury entered the 10:59:19
12 courtroom.) 10:59:23
13 THE COURT: All right. 10:59:50
14 Welcome back. As we resume with 10:59:52
15 Mr. Bohm this morning, I just want to make 10:59:56
16 sure, are you all able to hear okay? Are you 10:59:59
17 having any trouble with sound? 11:00:01
18 Okay. All right. Good. If you 11:00:03
19 do at some point, speak up and let us know 11:00:04
20 because obviously it's important for you to 11:00:07
21 hear the witness and counsel back and forth. 11:00:09
22 Okay. 11:00:11
23 All right. Mr. Banner, you can 11:00:11
24 resume. 11:00:13

1 MR. BANNER: Thank you, Your 11:00:14
2 Honor. 11:00:16
3 And, Mr. Ferrer, can we get the 11:00:16
4 diagram back on, the exhibit, Exhibit 5, and I 11:00:20
5 think we were about to turn to page 8, if we 11:00:22
6 go there. 11:00:24
7 BY MR. BANNER: 11:00:26
8 Q. Mr. Bohm, do you see the figure here 11:00:26
9 on this page, kind of what we were just 11:00:28
10 talking about the previous figure, and would 11:00:29
11 you just explain, just tell us briefly what 11:00:31
12 this is. 11:00:33
13 A. Yes, absolutely. 11:00:35
14 So I'll make sure I get the Athens 11:00:37
15 part of it right this time. So this is, 11:00:40
16 again, Athens. In this case, this is the dual 11:00:42
17 upstream variant of Athens, and so we have, in 11:00:45
18 this particular case, two instances, an Athens 11:00:51
19 chip, or in some we could do a simpler device, 11:00:56
20 but a majority of customers put two of them in 11:00:59
21 there. 11:01:02
22 Q. And, Mr. Bohm, just so it's clear for 11:01:03
23 the record, when you say, "two Athens chips," 11:01:05
24 are you talking about the two blue boxes at 11:01:09

1 the top? 11:01:11
2 A. Yes. Sorry. 11:01:11
3 Q. And the USB8460x on the left? 11:01:12
4 A. Yes. Thank you. 11:01:15
5 Q. And then what's here in the blue box 11:01:17
6 that says, "USB3740"; what is that? 11:01:19
7 A. So those are the same switches that I 11:01:21
8 mentioned before, the USB3740, and again, 11:01:24
9 they're for rerouting the CarPlay device on 11:01:30
10 the downstream ports to make sure it gets 11:01:35
11 connected to the CarPlay labeled port. 11:01:37
12 Q. So are the -- I'm sorry. 11:01:40
13 A. No, that's fine. 11:01:41
14 Q. Are those switches, are they separate 11:01:43
15 components from the Athens chips shown above 11:01:45
16 them? 11:01:47
17 A. Yes. Those are separate components, 11:01:47
18 and at least on Athens, and then in Sandia, we 11:01:49
19 enhanced it so that, again, those would not be 11:01:53
20 required in Sandia. 11:01:56
21 Q. Thank you, Mr. Bohm. 11:01:57
22 MR. BANNER: Can we move to the 11:02:00
23 next page, Mr. Ferrer. 11:02:01
24 BY MR. BANNER: 11:02:04

Q. And the graphic at the top of this 11:02:05
page, what are we seeing here, Mr. Bohm? 11:02:07
A. This time I get to say Sandia, so 11:02:09
this actually is showing the new one, and this 11:02:11
is a conceptual diagram showing that we have 11:02:15
one connection upstream, we have multiple 11:02:19
downstream ports; in this case, two. 11:02:23
So we no longer need those 11:02:27
external switches, they're integrated along 11:02:28
with some of the power components. And then 11:02:31
in the middle, that's where we have the 11:02:34
components that we defined to be -- we wanted 11:02:36
to functionally reproduce for the multi-host 11:02:40
device controller. 11:02:42
Q. So the EP Bridge, is that part of the 11:02:44
multi-host device controller? 11:02:49
A. Yes. 11:02:50
Q. And what does EP Bridge stand for? 11:02:51
A. So EP would be shorthand for 11:02:53
endpoint, and bridge, because we're bridging 11:02:56
the data from one endpoint to another 11:03:00
endpoint. 11:03:03
Q. So you didn't make that term up? 11:03:03
A. No. Bridge is a very commonly used 11:03:05

1 term in engineering, using it for almost all 11:03:09
2 of my engineering career, and I'm sure it 11:03:12
3 probably predates me by quite a bit; and 11:03:15
4 endpoint, as I had mentioned before, is used 11:03:18
5 in the specification, itself. 11:03:23
6 So we don't always like to be 11:03:24
7 super creative. In this case, we wanted to 11:03:26
8 just describe exactly what it was doing, so we 11:03:28
9 labeled it endpoint bridge. 11:03:31
10 Q. All right. 11:03:32
11 MR. BANNER: There's another 11:03:33
12 figure, Mr. Ferrer, on this page, page 9 of 11:03:34
13 Exhibit 25. Can you zoom in on that, on the 11:03:37
14 bottom. 11:03:39
15 BY MR. BANNER: 11:03:40
16 Q. Mr. Bohm, what is this figure? 11:03:41
17 A. Well, when we initially started our 11:03:44
18 work, we thought that we might have to do a 11:03:46
19 fairly complicated amount of data and control 11:03:50
20 transitions between the two endpoints to 11:03:54
21 support the multiple hosts, but the further in 11:03:56
22 we got, once we got the Apple spec and things 11:03:59
23 like that, we discovered that we could 11:04:02
24 actually simplify it quite a bit. 11:04:04

1 And so we actually implemented 11:04:06
2 what here we refer to as an endpoint mirror. 11:04:08
3 It simply mirrored data from one side to the 11:04:12
4 other. And internally, we also call that an 11:04:15
5 endpoint reflector; it's the same thing, just 11:04:18
6 two different labels for the one item. 11:04:21
7 Q. And what does that have to do with 11:04:23
8 your -- what does that have -- what role does 11:04:25
9 that play in Sandia? 11:04:27
10 A. So that's really what we simplified 11:04:29
11 the endpoint bridge to do, so that's more 11:04:33
12 descriptive in the end of what we -- what we 11:04:36
13 went to market with. 11:04:38
14 Q. All right. I think we're done with 11:04:39
15 the Sandia business plan. 11:04:41
16 Mr. Bohm, if you could turn to 11:04:43
17 Exhibit 292 in your binder. 11:04:45
18 A. Okay. 11:04:58
19 (Whereupon, Trial Exhibit 292 was 11:04:58
20 introduced.) 11:04:58
21 BY MR. BANNER: 11:04:59
22 Q. Do you recognize this document? 11:04:59
23 A. Yes. This is the 4916 data sheet for 11:05:01
24 Sandia. 11:05:07

MR. BANNER: All right. I move to admit Exhibit 292 into evidence. 11:05:10 11:05:12

MR. SAULSBURY: No objection. 11:05:14

THE COURT: All right. It's admitted. 11:05:15 11:05:16

MR. BANNER: Mr. Ferrer, could you please bring that up on the screen. Thanks. 11:05:17 11:05:18

BY MR. BANNER: 11:05:20

Q. So, Mr. Bohm, what is at the top of the USB4916/USB4914, what is that? 11:05:23 11:05:26

A. So internally, we just give it the last 4, but the full label here is USB4916 and the USB4914 are two part numbers for two different versions of this particular Sandia device. 11:05:32 11:05:35 11:05:41 11:05:47 11:05:50

And the change in the last digit, the 4 and the 6, indicates whether it has -- in the case of the 4914, two CarPlay ports downstream, and in the case of the 4916, four CarPlay ports downstream. 11:05:53 11:05:55 11:06:01 11:06:05 11:06:09

Q. And the title of this data sheet, Mr. Bohm, what is it? 11:06:11 11:06:13

A. The title is "USB 2.0 Hi-Speed Multi-Host Device Controller." 11:06:14 11:06:18

Q. And what do these part numbers have 11:06:20
to do with this title? 11:06:23
A. Well, this is the very Sandia that we 11:06:25
were just previously talking about where we 11:06:27
had enabled the multi-host device controller 11:06:30
within it so that we could support the mode 11:06:32
where two hosts are on simultaneously and they 11:06:35
are both able to communicate with the product. 11:06:39
Q. All right. 11:06:42
MR. BANNER: Mr. Ferrer, can we 11:06:43
turn to page 3. 11:06:45
BY MR. BANNER: 11:06:49
Q. Mr. Bohm, I want to look at 11:06:51
Figure 1.1 and ask you what this figure is 11:06:53
about. 11:06:55
A. So this is a simplified block diagram 11:06:57
of the device. 11:07:01
Q. Which device is that? 11:07:06
A. The Sandia USB4916 and 4914. 11:07:08
Q. Can you explain the ports shown at 11:07:13
the bottom of this diagram? There's four flex 11:07:18
ports and a standard port; can you explain 11:07:21
what those are? 11:07:23
A. Sure. 11:07:23

1 So the flex ports, those are the 11:07:24
2 ports that enable CarPlay when you plug the 11:07:27
3 iPhone in. And you notice there's a little 11:07:30
4 bracket under sort of the middle two there. 11:07:34
5 And those are only bonded out in USB4916 11:07:39
6 versions so you get four ports. 11:07:44
7 Q. Okay. 11:07:46
8 So just to -- you used the term 11:07:47
9 "bonded out." 11:07:48
10 A. Yeah. 11:07:50
11 Q. In layman's terms, what do you mean 11:07:50
12 when you're talking about the -- the bracketed 11:07:52
13 ports there? 11:07:56
14 A. Sorry, I realized that I said it and 11:07:56
15 I was like oh, no, now I have to define 11:07:59
16 another term. My apologies. 11:08:01
17 So when we -- when we put our 11:08:03
18 actual chip in the package like I showed 11:08:05
19 earlier on Exhibit 249, we use little tiny 11:08:08
20 wires called bond wires to go from the chip, 11:08:14
21 itself, to the little pins in the package that 11:08:17
22 actually get soldered down for the customer. 11:08:21
23 Q. So how many CarPlay ports does the 11:08:27
24 4916 version of the product have as shown in 11:08:29

this figure? 11:08:32
A. So the 4916 would get all four of 11:08:32
those flex ports, so it would have the four 11:08:35
enabled. The 4914 would only get the left 11:08:38
two. 11:08:42
And then you had asked, also, I 11:08:43
believe, about the standard port. That's just 11:08:46
a regular USB hub port. And for most of our 11:08:49
automotive customers, that would be used to 11:08:54
connect the break out box in, say, the back 11:08:56
seat of an SUV or a minivan or something where 11:08:59
you want to have more connectivity than just 11:09:02
whatever might be, you know, for the front 11:09:05
passengers. This gives additional ports for 11:09:07
the rear of the vehicle so they can sort of 11:09:10
daisy chain the product along in the car. 11:09:13
Q. Is the standard port a CarPlay 11:09:16
capable port? 11:09:19
A. No, it is just a regular USB port. 11:09:20
Q. Can you turn in your witness binder 11:09:22
to Exhibit 26, Mr. Bohm. 11:09:24
A. Okay. 11:09:38
(Whereupon, Trial Exhibit 26 was 11:09:38
introduced.) 11:09:38

BY MR. BANNER: 11:09:39
Q. Do you recognize this document? 11:09:39
A. Yes. This is a data sheet for the 11:09:42
USB4715 version of Sandia. 11:09:45
MR. BANNER: Your Honor, I move to 11:09:50
admit Exhibit 26 into evidence. 11:09:51
MR. SAULSBURY: No objection. 11:09:53
THE COURT: All right. It can 11:09:53
come in. 11:09:55
MR. BANNER: Mr. Ferrer, if you 11:09:55
could display that on the screen. 11:09:57
BY MR. BANNER: 11:09:57
Q. So again, this has a number at the 11:10:00
top, USB4715. Can you tell us what that is, 11:10:02
what that reference is, Mr. Bohm? 11:10:04
A. So again, that would be the part 11:10:06
number that Microchip's customers would use to 11:10:08
order this specific device. 11:10:10
Q. All right. 11:10:13
MR. BANNER: Let's go to page 6, 11:10:14
Mr. Ferrer. Figure 2.1. 11:10:16
BY MR. BANNER: 11:10:20
Q. Mr. Bohm, what is this figure showing 11:10:21
us here on page 6? 11:10:23

A. So similar to the previous one, this 11:10:26
is a simplified block diagram for the features 11:10:29
of this product. 11:10:33
Q. And can you tell us about kind of the 11:10:34
ports at the bottom? 11:10:37
A. So the flex ports here are, again, 11:10:38
these are the ports that enable CarPlay with 11:10:42
the iPhone. And you'll notice we don't have 11:10:44
the standard port on this particular product, 11:10:47
so it's not meant to enable the rear seat kind 11:10:50
of applications. 11:10:54
Q. And how many CarPlay ports are 11:10:55
available on this product? 11:10:57
A. There would be four. It would be all 11:10:59
four of these flex ports. 11:11:01
Q. Thank you. I think we're done with 11:11:03
Exhibit 26. 11:11:05
Mr. Bohm, earlier we took kind of 11:11:06
a fork in the road where you had -- we went 11:11:08
down to tell the story about Sandia, but you 11:11:12
had also mentioned your investigation when you 11:11:14
were talking to the automakers and trying to 11:11:16
get information about Apple, you discussed, 11:11:19
you know, the defendant, Aptiv. 11:11:22

Do you recall the fork in the road 11:11:24
that we took there? 11:11:27
A. Yes, I do. 11:11:28
Q. Okay. 11:11:29
So during your investigation, did 11:11:29
Aptiv, defendant Aptiv, come up? How did that 11:11:33
happen? 11:11:36
A. So we had learned, through some of 11:11:37
our customers, that actually the company that 11:11:40
Aptiv required, Unwired -- I'm sorry, acquired 11:11:45
Unwired had begun to advertise a product for 11:11:48
sale that was sounding very similar to what we 11:11:53
were also beginning to work on. 11:11:56
Q. And why was it similar? 11:11:57
A. Because it was indicating that it 11:11:58
could support simultaneous connectivity to two 11:12:01
hosts and support CarPlay with persistence 11:12:06
with a single upstream cable connection 11:12:09
between the break out box and the head unit. 11:12:12
Q. Mr. Bohm, can you turn to Exhibit 67 11:12:15
in your binder. 11:12:17
A. Yes. 11:12:24
(Whereupon, Trial Exhibit 67 was 11:12:24
introduced.) 11:12:24

BY MR. BANNER: 11:12:26
Q. And do you recognize Exhibit 67? 11:12:26
A. Yes, I do. This is an email chain 11:12:29
that was shared in the process of this court 11:12:34
case. 11:12:40
Q. Were you one of the recipients of at 11:12:42
least a portion of this email chain? 11:12:45
A. I'm not actually on the page that's 11:12:47
shown, but in the thread here, yes, I am 11:12:49
included. 11:12:51
MR. BANNER: Your Honor, I move to 11:12:52
admit Exhibit 67 into evidence. 11:12:53
MR. SAULSBURY: No objection. 11:12:55
THE COURT: All right. It will be 11:12:56
admitted. 11:12:58
MR. BANNER: Mr. Ferrer, if we 11:12:58
could jump to page 13, down at the bottom. I 11:13:00
want to start at the bottom where the email 11:13:08
starts. 11:13:10
BY MR. BANNER: 11:13:11
Q. Mr. Bohm, it will make it easier to 11:13:12
discuss. So what are we looking at here? 11:13:14
A. Well, so this is a email that I 11:13:17
received from David Sroka. He was our 11:13:21

1 marketing manager for our product at this 11:13:29
2 time. It was sent by Dave on November 12th of 11:13:31
3 2014, and he is asking for the patent number 11:13:34
4 for the dual host single endpoint patent. 11:13:39
5 That's the '243 Patent. 11:13:42
6 Q. Did you respond to Mr. Sroka's 11:13:50
7 request? 11:13:55
8 A. Yes, I did. Not on this page, a 11:13:56
9 little earlier. 11:14:05
10 MR. BANNER: Mr. Ferrer, please 11:14:06
11 jump to page 2 near the bottom. 11:14:07
12 BY MR. BANNER: 11:14:09
13 Q. Mr. Bohm, is there where you 11:14:10
14 responded to Mr. Sroka? 11:14:11
15 A. Yes. So I responded basically the 11:14:14
16 next day, November 13th, 2014. 11:14:17
17 Q. And did you send Mr. Sroka your 11:14:20
18 multi-hub patent? 11:14:25
19 A. Yes, I actually pasted the basic 11:14:27
20 whole thing right in so he got a snapshot of 11:14:30
21 it, along with the number. 11:14:32
22 Q. And why did you send this to Mr. 11:14:33
23 Sroka? 11:14:36
24 A. Well, we had had some prior 11:14:36

conversations about it, and then I think 11:14:38
further back in an email thread, there was 11:14:42
some issues that came up with the customer 11:14:45
where they wanted to have the patent number 11:14:48
again, so that's why he asked and why I 11:14:54
responded. 11:14:55
Q. Okay. 11:14:56
Was that back in Mr. Sroka's email 11:14:56
on page 13? 11:14:59
A. Yeah, I think it's actually whatever 11:15:01
preceded it. 11:15:06
Q. Okay. Let's look at this real quick. 11:15:07
MR. BANNER: If you could blow 11:15:09
that up, Mr. Ferrer. 11:15:10
BY MR. BANNER: 11:15:11
Q. That's that second sentence from Mr. 11:15:12
Sroka to you. Can you explain what he's 11:15:15
talking about with you there? 11:15:17
A. So he mentions that Delphi is going 11:15:18
to be moving full steam ahead with the Unwired 11:15:23
solution, and obviously he is asking to think 11:15:26
about options. Since we had had prior 11:15:30
conversations, he knew discussion of this 11:15:33
patent would be one of those options. 11:15:36

Q. Mr. Sroka, did he work in the same 11:15:38
group as you? 11:15:40
A. No. Dave worked in our marketing 11:15:41
team. 11:15:44
Q. So he wasn't part of the architecture 11:15:46
team? 11:15:48
A. No, no, he is not part of 11:15:48
architecture. 11:15:50
Q. After you sent your patent to Mr. 11:15:50
Sroka, did you try to confirm whether the 11:15:53
Unwired product used your multi-host device 11:15:55
controller technology? 11:15:58
A. Myself or our department? 11:15:59
Q. You first. 11:16:04
A. So we -- we never got any internal 11:16:05
documentation that described the internal 11:16:09
workings of the product, but we did try to see 11:16:11
what we could, you know, get out on the open 11:16:15
market in kind of a sales sheet, I think it 11:16:18
was called a feature sheet, if I recall, that 11:16:21
was talking about the break out box. So it 11:16:24
took quite a bit of time, but yes, we 11:16:31
definitely kept looking. 11:16:34
Q. Did you ever pass any of the 11:16:36

1 information you obtained with respect to the 11:16:37
2 Unwired product to your implementation team? 11:16:39
3 A. No, no. We would never do that. 11:16:41
4 Q. Were you ever able to confirm the 11:16:45
5 features on the Unwired product? 11:16:49
6 A. I, myself, was not, but at Microchip, 11:16:54
7 we had other technical team members who were, 11:16:59
8 yes. 11:17:01
9 Q. And what timeframe did that occur? 11:17:01
10 A. It was June, July of 2016, I believe. 11:17:04
11 Q. And what was the status of the Sandia 11:17:09
12 product at that time? 11:17:11
13 A. Around that same time, I think we 11:17:13
14 were sampling our Sandia product, so we had 11:17:16
15 our finished device and we were making it 11:17:18
16 available to the customers to test, I believe. 11:17:21
17 Q. Do you have an understanding of how 11:17:24
18 Sandia compares to the Unwired product? 11:17:26
19 A. In terms of what? 11:17:31
20 Q. Features. 11:17:34
21 A. Oh, features. Well, from the 11:17:35
22 multi-host device controller standpoint, from 11:17:38
23 what we understand from customers, they sound 11:17:41
24 fairly similar. 11:17:44

1 One of the main differences would 11:17:45
2 be theirs requires a custom driver to be 11:17:47
3 loaded on the head end unit and ours, we were 11:17:49
4 able to use standard drivers that were already 11:17:53
5 available on all those products. 11:17:57
6 MR. BANNER: Mr. Ferrer, if we can 11:18:00
7 just jump back to Exhibit 1, please, if we 11:18:01
8 could go to column 2 and starting around 11:18:11
9 line 20, if you blow that up for me. 11:18:14
10 So, "embodiments" -- starting, 11:18:25
11 "embodiments of the present invention," to the 11:18:28
12 end of that sentence. 11:18:31
13 BY MR. BANNER: 11:18:33
14 Q. Mr. Bohm, would you mind -- I know we 11:18:33
15 went through this earlier, but I wanted to get 11:18:35
16 this on the record. I don't think I had you 11:18:38
17 read this one. Would you mind reading it for 11:18:40
18 me. 11:18:42
19 A. "Embodiments of the present invention 11:18:42
20 the Ethernet switch may be replaced by a less 11:18:45
21 expensive and more compact multi-host USB 11:18:48
22 controller, allowing each host to access the 11:18:52
23 USB device directly." 11:18:54
24 Q. Mr. Bohm, just a couple more 11:18:56

1 questions and we'll finish up. 11:18:57
2 Have you been asked to offer an 11:19:00
3 opinion on whether Aptiv infringes your '243 11:19:01
4 Patent? 11:19:04
5 A. No, I'm not a patent attorney. No, I 11:19:04
6 haven't been going through the claims in any 11:19:09
7 way or anything like that. 11:19:11
8 Q. Mr. Bohm, you're an inventor on the 11:19:12
9 '243 Patent. 11:19:15
10 Do you have any other patents? 11:19:16
11 A. Yes, I believe I have 14 patents. 11:19:17
12 Q. Are all 14 of your patents related to 11:19:20
13 USB? 11:19:22
14 A. Most all of them are, not quite all. 11:19:23
15 Q. Have you always been an innovator? 11:19:26
16 A. I love solving problems and I've 11:19:30
17 enjoyed doing it in my engineering career. 11:19:34
18 MR. BANNER: I pass the witness. 11:19:37
19 - - - 11:19:37
20 CROSS-EXAMINATION 11:19:48
21 - - - 11:19:52
22 BY MR. SAULSBURY: 11:19:52
23 Q. Good morning, Mr. Bohm. 11:20:08
24 A. Good morning. 11:20:09

Q. You spoke to Mr. Banner about 11:20:11
Ethernet controllers. 11:20:14
A. Yes. 11:20:15
Q. And you said that one of your ideas 11:20:17
was that two computers could share one 11:20:21
Ethernet controller? 11:20:24
A. Correct. 11:20:26
Q. A USB Ethernet controller is a USB 11:20:27
device? 11:20:30
A. I'm sorry, could you -- 11:20:32
Q. A USB Ethernet controller is a USB 11:20:33
device; is that right? 11:20:36
A. A USB Ethernet controller, yes. 11:20:38
Q. And, in fact, this is a USB connect 11:20:43
controller here? 11:20:49
A. I believe so. I don't know what's 11:20:55
inside of it, but it would appear to be. 11:20:57
Q. Okay. 11:21:00
THE COURT: Are you offering that? 11:21:04
MR. SAULSBURY: Not yet. 11:21:06
THE COURT: Okay. 11:21:08
BY MR. SAULSBURY: 11:21:09
Q. So your idea was a way for two 11:21:10
computers to share one function; right? 11:21:14

A. What -- what function specifically? 11:21:18
Q. To share a USB function; right? 11:21:22
A. To share whatever the device function 11:21:26
would be; in that case that you showed, it 11:21:30
would be Ethernet. 11:21:33
Q. Okay. 11:21:34
You didn't invent having one 11:21:35
computer use one Ethernet controller; right? 11:21:39
A. No, that would have been prior art. 11:21:42
Q. And so if I were to connect this 11:21:49
Ethernet controller to the computer, that's 11:21:54
one host and one device; right? 11:21:56
A. I believe so. 11:21:59
Q. Okay. 11:22:00
Now, you didn't invent a way for a 11:22:01
second computer to connect to a second 11:22:08
Ethernet controller; right? You didn't invent 11:22:11
that? 11:22:22
A. No. 11:22:22
Q. Okay. 11:22:22
Each host controls its own device? 11:22:24
A. Each host is controlling its Ethernet 11:22:28
controller, yeah. 11:22:32
Q. Okay. 11:22:32

1 And you can attach a crossover 11:22:33
2 cable between two USB devices; right? 11:22:53
3 A. For Ethernet, you can do device to 11:22:57
4 device attach, I believe. 11:23:02
5 Q. Like I've shown here? 11:23:03
6 A. Um-hmm. 11:23:05
7 Q. Okay. 11:23:05
8 But that's not something you 11:23:06
9 invented? 11:23:08
10 A. I don't recall inventing that, no. 11:23:09
11 Q. Okay. 11:23:11
12 It's not covered by the patent 11:23:12
13 asserted here? 11:23:15
14 MR. BANNER: Objection, Your 11:23:17
15 Honor, calls for a legal opinion. 11:23:18
16 THE COURT: Sustained. 11:23:19
17 BY MR. SAULSBURY: 11:23:24
18 Q. And now this arrangement I just 11:23:25
19 showed with the crossover cable between the 11:23:27
20 Ethernet controllers, this complies with the 11:23:31
21 USB specifications; correct? 11:23:36
22 MR. BANNER: Objection, calls for 11:23:38
23 expert testimony. 11:23:40
24 BY MR. SAULSBURY: 11:23:41

Q. You don't know? 11:23:42
THE COURT: Hold on. Let me rule. 11:23:43
The objection is overruled. 11:23:46
Go ahead, if you know. 11:23:48
THE WITNESS: I don't know. I've 11:23:50
never tested a device like that. 11:23:52
BY MR. SAULSBURY: 11:23:54
Q. Well, it's compliant because, in this 11:23:57
case, each host, each computer, is talking to 11:23:59
its own device; correct? 11:24:03
A. But I don't believe that the USB 11:24:07
compliance labs would test that configuration, 11:24:11
so I don't know that you can say that it's 11:24:13
compliant. 11:24:16
Q. Okay. 11:24:16
The connection between each host 11:24:20
and its device is one host, one device; right? 11:24:22
A. So I'm not quite sure what question 11:24:29
you're asking. 11:24:31
Q. This is one host and one device here? 11:24:37
A. Correct. 11:24:39
Q. Okay. 11:24:40
And so that's compliant with the 11:24:41
requirement that a USB, you only have one 11:24:44

host; right? 11:24:47
A. So the USB compliance labs would test 11:24:49
that configuration as you're holding it. 11:24:53
Q. And this was a way for computers to 11:24:59
pass data from one computer to another; 11:25:01
correct? 11:25:04
A. Ethernet, yes, Ethernet is an 11:25:06
exchange -- allows computer to computer to 11:25:09
exchange data. 11:25:11
Q. It's not something you invented? 11:25:14
A. I did not invent the Ethernet, no. 11:25:16
Q. And you didn't invent connecting two 11:25:20
Ethernet controllers, two USB Ethernet 11:25:22
controllers together with the crossover cable; 11:25:26
correct? 11:25:30
A. As you had previously shown? 11:25:30
Q. Right. 11:25:36
A. You're referring to that? Yeah, I 11:25:37
did not invent that. 11:25:42
MR. SAULSBURY: I've marked this 11:26:09
as Exhibit 371, and I just want to get a 11:26:10
little bit closer to you. 11:26:14
(Whereupon, Trial Exhibit 371 was 11:26:14
introduced.) 11:26:14

BY MR. SAULSBURY: 11:26:14
Q. So you recognize that it's two USB 11:26:15
Ethernet controllers connected with a 11:26:18
crossover cable? 11:26:20
MR. BANNER: I'm sorry, Your 11:26:21
Honor, can I have a look at that? 11:26:22
THE COURT: Yeah, have you shown 11:26:24
it to him, Mr. Saulsbury? 11:26:25
MR. SAULSBURY: Here you go. 11:26:37
BY MR. SAULSBURY: 11:26:43
Q. The question was, you recognize this 11:26:44
as two USB controllers connected with the 11:26:47
crossover cable? 11:26:50
A. Well, I don't know that it's a 11:26:51
crossover cable. I can see that it's an 11:26:53
Ethernet cable. 11:26:56
MR. SAULSBURY: Okay. Move 11:26:57
Exhibit 371. 11:26:58
MR. BANNER: No objection. 11:27:00
THE COURT: Okay. It will come 11:27:01
in. 11:27:02
BY MR. SAULSBURY: 11:27:03
Q. Now, you didn't invent USB host 11:27:03
controllers; correct? 11:27:06

A. I missed the very first word. Would 11:27:07
you mind repeating? 11:27:10
Q. No problem. 11:27:11
You didn't invent USB host 11:27:12
controllers? 11:27:15
A. No, I did not invent USB host 11:27:15
controllers. 11:27:17
Q. You didn't invent USB interface 11:27:20
circuits either? 11:27:24
A. I have invented some interface 11:27:28
circuitry for USB. 11:27:31
Q. So the concept of a USB interface 11:27:32
circuit was known? 11:27:35
A. Are you referring to what's called 11:27:37
out in the USB 2.0 specification? 11:27:40
Q. That's right. 11:27:42
A. No, I did not invent the USB 2.0 11:27:43
specification. 11:27:46
Q. And you didn't invent the USB 11:27:47
interface as discussed in that specification; 11:27:49
correct? 11:27:53
A. I am not exactly sure how to answer. 11:27:58
I have built devices on the instructions that 11:28:01
are in there. Would you repeat that question 11:28:04

again, please? 11:28:08
Q. Yeah. 11:28:09
You didn't come up with the idea 11:28:10
of the USB interface; right? 11:28:12
A. No, no. As defined in the USB spec, 11:28:15
no. 11:28:18
Q. You didn't invent the USB endpoint 11:28:18
buffers? And again, you didn't -- sorry, let 11:28:23
me rephrase so I can simplify. 11:28:25
You didn't invent the concept of 11:28:28
the USB endpoint buffer; right? 11:28:31
A. As defined in the USB specification? 11:28:33
Q. Right. 11:28:36
A. No. In the 2.0 spec, no, that was in 11:28:36
the spec. 11:28:43
Q. You didn't invent any -- strike that. 11:28:43
In the context of the '243 Patent 11:28:45
asserted here, you didn't invent any new types 11:28:51
of device functions; correct? 11:28:53
MR. BANNER: Objection, vague. 11:29:01
THE COURT: Overruled. 11:29:03
THE WITNESS: So I'm still kind of 11:29:04
processing your question. You asked it in a 11:29:06
way -- I'm not exactly sure what you're 11:29:12

1 meaning by that. Is there a way you could 11:29:14
2 rephrase it? 11:29:16
3 MR. SAULSBURY: Yeah. 11:29:17
4 BY MR. SAULSBURY: 11:29:17
5 Q. I'd just like to know whether, in the 11:29:18
6 context of the patent asserted in this case, 11:29:21
7 you invented a new type of device function? 11:29:24
8 A. New type of device function. So I 11:29:28
9 don't believe we disclosed a new type of 11:29:40
10 device function in the patent, as I recall, so 11:29:43
11 I think the answer is no. 11:29:48
12 Q. Again, in the context of the patent 11:29:49
13 asserted here, you didn't invent one device 11:29:54
14 function that reports different device 11:29:58
15 descriptors to different hosts; correct? 11:30:03
16 A. I don't believe there's anything that 11:30:13
17 precludes that. 11:30:15
18 Q. It's not something you invented? 11:30:17
19 A. I think it's allowed for someone 11:30:21
20 skilled in the art to create a product that 11:30:24
21 would do that. It didn't say that they must 11:30:26
22 be the same. 11:30:29
23 Q. Sure. My question is a little bit 11:30:30
24 different, though. 11:30:31

1 That's not something that's 11:30:32
2 disclosed in your '243 Patent; correct? 11:30:34
3 A. As far as the specific embodiments, 11:30:37
4 that's not an example that we gave. 11:30:39
5 Q. Okay. 11:30:41
6 And nowhere in the '243 Patent do 11:30:42
7 you disclose one device function that reports 11:30:45
8 different device descriptors to different 11:30:51
9 codes; correct? 11:30:53
10 A. We do specify that the responses need 11:30:55
11 to be appropriate for the host, so it would be 11:30:59
12 whatever the host would be expecting. 11:31:02
13 Q. Again -- 11:31:05
14 A. It could be different. 11:31:06
15 Q. Again, the question is a little bit 11:31:07
16 different. 11:31:09
17 Nowhere in the '243 Patent do you 11:31:10
18 disclose one device function that reports 11:31:13
19 different device descriptors to different 11:31:19
20 hosts; right? 11:31:22
21 A. I don't recall doing that as this 11:31:23
22 specific embodiment, no. 11:31:27
23 Q. Okay. 11:31:29
24 And you have the '243 Patent in 11:31:30

1 front of you; correct? 11:31:34
2 A. Yes, I do. 11:31:35
3 Q. Exhibit 1? 11:31:36
4 A. I believe so. 11:31:37
5 Q. And you reviewed it in advance of 11:31:48
6 your testimony today? 11:31:52
7 A. Somewhat, yes. 11:31:54
8 Q. Okay. 11:31:55
9 You don't recall seeing any 11:31:56
10 discussion of a device function that reports 11:31:58
11 different device descriptors to different 11:32:03
12 hosts; right? 11:32:06
13 A. That is correct. As I said, I don't 11:32:07
14 recall putting it in the embodiments. 11:32:09
15 Q. You claim to have invented a way to 11:32:16
16 share a single USB device with more than one 11:32:20
17 host? 11:32:23
18 A. Is there a specific reference you're 11:32:38
19 wanting me to look at? 11:32:40
20 Q. Sure. Why don't we take a look at 11:32:43
21 claim 1. 11:32:45
22 MR. SAULSBURY: Mr. Glass, if we 11:32:49
23 could please see claim 1 in evidence. This is 11:32:50
24 on page 6 of Trial Exhibit 1 running on to 11:32:53

1 page 7. 11:32:59
2 BY MR. SAULSBURY: 11:33:00
3 Q. Do you recognize this as claim 1 of 11:33:01
4 the '243 Patent? 11:33:03
5 A. That seems right, yeah. 11:33:05
6 Q. You talked about Figure 3 of the 11:33:13
7 patent in your direct. 11:33:16
8 A. Yes, sir. 11:33:19
9 MR. SAULSBURY: Can we get 11:33:21
10 Figure 3 up side-by-side with claim 1, please. 11:33:24
11 BY MR. SAULSBURY: 11:33:27
12 Q. Everything in Figure 3 over on the 11:33:31
13 right is found in claim 1 of your patent; 11:33:36
14 correct? 11:33:39
15 A. Well, I will be honest, I haven't 11:33:41
16 studied it in that respect. 11:33:45
17 Q. Well, why don't we take it 11:33:49
18 step-by-step. 11:33:51
19 A. Okay. 11:33:53
20 Q. See how the first element is a USB 11:33:53
21 multi-host device? 11:33:58
22 A. Okay. 11:33:58
23 Q. See how, at the very bottom of 11:33:59
24 Figure 3, the big box is labeled USB 11:34:02

multi-host device? 11:34:05
A. Yes. 11:34:08
Q. So the first element is found in 11:34:08
Figure 3; right? 11:34:11
A. You're correct, yes. 11:34:14
Q. Okay. 11:34:16
The next element is first and 11:34:17
second upstream ports configured to couple to 11:34:19
responding first and second hosts. 11:34:23
Do you see that? 11:34:25
A. Yes. 11:34:26
Q. That's the upstream ports 1 and 2 11:34:26
that are labeled Boxes 302 and 304 in 11:34:29
Figure 3; right? 11:34:34
A. Yes. 11:34:34
Q. Okay. 11:34:35
The next element of claim 1 is a 11:34:35
USB device/function block. That corresponds 11:34:39
to the box at the bottom of Figure 3 labeled 11:34:46
312 device/function; correct? 11:34:50
A. Yes, I believe that is correct. 11:34:53
Q. Okay. 11:34:55
The next element is a multi-host 11:34:55
device controller; right? 11:34:58

A. Yes. 11:35:01
Q. And claim 1 goes on to say it's "a 11:35:03
multi-host device controller coupling the 11:35:06
device/function block to the first and second 11:35:09
upstream ports." Let's just stop there. 11:35:11
The USB multi-host device 11:35:14
controller that's shown in Figure 3 is 108? 11:35:17
A. I'm sorry, was that a question? 11:35:29
Q. Yes, it was. 11:35:31
A. Okay. I think I must have missed the 11:35:32
question. 11:35:35
Q. No problem. 11:35:35
The multi-host device controller 11:35:36
of claim 1, that's depicted in Figure 3 as the 11:35:41
box labeled 108? 11:35:44
A. I think that seems correct, yes. 11:35:45
Q. And we saw that in claim 1, it says, 11:35:49
"multi-host device controller coupled the USB 11:35:53
device/function block to the first and second 11:35:56
upstream ports." 11:35:58
Do you see that? 11:35:59
A. Yes. 11:36:00
Q. Okay. 11:36:01
And in Figure 3, that's what's 11:36:01

1 depicted; right, that arrow between -- going 11:36:03
2 up to the multi-host device controller, and 11:36:08
3 then if you follow it all the way up to the 11:36:10
4 top, you see that the multi-host device 11:36:13
5 controller is coupling the device function up 11:36:15
6 to the two ports you see at the top; right? 11:36:17
7 A. Yes. 11:36:26
8 Q. And claim 1 goes on to say, "wherein 11:36:26
9 the multi-host device controller is configured 11:36:30
10 to establish concurrent respective dedicated 11:36:32
11 USB connections between the USB device block 11:36:35
12 and the first and second upstream ports." 11:36:38
13 Do you see that? 11:36:40
14 A. Yes. 11:36:42
15 Q. And that's the function of the 11:36:43
16 multi-host device controller that's depicted 11:36:46
17 in Figure 3 as block 108? 11:36:49
18 MR. BANNER: Objection. Calls for 11:36:53
19 a legal conclusion. 11:36:56
20 THE COURT: Overruled. 11:36:57
21 Go ahead. 11:36:58
22 THE WITNESS: Yes, I think so. 11:37:00
23 BY MR. SAULSBURY: 11:37:02
24 Q. Claim 1 goes on to say, "to allow the 11:37:03

1 corresponding first and second hosts to," and 11:37:07
2 then you see a list of things it needed to 11:37:10
3 allow. This is in claim 1. 11:37:12
4 A. Right. 11:37:14
5 Q. The first thing it allows is 11:37:16
6 "simultaneously request access to the USB 11:37:19
7 block" {sic} -- sorry, "USB device" by both 11:37:22
8 levels. 11:37:25
9 Do you see that? 11:37:25
10 A. Yes. 11:37:26
11 Q. And the multi-host device controller, 11:37:26
12 108, allows for that; correct? It allows both 11:37:31
13 hosts connected to upstream ports to 11:37:34
14 simultaneously request access to the USB 11:37:37
15 device? 11:37:39
16 A. Yes. 11:37:40
17 Q. Okay. 11:37:40
18 The next requirement we see is 11:37:40
19 that the multi-host controller allow the first 11:37:45
20 and second host to alternately access the USB 11:37:51
21 device block to use at least one function. 11:37:55
22 Do you see that? 11:37:57
23 A. Yes. 11:37:58
24 Q. And the multi-host device controller 11:37:58

in Figure 3 allows for that; correct? 11:38:01
A. Correct. 11:38:03
Q. If we continue on in claim 1, it has 11:38:04
to allow alternating access to USB device 11:38:07
block without either one of the first and 11:38:13
second hosts reconfiguring the USB device 11:38:15
block each time a different one of the first 11:38:19
and second hosts is given access to the USB 11:38:23
device block to use the at least one function. 11:38:26
Do you see that? 11:38:30
A. Yes. 11:38:31
Q. And the multi-host device controller 11:38:32
in Figure 3 allows for that; right? 11:38:34
A. Absolutely, yeah. 11:38:37
Q. And so you understand that claim 1 of 11:38:38
your patent is invalid; right? 11:38:44
A. I know it was included in that Court 11:38:46
action, yes. 11:38:48
Q. Okay. 11:38:49
It was -- it was found by the 11:38:49
patent office -- 11:38:52
A. Invalid. 11:38:53
Q. -- to be invalid -- my apologies. 11:38:54
It was found by the patent office 11:38:56

1 to be invalid in light of the patent? 11:38:58
2 A. Honestly, I was not involved in the 11:39:02
3 patents, so I don't know which patents were 11:39:04
4 involved, but I do know the outcome of the -- 11:39:06
5 of the case, yes. 11:39:08
6 Q. Okay. 11:39:09
7 And so everything shown here in 11:39:10
8 Figure 3 that we just went over is covered by 11:39:12
9 invalid claim 1; right? 11:39:16
10 A. Yes. It's the claim 1 you walked 11:39:19
11 through. 11:39:22
12 Q. Yes. 11:39:22
13 We're talking here today about 11:39:23
14 claims 23, 24 and 25; right? 11:39:32
15 A. Right. That's my understanding. 11:39:35
16 MR. SAULSBURY: Mr. Glass, can we 11:39:41
17 please leave up claim 1 on the left and then 11:39:43
18 put up claim 23 on the right. 11:39:45
19 BY MR. SAULSBURY: 11:39:54
20 Q. And while that's happening, let me 11:39:54
21 just ask you, what's the difference between 11:39:55
22 claim 1, which is invalid, and claim 23? 11:39:59
23 A. Well, I -- I'll need to be honest 11:40:05
24 with you, I have not sat studying the 11:40:08

1 difference between claim 1 and claim 23, so 11:40:11
2 it's not something I have done prior to coming 11:40:13
3 here today. 11:40:18
4 Q. Do you want to take a look at claim 11:40:19
5 23 now and let me know what the difference is? 11:40:21
6 A. I certainly can, if you don't mind my 11:40:23
7 taking some time. 11:40:26
8 Q. That's no problem. Thank you. 11:40:27
9 (Whereupon, the witness reviews 11:40:29
10 the exhibit.) 11:40:31
11 MR. BANNER: Your Honor, I'm going 11:42:13
12 to object that the exercise that's being asked 11:42:15
13 to be performed here is asking for an expert 11:42:19
14 opinion. 11:42:22
15 THE COURT: It's overruled. 11:42:24
16 (Whereupon, the witness reviews 11:40:29
17 the exhibit.) 11:40:31
18 THE WITNESS: Okay. So -- oh, I'm 11:44:48
19 sorry. I didn't know you had stepped away. 11:44:51
20 MR. SAULSBURY: My apologies. 11:44:53
21 THE WITNESS: I had my head down 11:44:54
22 here. So if you remind me again what your 11:44:55
23 question was, you wanted to know if there was 11:44:59
24 a difference? 11:45:02

1 MR. SAULSBURY: Yeah. 11:45:03
2 BY MR. SAULSBURY: 11:45:04
3 Q. My question was what's the difference 11:45:05
4 between claim 23 and claim 1, which is 11:45:06
5 invalid? 11:45:10
6 A. So in claim 1, around line 65, it 11:45:11
7 talks about alternatively access the USB 11:45:21
8 block, and in claim 23, it is talking about 11:45:25
9 simultaneous with respect to the USB access; 11:45:33
10 so that's -- just sitting here, obviously, 11:45:39
11 it's a little difficult to do this in a 11:45:41
12 witness chair, but that's what I was able to 11:45:43
13 come up with on a quick inspection, but I 11:45:46
14 wouldn't contend it was thorough. 11:45:52
15 Q. Thank you. 11:45:53
16 A. Is that what you were looking for? 11:45:54
17 Q. Well, claim 1 actually also says that 11:45:56
18 the multi-host device controller is configured 11:46:00
19 to allow the corresponding first and second 11:46:03
20 host to simultaneously request access to the 11:46:06
21 USB device; right? 11:46:11
22 A. You are right. I think I had missed 11:46:11
23 that line when I was moving back. 11:46:13
24 Q. Are there any other differences you 11:46:16

1 identified -- or rather, I should say, is 11:46:19
2 there anything else that you identified that 11:46:21
3 you think is different? 11:46:22
4 A. No, nothing else. It seemed to me 11:46:23
5 that what I was seeing in claim 23 appeared to 11:46:27
6 be pretty well included in claim 1. 11:46:30
7 Q. Okay. 11:46:33
8 Now, you were -- strike that. 11:46:42
9 You testified earlier that you 11:46:44
10 understand that claim 1 was invalidated by the 11:46:46
11 patent office? 11:46:49
12 A. Correct, yes. 11:46:50
13 Q. Okay. 11:46:51
14 And that was in light of the 11:46:52
15 patent of Mr. Dickens; is that right? 11:46:55
16 A. Well, again, I'm not at all familiar 11:46:57
17 with that patent. I just know about the Court 11:47:00
18 action. 11:47:02
19 Q. Right. 11:47:02
20 So Mr. Dickens invented claim 1 11:47:03
21 first? 11:47:06
22 A. I have no idea what the patent office 11:47:06
23 used to invalidate claim 1. I just know that 11:47:08
24 claim 1 was invalidated. 11:47:12

Q. Microchip employers didn't provide 11:47:17
you with a copy of that decision? 11:47:19
A. Just a summary of it. I was not 11:47:21
involved in that process. 11:47:24
Q. Let's take a look at the invention 11:47:34
disclosure form that you discussed with Mr. 11:47:38
Banner. 11:47:41
MR. SAULSBURY: Mr. Glass, could 11:47:42
we please take a look at Exhibit 24 in 11:47:43
evidence at page 10. 11:47:45
MR. BANNER: Objection, Your 11:47:46
Honor, this is not in evidence yet. 11:47:47
THE COURT: 24 is not in evidence. 11:47:51
MR. SAULSBURY: It's not? My 11:47:53
apologies. I must have written it down wrong. 11:47:58
My apologies. I think I was 11:48:12
looking at 241. 11:48:14
BY MR. SAULSBURY: 11:48:40
Q. Mr. Bohm, I've just handed you what's 11:48:41
been marked as Trial Exhibit 24. 11:48:43
(Whereupon, Trial Exhibit 24 was 11:48:43
introduced.) 11:48:43
BY MR. SAULSBURY: 11:48:43
Q. Do you recognize this as your 11:48:45

1 invention -- sorry, your Innovation 11:48:48
2 Documentation, Disclosure and Evaluation form 11:48:50
3 for the '243 Patent? 11:48:53
4 A. That seems right, yes. 11:49:01
5 MR. SAULSBURY: Move to admit 11:49:06
6 Exhibit 24. 11:49:08
7 MR. BANNER: No objection. 11:49:09
8 THE COURT: All right. It's 11:49:10
9 admitted. 11:49:11
10 MR. SAULSBURY: And can we please 11:49:13
11 see the first page, Mr. Glass. 11:49:20
12 BY MR. SAULSBURY: 11:49:24
13 Q. Now, I'd like to get one quick 11:49:24
14 housekeeping thing out of the way. 11:49:27
15 Do you see here at the bottom of 11:49:28
16 the page, sort of in small print, it says, 11:49:30
17 "revised 5/29/03"? 11:49:33
18 A. Yes. 11:49:36
19 Q. And do you see how at the top, it 11:49:36
20 also says, "Revised 5/29/03"? 11:49:38
21 A. Yes. 11:49:42
22 Q. Okay. 11:49:42
23 Now, that's the date that the 11:49:43
24 template for the form was revised; correct? 11:49:47

A. I don't know that, but I think that's 11:49:52
a reasonable guess. 11:49:55
Q. It's not the date you filled out this 11:49:57
form; right? 11:49:59
A. No, no. Correct. 11:49:59
Q. And that's because you came up with 11:50:06
this idea in late 2005? 11:50:08
A. Yes. And I think that date should be 11:50:13
in here somewhere. 11:50:16
Q. Okay. 11:50:18
Let's flip to page 10, please. 11:50:30
A. Okay. 11:50:36
Q. I believe this might have been what 11:50:37
you were looking for. 11:50:38
A. Yes. 11:50:39
Q. Do you see how, at the top, in 11:50:39
section A, it says, "Date you first conceived 11:50:41
of your solution"? 11:50:44
A. Yes. 11:50:45
Q. And it says, "October 24, 2005"? 11:50:45
A. Correct. 11:50:49
Q. That's when you came up with the idea 11:50:50
that resulted in the '243 Patent? 11:50:51
A. Correct. 11:50:54

Q. Let's take a look at section C on the 11:50:57
same page. 11:51:03
A. Okay. 11:51:04
Q. Do you see how it asks when your 11:51:06
solution was first disclosed to someone else 11:51:09
in your company? 11:51:11
A. Yes. 11:51:13
Q. You said you first disclosed the idea 11:51:14
on October 24, 2005; right? 11:51:16
A. Yes, that is what's written here. 11:51:19
Q. The same day you conceived of your 11:51:21
invention? 11:51:24
A. Yes. The chief technology officer 11:51:24
sat just down the hall from me, so I went and 11:51:27
had a conversation with him. 11:51:30
Q. And that would be Mr. Doug Smith? 11:51:31
A. That would be Mr. Doug Smith. 11:51:33
Q. Okay. 11:51:35
You told Mr. Smith about your idea 11:51:35
and the concept of the switching hub 11:51:37
presentation? 11:51:43
A. Well, he had asked me to do the 11:51:43
switching hub presentation, so as we were 11:51:45
discussing that, I talked to him about the 11:51:47

idea we were just coming up with and he 11:51:49
thought it would be a good idea to pursue. 11:51:52
Q. You gave that presentation at SMSC's 11:51:57
fall 2005 conclave? 11:52:01
A. Yes, that's correct. 11:52:05
Q. That's what's referred to here at the 11:52:06
end of the sentence? 11:52:08
A. Yes. 11:52:09
Q. Conclave, that's another word for 11:52:11
gathering; is that right? 11:52:13
A. That sounds right. It wasn't the 11:52:15
word I was using, it was Doug Smith's word. 11:52:18
Q. Fair enough. 11:52:21
Mr. Bohm, could you please flip to 11:52:22
Exhibit 241 in your binder. 11:52:33
MR. SAULSBURY: And, Mr. Glass, 11:52:36
could we please publish Exhibit 241 in 11:52:38
evidence, starting on page 1. 11:52:41
BY MR. SAULSBURY: 11:52:44
Q. Now, Mr. Bohm, this is a page that 11:52:48
you presented at the 2005 conclave? 11:52:51
A. Yes, that's correct. 11:52:53
Q. Now, this switching hub you presented 11:52:54
on was called the SMSC 2524? 11:52:57

A. The actual device that we were 11:53:02
working with at the time, yes, that is the 11:53:03
correct number, as I recall. 11:53:06
Q. And to be clear, the SMSC 2524 is 11:53:08
different from the system in your patent; 11:53:13
right, in the '243 Patent, that is? 11:53:16
A. Yes, because this '243 Patent was not 11:53:20
for a switching hub. 11:53:23
Q. And the difference is that the 2524 11:53:26
required that you throw a switch to hand over 11:53:31
controls from one host to another host; 11:53:34
correct? 11:53:36
A. Some sort of switching mechanism, 11:53:38
yes, but there were a number of schemes 11:53:41
involved. 11:53:43
Q. It didn't have to be a mechanical 11:53:44
switch; right? 11:53:46
A. No. In fact, they were built in, so 11:53:47
it was some sort of mechanical means or 11:53:49
software means to switch it. 11:53:53
Q. The 2524 couldn't automatically share 11:53:57
a USB device with more than one host at a 11:54:01
given time; right? 11:54:05
A. At a given time, no, no, that is 11:54:06

1 correct. 11:54:15
2 Q. Now, it occurred to you, in the 11:54:15
3 context of this switch, that it would be 11:54:18
4 better for both hosts to share the device 11:54:22
5 without having to switch back and forth; 11:54:25
6 right? 11:54:28
7 A. Yes, that is correct. 11:54:28
8 Q. And that's how you came up with the 11:54:29
9 idea of the '243 Patent? 11:54:31
10 A. Yes, it led to that patent 11:54:33
11 disclosure. Yes. 11:54:36
12 Q. And that idea is embodied in claim 1 11:54:37
13 that we saw earlier; right? 11:54:40
14 MR. SAULSBURY: It we could 11:54:44
15 actually take a look at claim 1, please. 11:54:44
16 THE WITNESS: Okay. I'm sorry, I 11:54:49
17 kind of missed the first part of your 11:54:52
18 question. 11:54:53
19 MR. SAULSBURY: No problem. 11:54:54
20 BY MR. SAULSBURY: 11:54:55
21 Q. The question was, your idea for how 11:54:56
22 you could share one device with two hosts 11:55:02
23 without having to switch back and forth, 11:55:07
24 that's embodied in claim 1 here of the 11:55:09

1 asserted patent? 11:55:13
2 A. Yes. 11:55:16
3 Q. And you know you didn't invent that 11:55:19
4 claim, Mr. Dickens did first; right? 11:55:22
5 A. Well, again, I have no idea where 11:55:24
6 that came in. 11:55:26
7 Q. In any case, you understand you 11:55:28
8 weren't the first to invent it? 11:55:30
9 A. I understand that it was eliminated 11:55:31
10 as a claim in the patent due to prior art, 11:55:34
11 yes. 11:55:38
12 Q. Okay. 11:55:39
13 And you also understand that you 11:55:39
14 weren't the first to invent what we saw in 11:55:46
15 Figure 3; right? 11:55:48
16 A. I know that we still have other 11:55:50
17 active claims. I have to say I have not sat 11:55:54
18 and looked at the existing claims versus 11:55:57
19 Figure 3, so what was your question again? 11:56:01
20 Q. Yeah. 11:56:05
21 My question was, you understand 11:56:06
22 that you did not invent what's in Figure 3? 11:56:10
23 A. So no, I don't understand that. 11:56:14
24 Q. Okay. 11:56:16

1 Well, you recall how we just did 11:56:17
2 that exercise where we showed that everything 11:56:19
3 in Figure 3 was found in claim 1? 11:56:22
4 A. I do, but we didn't do that for all 11:56:26
5 of the remaining claims, so I don't know, 11:56:28
6 because I have never done the exercise, of how 11:56:30
7 Figure 3 relates to the remaining claims from 11:56:34
8 the Court action. That's not something that 11:56:38
9 I've done. There are some other experts 11:56:40
10 involved with that. 11:56:43
11 Q. You couldn't identify any difference 11:56:43
12 with respect to claim 23, though; right? 11:56:46
13 A. Well, again, I -- you know, I haven't 11:56:48
14 sat and done any comparison exercise like you 11:56:52
15 asked me to do, so I was just looking here, 11:56:55
16 and from a sitting here standpoint, I didn't 11:56:58
17 quickly notice anything, no. 11:57:01
18 Q. From the standpoint of your 11:57:03
19 invention? 11:57:06
20 A. Reading the claims in the invention, 11:57:08
21 yes. 11:57:11
22 Q. Let's go back to Exhibit 24 in your 11:57:12
23 binder, your innovation and disclosure form. 11:57:14
24 MR. SAULSBURY: Thank you, Mr. 11:57:20

Glass. 11:57:21
BY MR. SAULSBURY: 11:57:22
Q. I want to zoom out for a moment and 11:57:23
talk about the purpose of this form. 11:57:24
Now, you understand that Microchip 11:57:26
had procedures in place that required 11:57:28
engineers to document and then disclose 11:57:30
innovations for possible patents; correct? 11:57:33
A. Yes, that's correct. 11:57:37
Q. Okay. 11:57:39
And it was important that you 11:57:40
filled out the form accurately; right? 11:57:41
A. Absolutely. 11:57:43
Q. And that's because it may be used by 11:57:44
Microchip's lawyers to apply for a patent; 11:57:47
right? 11:57:50
A. That was the purpose of it, yes. 11:57:50
Q. And it's important to make accurate 11:57:52
representations to the patent office? 11:57:54
A. Of course. 11:57:56
Q. Now, if we could take a look -- 11:57:58
MR. SAULSBURY: Mr. Glass, if we 11:58:03
could take this down, actually, and if we 11:58:04
could take a look at numbered paragraph 1, and 11:58:07

I'd like to call your attention to the final 11:58:11
sentence. 11:58:13
BY MR. SAULSBURY: 11:58:13
Q. Do you see how it says, "The 11:58:14
importance of engineers keeping a notebook (or 11:58:15
other dated and witnessed hardcopy) AS THEY 11:58:19
DEVELOP their work cannot be overstated!" 11:58:24
Do you see that? 11:58:26
A. I do, yes. 11:58:27
Q. And that was important so that there 11:58:30
was a contemporaneous record showing what you 11:58:33
invented; right? 11:58:36
A. Yes. 11:58:38
Q. Okay. 11:58:39
If we go down to paragraph A, the 11:58:43
form says -- and actually, I apologize, it 11:58:47
actually shows up on page 10. Page 10 is 11:58:51
where it calls for attachments. Yes, if we 11:58:54
could go to paragraph A, where it asks when 11:58:57
you first conceived of your solution, the 11:59:03
attached notebook entries or other written 11:59:05
records, and include month, day, year. 11:59:08
Do you see that? 11:59:11
A. Yes, I do. 11:59:12

Q. But you attached nothing? 11:59:13
A. Because we would be handing them 11:59:15
whatever the documents were. We didn't attach 11:59:17
it as an electronic file in this Word 11:59:19
document. 11:59:23
Q. Handed it to who? 11:59:23
A. Handed it to -- it would have been 11:59:25
either counsel or Doug Smith at SMSC at the 11:59:27
time. 11:59:31
Q. Do you know why the version of this 11:59:31
invention disclosure provided to Aptiv in this 11:59:33
case had no attachment? 11:59:35
A. I honestly have no idea. I was not 11:59:37
involved with that at all. 11:59:40
But that all occurred at SMSC. I 11:59:42
don't know what Microchip was able to recover 11:59:45
on any of those kinds of document submissions. 11:59:47
Q. Let's take a look at the rest of 11:59:54
page 10. And let's go down to section B. The 11:59:56
question is about whether the device had 12:00:03
actually been -- sorry, not section B. Oh, my 12:00:05
apologies. It is, in fact, section B. 12:00:16
This is about whether the device 12:00:20
had actually been constructed; right? 12:00:25

A. Correct, yes. 12:00:27
Q. Your response was N/A, as in not 12:00:28
applicable? 12:00:31
A. Yes. At the time, we had not built a 12:00:32
model of this device. 12:00:36
Q. Okay. 12:00:38
Now, this innovation is a part of 12:00:39
the form submitted to SMSC's attorneys; right? 12:00:44
A. Yes. I don't remember now exactly 12:00:48
who I submitted it to. I don't remember if it 12:00:50
was directed directly to attorneys or Doug 12:00:54
Smith or how that flow occurred. 12:00:57
Q. Ultimately, it got to the attorneys? 12:00:58
A. Ultimately, the attorneys were 12:01:00
involved, yes. 12:01:02
Q. And they turned it into a patent? 12:01:02
A. I think they actually used an 12:01:06
external firm to turn it into a patent, so I 12:01:07
don't think it was an actual in-house 12:01:11
attorney. But yes, ultimately, attorneys 12:01:13
turned it into a patent. 12:01:15
Q. So you didn't actually write the 12:01:16
language that appears in the patent; right? 12:01:18
A. That is correct, yes. 12:01:20

Q. Could you please turn back to 12:01:26
Exhibit 1 in your binder. 12:01:30
MR. SAULSBURY: And if we could -- 12:01:34
thank you. 12:01:37
BY MR. SAULSBURY: 12:01:37
Q. You recognize this as your '243 12:01:38
Patent? 12:01:41
A. Yes. 12:01:41
Q. The patent asserted here? 12:01:41
A. Right. 12:01:43
Q. Now, you didn't mention host-to-host 12:01:44
communication in your patent; right? 12:01:47
A. Not that I recall. 12:01:53
Q. Your patent doesn't mention role 12:01:55
reversal either? 12:01:59
A. I'm sorry, would you repeat? 12:02:00
Q. Certainly. 12:02:02
Your patent also doesn't mention 12:02:02
role reversal; right? 12:02:05
A. No, we have a different patent that 12:02:06
covers that. 12:02:09
Q. Okay. 12:02:09
Your invention disclosure didn't 12:02:13
mention host-to-host communication either? 12:02:16

MR. BANNER: Asked and answered. 12:02:18

THE COURT: Overruled. 12:02:20

Go ahead. 12:02:21

THE WITNESS: Not that I recall, 12:02:22

no. 12:02:25

BY MR. SAULSBURY: 12:02:25

Q. Now, why don't we flip back actually 12:02:33

to your invention disclosure, Exhibit 24. And 12:02:36

if you could please flip to page 5 of it, and 12:02:41

I'd like to direct your attention to section 12:02:46

B. 12:02:48

It says, "How have others 12:02:49

attempted to solve this problem?" Are you 12:02:51

there with me? 12:02:54

A. Yes, I am. 12:02:55

Q. Now, in the paragraph below, you 12:02:56

endeavor to explain how others attempted to 12:03:02

solve the problem of sharing one USB device 12:03:05

with multiple hosts; right? 12:03:09

A. I'm just reading it because it's been 12:03:15

a very long time since I have written this. 12:03:17

Q. Certainly. Take your time. 12:03:19

(Whereupon, the witness reviews 12:03:21

the exhibit.) 12:03:23

1 THE WITNESS: Yes, that is 12:03:38
2 correct. 12:03:40
3 BY MR. SAULSBURY: 12:03:40
4 Q. All the prior devices you described 12:03:40
5 here are USB switches; right? 12:03:44
6 A. That is correct, yes. 12:03:47
7 Q. USB switches don't allow for 12:03:49
8 host-to-host communication; right? 12:03:52
9 A. None that I'm aware of, or at least 12:03:56
10 none that I was aware of at that time. I 12:04:00
11 haven't looked at them in many years. 12:04:01
12 Q. They also don't provide role 12:04:04
13 reversal? 12:04:13
14 A. That's not something that -- that I 12:04:13
15 thought to look for. We do have USB devices 12:04:17
16 that do role reversal and they can be used 12:04:21
17 with the switches. We have them in Athens, so 12:04:23
18 yes, we have switching hubs that do role 12:04:26
19 reversal. 12:04:29
20 Q. My question was a little different, 12:04:29
21 and I apologize. I know there's been a number 12:04:31
22 of questions. 12:04:34
23 A. Okay. 12:04:34
24 Q. My question was, with respect to the 12:04:35

1 prior art you identified for the prior 12:04:36
2 switches, those switches don't allow for role 12:04:40
3 reversal; right? 12:04:42
4 A. Oh, in this timeframe, I don't 12:04:43
5 remember seeing any, no. It's not anything I 12:04:48
6 recall. 12:04:52
7 Q. And in the context of Athens, what 12:04:52
8 you said is that you can use switches along 12:04:54
9 with other components to accomplish role 12:04:57
10 reversal; right? 12:05:01
11 A. Well, in Athens, role reversal is 12:05:03
12 built in on one of the ports. 12:05:05
13 Q. Right. 12:05:07
14 But role reversal isn't a function 12:05:08
15 that was available in prior switches; right? 12:05:14
16 A. In this timeframe of this disclosure? 12:05:18
17 Q. Oh, sorry. I thought -- 12:05:33
18 A. No. 12:05:35
19 Q. I thought you answered. 12:05:36
20 A. You're saying in reference to this 12:05:37
21 disclosure? 12:05:39
22 Q. That's correct. I didn't realize it 12:05:39
23 was a question. That's correct. 12:05:41
24 I'm sorry, did you answer? 12:05:43

A. So yeah, I would not have been aware 12:05:44
of any at this time or I would have disclosed 12:05:46
it. 12:05:48
Q. And so to be clear, at this time, you 12:05:52
weren't aware of any prior art that mentions 12:05:54
host-to-host communication; right? 12:05:57
A. None comes to mind that I would have 12:06:02
known about in this timeframe. 12:06:06
Q. Okay. 12:06:07
And none of the prior art you 12:06:07
disclosed to the patent office was about role 12:06:09
reversal; right? 12:06:12
A. Again -- well, I guess -- let me back 12:06:15
up a second and say, you know, the file 12:06:19
wrapper that contains all the prior art, much 12:06:23
of that was gathered by the patent attorneys 12:06:25
and stuff. So I don't -- I don't know, I 12:06:28
didn't go to review all of that prior art. 12:06:30
So I guess to clarify my response, 12:06:33
as far as what -- are you just asking about 12:06:38
what I disclosed or what was disclosed to the 12:06:40
patent office? 12:06:42
Q. You know, that was a helpful 12:06:44
clarification. 12:06:45

1 So with respect to what you 12:06:46
2 disclosed, there was no prior art that allowed 12:06:48
3 for role reversal; right? 12:06:57
4 A. Again, not -- not that I recall and I 12:07:01
5 don't see any mention of that here, but as far 12:07:04
6 as -- 12:07:07
7 Q. And in terms -- 12:07:07
8 A. -- as far as what I did. 12:07:08
9 Q. I'm sorry, you go ahead. 12:07:10
10 A. No, as far as what I disclosed. 12:07:12
11 Q. And as far as the rest of the prior 12:07:14
12 art disclosed to the patent office, you don't 12:07:16
13 know because that was left to the attorneys? 12:07:18
14 A. Yes, they did whatever prior art 12:07:21
15 searches they needed to do, and, you know, 12:07:22
16 we -- we wouldn't -- excuse me, we would not 12:07:25
17 review everything. But there were certain 12:07:28
18 things, if they thought it required attention, 12:07:31
19 that they would ask us about. So I probably 12:07:34
20 had seen a little of it, but certainly not 12:07:37
21 all. 12:07:40
22 Q. And from what you saw, none of it 12:07:42
23 disclosed host-to-host communications; right? 12:07:44
24 A. You know, to be very honest at this 12:07:47

1 point in time, especially for a 1300-page 12:07:49
2 document with lots of prior art in it, I don't 12:07:53
3 recall any of that prior art. So I can't 12:07:56
4 really answer the question I think you're 12:07:59
5 asking. 12:08:02
6 Q. Let me try asking a slightly 12:08:04
7 different question, and this is specifically 12:08:06
8 about what you know of, what you're aware of, 12:08:13
9 setting aside what the attorneys did. 12:08:16
10 You don't know if there were 12:08:18
11 existing prior art devices capable of 12:08:20
12 host-to-host communication; right? 12:08:23
13 A. So are you talking with regard to any 12:08:25
14 standard of any kind or what -- what is the 12:08:30
15 context? 12:08:34
16 Q. Let me try it this way. 12:08:34
17 Were you aware of any host-to-host 12:08:37
18 bridges that existed as of the time of your 12:08:40
19 invention? 12:08:46
20 A. The only thing I would have recalled 12:08:47
21 would be, you know, written here. I didn't 12:08:51
22 talk about it, so I'm not really sure how to 12:08:54
23 answer. 12:09:00
24 Q. You were deposed in this case, Mr. 12:09:11

Bohm? 12:09:13
A. Yes, I was. 12:09:14
Q. Okay. 12:09:15
MR. SAULSBURY: Your Honor, may I 12:09:34
approach? 12:09:35
THE COURT: Yes. 12:09:36
(Whereupon, a discussion was held 12:09:36
at sidebar as follows: 12:12:12
MR. SAULSBURY: Permission to 12:12:12
play -- and I didn't think it called for a 12:12:12
sidebar, it was just a heads-up to play 184 at 12:12:12
line 25 through 185 at line 6 of the 12:12:12
deposition. 12:12:12
MR. BANNER: This is improper 12:12:12
impeachment. He gave the same answer and said 12:12:12
he wasn't aware. It's the same thing he said 12:12:12
in his deposition. 12:12:12
THE COURT: It does look like the 12:12:12
same answer. 12:12:12
What's the purpose? 12:12:12
MR. SAULSBURY: He said I'm not 12:12:12
really sure. 12:12:12
THE COURT: I'm looking at the 12:12:12
transcript and I don't -- I don't see it as 12:12:12

terribly different from what he said today. 12:12:12
MR. SAULSBURY: I think it 12:12:12
clarifies what he said. 12:12:12
THE COURT: I mean, I'll let you 12:12:12
play it. I mean, it's fine. It's not going 12:12:12
to -- I don't know that it's going to 12:12:12
accomplish much of impeachment, but if you 12:12:12
want to put it in front of him, go ahead. 12:12:12
(Whereupon, sidebar discussion 12:12:12
concluded.) 12:12:21
MR. SAULSBURY: Mr. Glass, will 12:12:21
you please play clip 1201. 12:12:23
(Whereupon, a video was played for 12:12:27
the jury.) 12:12:30
BY MR. SAULSBURY: 12:12:57
Q. Mr. Bohm, you were personally 12:12:58
involved in analyzing Aptiv's dual role hub 12:13:00
for this case; right? 12:13:05
A. No, I was not. 12:13:06
Q. Did you do any analysis with respect 12:13:09
to the dual role hub product? 12:13:11
A. No, I did not. 12:13:14
MR. SAULSBURY: Your Honor, 12:13:16
permission to show Mr. Bohm's deposition 12:13:17

1 transcript at 158 line 25 through 159, 1 12:13:27
2 through 4. 12:13:32
3 THE COURT: Okay. 12:13:33
4 MR. SAULSBURY: Mr. Glass, would 12:13:34
5 you please do that. And could we please blow 12:13:35
6 up 158, line 25 through 159, 1 through 4. 12:13:45
7 BY MR. SAULSBURY: 12:13:52
8 Q. When you were asked in your 12:13:52
9 deposition, "Did you do any analysis with 12:13:54
10 respect to the accused dual role hub product?" 12:13:55
11 And you answered, "Me being me personally?" 12:14:00
12 And I said, "Yes." 12:14:03
13 A. It is interesting. 12:14:04
14 Could I see the couple of 12:14:05
15 questions that preceded it? 12:14:06
16 Q. What's -- what do you need to see? I 12:14:10
17 asked you whether you analyzed the hub. 12:14:15
18 A. Oh, I know what this was. I think I 12:14:17
19 am interpreting analysis of it differently 12:14:23
20 right here today than I think I did here. 12:14:27
21 Q. So you did, in fact, analyze Aptiv's 12:14:29
22 dual role hub; right? 12:14:33
23 A. I saw a de-capped part where we 12:14:34
24 analyzed the costing data for the dot size 12:14:39

1 that we were marketing. 12:14:45
2 Q. Okay. 12:14:46
3 A. But I have not actually analyzed the 12:14:47
4 internals or the functionality of the Aptiv 12:14:50
5 hub. 12:14:54
6 So the questioning of the -- of 12:14:55
7 the deposition, you know, I think it was a 12:14:58
8 broader thing, whereas the discussion we were 12:15:01
9 having -- I didn't focus on the internal 12:15:04
10 workings of it and patent claims, so that 12:15:07
11 would be my reason. 12:15:11
12 Q. My apologies. 12:15:12
13 So your testimony is you haven't 12:15:14
14 analyzed the internal workings of the Aptiv 12:15:15
15 hub? 12:15:19
16 A. From the internal workings, no, I 12:15:19
17 have not analyzed the internal workings of the 12:15:21
18 Aptiv hub. 12:15:24
19 Q. You were here for the opening 12:15:25
20 statements; right? 12:15:27
21 A. Yes, I was. 12:15:28
22 Q. Okay. 12:15:28
23 And you recall seeing the letter 12:15:29
24 that Mr. -- sorry, the letter that Microchip 12:15:34

1 sent to Aptiv about infringement? I'm just 12:15:42
2 trying to place a timeframe. 12:15:45
3 A. Yeah. 12:15:47
4 Q. You're familiar with that letter? 12:15:47
5 A. Yes. 12:15:49
6 Q. Okay. 12:15:49
7 Now, you were involved in the 12:15:50
8 infringement analysis leading up to that 12:15:56
9 letter; right? 12:15:59
10 A. So I am trying to put my head in the 12:15:59
11 mind -- or, excuse me, in the timeframe of 12:16:03
12 what we were seeing then. 12:16:05
13 I believe that was based totally 12:16:12
14 on what we were hearing Aptiv was advertising, 12:16:14
15 so it was based on advertised features. We 12:16:20
16 didn't have any -- anything that would tell us 12:16:22
17 conclusively that they were infringing or not, 12:16:26
18 I don't believe, at that time. 12:16:31
19 Q. Right. 12:16:31
20 So before you sent that letter, 12:16:32
21 you never actually used the dual role hub? 12:16:34
22 A. I personally have never used an Aptiv 12:16:39
23 device, I forget the -- Boston chip, I think 12:16:45
24 that's what they were calling it in the 12:16:48

1 opening. 12:16:49
2 Q. Okay. 12:16:50
3 And you also didn't have any 12:16:51
4 documentation for Aptiv's hub before you sent 12:16:53
5 the letter? 12:16:57
6 A. Not to their hub, no. 12:16:57
7 As I mentioned, I think, during my 12:16:59
8 previous questioning, we had a sales sheet, I 12:17:04
9 believe. It was not a confidential document. 12:17:08
10 It just listed some features of the break out 12:17:11
11 box. But we had no documentation on the chip, 12:17:14
12 itself. 12:17:18
13 Q. And, in fact, as of January 5th, 12:17:21
14 2015, Microchip hadn't confirmed how Aptiv's 12:17:24
15 device worked; right? 12:17:27
16 MR. BANNER: Objection, calls for 12:17:28
17 speculation. 12:17:31
18 THE COURT: Sustained. 12:17:32
19 BY MR. SAULSBURY: 12:18:05
20 Q. Mr. Bohm, I've handed you what's been 12:18:05
21 marked as trial Exhibit 268. 12:18:08
22 (Whereupon, Trial Exhibit 268 was 12:18:08
23 introduced.) 12:18:08
24 BY MR. SAULSBURY: 12:18:08

Q. Do you recognize this as an email 12:18:10
from David Sroka of Microchip? 12:18:14
A. Yes. 12:18:22
MR. SAULSBURY: Okay. Move to 12:18:24
admit 268. 12:18:25
MR. BANNER: No objection. 12:18:28
THE COURT: All right. Admitted. 12:18:29
MR. SAULSBURY: Mr. Glass, please 12:18:30
let us see it. 12:18:33
BY MR. SAULSBURY: 12:18:34
Q. Now, Mr. Bohm, this is an email dated 12:18:34
January 5th, 2015; right? 12:18:37
A. Yes, that is correct. 12:18:40
Q. And you can see how in the very first 12:18:40
sentence it says, "The diagram is our 12:18:42
creation/interpretation of what Unwired is 12:18:45
doing, and has not been confirmed"; right? 12:18:47
A. Yes. 12:18:50
Q. So January 5th, Microchip hadn't 12:18:51
confirmed that this device worked; right? 12:18:55
A. I would not agree with that 12:18:59
statement. We are getting some guesses from 12:19:03
our marketing team as to what they believe 12:19:06
that Unwired at this time was doing, but we 12:19:10

1 had no way to know if that was correct or not. 12:19:15
2 Q. Right. I think we're on the same 12:19:17
3 page. 12:19:19
4 And therefore, you had not 12:19:19
5 confirmed how Aptiv's device worked? 12:19:21
6 A. I apologize. I thought you said "had 12:19:23
7 confirmed." I maybe misunderstood your 12:19:25
8 question. 12:19:28
9 Q. No worries at all. I think we're on 12:19:28
10 the same page. 12:19:30
11 Despite not knowing how Aptiv -- 12:19:36
12 strike that. 12:19:38
13 Despite not having confirmed how 12:19:38
14 this device worked, Microchip sent Aptiv a 12:19:41
15 letter threatening legal action just a week 12:19:46
16 later; right? 12:19:49
17 A. I don't remember the dates. I'll 12:19:53
18 take your word for it, I suppose. 12:19:54
19 Q. Mr. Bohm, I've just handed you what's 12:20:25
20 been marked as Trial Exhibit 9. 12:20:27
21 (Whereupon, Trial Exhibit 9 was 12:20:27
22 introduced.) 12:20:27
23 BY MR. SAULSBURY: 12:20:27
24 Q. Do you recognize this as -- do you 12:20:31

1 recognize this document? 12:20:32
2 A. Yes, it seems like the letter that 12:20:34
3 our internal counsel sent to Delphi. 12:20:37
4 MR. SAULSBURY: Move to admit 12:20:41
5 Exhibit 9. 12:20:43
6 MR. BANNER: No objection. 12:20:43
7 THE COURT: All right. It's 12:20:44
8 admitted. 12:20:45
9 BY MR. SAULSBURY: 12:20:46
10 Q. Do you see how this letter is dated 12:20:47
11 January 12th, 2015? 12:20:50
12 A. Yes. 12:20:54
13 Q. Does that refresh your recollection 12:20:55
14 that just a week after Microchip said it 12:20:56
15 hadn't confirmed how Aptiv's chip worked, it 12:21:02
16 sent a threatening legal letter? 12:21:06
17 A. I'm looking at the letter here, if 12:21:10
18 you give me a moment. 12:21:13
19 (Whereupon, the witness reviews 12:21:14
20 the exhibit.) 12:21:16
21 BY MR. SAULSBURY: 12:21:23
22 Q. And I can perhaps speed this up. 12:21:24
23 Do you see how, in the second 12:21:26
24 paragraph, it says, "Microchip and its 12:21:28

1 subsidiaries have made core innovations in the 12:21:30
2 area of multi-host USB device controllers"? 12:21:32
3 And then it refers to two patents, 12:21:37
4 one of them is the '243 Patent asserted here. 12:21:39
5 And it goes on, it says, "These 12:21:42
6 patents protect fundamental aspects of the 12:21:43
7 multi-host type USB device controllers. More 12:21:47
8 specifically, our patents cover key aspects of 12:21:49
9 any multi-host USB device controller-based 12:21:52
10 solution that might be implemented within the 12:21:55
11 automotive infotainment environment." 12:21:57
12 Do you see that? 12:22:00
13 A. Yes, I do. 12:22:01
14 Q. And it says, "Please know that if 12:22:02
15 required Microchip will defend its 12:22:05
16 intellectual property rights to protect our 12:22:06
17 interests in this space." 12:22:10
18 Do you see that? 12:22:10
19 A. I do. 12:22:11
20 Q. So this refreshes your recollection 12:22:18
21 then a week after Microchip had confirmed -- 12:22:19
22 sorry, a week after saying that it couldn't 12:22:23
23 confirm if the chip worked, Microchip sent a 12:22:26
24 letter saying the defendant's IP rights in 12:22:32

that its patents covered any multi-host device 12:22:36
controller solution that might be implemented 12:22:41
in the automotive infotainment system; right? 12:22:43
MR. BANNER: Objection, vague. 12:22:50
THE COURT: Overruled. 12:22:51
THE WITNESS: Yep, that's what it 12:22:53
says. 12:22:54
BY MR. SAULSBURY: 12:22:55
Q. Now, eventually you did get your 12:22:55
hands on one of Aptiv's chips; right? 12:22:57
A. No. We got ahold of a break out box. 12:22:59
Q. And that break out box -- 12:23:04
A. Not the chip. 12:23:06
Q. My apologies. 12:23:09
The break out box you got ahold 12:23:10
of, that had an Aptiv chip on it; right? 12:23:12
A. Well, we got ahold of different 12:23:14
things at different times. If you could give 12:23:18
me a little bit of a clue as far as what time 12:23:23
period you're talking about, I might be able 12:23:26
to better answer your question. 12:23:28
Q. Certainly. Let's take a look. 12:23:32
(Brief pause.) 12:24:53
BY MR. SAULSBURY: 12:24:59

Q. Mr. Bohm, I've just handed you what's 12:25:00
been marked as Exhibit 288. 12:25:02
(Whereupon, Trial Exhibit 288 was 12:25:02
introduced.) 12:25:02
BY MR. SAULSBURY: 12:25:02
Q. Do you recognize the photos that are 12:25:05
in Exhibit 288? 12:25:06
A. I can't say that I recall the photos. 12:25:44
I may have seen them, but I don't recall. 12:25:48
(Brief pause.) 12:26:13
MR. SAULSBURY: Your Honor, it 12:26:16
looks like we don't have 287. Can we take a 12:26:21
lunch break now and then I can come back and 12:26:25
start with that? 12:26:28
THE COURT: That's fine. 12:26:29
So we would have taken a lunch 12:26:30
break in about 10 minutes anyway. 12:26:33
I'm going to remind you again the 12:26:35
caution I gave you yesterday. I know you're 12:26:37
starting to hear testimony. You should not be 12:26:39
talking with each other about the evidence 12:26:41
that's coming in. That includes things like, 12:26:44
you know, whether any of you wants 12:26:46
clarification of the evidence from someone 12:26:50

1 else, it shouldn't include your impressions of 12:26:52
2 the witnesses or questions or anything like 12:26:55
3 that. 12:26:58
4 You have to hold that all to 12:26:59
5 yourself until you get to deliberations. 12:27:00
6 Okay? So chat about other things over lunch, 12:27:02
7 but not about the evidence coming in. 12:27:05
8 So with that, we'll take lunch, 12:27:07
9 we'll plan on 45 minutes and we'll be back 12:27:09
10 here around 1:15. Okay. 12:27:12
11 (Whereupon, the jury was excused 12:27:17
12 from the courtroom.) 12:27:26
13 THE COURT: Just a ballpark of 12:27:38
14 what you have left? 12:27:41
15 MR. SAULSBURY: 15 minutes, 12:27:42
16 ideally 10. 12:27:44
17 THE COURT: Okay. 12:27:45
18 MR. BANNER: Your Honor, would you 12:27:46
19 mind letting Mr. Bohm know -- 12:27:47
20 THE COURT: I'm sorry, Mr. Bohm, 12:27:50
21 you can step down. My apologies. 12:27:51
22 And just a reminder, over the 12:27:53
23 lunch break, you are still under oath, so you 12:27:54
24 should not be chatting with anybody about your 12:27:56

1 testimony. 12:27:58
2 THE WITNESS: I clearly understand 12:27:59
3 that. 12:27:59
4 Should I be standing when the jury 12:28:00
5 comes out? I feel like I would bump into 12:28:02
6 them. 12:28:04
7 THE COURT: I'm concerned that you 12:28:05
8 would topple over, so it's fine. I don't 12:28:07
9 think it's a problem. 12:28:08
10 All right. You can step down. 12:28:10
11 And then I assume, Mr. Banner, 12:28:12
12 you'll have a little bit of redirect? 12:28:14
13 MR. BANNER: Yes, just a small 12:28:17
14 amount. 12:28:20
15 THE COURT CLERK: All rise. 12:28:21
16 (Whereupon, a 45-minute luncheon 12:28:22
17 recess was taken at 12:30 p.m.) 12:28:24
18 THE COURT CLERK: All rise. 13:14:11
19 THE COURT: All right. Have a 13:14:22
20 seat, please. 13:14:23
21 I just have one quick 13:14:27
22 clarification before we bring the jury back 13:14:30
23 in. After listening to the openings and 13:14:35
24 testimony so far, where do you stand on the 13:14:38

'708 Patent? Did you drop that claim? 13:14:44

MR. BANNER: Yeah, we dropped it, 13:14:45

Your Honor. 13:14:48

THE COURT: Okay. 13:14:51

So I'll fix the instructions 13:14:52

accordingly. So I did instruct the jury on it 13:14:54

yesterday, and in the instructions, I don't 13:14:57

think I knew it was dropped, but my guess is 13:15:00

-- I'm not going to worry about it too much. 13:15:03

And if you want me to say something at the 13:15:05

conclusion of the instructions, we can figure 13:15:07

that out somehow. 13:15:09

MR. SLAYDEN: Should we just 13:15:10

assign that to highlight at the moment, Your 13:15:11

Honor? 13:15:14

THE COURT: Yes, that's fine. 13:15:14

Okay. You can bring them in. 13:15:15

MR. BANNER: Your Honor, could I 13:15:17

ask for one thing? 13:15:18

THE COURT: Sure. 13:15:19

MR. BANNER: I don't know if 13:15:20

counsel plans on playing any more deposition 13:15:21

testimony, but my understanding is that the 13:15:23

process of impeachment requires that the -- 13:15:26

1 that the witness gets to review and refresh 13:15:31
2 his memory as to what he answered in his 13:15:35
3 deposition before it's kind of put up on the 13:15:38
4 screen. If that's not Your Honor's 13:15:40
5 understanding, I understand, but I just wanted 13:15:41
6 to -- 13:15:43
7 THE COURT: That hasn't 13:15:43
8 necessarily been my practice, but I will say 13:15:44
9 that there's -- obviously, if there is a 13:15:47
10 question about the completeness, you can raise 13:15:49
11 it or you can raise it on redirect. I don't 13:15:54
12 have the transcript -- I mean, I have the 13:15:56
13 transcript but I haven't studied it, but if 13:15:58
14 they think that's a basis for impeach, I'll 13:16:00
15 let them impeach. 13:16:03
16 MR. BANNER: Okay. 13:16:05
17 (Whereupon, the jury entered the 13:16:06
18 courtroom.) 13:16:08
19 THE COURT: All right. 13:17:02
20 You can proceed. All right. So 13:17:03
21 welcome back. We're going to continue now 13:17:04
22 with the rest of Mr. Bohm's cross-examination. 13:17:07
23 MR. SAULSBURY: Thank you, Your 13:17:11
24 Honor. 13:17:13

1 THE COURT: Yes. 13:17:13
2 BY MR. SAULSBURY: 13:17:19
3 Q. Mr. Bohm, I've just handed you what's 13:17:19
4 been marked as Exhibit 287. 13:17:22
5 (Whereupon, Trial Exhibit 287 was 13:17:22
6 introduced.) 13:17:22
7 BY MR. SAULSBURY: 13:17:22
8 Q. Do you recognize this as an email 13:17:24
9 from you to Mitch Obolsky? 13:17:26
10 A. Yes, in early 2016. 13:17:29
11 MR. SAULSBURY: Okay. Your Honor, 13:17:31
12 I represent that the images marked as 13:17:33
13 Exhibit 288 are the attachment to the email 13:17:36
14 that is Exhibit 287. I offer both 287 and 13:17:37
15 288. 13:17:41
16 MR. BANNER: No objection. 13:17:43
17 THE COURT: Okay. They are 13:17:44
18 admitted. 13:17:45
19 MR. SAULSBURY: Mr. Glass, would 13:17:46
20 you put up 287, please. There we go. 13:17:49
21 BY MR. SAULSBURY: 13:17:52
22 Q. So in this email, Mr. Bohm, you were 13:17:53
23 telling Mr. Obolsky that you had received the 13:17:54
24 new BOB. That's the break out box; right? 13:17:58

A. Correct. 13:18:02
Q. And the break out box that contained 13:18:02
the Unwired device this morning? 13:18:08
A. Yes. 13:18:10
Q. And you opened it up and you took a 13:18:11
couple pictures? 13:18:13
A. Yes. 13:18:14
Q. Those are the pictures that I handed 13:18:14
you as Exhibit 288? 13:18:17
A. You know, I'll take your word for it. 13:18:18
Q. Now, you say you didn't beep out the 13:18:20
board to create a schematic, but you did 13:18:22
follow the USB lines and they definitely go to 13:18:26
the Unwired chip? 13:18:28
A. Yep. 13:18:29
Q. Now, if you go down to the next 13:18:31
paragraph, you say, "The unwired chip (likely 13:18:33
an MCM), has a C4 rev. Could be a single die 13:18:36
that is rumored, but hard to say." 13:18:42
Do you see that? 13:18:44
A. Yes, I do. 13:18:45
Q. Again, you continue, "We can decap 13:18:46
this, but it does belong to Tecvox, so if we 13:18:49
do a decap it would be only fair to share the 13:18:52

report"? 13:18:57
A. I see that, yes. 13:18:57
Q. Now, Tecvox makes USB hubs; right? 13:18:58
A. I think they make the break out box. 13:19:03
Q. Right. 13:19:06
A. Is that what you're referring to? 13:19:07
Q. That's right. They are one of 13:19:08
Aptiv's direct competitors? 13:19:10
A. Yes, I believe so. 13:19:12
Q. And you, in fact, did that decapping? 13:19:13
A. Yes, I think it is the decap that I 13:19:17
actually referred to earlier. 13:19:19
Q. Now, if you please turn back to 13:19:24
Exhibit 67 in your binder, this is one of the 13:19:27
documents you went over with Mr. Banner. And 13:19:28
we'll take a look at 67 in evidence. 13:19:33
Mr. Bohm, I'd like you to turn to 13:19:37
page 13, please. 13:19:40
A. Again, that was 67? 13:19:42
Q. That's right. Page 13. 13:19:45
And I direct your attention to the 13:19:47
email at the bottom from Mr. Sroka to you. 13:19:49
A. I'm still getting there. 13:19:54
Q. You can also see it up on the screen 13:20:01

here if you need it. 13:20:02
A. Okay. 13:20:03
Q. Do you see how Mr. Sroka asks, "Do 13:20:04
you have the patent number for the Dual host, 13:20:08
single endpoint?" 13:20:10
A. Yes. 13:20:11
Q. And your reply is on page 3 of this 13:20:13
document? 13:20:15
A. As I recall, yes. 13:20:17
MR. SAULSBURY: Could we go to 13:20:25
page 3, please, Mr. Glass. 13:20:26
BY MR. SAULSBURY: 13:20:27
Q. This is your reply here on page 3? 13:20:28
A. Yes. 13:20:32
MR. SAULSBURY: And if you could 13:20:36
put the whole top of page 3, Mr. Glass, right 13:20:38
there is good and all the way up to the top. 13:20:42
That works, sure. And then can you blow up? 13:20:50
Keep going. There we go. 13:20:55
BY MR. SAULSBURY: 13:21:02
Q. You replied to Mr. Sroka and you 13:21:03
actually provided a different patent than the 13:21:07
patent that's asserted here; right? 13:21:09
A. Yes. This was the '708 Patent. This 13:21:13

1 was the other patent, yes. 13:21:17
2 Q. Thank you. 13:21:18
3 MR. SAULSBURY: No further 13:21:25
4 questions. 13:21:27
5 THE COURT: Okay. 13:21:27
6 Mr. Banner? 13:21:28
7 - - - 13:21:28
8 REDIRECT EXAMINATION 13:21:32
9 - - - 13:21:33
10 BY MR. BANNER: 13:21:33
11 Q. Thank you, Mr. Bohm. I have a few 13:21:33
12 questions for you. 13:21:35
13 And -- 13:21:36
14 MR. BANNER: Mr. Ferrer, 13:21:51
15 apologies. Mr. Ferrer, can you pull up 13:21:53
16 Exhibit 1 of the claims 23 and 1 and put them 13:21:54
17 side-by-side, please. 13:21:59
18 BY MR. BANNER: 13:22:01
19 Q. Mr. Bohm, you remember answering 13:22:01
20 questions about claims 23 and claim 1 of your 13:22:03
21 '243 Patent? 13:22:09
22 A. Yes. 13:22:09
23 Q. Did you write the claims here, claim 13:22:10
24 23 or claim 1 of the '243 Patent? 13:22:13

A. No, I did not write any of them. 13:22:15
Q. Who wrote the claims? 13:22:17
A. I'm sorry? 13:22:18
Q. Who wrote the claims? 13:22:20
A. This would have been patent counsel, 13:22:21
either in-house or external. 13:22:23
Q. Do you understand the legal meaning 13:22:27
of the words in the claims of your patents? 13:22:29
A. Probably not without going to look 13:22:33
them up, what they are. 13:22:35
Q. Have you reviewed the Court claim 13:22:36
construction order in this case where the 13:22:38
Court decided what the words in the claims of 13:22:40
your patent means? 13:22:42
A. No, I've never reviewed that. 13:22:43
Q. Okay. 13:22:45
If you look at claim 1 and claim 13:22:45
23 up here on the screen, are the words found 13:22:47
in claim 1 of your patent the same as the 13:22:50
words found in claim 23 of your patent? 13:22:53
A. As I was reviewing them, I was 13:22:55
finding many, if not all. The words appear to 13:22:58
be common between the two, yes. 13:23:01
Q. So are they identical? 13:23:02

A. That was my initial take-away when I 13:23:05
was doing the review up here, yes. 13:23:08
Q. The words in your claim -- in claim 13:23:10
23 are the same as the words in claim 1? 13:23:12
A. Well, no, not all of the words, but 13:23:15
many of the words were contained in both. I'm 13:23:18
sorry, I may have misunderstood your question. 13:23:21
Q. I'm sorry, it was probably a bad 13:23:23
question. 13:23:25
MR. BANNER: Let's go to 13:23:25
Exhibit 1, Mr. Ferrer. Page 11. And blow 13:23:27
that up. 13:23:36
BY MR. BANNER: 13:23:36
Q. Mr. Bohm, we talked about this in the 13:23:38
first part of your testimony, and do you 13:23:40
remember what this is, Inter Partes Review 13:23:44
Certificate? 13:23:46
A. Yes. 13:23:46
Q. And what is it? 13:23:47
A. So this is the outcome of the Court 13:23:47
case regarding all of the claims defining 13:23:51
which claims would be cancelled and which 13:23:54
claims are still found to be patentable. 13:23:57
Q. Is claim 23 one of the claims that 13:24:00

1 the patent office found patentable? 13:24:02
2 A. Yes. 13:24:04
3 Q. Is claim 1 one of the claims that the 13:24:04
4 patent office cancelled? 13:24:07
5 A. Yes. 13:24:08
6 MR. BANNER: No further questions, 13:24:11
7 Your Honor. 13:24:12
8 THE COURT: Okay. 13:24:13
9 MR. SAULSBURY: No further 13:24:13
10 questions. 13:24:14
11 THE COURT: All right. Mr. Bohm, 13:24:14
12 you can step down. 13:24:16
13 (Whereupon, the witness was 13:24:16
14 excused.) 13:24:18
15 THE COURT: Counsel, can he leave 13:24:23
16 those binders there? 13:24:25
17 MR. BANNER: They were 13:24:27
18 specifically for him. 13:24:28
19 THE COURT: Okay. So you can 13:24:29
20 leave them there and counsel will take them 13:24:30
21 back. 13:24:32
22 (Brief pause.) 13:24:33
23 THE COURT: All right. 13:24:58
24 Mr. Slayden, you may -- Mr. 13:25:00

Slayden, are you going next? 13:25:05
MR. SLAYDEN: Yes. 13:25:08
THE COURT: All right. Who do you 13:25:08
call? 13:25:09
MR. SLAYDEN: I call Mr. Obolsky. 13:25:11
THE COURT: All right. Mr. 13:25:12
Obolsky, please come up. 13:25:13
THE COURT CLERK: Would you please 13:25:33
stand and raise your right hand. Please state 13:25:35
and spell your name for the record. 13:25:37
THE WITNESS: My name is Mitch 13:25:39
Obolsky, it's M-I-T-C-H, last name is 13:25:40
O-B-O-L-S-K-Y. 13:25:45
- - - 13:25:46
...MITCHEL OBOLSKY, after having 13:25:46
first been sworn and/or affirmed, was examined 13:25:46
and testified as follows... 13:25:46
- - - 13:25:58
DIRECT EXAMINATION 13:25:58
- - - 13:26:02
BY MR. SLAYDEN: 13:26:02
Q. Please state your name for the 13:26:03
record. 13:26:04
A. Yes, my name is Mitch Obolsky. 13:26:05

Q. When did you join Microchip? 13:26:09
A. I joined Microchip in 1995. 13:26:11
Q. What's your current title in 13:26:14
Microchip? 13:26:16
A. My current title is Senior Vice 13:26:16
President of the Networking and Data Center 13:26:19
Business Unit. 13:26:23
Q. Can you describe your 13:26:23
responsibilities to the jury, please. 13:26:24
A. Yes. At the highest level, I run 13:26:26
four business units of Microchip and they all 13:26:29
are related to wire connectivity. 13:26:31
Q. How long have you been in your 13:26:35
current position? 13:26:38
A. The current position I've held is 13:26:39
about four years. 13:26:41
Q. And as Senior Vice President, do you 13:26:42
manage any engineers? 13:26:45
A. Yes, I do. 13:26:46
Q. How many? 13:26:47
A. Today, roughly 2,000 engineers. 13:26:48
Q. Can you describe to the jury the type 13:26:51
of products that fall under your 13:26:54
responsibility at Microchip? 13:26:55

A. Yeah. At a high level, they are all 13:26:56
wire connectivity. Do you want me to give a 13:27:00
little more detail? 13:27:02
Q. Maybe just a little bit. 13:27:03
A. Okay. So the ones we're talking 13:27:05
about come from one of my business units 13:27:07
that's a USB and Ethernet, we've seen a lot 13:27:09
about USB. 13:27:13
Another business unit does what's 13:27:13
called host, the automotive infotainment 13:27:16
group, and that business does connectivity 13:27:20
from the head unit out to the speaker. 13:27:22
Another business unit works on 13:27:24
data center storage products, and the last one 13:27:25
works on telecom products. 13:27:28
Q. And are you in charge -- is your 13:27:31
group in charge, I'm sorry, or is it your 13:27:35
responsibility over the Sandia chip that's 13:27:38
involved in this case? 13:27:41
A. Yes. That falls under my 13:27:42
responsibility. 13:27:45
Q. Okay. 13:27:45
Let's back up a little bit and let 13:27:47
the jury know a little bit about you. 13:27:49

Where did you attend college? 13:27:50
A. I attended college in upstate New 13:27:52
York; I went to Cornell University. 13:27:54
Q. And what did you study? 13:27:56
A. I studied electrical engineering. 13:27:57
Q. What year did you graduate? 13:28:00
A. I graduated in 1983. 13:28:01
Q. Well, over the past 40 years, have 13:28:04
you had time to have a family? 13:28:09
A. Yes, I did. 13:28:09
Q. Are you married? 13:28:10
A. Yes, I am. 13:28:11
Q. How long have you been married? 13:28:12
A. I've been married also about 13:28:14
40 years. 13:28:16
Q. And do you have kids? 13:28:16
A. Yes, three. 13:28:17
Q. Okay. 13:28:17
Are they still at home? 13:28:18
A. No, they've all left. 13:28:19
Q. Well, did you have the chance -- did 13:28:22
they have any grandchildren for you? 13:28:25
A. Yes, I have four granddaughters so 13:28:28
far. 13:28:31

Q. You said 1995. I guess if my math is 13:28:31
right, I think you've been at Microchip for 13:28:33
27 years? 13:28:36
A. Yes, 27 years. 13:28:37
Q. Can you tell the jurors why you've 13:28:38
been at Microchip for 27 years? 13:28:39
A. Yes. You know, Microchip is a 13:28:41
special company in semiconductors in that it's 13:28:45
purpose built. Culture is one that's 13:28:49
enjoyable in that world. We have a definition 13:28:51
of what we expect out of an employee, we 13:28:56
measure it regularly, and, you know, the 13:28:59
people work very well together. 13:29:02
Q. Has Microchip changed over the 13:29:06
27 years you've been there? 13:29:09
A. Yes, it has. 13:29:10
Q. And has Microchip's product offerings 13:29:11
grown over those 27 years? 13:29:13
A. Yeah. So that's the change. 13:29:14
Microchip has grown substantially. Microchip 13:29:16
was -- you know, when I joined originally, it 13:29:18
was a small company. Now it's maybe 30 times 13:29:21
the size it was when I first joined. And, you 13:29:23
know, we were a very narrow product offering, 13:29:27

you know, what was called microcontrollers, 13:29:31
that was one or two business units, and today 13:29:34
we have 25 business units, so we're a much 13:29:36
bigger company today. 13:29:39
Q. About how many different products 13:29:39
does Microchip offer today? 13:29:41
A. So, yeah, it's a big number that's 13:29:43
roughly 180,000 different part numbers that 13:29:46
are available for sale today. 13:29:49
Q. Can you describe to the jury some 13:29:51
examples of the products Microchip makes? 13:29:53
A. Sure. We talked about the ones that 13:29:56
were under my direct responsibility, so in the 13:30:01
world of USB, there would be products for 13:30:04
microcontrollers, for all kinds of PCs, for 13:30:07
consumer products. Microcontrollers were a 13:30:11
key to the company. What we described as 8, 13:30:14
16 and 32-bit, which is basically a small, 13:30:17
medium and large size. Those products are 13:30:20
used to drive a very large number of 13:30:22
electronic devices. 13:30:24
Probably most of you have a 13:30:25
hundred different parts of a microchip in some 13:30:27
part that you've bought, just hidden inside. 13:30:31

Q. Does Microchip make consumer 13:30:33
products? 13:30:35
A. Yeah, Microchip does make products 13:30:36
that are sold into consumer products. 13:30:38
Q. Okay. All right. 13:30:41
Has Microchip's capacity to 13:30:42
produce and make microchips grown since you've 13:30:44
been at the company? 13:30:49
A. Yeah. As a rough estimate, we 13:30:50
probably produced about a million parts a day 13:30:51
when I first joined, and today we produce more 13:30:54
than 20 million parts today, so about 20X. 13:30:56
Q. So what is that per year do you 13:30:59
think, on average, of chips that Microchip 13:31:01
makes? 13:31:03
A. At a high level, we currently are 13:31:04
running roughly eight billion units per year, 13:31:06
so that's like more than there's every person 13:31:09
on the planet to get a sense where you likely 13:31:12
have one. 13:31:15
Q. Does Microchip make the same number 13:31:16
of chips of each chip each month or does it 13:31:18
vary? 13:31:20
A. So we -- we make whatever the 13:31:20

1 customers ask for, and that varies 13:31:23
2 considerably across the year. So yes, we 13:31:26
3 respond to the needs. For example, a lot of 13:31:29
4 our customers buy a lot of their products 13:31:33
5 Christmastime. They make consumer products 13:31:36
6 that are only used from October to December 13:31:38
7 and sold only at Christmas. 13:31:40
8 Other companies like automotive 13:31:42
9 industry tends to ramp in June by every year 13:31:44
10 and by March have stopped buying product. So 13:31:48
11 every one of our customers has a different 13:31:50
12 pattern, so we're quite flexible. 13:31:52
13 Q. And talking about customers, what is 13:31:54
14 the preferred customer at Microchip? 13:31:56
15 A. So a preferred customer is usually 13:31:57
16 one of our larger customers and someone we 13:31:59
17 have a strong relationship, we give them 13:32:02
18 preferred service, preferred support. In most 13:32:04
19 cases, what's important to them is the 13:32:08
20 technical support. We have a very large 13:32:11
21 number of sales and technical people that are 13:32:13
22 application engineers and we would help them 13:32:17
23 develop a design, get it into production, work 13:32:20
24 with all the qualification testing and even 13:32:22

solve issues later. 13:32:25

Q. Pricing, do your preferred customers 13:32:27

get discounts on Microchip products? 13:32:30

A. Yes. If you are a larger preferred 13:32:32

customer, certainly you get a price that's 13:32:34

well below what would be our normal list 13:32:36

price. 13:32:38

Q. And can you explain to the jurors how 13:32:38

that pricing is set for preferred customers? 13:32:40

A. Yes. So for large customers, we use 13:32:43

sort of a long-term agreement. They are not 13:32:49

formal agreements, but, in essence, what we do 13:32:51

is quote all the parts we sell to them once a 13:32:53

year; we give them the prices for that year 13:32:57

and they give us a forecast of how much 13:32:59

they're going to buy. And then, you know, how 13:33:01

much they intend to buy the next four years, 13:33:03

and we give them a rough estimate of what 13:33:05

they'll pay. So they can make give us a 13:33:07

forecast. 13:33:10

Q. Would it be correct to say that if 13:33:10

they buy more chips or earn more chips, they 13:33:12

get a better pricing? 13:33:15

A. Yes, certainly. During the annual 13:33:16

1 agreements, often we find if they decided to 13:33:18
2 use our product in more locations, then they 13:33:21
3 would pay less per unit, or if they were going 13:33:23
4 to use it less, then they would pay more. 13:33:25
5 Q. Do the terms of the long-term 13:33:28
6 agreements that you mentioned change year to 13:33:30
7 year? 13:33:32
8 A. Yes. So again, you know, it's just a 13:33:34
9 forecast. The customers' business changes 13:33:37
10 over time and, you know, based on that most 13:33:40
11 recent use for last year, often it will be 13:33:42
12 higher or lower than first said. The plans 13:33:46
13 change. It's hard to have five years correct. 13:33:48
14 But each year, we review it and 13:33:50
15 then we come up with a price for the next 13:33:52
16 coming year. 13:33:55
17 Q. Is that an agreement between you and 13:33:56
18 the customer? 13:33:58
19 A. Yes, it is. 13:33:59
20 Q. This case is about Microchip's '243 13:33:59
21 Patent. 13:34:02
22 During your 27 years, have you 13:34:02
23 seen Microchip invest in innovation? 13:34:05
24 A. Yes. Microchip has a large number of 13:34:07

1 engineers and their jobs are research and 13:34:12
2 development to provide new features to new 13:34:15
3 products. 13:34:18
4 Q. Does Microchip file patent 13:34:19
5 applications to protect its innovations? 13:34:22
6 A. Yes, it does. 13:34:24
7 Q. And do you know how many patents 13:34:25
8 Microchip currently owns worldwide? 13:34:28
9 A. Yeah, today roughly 7,000 worldwide 13:34:30
10 patents. 13:34:32
11 Q. And during your 27 years, have you 13:34:32
12 ever been granted a patent? 13:34:35
13 A. Yes, I have. One patent. 13:34:35
14 Q. Does Microchip use your invention? 13:34:39
15 A. No, it does not. 13:34:42
16 Q. Do you think there's a future market? 13:34:44
17 A. Potentially. You know, the patent 13:34:47
18 has applicability. The challenge is to find a 13:34:50
19 way to use it, and the price point has to be 13:34:54
20 right for a customer, so some day. 13:34:59
21 Q. Okay. 13:35:01
22 I think you have your exhibit 13:35:01
23 notebook there. Can you turn to Exhibit 1, 13:35:03
24 please. 13:35:05

1 MR. SLAYDEN: Mr. Ferrer, can we 13:35:13
2 look at Exhibit 1. 13:35:14
3 BY MR. SLAYDEN: 13:35:15
4 Q. Do you recognize Exhibit 1, Mr. 13:35:16
5 Obolsky? 13:35:18
6 A. Yes, I do. 13:35:18
7 Q. And on the first page, do you see 13:35:19
8 where it lists assignee? 13:35:21
9 A. Yes, I do. 13:35:23
10 Q. And what company does it identify? 13:35:24
11 A. It lists Standard Microsystems 13:35:26
12 Corporation. 13:35:30
13 Q. And do you have a nickname for that? 13:35:30
14 A. Yeah, we call it SMSC. 13:35:32
15 Q. Did Microchip purchase SMSC? 13:35:35
16 A. Yes, we did. 13:35:37
17 Q. And when was that, if you know? 13:35:38
18 A. It was roughly 2012, when the deal 13:35:40
19 closed. 13:35:43
20 Q. Do you know how much Microchip paid 13:35:44
21 for SMSC? 13:35:46
22 A. Yes. Net we paid about $750 million 13:35:47
23 for SMSC. 13:35:50
24 Q. Can you explain to the jury why you 13:35:52

1 would pay $750 million for SMSC? 13:35:53
2 A. Yes. Microchip buys many companies, 13:35:56
3 and the reason we buy the companies and why we 13:36:01
4 would pay that price is we're buying their 13:36:03
5 engineers, we're buying their technology, 13:36:06
6 we're buying their product, we're buying their 13:36:08
7 customers, and then often, ultimately, the 13:36:12
8 market. 13:36:16
9 Q. You mentioned technology as part of 13:36:16
10 the acquisition. Did Microchip acquire SMSC 13:36:18
11 patents? 13:36:21
12 A. Yes, we did. All of their patents. 13:36:22
13 Q. And the '243 is one of those patents? 13:36:24
14 A. Yes, it is. 13:36:28
15 Q. Okay. 13:36:29
16 After the purchase, did SMSC 13:36:32
17 remain a stand-alone company? 13:36:35
18 A. No, it did not. We merged the 13:36:36
19 division of SMSC into Microchip, into what we 13:36:39
20 call Microchip classic, the historical part of 13:36:42
21 Microchip. 13:36:44
22 Q. And did you become responsible for 13:36:45
23 any SMSC business units? 13:36:48
24 A. Yes. I took on what later became 13:36:50

1 named the USB Networking Business Unit which 13:36:54
2 was responsible for the USB product line and 13:36:57
3 the Ethernet product line. 13:37:00
4 Q. Did Mr. Bohm, the inventor of the 13:37:02
5 patent here, join part of Microchip at the 13:37:06
6 SMSC acquisition? 13:37:08
7 A. Yes, he did. 13:37:11
8 Q. And what position did he hold when he 13:37:12
9 joined? 13:37:14
10 A. Yeah, so as you heard earlier from 13:37:15
11 Mark, he was the manager for the architectural 13:37:20
12 engineering group. 13:37:23
13 Q. And that group was part of your 13:37:24
14 business unit? 13:37:27
15 A. Yes, it was. 13:37:27
16 Q. When Microchip purchased SMSC, did 13:37:32
17 SMSC sell you products that used Mr. Bohm's 13:37:35
18 multi-host patent? 13:37:40
19 A. No, they did not. Microchip did not. 13:37:41
20 Q. And after the purchase of SMSC, did 13:37:43
21 Microchip immediately take any action to 13:37:46
22 produce a product using Mr. Bohm's patent? 13:37:48
23 A. No, we did not. 13:37:50
24 Q. And can you explain to the jury why 13:37:51

1 you didn't produce a product under Mr. Bohm's 13:37:53
2 patent? 13:37:56
3 A. So at that point, there was not yet a 13:37:57
4 market that would clearly have that need where 13:38:01
5 we could. 13:38:04
6 Q. Are you responsible for approving 13:38:09
7 patent maintenance fees for your business 13:38:12
8 unit? 13:38:13
9 A. Yes, I am. 13:38:14
10 Q. For example, have you approved the 13:38:14
11 patent maintenance fees for Mr. Bohm's 13:38:17
12 patents? 13:38:19
13 A. Yes, that's part of my 13:38:19
14 responsibility. 13:38:21
15 Q. Did Microchip sell any products using 13:38:21
16 Mr. Bohm's patent between 2012 and 2016? 13:38:24
17 A. No, we did not. 13:38:28
18 Q. Can you explain to the jury why 13:38:29
19 Microchip would pay maintenance fees on Mr. 13:38:30
20 Bohm's patent if Microchip was not using Mr. 13:38:33
21 Bohm's invention? 13:38:36
22 A. Yes. If we believe a patent still 13:38:37
23 has value today or in the future, you know, if 13:38:40
24 we intend -- there's the possibility of using 13:38:43

that patent, we will pay maintenance fees to 13:38:46
keep it alive. 13:38:49
Q. Is that because you think maybe in 13:38:51
the future, a market might materialize? 13:38:53
A. Yes. It's not clear always what the 13:38:55
future will bring, but we could see the value 13:38:59
of the patent. 13:39:02
Q. Okay. 13:39:03
Did the market materialize for Mr. 13:39:04
Bohm's multi-host invention? 13:39:07
A. Yes, it did. That was the advent of 13:39:09
a complex spec. 13:39:13
Q. I'd like to transition to discuss 13:39:15
Microchip's USB hub business. 13:39:17
What is a USB hub chip? 13:39:20
A. So at a high level, and I think it 13:39:22
was a bit described earlier, but at a high 13:39:25
level, USB hub chip, so normally you have a 13:39:27
connection to a computer and you need more 13:39:31
connections. What a USB hub chip will do is 13:39:34
take a single host and fan that out into a lot 13:39:38
more ports at that point. 13:39:40
Q. And what year did Microchip introduce 13:39:43
the hub chip? 13:39:48

A. So Microchip, including its history 13:39:48
of SMSC, started selling USB hub chips around 13:39:51
2006. 13:39:55
Q. Okay. Roughly 16 years? 13:39:57
A. About 16, 16 years, yeah. 13:39:59
Q. How many hub chip manufacturers are 13:40:02
there? 13:40:04
A. There are actually many hub chip 13:40:04
manufacturers. There are very few automotive 13:40:06
hub chip manufacturers. 13:40:11
Q. And can you explain why there are few 13:40:11
automotive USB hub chip manufacturers? 13:40:13
A. Yeah. So the primary high volume use 13:40:16
of hub chips is into PCs and consumer products 13:40:20
like monitors, and the hub you can go to the 13:40:25
store and buy, and so those are usually -- 13:40:28
they work over a temperature range, they don't 13:40:31
have intrinsic quality requirements. 13:40:33
Taking that market to the 13:40:37
automotive business is much different. We 13:40:38
need higher reliability, higher qualities, we 13:40:41
have to cover a wide temperature range. There 13:40:43
is a lot of tougher requirements on an 13:40:45
automotive hub. 13:40:47

Q. Just in general, automotive hubs seem 13:40:48
to be more robust and tough -- 13:40:51
A. Absolutely. 13:40:53
Q. -- than consumer PC hub chips? 13:40:53
A. Sorry. Yes. They certainly do need 13:40:56
to be more robust than a standard lower cost 13:40:59
consumer product. 13:41:03
Q. Do you know, since it's in your 13:41:05
business, about how many USB hub chips 13:41:06
Microchip sells to the automotive industry 13:41:09
each year? 13:41:11
A. Yeah. So roughly the last year or 13:41:12
two, I would say about 35 million units per 13:41:14
year. 13:41:17
Q. Have you heard of the term "The Big 13:41:18
3"? 13:41:21
A. Yes. 13:41:21
Q. What does it refer to? 13:41:22
A. It refers to the historical large 13:41:24
three U.S. automotive manufacturers, so Ford, 13:41:28
Chrysler, GM. Tesla may want to be called The 13:41:31
Big 4 some day. 13:41:35
Q. Before Unwired began selling its dual 13:41:36
role hub, who was the first supplier of hub 13:41:40

chips to the three big automakers? 13:41:42
A. So before Unwired entered the market 13:41:44
and even Unwired, itself, Microchip had almost 13:41:46
100 percent of the business with The Big 3; 13:41:50
all three of those manufacturers were using 13:41:54
Microchip's hub chip in their break out box. 13:41:56
Q. And where are Microchip's automated 13:41:59
USB hub chips produced? 13:42:03
A. So it's a little complex. Let me 13:42:05
take you through how you usually make a chip 13:42:07
so I can tell you how it's produced. 13:42:09
So the first step is we have to 13:42:11
produce a wafer. Those wafers today are 13:42:12
produced for all of the hub chips as a Taiwan 13:42:15
semiconductor, TS1C. 13:42:18
The second step is we bring them 13:42:20
back and we probe them and we separate out 13:42:22
which are the good, which are no good. We put 13:42:25
plastic around them. By the way, we probe 13:42:28
them in our facilities at Microchip. We put 13:42:30
the plastic around it. That can be done in 13:42:32
one of three places. We use Amcore, one 13:42:34
manufacturer that makes -- puts the plastic 13:42:37
around it; ASC is another one, or we do it in 13:42:39

our factories. 13:42:43
And as a final test, we bring them 13:42:44
back to our Thailand facility, we test 13:42:46
everything and then ship it out to the 13:42:48
customer. 13:42:49
Q. What portion of Microchip's yearly 13:42:50
chip production is automotive USB hub chip 13:42:52
production? 13:42:56
A. Yeah, so at a high level, I gave you 13:42:56
two numbers. We sell about 35 million chips 13:42:58
to automotive USB hubs out of eight billion, 13:43:02
so it is about one out of every 200 chips. 13:43:05
Q. Between 2017 and 2021, did Microchip 13:43:07
have the capacity to produce an additional 10 13:43:13
million Sandia chips per year? 13:43:16
A. Yes. Certainly. If you look at our 13:43:17
production of eight billion chips, you know, 13:43:20
we talked about it being 20 million chips per 13:43:22
day, so an entire year's worth of -- if you 13:43:25
add 10 million more chips, was that the 13:43:29
question? 13:43:31
Q. Yes. 13:43:31
A. It would only be about a half a day 13:43:32
of our equipment production. So it's a very 13:43:34

1 small amount for Microchip. 13:43:36
2 Q. So what happens to Microchip's yearly 13:43:38
3 sales and marketing calls when Microchip sells 13:43:40
4 additional units of an existing product to an 13:43:43
5 existing customer? 13:43:46
6 A. So a bit of a complex question. Let 13:43:48
7 me break that down. 13:43:50
8 Q. Sorry. 13:43:51
9 A. Let me break that down in pieces. 13:43:52
10 So -- so if we're visiting a customer and -- a 13:43:55
11 customer like Aptiv in this example, selling 13:43:58
12 them a hundred parts already and we want to 13:44:01
13 sell them one more, it's not a big expense. 13:44:03
14 So we go in there, he knows everybody, it's a 13:44:06
15 very small incremental expense. 13:44:09
16 Now, if we are selling the same 13:44:11
17 product family, we've always told the world 13:44:13
18 the marketers have already prepared all the 13:44:16
19 material, they have already sold all of their 13:44:18
20 competitors, so the amount of effort to sell 13:44:20
21 it to one more person is actually quite small 13:44:21
22 of, essentially, the same product family to 13:44:24
23 the same customers. 13:44:28
24 Q. Right. 13:44:28

Now, you mentioned that 13:44:30
Microchip's chips are in a lot of car 13:44:32
manufacturers. Can you give the jury a sense 13:44:35
of which car manufacturers have Microchip 13:44:38
chips in them? 13:44:42
A. Yeah. So across time, you can pretty 13:44:43
much name almost every car manufacturer. Let 13:44:45
me just take you through some of The Big 3 13:44:48
have it in U.S. across time, Tesla does; if 13:44:51
you go to Europe, Audi, VW, BMW, Dimer, 13:44:54
Mercedes, they all use our chips for at least 13:45:00
some of their cars. 13:45:04
We go to Asia, a Kia, Mazda, 13:45:06
Toyota, Honda, Nissan. You know, we pretty 13:45:09
much at times have been in every one of those 13:45:14
customers. 13:45:17
Q. And would that be true for what's at 13:45:17
issue here; that is, in relation to USB hub 13:45:19
chips? 13:45:21
A. Yes. Most certainly. And actually, 13:45:22
that was my reference with the USB -- 13:45:24
automotive USB hub chips have been, at times, 13:45:26
pretty much in every one of them. 13:45:30
Q. Okay. 13:45:32

1 Was Microchip selling an 13:45:33
2 automotive USB hub chip in 2014? 13:45:35
3 A. I'm sorry, repeat? 13:45:38
4 Q. Was Microchip selling a automotive 13:45:39
5 USB hub chip in 2014? 13:45:41
6 A. Yes. Yep. We were. 13:45:43
7 Q. More than one? 13:45:46
8 A. Yeah, there were many products by 13:45:47
9 that time. 13:45:49
10 Q. In 2014, could you connect the iPhone 13:45:50
11 to a car using one of Microchip's USB hub 13:45:54
12 chips? 13:45:57
13 A. Yes, you could. As you heard 13:45:57
14 earlier, the Athens chip was in the 13:46:00
15 marketplace and it offered two different 13:46:02
16 solutions to CarPlay. You know, the single 13:46:04
17 upstream solution, which we call FlexConnect 13:46:08
18 or Flex, and then also the Dual upstream. 13:46:10
19 Sometimes a car wanted two wires 13:46:14
20 so we gave them the Dual upstream solution, 13:46:16
21 but either one of those two could have worked 13:46:18
22 CarPlay in pretty much any car. 13:46:20
23 Q. I don't know if you were here 13:46:23
24 yesterday, I think you were, Aptiv's counsel 13:46:24

1 referred to Microchip's old technology in 13:46:26
2 opening statements. 13:46:29
3 Does Microchip still sell the 13:46:30
4 Athens USB hub chip today? 13:46:32
5 A. Yes, it does. Athens was actually 13:46:35
6 brand new in 2014, we were just reaching 13:46:37
7 production, so -- and then today, Athens is 13:46:39
8 still a very high seller. As a matter of 13:46:43
9 fact, the volume continues to grow even this 13:46:45
10 year. 13:46:48
11 Q. Are Athens hub chips compliant with 13:46:48
12 USB standard? 13:46:51
13 A. Yes, they are. USB standard, I think 13:46:52
14 one of the challenges in all of this 13:46:55
15 discussion, a USB standard called out for one 13:46:57
16 host and the Athens chip can give you one host 13:47:00
17 and is compliant and has a USB logo, which 13:47:05
18 means we have taken it to a third party lab, 13:47:08
19 checked that we complied with the current 13:47:10
20 standards, and they give us a logo to prove 13:47:12
21 the compliance. 13:47:15
22 Q. Shifting gears a little bit, can you 13:47:15
23 please describe for the jury the different 13:47:18
24 players and their roles in the USB hub 13:47:20

1 business? 13:47:23
2 A. Yeah. This one -- so first you have 13:47:25
3 to understand how this fits in the car. So 13:47:27
4 you've heard some discussion today, there is a 13:47:31
5 head unit, that's one of the two computers in 13:47:34
6 the car, one of the computers in the car. 13:47:37
7 Then there is always a connector and a wire 13:47:39
8 and a break out box, okay. So those are all 13:47:41
9 pieces. 13:47:45
10 So if you go through the whole 13:47:45
11 sequence, there is a manufacturer of a head 13:47:47
12 unit, there is a manufacturer of connectors, 13:47:49
13 manufacturer of cables, another manufacturer 13:47:51
14 of the break out box very often and then there 13:47:53
15 are contract manufacturers for each of them. 13:47:57
16 And then, of course, the automotive 13:47:59
17 manufacturer would buy it all and puts it 13:48:01
18 together and Microchip makes the chip. So a 13:48:04
19 lot of different companies involved. 13:48:06
20 And there's software. So Apple 13:48:07
21 has, say, for instance, in CarPlay, so 13:48:10
22 everything had to work with Apple, and there's 13:48:12
23 always an operating system, so a lot of 13:48:14
24 different companies have to work together. 13:48:17

Q. So all of those companies you just 13:48:21
mentioned need to work together to integrate a 13:48:23
phone into a car? 13:48:26
A. Yes. They certainly all need to work 13:48:27
together or it won't work. 13:48:30
Q. Were you in the courtroom yesterday 13:48:36
when Aptiv's counsel referred to Microchip as 13:48:38
a 900-pound gorilla? 13:48:41
A. Yes. 13:48:43
Q. Do you know the relative size of 13:48:45
Aptiv compared to Microchip? 13:48:48
A. If you look at just raw head count, 13:48:49
right, Microchip today has about 18,000, 13:48:52
19,000 employees and Aptiv has about 180,000 13:48:56
employees, so roughly 10 times the number of 13:49:02
people in the size of Aptiv. 13:49:04
Q. Is Aptiv currently a customer of 13:49:07
Microchip? 13:49:10
A. Yes. We sell many, many products to 13:49:10
Aptiv today. 13:49:12
Q. Did you previously know Aptiv by a 13:49:13
different name? 13:49:17
A. Yes, the history was just before 13:49:17
being Aptiv, they were known as Delphi, and 13:49:21

before that, they were a subsidiary or a 13:49:24
portion of General Motors before they were 13:49:26
spun out separately in around 1999. 13:49:28
Q. How long has Aptiv or Delphi been a 13:49:31
Microchip customer? 13:49:34
A. I've been with Microchip for 13:49:36
27 years, and they were a customer right when 13:49:38
I came, so certainly more than 25 years. 13:49:40
Q. I don't know if you mentioned it 13:49:42
already, but how many different products does 13:49:44
Microchip supply to Aptiv each year today? 13:49:46
A. Today, and I did a quick check in 13:49:48
preparing, but it's slightly more than 100 13:49:52
different part numbers are still sold to Aptiv 13:49:54
today. 13:49:57
Q. Do multiple Microchip business units 13:49:57
supply products to Aptiv today? 13:50:01
A. Yeah. At a high level, you know, 13:50:03
roughly 12 of the 25 business units today are 13:50:06
selling to Aptiv. 13:50:09
Q. Can you identify for the jury some of 13:50:12
the products that Microchip supplies to Aptiv 13:50:14
today? 13:50:17
A. Yeah. So let me start with the ones 13:50:18

that are directly under me and kind of fan out 13:50:20
a little bit so you get an idea. 13:50:23
We talked about the USB chips from 13:50:25
my USB networking division. Also the Ethernet 13:50:27
chips are being sold to Aptiv. Another 13:50:31
division that's under me, the automotive 13:50:33
infotainment division, sells a lot of chips to 13:50:36
Aptiv today. 13:50:39
And then from there, many other 13:50:40
divisions, micro divisions selling to General 13:50:41
Motors, we have RF division and I don't know 13:50:47
exactly how Aptiv uses it, but they're 13:50:49
typically used for buttons in your car that's 13:50:51
the garage door opener or the key fob you push 13:50:53
the button on. 13:50:57
But there are many, many, many 13:50:58
products like that out there that we are 13:51:00
partners together on. 13:51:02
Q. So you are still business partners in 13:51:03
a sense? 13:51:05
A. Oh, absolutely. Absolutely. 13:51:05
Q. Switching gears a little bit, what is 13:51:07
list price? 13:51:10
A. List price would be if you go to the 13:51:11

1 website, you know nobody at Microchip and you 13:51:12
2 want to buy one or you want to buy 100 or a 13:51:16
3 thousand, there's a price there. And many 13:51:19
4 customers still do that today; they'll go 13:51:20
5 there and push a button and that's the price 13:51:23
6 you'll pay. 13:51:25
7 Q. Does Aptiv pay this price for 13:51:26
8 Microchip products? 13:51:28
9 A. Aptiv certainly does not. 13:51:29
10 Q. Do they pay more or less than this 13:51:30
11 price? 13:51:32
12 A. Aptiv -- as all large customers, I 13:51:33
13 would say Aptiv today probably pays between 13:51:36
14 one-third to one-half of our list price. 13:51:39
15 Q. And how is that price set? 13:51:42
16 A. So we talked a little earlier in that 13:51:44
17 annual review, we discussed how many parts do 13:51:47
18 you plan to buy, what is our future together 13:51:50
19 in this family, assuming you have one product 13:51:53
20 today, could be two tomorrow and then four, 13:51:56
21 right. And so we'll set a price. 13:51:58
22 So it's based on how much they're 13:52:01
23 currently buying and how much they plan to 13:52:02
24 buy. We review that again every year, you 13:52:05

1 know, annually to chew everything up and then 13:52:08
2 we do it again one year later. 13:52:12
3 Q. So even though this litigation is 13:52:13
4 ongoing, you're still selling product to Aptiv 13:52:15
5 and supporting those products on behalf of 13:52:18
6 Aptiv? 13:52:20
7 A. Absolutely. That's -- you know, we 13:52:21
8 have a narrow quarrel. We're here today on 13:52:24
9 one item. As a matter of fact, even the last 13:52:27
10 two weeks, Aptiv has been asking for a lot of 13:52:30
11 help, essentially the same group of engineers 13:52:32
12 on the Ethernet products. 13:52:35
13 Q. So are automotive industry customers 13:52:39
14 like Aptiv treated differently by Microchip 13:52:41
15 than some other customers? 13:52:44
16 A. Yes. We typically put dedicated 13:52:45
17 teams in place. So, for instance, one of my 13:52:49
18 responsibilities is something called 13:52:52
19 automotive product group, and it has engineers 13:52:53
20 and marketers that are able to do both, you 13:52:57
21 know, applications support or technical 13:53:01
22 support, and they put in place so that we can 13:53:04
23 be far more responsive because the needs of 13:53:07
24 this type of customer, you know, say you have 13:53:09

a single fail somewhere, if it's a consumer 13:53:12
product, it can take a week or two to respond. 13:53:16
If it's an automotive product, everybody wants 13:53:18
to know what is going on, what is causing 13:53:21
this, could there be more of them. 13:53:22
Did Microchip have some issue? Is 13:53:24
it a software issue? Is it their issue? So 13:53:26
very quickly we have to resolve issues for 13:53:28
automotive customers. 13:53:31
Q. Understand. 13:53:32
Now, switching gears a little bit, 13:53:33
are you familiar with a company named Unwired? 13:53:34
A. Yes, I am. 13:53:36
Q. And can you give a little background 13:53:38
of your understanding of who Unwired was or 13:53:40
is? 13:53:43
A. Yeah. So Unwired, prior to being 13:53:44
acquired by Aptiv, was a customer of 13:53:48
Microchip, and Unwired made break out boxes 13:53:51
that originally were based on our technology 13:53:56
and then decided to do some based on this new 13:53:58
technology that was infringing our patents. 13:54:02
Q. You mentioned the term "break out 13:54:07
box," and I don't want the jury to be 13:54:09

1 confused. I believe Mr. Bohm referred to a 13:54:11
2 break out box also known by another name 13:54:14
3 sometimes? 13:54:16
4 A. So it depends. And I know there may 13:54:16
5 have been a little confusion because we make a 13:54:19
6 chip, we make a USB hub chip, right? It goes 13:54:21
7 into what we would call a break out box. 13:54:25
8 Because we sell USB hub chips that go into 13:54:27
9 thousands of applications, we identify that 13:54:29
10 break out box as a plastic module in a car 13:54:31
11 where one port goes over to the head unit and 13:54:34
12 then brings out whatever they bring out, two 13:54:37
13 or four. 13:54:39
14 We call that a break out box and 13:54:39
15 it breaks out functionality. So that's my 13:54:41
16 reference. And I think on the other side, 13:54:44
17 sometimes they call that a hub. 13:54:47
18 Q. Call it a hub? 13:54:48
19 A. So I apologize if we don't use the 13:54:49
20 same terminology. 13:54:51
21 Q. All right. 13:54:52
22 What parts did Unwired -- excuse 13:54:53
23 me. Was Unwired ever a Microchip customer? I 13:54:57
24 think you mentioned that. 13:55:00

A. Yeah. As I mentioned, yeah, 13:55:01
certainly. Certainly they were. 13:55:03
Q. What parts did Unwired buy from 13:55:04
Microchip? 13:55:06
A. So in the -- you know, the early part 13:55:06
of their existence, in the early use of break 13:55:12
out boxes, I believe they were using a 13:55:17
standard hub, automotive hub, and they also 13:55:18
used a hub car combo, but they were all 13:55:21
automotive hubs. 13:55:26
Q. And when did they start to become a 13:55:27
customer, about what timeframe? 13:55:28
A. So I would say 2010-ish. 13:55:30
Q. So you mentioned Aptiv is also a hub 13:55:35
or break out box manufacturer. Before Aptiv 13:55:37
acquired Unwired, were they competitors in the 13:55:40
market? 13:55:43
A. They absolutely were competitors, 13:55:43
trying to bid on the same programs against 13:55:47
each other, at the end, automotive 13:55:50
manufacturers. 13:55:53
Q. And were they both buying Microchip 13:55:54
chips to put in their hubs to break out boxes? 13:55:59
A. Yes, they were both buying Microchip 13:56:01

1 hubs. 13:56:03
2 Q. In 2014, before Unwired was acquired 13:56:04
3 by Aptiv, about how many USB hub chips did 13:56:06
4 Microchip provide Unwired that year? 13:56:10
5 A. So I think right before they were 13:56:13
6 acquired, you know, roughly two-and-a-half 13:56:15
7 million chips per year. 13:56:17
8 Q. So did Unwired have a long-term 13:56:19
9 customer relationship with Microchip? 13:56:22
10 A. So at that time, Unwired was a 13:56:24
11 smaller company. You know, usually we have a 13:56:26
12 long list of products and we do them based on 13:56:28
13 the list. They were buying very few part 13:56:31
14 numbers from us, and so a small company not 13:56:33
15 buying many products, we did not have a 13:56:35
16 long-term agreement. 13:56:38
17 Q. Did Unwired pay you more or less than 13:56:38
18 list price for Microchip USB hub chips? 13:56:41
19 A. Yeah, Unwired was buying a reasonable 13:56:44
20 volume so they did not pay list price. They 13:56:47
21 probably were somewhere between 30 and 13:56:50
22 50 percent of list price. 13:56:52
23 Q. I think you mentioned it, but just to 13:56:53
24 confirm, Unwired was a customer when Aptiv 13:56:55

1 purchased them in 2014? 13:56:57
2 A. Unwired was a customer of Microchip. 13:57:00
3 Q. Microchip? 13:57:02
4 A. Yes, when they were purchased by 13:57:03
5 Aptiv. 13:57:06
6 Q. In 2014, did Unwired ask Microchip to 13:57:07
7 quote USB hub chips for its hubs for any of 13:57:10
8 The Big 3 automakers? 13:57:15
9 A. Yes. 13:57:16
10 Q. In 2014, besides Unwired, did other 13:57:19
11 hub manufacturers ask Microchip to quote USB 13:57:22
12 hub chips? 13:57:25
13 MS. DURIE: Your Honor, objection, 13:57:27
14 leading. 13:57:27
15 THE COURT: Overruled. 13:57:28
16 Go ahead. 13:57:30
17 BY MR. SLAYDEN: 13:57:30
18 Q. In 2014, besides Unwired, did other 13:57:31
19 hub manufacturers ask Microchip to quote USB 13:57:34
20 hub chips for hubs for any of the three big 13:57:39
21 automakers? That's a mouthful. 13:57:42
22 A. Besides Unwired, all of our current 13:57:45
23 customers for hubs also were asking to quote 13:57:48
24 the next generation of product for The Big 3. 13:57:52

Q. Okay. 13:57:54
When you quoted products to the 13:57:55
other hub manufacturers, did you have an 13:57:57
expectation that you would win the business? 13:58:00
A. Yes. You know, as we looked into 13:58:03
beginning of CarPlay being announced where we 13:58:08
had two solutions, we believed were the best 13:58:10
solutions on the market, they certainly were 13:58:12
the best on buying solution, but some wanted 13:58:16
one, some wanted the others. 13:58:18
But in the middle of 2014, we 13:58:19
thought we were going to win almost every one 13:58:21
of them. 13:58:24
Q. And who won The Big 3 USB hub CarPlay 13:58:24
business in 2014? 13:58:27
A. Yeah, so -- so we got to the middle 13:58:29
of the year, and later in the year, as we 13:58:33
learned more about Unwired, we learned that we 13:58:35
had lost all three of them to Unwired. 13:58:38
Q. And what was Microchip's reaction 13:58:41
when it found out its customer had now become 13:58:43
a competitor for USB hub chips? 13:58:45
A. As you saw earlier, as anybody would, 13:58:48
when you lose, we looked at, okay, what's it 13:58:52

1 take? What are their needs, what didn't we 13:58:54
2 meet and what do we have to do to win the next 13:58:56
3 one? 13:58:58
4 Q. So it's clear for the jurors, did 13:58:58
5 Microchip have a CarPlay solution at that 13:59:02
6 time? 13:59:03
7 A. Yes, we had two different CarPlay 13:59:03
8 solutions; one for one wire and one for two, 13:59:05
9 that pretty much every car manufacturer had 13:59:09
10 planned to use. 13:59:11
11 Q. And was there a particular hub chip 13:59:12
12 that was being used at that time? 13:59:13
13 A. Yes. The Athens family that was 13:59:16
14 discussed earlier was the target for all of 13:59:19
15 those discussions. 13:59:22
16 Q. Okay. 13:59:23
17 Going back to this timeframe 13:59:24
18 around 2014, before Aptiv bought Unwired, did 13:59:26
19 Aptiv contact Microchip about investigating 13:59:30
20 what Unwired was doing? 13:59:33
21 A. Yes, they did. 13:59:36
22 Q. Okay. 13:59:38
23 Let's turn to -- can you turn in 13:59:39
24 your binder to Exhibit 245. I can't find it. 13:59:42

1 A. There it is. I found it. 13:59:57
2 (Whereupon, Trial Exhibit 245 was 13:59:57
3 introduced.) 13:59:57
4 BY MR. SLAYDEN: 13:59:57
5 Q. Do you recognize this document? 14:00:02
6 A. Yes, I do. 14:00:04
7 Q. And what is it? 14:00:05
8 A. It's an internal Microchip email. 14:00:06
9 MR. SLAYDEN: Okay. I move to 14:00:09
10 admit Exhibit 245. 14:00:10
11 MS. DURIE: No objection. 14:00:13
12 THE COURT: All right. It's 14:00:14
13 admitted. 14:00:15
14 BY MR. SLAYDEN: 14:00:16
15 Q. This email is dated May 1st, 2014. 14:00:16
16 At this point, had Aptiv acquired Unwired yet? 14:00:19
17 A. No, not yet. 14:00:22
18 Q. And during -- 14:00:25
19 A. I think -- sorry. Can you ask again? 14:00:27
20 Q. I'm sorry, who were the -- do you 14:00:29
21 know any of the people on this email? 14:00:34
22 A. Yes. So this email was written by 14:00:35
23 one of our salesman to, it looks like, a range 14:00:37
24 of marketers and other salespeople and 14:00:40

applications engineers. 14:00:44

Q. Okay. 14:00:45

You see the first sentence there 14:00:46

it states, "The director of program management 14:00:48

of Delphi called." 14:00:52

Do you see that? 14:00:53

A. Yes, I do. 14:00:54

Q. And so this was referring to Delphi 14:00:54

contacting Microchip? 14:00:56

A. Yes, it appears to say that. 14:00:58

Q. Okay. 14:01:01

It goes on to state, "Delphi has 14:01:01

been promoting our Flexconnect solution to 14:01:03

some key OEMs like, GM and Chrysler." 14:01:06

Do you see that? 14:01:09

A. Yes, I do. 14:01:09

Q. What is that referring to? 14:01:11

A. Yeah, so what that means is in this 14:01:11

period of time, we had been working closely 14:01:14

with Delphi, and from what we had understood, 14:01:17

we were likely together to win both of them 14:01:20

with Microchip's FlexConnect solution for 14:01:23

CarPlay. 14:01:26

Q. Okay. 14:01:27

1 The next sentence, as you see 14:01:28
2 there, refers to or references "Unwire Carplay 14:01:31
3 silicon solution is around $1.60 range." 14:01:35
4 Can you provide some context for 14:01:40
5 the jurors on how Unwired's pricing at this 14:01:41
6 time compared to Microchip's pricing on its 14:01:45
7 own USB hub chips? 14:01:47
8 A. Yes. So at this point of time, in 14:01:48
9 the reasonable absence of competitors, we were 14:01:53
10 selling products for about $3 each, and this 14:01:55
11 was roughly half of what we were selling them 14:01:58
12 for. 14:02:00
13 Q. And the last sentence there, this is 14:02:02
14 an important point there, and the "He" 14:02:05
15 referring there, "He requested us," first of 14:02:10
16 all, who is "He"? 14:02:12
17 A. As I read this message, it appears to 14:02:14
18 be that director or program management at 14:02:16
19 Delphi. 14:02:19
20 Q. So that's Delphi? 14:02:19
21 A. Yes. 14:02:20
22 Q. And it reads, "He requested us" -- 14:02:21
23 and I guess "us" is Microchip -- "to find out 14:02:23
24 more information on this and want to work with 14:02:27

us to fight against this solution ASAP." 14:02:30
Do you have an understanding of 14:02:35
what he's referring to? 14:02:36
A. Yes, because at that point, we 14:02:36
thought we were likely to win our solution, 14:02:38
and all the sudden, this alternate solution 14:02:42
from Unwired had showed up, and they were 14:02:44
asking us to say what we could do to find a 14:02:48
solution for them to compete against it. 14:02:51
Q. So just to be clear, they were asking 14:02:54
you to investigate the Unwired solution? 14:02:57
A. Oh, absolutely. They were asking us 14:02:58
to look into it. 14:03:00
Q. And that's because Aptiv at that time 14:03:01
was a direct competitor with Unwired? 14:03:04
A. Yes. Aptiv was -- was still a 14:03:06
competitor of Unwired just three or 14:03:09
four months before they acquired this, it 14:03:11
appears. 14:03:13
Q. And at that time, was Aptiv promoting 14:03:14
Microchip's FlexConnect solution? 14:03:17
A. At this point, that was a solution 14:03:19
they were trying to use, as we understood it. 14:03:22
As we also understood it from, you know, 14:03:25

1 talking to Chrysler themselves, they were 14:03:27
2 planning to use it also. 14:03:29
3 Q. And after Delphi's request, did 14:03:30
4 Microchip investigate Unwired's solution and 14:03:32
5 response to Aptiv? 14:03:36
6 A. Yes, we certainly did. 14:03:37
7 Q. Now, you explained earlier that Aptiv 14:03:40
8 acquired Unwired later in 2014. After 14:03:42
9 Microchip was informed that Aptiv had won The 14:03:45
10 Big 3 USB CarPlay business in 2014, what did 14:03:49
11 Microchip do? 14:03:52
12 A. So, yes, once we learned that we had 14:03:54
13 lost, you know, we went down a path of what 14:03:59
14 can we do to respond, what's our next chip, 14:04:02
15 right? 14:04:05
16 So the reality of what -- where we 14:04:05
17 were was we had two what we viewed as USB 14:04:11
18 standard compliant solutions. They had come 14:04:13
19 up with noncompliant solution, didn't match 14:04:16
20 the standard. We didn't actually think 14:04:18
21 anybody was going to buy it because it was 14:04:21
22 noncompliant. 14:04:23
23 But if, at the end of the day, 14:04:23
24 Apple was going to allow it and the automotive 14:04:25

1 manufacturers were going to allow it, then 14:04:28
2 fine, we would bring one to market also. 14:04:30
3 Q. So did you determine what Microchip 14:04:38
4 specifically needed to do to win The Big 3's 14:04:40
5 business the next time? 14:04:43
6 A. Yes. So that's when we started on 14:04:44
7 the path of developing the Sandia business 14:04:47
8 plan, and began the investigation of what we 14:04:50
9 would have to do. 14:04:52
10 Q. Do you understand the term "USB 14:04:56
11 persistent"? 14:04:57
12 A. Yes. It's not a term I normally use, 14:04:58
13 but yes, I do. 14:05:01
14 Q. And what relevance does this have in 14:05:02
15 a car? 14:05:05
16 A. So -- so when you look at CarPlay, 14:05:06
17 you plug in and your phone works and it all 14:05:09
18 comes up on the display; that's the simple 14:05:12
19 part. 14:05:14
20 What we view as a minor feature 14:05:15
21 turned out to be something that both Unwired 14:05:19
22 can do and became a request from The Big 3. 14:05:21
23 So normally you would have, you're playing 14:05:24
24 music with MP3 player, another phone, it's the 14:05:28

1 head unit playing in the car. The challenge 14:05:32
2 was that that host needed to talk to that item 14:05:35
3 so the two could stay connected and talk. 14:05:37
4 You plug in your iPhone, the 14:05:39
5 iPhone became the host, the head unit no 14:05:42
6 longer could talk to that item, but the only 14:05:46
7 one host in the system would have been that 14:05:49
8 one. So there needed to be a way -- so this 14:05:51
9 notion of persistence needed to be a way to 14:05:54
10 continue to talk to that music player, as an 14:05:57
11 example. 14:06:00
12 It could have been Maps, it could 14:06:01
13 have been something else, but there needed to 14:06:03
14 be a way to continue to have the head unit 14:06:04
15 talk to it. 14:06:06
16 So at the time, Apple said they do 14:06:07
17 not want -- they don't want to take it over, 14:06:09
18 they want to let the head unit deal with it. 14:06:11
19 And the standard just at this point, normal 14:06:13
20 set of products don't allow it because it 14:06:16
21 would require two systems. 14:06:19
22 Q. What was it that The Big 3 wanted at 14:06:22
23 the time back in 2014 that Microchip wasn't 14:06:25
24 offering in their solution for CarPlay and 14:06:28

1 specifically -- I'm sorry? 14:06:32
2 A. So for CarPlay, itself, we could do 14:06:35
3 everything. What we couldn't do was, at the 14:06:37
4 point of the CarPlay connection, allow these 14:06:39
5 other items to stay connected to the end unit, 14:06:41
6 so that's this persistence. You could drop 14:06:44
7 temporarily and come back, but you couldn't 14:06:47
8 keep both active at the same time. 14:06:48
9 Q. So as you investigated further and 14:06:50
10 tried to determine how to win the business 14:06:53
11 next time, did you determine anything else 14:06:56
12 that Microchip needed to do to win the 14:06:59
13 business next time? I'm sorry, that was a 14:07:02
14 terrible question. 14:07:05
15 A. I'm sorry, maybe you can rephrase 14:07:06
16 that. 14:07:08
17 Q. Aside from what you've already 14:07:08
18 listed, when you were doing a determination of 14:07:10
19 what you needed to do to win The Big 3 14:07:12
20 business next time, was there anything else 14:07:15
21 you determined that must be offered by 14:07:16
22 Microchip to get that business? 14:07:19
23 A. So, yeah. So if you look -- if you 14:07:22
24 look at where we were in time, right, we 14:07:27

needed -- we needed a noncompliant solution. 14:07:29
We looked at it and said, you know, there are 14:07:32
lots of ways we could do this. The software 14:07:35
we wanted to be a Microchip solution in some 14:07:39
of the alternatives that were being proposed, 14:07:43
but we began to look at it and we began to 14:07:45
analyze what should the chip be, what should 14:07:49
the features be. 14:07:53
Q. Did you ever come to understand that 14:07:54
the '243 Patent was involved? 14:07:55
A. Yes. Yes. So a different question. 14:07:58
So yeah, as you start to look at the fact that 14:08:00
you need two hosts, multi-host system, yeah, 14:08:03
at that point, right. And as you heard Mark 14:08:07
say, in the background they were already 14:08:10
thinking about what might it be. 14:08:12
At this point, we said we're going 14:08:13
to do a chip and I put the burden on them 14:08:15
guys; we're late, we have to use all the IP we 14:08:17
already have, how do we get it to market 14:08:20
quickly. 14:08:22
And so they said, yeah, we have 14:08:22
all this IP. In fact, we already should be 14:08:24
able to do this quite quickly. 14:08:27

Q. And in response to Aptiv's specific 14:08:29
request for you to investigate Unwired's 14:08:31
solution, did you determine anything relating 14:08:34
to the '243 Patent at that point or had 14:08:36
technology? 14:08:39
A. Yeah. So it also became obvious, as 14:08:40
we started to get serious about what that next 14:08:42
chip would have to be, we were looking at 14:08:45
options again. We were constrained on cost, 14:08:47
we were constrained on time. The team was 14:08:50
looking to alternatives. 14:08:52
But what also started to become 14:08:53
obvious was that, you know, we couldn't find 14:08:54
another way to do it except for to do it the 14:08:57
way that was outlined originally on the 14:08:59
multi-host patent. And as we thought about 14:09:02
it, we said well, okay, we can't do it a 14:09:03
different way, then what is Unwired doing? 14:09:06
Are they also doing it that same way, right? 14:09:08
Are they, therefore, infringing our patent, 14:09:11
right? 14:09:14
So that was that whole-sided 14:09:14
discussion about if they're doing this, we 14:09:17
don't know for certain, they may have 14:09:19

1 something clever or they were infringing on 14:09:21
2 the patent, right? But if it's a multi-host, 14:09:23
3 they are likely infringing on the patent. 14:09:26
4 Q. Changing gears a little bit, did it 14:09:28
5 surprise Microchip that the car manufacturers 14:09:29
6 would accept a non-standard USB hub chip? And 14:09:31
7 I'm back in 2014 when they lost The Big 3 14:09:34
8 business. 14:09:38
9 A. Yeah, we were certainly surprised. 14:09:38
10 Historically, the automotive industry is 14:09:41
11 extremely conservative. They didn't want to 14:09:44
12 put anything out there to start a problem in 14:09:47
13 the field. So the fact that they would do 14:09:50
14 something out of standard certainly is 14:09:52
15 surprising. 14:09:53
16 Q. And can you explain to the jurors 14:09:55
17 what you mean by standard or non-standard USB 14:09:56
18 in the context of the iPhone? 14:10:00
19 A. Yeah. So we talked about this 14:10:04
20 complex ecosystem where everybody makes 14:10:06
21 different pieces of it and they all have to 14:10:09
22 come together and work. The beauty of 14:10:11
23 standard and why standards exist in the 14:10:13
24 industry is that we define all of those 14:10:15

electrical connections and we know that the 14:10:17
minute we plug them together, they all should 14:10:19
work. 14:10:21
But when you don't follow the 14:10:22
standard, you introduce risk. And you never 14:10:23
know for sure whether all the pieces will work 14:10:25
together. So our bias would have been to stay 14:10:28
with something standard if, you know, if we 14:10:31
could. 14:10:33
At the end, if we could not 14:10:34
accomplish that one additional feature, they 14:10:36
went to non-standard. And we were surprised. 14:10:38
We were surprised that automotive 14:10:40
manufacturers would allow it, also surprised 14:10:43
Apple would allow it. 14:10:45
Q. And why were you surprised, just from 14:10:48
historically that was a change? 14:10:51
A. Yeah. So we had sold -- every USB 14:10:53
hub we had ever sold, they had always asked 14:10:56
that we produce local documentation to prove 14:10:58
it met the standard. So up until then, if it 14:11:01
wasn't standard, we couldn't even show it to 14:11:03
you. And then all of the sudden, they were 14:11:06
going to allow something not standard. 14:11:07

Q. And did it surprise you that 14:11:09
Microchip -- did it surprise you that 14:11:12
Microchip -- that any of the manufacturers 14:11:14
would accept something non-standard? 14:11:16
A. Yeah. The head manufacturers are a 14:11:19
little less concerned; they don't directly 14:11:22
talk to the outside world. The only thing 14:11:23
that surprised us about it was that it added 14:11:25
complexity. 14:11:28
So the solution on the table that 14:11:28
was being offered added a lot of additional 14:11:30
software and some custom drivers, and so we 14:11:32
were surprised because a lot of the people say 14:11:35
we have this, you buy it. They don't really 14:11:38
want to go change it for, you know, specific 14:11:40
special needs. But they did. 14:11:42
Q. And you mentioned that the solution 14:11:44
on the table at that time back in 2014, whose 14:11:46
solution was that? 14:11:49
A. The solution was the Unwired 14:11:49
solution, but at that point, the head units 14:11:52
had all changed their software. 14:11:54
Q. Was anyone from your USB and 14:11:58
networking group -- business unit, excuse 14:12:01

me -- involved in designing the architecture 14:12:03
for a new USB hub chip for CarPlay? 14:12:05
A. Yes. 14:12:08
Q. And who was it from your business 14:12:09
unit who was involved? 14:12:12
A. As you saw earlier, Mr. Bohm was 14:12:13
responsible for the architecture, the 14:12:16
architecture team that did that work. 14:12:18
Q. And did your business unit determine 14:12:20
that architecture for a new multiple-host hub 14:12:22
chip? 14:12:26
A. Yes. Yes, it did. 14:12:26
Q. And did you give it a name? 14:12:27
A. Yes, that was the beginning of the 14:12:29
Sandia chip that we've talked about earlier. 14:12:32
MR. SLAYDEN: Mr. Ferrer, can you 14:12:36
bring up Exhibit 25, please. 14:12:37
BY MR. SLAYDEN: 14:12:40
Q. And do you have 25? You can look at 14:12:41
it right here. 14:12:43
Are you familiar with this 14:12:44
document? 14:12:45
A. I got it. Where am I supposed to 14:12:46
look? 14:12:48

Q. You can look at 25, yep. I'll wait 14:12:48
for you. 14:12:51
A. Okay. 14:12:52
Q. Are you familiar with it? 14:12:57
A. Yes, I am. 14:12:59
Q. Did you write it? 14:13:00
A. No, I did not write it. 14:13:01
Q. Who wrote this document? 14:13:02
A. This document was written by Dave 14:13:04
Sroka. 14:13:09
Q. And who is Dave Sroka? 14:13:09
A. Dave Sroka is one of the marketing 14:13:11
managers within the UNG business unit. 14:13:13
Q. He is not an engineer? 14:13:17
A. Yes, he is also an engineer. 14:13:18
Q. Oh, is he? 14:13:20
A. Yes. 14:13:20
Q. Does Mr. Sroka report to you? 14:13:21
A. He does report in to my group, but he 14:13:24
doesn't report directly to me. 14:13:26
Q. When did Dave Sroka publish 14:13:27
Exhibit 25, the Sandia business plan? 14:13:31
A. It appears to be published August of 14:13:33
2015. 14:13:34

Q. As a VP for the business unit, did you ultimately approve this plan, Exhibit 25? 14:13:36 14:13:38

A. Yes, I did. 14:13:40

Q. Before the Sandia business plan was published, had Mark Bohm's team already defined the Sandia architecture? 14:13:43 14:13:44 14:13:47

A. Yes. He would have had to. 14:13:50

Q. Why is that? 14:13:54

A. You want me to elaborate? 14:13:55

So to write a business plan, what's the purpose of a business plan? We have engineers. So what we have to do is define what is it we're going to do, okay? How much will the product cost to sell, how much time will it take to develop, right? 14:13:57 14:13:58 14:14:00 14:14:03 14:14:05 14:14:08

And then -- and then, you know, how many units might we sell given certain features; should this feature be in, should it be out? If we add a feature, that cost went up, take it out; it went down. Both ways impact sales. 14:14:10 14:14:13 14:14:15 14:14:19 14:14:21 14:14:24

So we have to know roughly what it is before we can agree to know what to build. 14:14:26 14:14:28

Q. Does Microchip sell Sandia hub chips 14:14:31

today? 14:14:35
A. Yes, we do. 14:14:35
Q. When did planet Microchip start 14:14:37
selling Sandia hub chips? 14:14:40
A. So Sandia was first sampled somewhere 14:14:41
in 2016 and the sales began in 2017. 14:14:43
Q. Does Microchip offer different Sandia 14:14:46
solutions to support CarPlay? 14:14:49
A. Yes, we do. And as you saw earlier, 14:14:51
we offer three different CarPlay solutions; 14:14:54
the two that Athens previously had done and 14:14:57
now this multi-host in Mark Bohm's patent. 14:15:00
Q. Okay. 14:15:04
Can you briefly identify, just by 14:15:04
name, the three different solutions? 14:15:06
A. Yes. So there's the FlexConnect 14:15:08
solution, that's a single upstream that allows 14:15:11
different ports to take over and become the 14:15:15
host; there is a Dual upstream with the two 14:15:17
wires, and then there is the multi-hub 14:15:19
solution where you have a single wire with two 14:15:22
hosts simultaneously. 14:15:24
Q. About how many Sandia hub chips does 14:15:25
Microchip make a year? 14:15:28

A. So today, we are running roughly 10 14:15:29
million a year. 14:15:31
Q. About what percentage of Microchip's 14:15:33
annual chip production is Sandia production? 14:15:35
A. Yeah, so if you follow through the 14:15:38
math, 10 million and eight billion, it is 14:15:41
about one out of every 800 chips. 14:15:44
Q. How did the actual demand for Sandia 14:15:46
compare to the forecast in the Sandia business 14:15:49
plan, Exhibit 25? 14:15:51
A. So we are roughly on track, you know, 14:15:53
volume is roughly on the same order of what 14:15:55
was originally expected today. 14:15:58
Q. Okay. 14:15:59
And does Microchip's Sandia hub 14:15:59
chip compete against Aptiv's Boston 2 hub chip 14:16:04
that Microchip accuses of infringement in this 14:16:09
case? 14:16:11
A. Yes, it does. 14:16:12
Q. How many multiple-host CarPlay units 14:16:15
USB hub solutions are currently offered in the 14:16:18
market? 14:16:21
A. Yeah, right now today, generally 14:16:21
available, offered, I am only aware of two; 14:16:25

the one Microchip offers and the one that 14:16:29
Aptiv offers. 14:16:31
Q. Okay. 14:16:32
And how does Aptiv's price of its 14:16:32
USB hub chip compare to Microchip's Sandia 14:16:35
chip? 14:16:38
A. So Aptiv's pricing was reasonably 14:16:38
aggressive, and as we noted, prior generations 14:16:41
were $3 and Aptiv was, you know, the 14:16:44
equivalent because they sell modules for about 14:16:48
a dollar and-a-half, and so reasonably 14:16:50
impressive compared to what we were. 14:16:54
Q. So did Aptiv's USB hub pricing impact 14:16:57
Microchip's Sandia pricing? And I meant to 14:17:01
say chip pricing. 14:17:06
A. Yes, certainly. In the absence of a 14:17:07
competitor, right, we would have -- you know, 14:17:09
we would have reduced the price, but not as 14:17:12
far as we had to, to continue to compete with 14:17:14
that solution in the market. 14:17:20
Q. Just to be clear for the jurors, does 14:17:22
this mean Microchip had to price Sandia chips 14:17:23
lower than it would have if Aptiv was not 14:17:27
selling its own multi-host chip? 14:17:29

A. Yeah, to be clear, certainly. Yeah. 14:17:32
Having a competitor at a much lower price and 14:17:35
we still go head-to-head in many dockets, we 14:17:38
needed to lower our price in the marketplace. 14:17:42
Q. Does Microchip's USB hub solution 14:17:44
offer any advantages over Aptiv's USB hub 14:17:46
product? 14:17:49
A. So, yes. So Microchip offers many 14:17:50
advantages over the Aptiv solution. The 14:17:54
product itself, we talked about, had a lot of 14:17:58
flexibility. We required far less software. 14:18:01
We are not really invasive, very easy to 14:18:03
implement, the head units don't have to change 14:18:06
very much. We offer very high quality, very 14:18:09
high reliability, large sales force that can 14:18:11
help customers around the world very quickly. 14:18:16
And then compatibility. So one 14:18:20
very strong advantage is we sell a lot of 14:18:22
chips that go into PCs and into consumer 14:18:25
products, and, you know, when you plug a USB 14:18:28
product, right, into a car, we've already 14:18:31
plugged in likely very similar products for 14:18:35
many, many years in these other products that 14:18:38
Microchip sells. 14:18:41

1 So we know pretty much any phone 14:18:41
2 that comes out is going to come up. So 14:18:43
3 compatibility, if you're going to buy your 14:18:45
4 car, new phone comes out tomorrow, you plug it 14:18:48
5 in, it doesn't work. 14:18:50
6 So our history and the very high 14:18:51
7 number of parts we've sold helps with 14:18:53
8 compatibility. 14:18:56
9 Q. Okay. 14:18:57
10 Is Microchip planning a next 14:18:59
11 generation of USB hub chips? 14:19:00
12 A. We certainly are. 14:19:02
13 Q. Is your business unit presently in 14:19:04
14 the development -- excuse me. 14:19:07
15 Is your business unit presently in 14:19:08
16 the development phase of additional chips? 14:19:10
17 A. Certainly. The USB and networking 14:19:13
18 business group typically works on about 12 14:19:15
19 different products at a time. The way they 14:19:19
20 are used, usually we can start about three or 14:19:23
21 four a year, so four products are year-end 14:19:25
22 products, four in the early part of the 14:19:28
23 development, and then we're doing the research 14:19:30
24 work and the business planning work on four 14:19:32

about to start. 14:19:34
So pretty much about 12 being 14:19:35
debated at any one time and being developed. 14:19:37
Q. Is there any time when Microchip is 14:19:40
not developing the next generation USB hub 14:19:42
chip? 14:19:45
A. No, there is no time, and the roadmap 14:19:45
we have extends on. We have -- Sandia was 14:19:48
released, the next product after it was 14:19:51
already released, it's in production, and the 14:19:54
next part is in development, and the one 14:19:56
behind it is already in the plan, so there is 14:19:58
already a long process. 14:20:01
Q. And I don't know if I will say it 14:20:02
right, but is there already a next generation 14:20:04
past Sandia? 14:20:06
A. Yes. As I said, I mentioned briefly, 14:20:07
yeah, there is a product past Sandia, but 14:20:09
that's already -- called Olympus. That's 14:20:13
already selling in the marketplace. 14:20:15
Q. Does it have advantages over Sandia? 14:20:16
A. It does. We added -- so when you 14:20:19
plug in today into a car, you pick up two 14:20:21
things; you pick up charging of your phone and 14:20:24

you also pick up the ticket connection to the 14:20:27
head unit or play music or whatever it might 14:20:29
be. 14:20:32
And externally on Sandia, all the 14:20:33
components that had to do with charging were 14:20:36
external. With the next generation, we 14:20:39
brought a lot more of those components into 14:20:42
the chip. 14:20:43
Q. Okay. 14:20:44
Changing gears a little bit, did 14:20:46
the fact that Unwired and Aptiv used 14:20:49
Microchip's patented technology upset 14:20:51
Microchip? 14:20:55
A. Yes. 14:20:55
Q. Can you explain to the jurors why 14:20:56
that would upset Microchip? 14:20:57
A. We were bothered on two fronts. So 14:20:59
up 'til then, you know, we had been partners. 14:21:03
When we won, we won together. They knew our 14:21:07
roadmap, they knew what we had planned. And 14:21:10
so after that, fine, they decided to do their 14:21:12
own chip. That, in itself, is not a problem. 14:21:15
But at that point, they became 14:21:18
competitors; it starts to bother us. But now 14:21:19

they become unfair competitors because they 14:21:22
are using technology that Microchip has 14:21:24
developed as the key feature of their product. 14:21:25
So yes, it bothered us. 14:21:29
Q. And did you have concerns about 14:21:30
sharing products and pricing information with 14:21:32
Aptiv going forward? 14:21:34
A. Yes. So we were still partners in 14:21:35
many ways, but it became problematic to share 14:21:39
our product roadmaps, our costs, our features 14:21:42
with somebody who would be competing with us. 14:21:45
So more specifically, right, if 14:21:48
you can sell both my product and yours and you 14:21:49
know my pricing, pretty easy to figure out 14:21:53
where you should set your pricing. So we did 14:21:55
not want to share those products with them 14:21:58
after that. 14:22:00
Q. That's because they're actually not 14:22:01
selling chips, they're actually selling a 14:22:03
break out box or a hub that the chip is 14:22:04
inside; correct? 14:22:06
A. Yes. They are selling a module at 14:22:07
the end of the day, and if that module could 14:22:09
have either their internally developed chip or 14:22:11

our chip, it is a bit of a problem with us, 14:22:13
because at that point, very often when they 14:22:14
sell their chip, they win and we lose, right? 14:22:17
Up until now, up until they have their own 14:22:19
chip, when they win, we win, right? But now 14:22:23
all the sudden, if they win, we lose, right? 14:22:25
So that's very competitive. 14:22:28
Q. Did Microchip ever specifically 14:22:31
inform Aptiv about Bohm's multi-host patent? 14:22:33
A. Yes, we did. 14:22:36
Q. And what did you expect Aptiv to do 14:22:38
in response to your notice of infringement? 14:22:41
A. Yeah, so certainly in that period of 14:22:43
time, what I really expected is we would sit 14:22:45
together, given we were already working 14:22:48
together, given we actually all knew each 14:22:50
other, I thought we would sit down and work 14:22:53
out some sort of business solution. I really 14:22:54
did not expect us to be here, so... 14:22:56
Q. Okay. 14:23:00
And before this lawsuit then, did 14:23:00
you personally talk to your customer, Aptiv, 14:23:02
to resolve this dispute? 14:23:04
A. Yes, I -- we talked something like 10 14:23:06

different times. 14:23:10

Q. And no result? 14:23:11

A. We could not find a solution. 14:23:13

Q. Okay. 14:23:15

Has Aptiv asked Microchip to 14:23:16

supply Sandia hub chips for its product during 14:23:19

the period Aptiv has been selling its own 14:23:22

multi-host chip? 14:23:24

A. Yes, they did. 14:23:25

Q. Were any of Aptiv's requests for U.S. 14:23:28

carmakers? 14:23:30

A. Yes, our understanding is they were. 14:23:31

Q. And what was Microchip's response to 14:23:33

Aptiv's request? 14:23:36

A. So, you know, at first we said yes, 14:23:36

possibly -- a method by which we can do this. 14:23:40

But then it started to become obvious that it 14:23:42

was very hard to do this. And as a 14:23:45

competitor, we said fine, going forward, you 14:23:48

know, we won't offer you that product. You 14:23:50

can buy the early one still, but any of the 14:23:52

new ones that we're developing, we don't want 14:23:55

to give you those details anymore. 14:23:56

Q. Okay. 14:23:59

1 In 20 -- I want to change gears a 14:23:59
2 little bit to some pricing questions. 14:24:03
3 In 2014, after -- after Aptiv won 14:24:05
4 the new Big 3 business with Unwired's Boston 2 14:24:08
5 hub chip, did Microchip change any prices it 14:24:15
6 charged to Aptiv? 14:24:17
7 A. Yes, we did. 14:24:18
8 Q. And what did you change? 14:24:19
9 A. So we got to the point where the 14:24:21
10 long-term agreement was up for renewal and we 14:24:24
11 knew we had a quandary. And as we discussed 14:24:26
12 it, what we decided was -- at first we said 14:24:29
13 let's give them all the pricing for everything 14:24:33
14 but this sub-piece of the market, and for all 14:24:36
15 the other products, we said everything is 14:24:38
16 business as usual. We're still partners. We 14:24:40
17 win together; we lose together. Nothing needs 14:24:43
18 to change. 14:24:45
19 For this sub-piece, what we said 14:24:46
20 is -- at first, you know, we wouldn't even 14:24:48
21 give them an update, and then we decided that 14:24:50
22 all the forecasts they had given us were no 14:24:52
23 longer going to be true. They had their own 14:24:55
24 alternate solution. It's very likely they're 14:24:57

1 going to buy far less chips than anything they 14:24:59
2 had told us in the past. 14:25:02
3 So we did raise prices, but also, 14:25:03
4 you know, our intent was not to -- not to stop 14:25:05
5 relationships with the other parts of the 14:25:09
6 company because they are -- we are both large 14:25:11
7 companies. So to the point where what got 14:25:14
8 interesting is another part of their company 14:25:17
9 was buying the exact same chip and we said 14:25:19
10 fine, as long as we can keep track of who buys 14:25:21
11 what, do not touch the pricing for the other 14:25:24
12 part of the company, just in this narrow area 14:25:27
13 where we're directly competing and you are no 14:25:29
14 longer going to buy the committed volume, so 14:25:31
15 we are going to raise the pricing. 14:25:34
16 And we said -- we gave them a 10 14:25:35
17 to 20 percent increase; I don't remember 14:25:38
18 exactly. 14:25:39
19 Q. And you talked about long-term 14:25:41
20 agreements, and we talked about earlier that 14:25:42
21 those long-term agreements were based on 14:25:44
22 forecasted volumes. 14:25:47
23 Can you give an example, some 14:25:49
24 context to the jury, for example, in 2017, how 14:25:51

1 the forecast may have changed from what you 14:25:54
2 had agreed to previously? 14:25:56
3 A. So, yeah. Just at a high level, for 14:25:57
4 instance, they were forecasting about seven 14:26:01
5 million units to purchase and then I have 14:26:02
6 around two million units instead. 14:26:06
7 Maybe a better way to look at it, 14:26:07
8 right, actually look at the real history of 14:26:09
9 what was going on. In the year before the 14:26:11
10 acquisition, the two companies combined, the 14:26:13
11 Delphi side and the Unwired side purchased 14:26:17
12 $16 million worth of USB hub chips from us. 14:26:21
13 The year after, that dropped to eight million. 14:26:23
14 And then, although we were just 14:26:26
15 starting to reset pricing, what we then 14:26:27
16 learned the year after was five million. None 14:26:29
17 of the forecasts were for business to drop by 14:26:32
18 a half and a third. Everything was up, up, up 14:26:34
19 until they had this alternate solution all the 14:26:37
20 sudden. 14:26:40
21 Q. So after removing Aptiv's 14:26:40
22 advantageous long-term agreement, the pricing 14:26:43
23 on USB hub chips alone, not affecting the 14:26:45
24 other products, was Aptiv still paying less 14:26:48

1 than some other of Microchip's customers for 14:26:51
2 the same products? 14:26:54
3 A. Yes. If you go look at the pricing, 14:26:55
4 what you see is very often, they were in the 14:26:58
5 bottom third of where the customers were. 14:27:00
6 Even after the price increases, sometimes they 14:27:03
7 still were almost the lowest price, but in no 14:27:06
8 case were they the highest price. 14:27:08
9 There was often many other 14:27:10
10 customers who, you know, we didn't have strong 14:27:12
11 relationships that are paying much higher 14:27:14
12 prices than Aptiv was paying. 14:27:16
13 Q. That's even after they continued in 14:27:18
14 the market with Boston 2? 14:27:21
15 A. Even after we adjusted prices up, 14:27:22
16 right, they are still nowhere near the top. 14:27:25
17 So I still had hoped we would find a solution, 14:27:27
18 right? 14:27:30
19 Q. Yeah. 14:27:30
20 A. So that was the essence of it. 14:27:31
21 Q. So I think you mentioned 14:27:33
22 previously -- well, maybe not, but how many 14:27:35
23 products does Microchip still supply to Aptiv 14:27:40
24 today? 14:27:43

A. Yeah, so a brief check, it's a little 14:27:43
bit more than a hundred different part numbers 14:27:45
are being sold to Aptiv today. 14:27:47
Q. So how many parts were affected by 14:27:48
this price change out of the hundred? 14:27:52
A. I think it's five or six part numbers 14:27:53
total. And again, only in some parts of their 14:27:56
business. 14:27:58
Q. And I guess I wonder why, since we're 14:28:00
in this litigation, you didn't change the 14:28:05
prices on all of Aptiv's parts? 14:28:07
A. Yeah, so at the end, obviously, you 14:28:09
know, telling them that we were unhappy about 14:28:12
our -- about their patent infringement, you 14:28:15
know, led to a little more challenges in the 14:28:18
business. But at the end of the day, we could 14:28:20
easily win together in many, many other fields 14:28:23
of play. 14:28:25
We kept a good relationship. We 14:28:26
didn't bring this up. It didn't come up in 14:28:28
any of our discussions with them. Who knows 14:28:31
what happened on their side. And we continued 14:28:33
to work together, and 'til this day, we 14:28:35
continue to win new programs together and many 14:28:38

1 other products in the business. 14:28:40
2 Q. Can you turn to Exhibit 45 in your 14:28:42
3 notebook, please. 14:28:44
4 (Whereupon, Trial Exhibit 45 was 14:28:44
5 introduced.) 14:28:44
6 BY MR. SLAYDEN: 14:28:44
7 Q. Do you recognize this document? 14:28:52
8 A. Yes, I do. 14:28:54
9 Q. What is it? 14:28:55
10 A. So this document shows the unit 14:28:56
11 sales, revenue and sales price, and as well as 14:29:00
12 the costs and therefore profits for each of 14:29:03
13 the products in the automotive USB hub product 14:29:07
14 line. 14:29:11
15 Q. Okay. 14:29:11
16 How was it created? 14:29:11
17 A. Actually I created it. I pulled the 14:29:13
18 data, the sales data, from our sales database 14:29:15
19 and the cost data from our cost database. 14:29:19
20 MR. SLAYDEN: Move to admit 14:29:22
21 Exhibit 45. 14:29:24
22 MS. DURIE: No objection. 14:29:24
23 THE COURT: All right. It is 14:29:25
24 admitted. 14:29:25

BY MR. SLAYDEN: 14:29:25
Q. Can you turn to Exhibit 46 in your 14:29:26
notebook. 14:29:28
A. Okay. 14:29:33
(Whereupon, Trial Exhibit 46 was 14:29:33
introduced.) 14:29:33
BY MR. SLAYDEN: 14:29:33
Q. Are you there? Okay. 14:29:33
Do you recognize this document? 14:29:35
A. Yes, I do. 14:29:36
Q. What is it? 14:29:37
A. This is a subset of the data from the 14:29:39
prior report. It doesn't include in it the 14:29:41
cost of profit; it just shows the units, 14:29:44
revenue and sales price for each of those same 14:29:47
products. 14:29:49
MR. SLAYDEN: Move to admit 14:29:51
Exhibit 46. 14:29:53
MS. DURIE: No objection. 14:29:53
THE COURT: Okay. It's admitted. 14:29:53
BY MR. SLAYDEN: 14:29:55
Q. Can you turn to Exhibit 48 in your 14:29:56
notebook, please. 14:29:58
A. Okay. 14:29:59

1 (Whereupon, Trial Exhibit 48 was 14:29:59
2 introduced.) 14:29:59
3 BY MR. SLAYDEN: 14:30:01
4 Q. And do you recognize this document? 14:30:01
5 A. Yes, I do. 14:30:04
6 Q. And what is it? 14:30:05
7 A. It's similar to the last one we just 14:30:06
8 talked about, but just extends the period to 14:30:09
9 add more years. So it has revenue units and 14:30:11
10 sales price up through about two, three 14:30:15
11 quarters ago. 14:30:19
12 MR. SLAYDEN: Move to admit 14:30:19
13 Exhibit 48. 14:30:21
14 MS. DURIE: No objection. 14:30:21
15 THE COURT: It is admitted. 14:30:22
16 BY MR. SLAYDEN: 14:30:23
17 Q. Please turn to Exhibit 88 in your 14:30:24
18 notebook, please. 14:30:26
19 A. This one is not here. 14:30:30
20 Q. 88 is not there? 14:30:33
21 (Brief pause.) 14:30:57
22 MR. SLAYDEN: One minute. Sorry. 14:31:22
23 My apologies. 14:31:24
24 (Brief pause.) 14:31:25

1 THE COURT: I'm not sure what 14:31:39
2 you're asking, Mr. Slayden. 14:31:40
3 MR. BANNER: Your Honor, we'd like 14:31:41
4 to put it on the screen. 14:31:43
5 MR. SLAYDEN: It is a native 14:31:44
6 document. We don't have a paper copy of it. 14:31:45
7 There's no objection to it. We're just 14:31:48
8 getting it into the record. 14:31:49
9 (Whereupon, Trial Exhibit 88 was 14:31:49
10 introduced.) 14:31:51
11 THE COURT: Are you moving it into 14:31:51
12 admission or are you putting it up for 14:31:52
13 foundation purposes? 14:31:54
14 MR. SLAYDEN: I'm just going to 14:31:55
15 move it into admission, yes, sir. 14:31:56
16 MS. DURIE: No objection. 14:31:58
17 THE COURT: Fine. It is admitted. 14:31:59
18 If you want to show it, you can. 14:32:01
19 MR. SLAYDEN: Okay. 14:32:03
20 BY MR. SLAYDEN: 14:32:12
21 Q. I think we are getting about done 14:32:05
22 here, Mr. Obolsky. Just one minute, and I 14:32:07
23 apologize. 14:32:10
24 Now, you explained earlier that 14:32:12

1 Aptiv, the defendant in this case, had asked 14:32:14
2 Microchip to look into the Unwired chip back 14:32:16
3 in May 2014; correct? 14:32:19
4 A. Yes, I did. 14:32:21
5 Q. Okay. 14:32:22
6 I'd like to ask you a few 14:32:23
7 questions about Microchip documents Aptiv's 14:32:24
8 counsel referenced during her opening 14:32:28
9 statement. 14:32:30
10 Can you turn to Exhibit 246 in 14:32:30
11 your notebook. 14:32:33
12 A. Okay. 14:32:33
13 (Whereupon, Trial Exhibit 246 was 14:32:33
14 introduced.) 14:32:33
15 BY MR. SLAYDEN: 14:32:38
16 Q. Do you recognize this document? 14:32:38
17 A. Yes, it's an internal Microchip 14:32:39
18 email. 14:32:42
19 MR. SLAYDEN: Move to admit 14:32:44
20 Exhibit 246. 14:32:46
21 MS. DURIE: No objection. 14:32:46
22 THE COURT: All right. It will be 14:32:47
23 admitted. 14:32:48
24 MR. SLAYDEN: Mr. Ferrer, can you 14:32:48

please bring up Exhibit 246. 14:32:51
BY MR. SLAYDEN: 14:32:53
Q. Now, look at 246. This is an email 14:32:53
from July 20th, 2014. 14:32:56
Do you recognize the names on this 14:32:58
email? 14:33:00
A. Yes. 14:33:02
Q. And can you describe to the jury 14:33:03
generally who are the people on this email? 14:33:05
A. Yes. The first sent email is one of 14:33:08
the marketing managers in the group, and then 14:33:13
the people that are copied on it -- on the 14:33:14
"To" list are marketers, some salespeople and 14:33:18
some application engineers. 14:33:21
Q. Now, the second paragraph, second to 14:33:25
the last sentence, see if you can follow me, 14:33:27
it starts with, "Our 'Flex Hub.'" 14:33:32
Do you see that? 14:33:34
A. Yeah. 14:33:34
Q. It says, "Our 'Flex Hub' and the 14:33:35
associated AIPD solutions was generally well 14:33:37
received and is winning at many of the 14:33:40
automotive accounts." 14:33:42
Can you explain to the jury what 14:33:44

1 that means? 14:33:45
2 A. Yeah. So this was midyear 2014. The 14:33:46
3 salesmen went out, visited the customers at -- 14:33:51
4 you know, this is all The Big 3 and more, and 14:33:55
5 our belief at that time was our CarPlay flex 14:33:57
6 hub solution was likely to win almost all of 14:34:00
7 them. 14:34:04
8 Q. The next paragraph, the last sentence 14:34:06
9 starts with, "We have proposed that we do a 14:34:08
10 CES reference design with Delphi (both BoB and 14:34:13
11 head unit)" -- and BoB referring to break out 14:34:20
12 box -- "and we are proceeding..." 14:34:24
13 Now, this was referring to Delphi; 14:34:26
14 right? 14:34:28
15 A. Yes, I believe it is. 14:34:28
16 Q. Okay. 14:34:30
17 Can you explain what the sentence 14:34:30
18 is referring to? 14:34:32
19 A. So, yes. At this point, we were 14:34:33
20 still partners and this was all new, and so 14:34:35
21 what we wanted to do was go to the Consumer 14:34:40
22 Electronics Show, which is a very big show in 14:34:42
23 Las Vegas every January, and we wanted to show 14:34:45
24 a demonstration that showed a Delphi head unit 14:34:47

and then a Delphi break out box that uses 14:34:50
Microchip's flex solution and show that, you 14:34:53
know, as an example. 14:34:55
Q. Does Microchip sell chips to Aptiv 14:34:57
for its head units also? 14:35:00
A. Yes, we do. 14:35:02
Q. And what do you sell to them? 14:35:03
A. We sell almost the same part numbers 14:35:05
to them also. 14:35:08
Q. But -- okay. 14:35:09
So I take it the last sentence 14:35:10
refers to jumping outside of USB standards and 14:35:15
flex on every port. 14:35:18
Do you see that? 14:35:19
A. Where is that? 14:35:21
Q. Second to the last paragraph and it 14:35:24
refers to stepping outside. There you go. 14:35:34
And flex on every port. 14:35:38
Do you see that? 14:35:39
MR. SLAYDEN: Just keep going and 14:35:41
highlight, please. 14:35:44
BY MR. SLAYDEN: 14:35:44
Q. Can you explain to the jury what this 14:35:45
means? 14:35:47

A. Yeah. So this is the solution we did 14:35:48
not have. So up 'til this point, all of our 14:35:50
hubs, what was available to sell, were 14:35:55
standard compliant. They all had one upstream 14:35:56
port or one host and multiple downstream ports 14:35:59
or endpoints. 14:36:03
And at this point, right, we could 14:36:05
handle the idea of flexing on one port, no 14:36:07
problem. You could plug in, you could switch 14:36:10
from the head unit being the computer to our 14:36:12
chip -- to the USB -- sorry, to the iPhone 14:36:15
being the computer using our USB chip. 14:36:20
What we could not do was also 14:36:23
allow all the ports to be able to stay 14:36:25
connected to one or the other, right? The 14:36:29
minute the iPhone shows up, the head unit 14:36:33
computer would lose connection to everything 14:36:36
else. 14:36:37
Q. Okay. 14:36:37
So can you explain to the jurors 14:36:38
why Microchip did not want to make a chip that 14:36:40
was not compliant with the USB standards? 14:36:42
A. So, yes. The point I was making a 14:36:44
little bit earlier was, you know, the 14:36:48

1 automotive customers are generally pretty -- 14:36:50
2 they don't want you to have problems. And up 14:36:53
3 until this point, pretty much everything they 14:36:56
4 had ever asked from us had to be standard 14:36:58
5 compliant. 14:37:00
6 And also, Apple is very 14:37:01
7 controlling, and we had quite a bit of concern 14:37:04
8 would they allow chips that were non-standard 14:37:06
9 compliance to be used in a system with the 14:37:08
10 iPhone. 14:37:10
11 Q. Can you turn to Exhibit 66 in your 14:37:12
12 notebook, please. 14:37:15
13 A. Okay. 14:37:25
14 (Whereupon, Trial Exhibit 66 was 14:37:25
15 introduced.) 14:37:25
16 BY MR. SLAYDEN: 14:37:26
17 Q. Do you recognize this document? 14:37:26
18 A. Yes. It is an internal Microchip 14:37:28
19 email. 14:37:31
20 MR. SLAYDEN: Move to admit 14:37:32
21 Exhibit 66. 14:37:34
22 MS. DURIE: No objection. 14:37:34
23 THE COURT: Admitted. 14:37:35
24 MR. SLAYDEN: Mr. Ferrer, can you 14:37:36

bring up Exhibit 66. 14:37:37
Thank you, sir. 14:37:39
BY MR. SLAYDEN: 14:37:40
Q. Now, this is an email from 14:37:40
December 1, 2014, and just for reference, as 14:37:42
you talked about, this is before Aptiv 14:37:47
acquired Unwired. 14:37:50
Do you recognize the names on this 14:37:53
email? 14:37:55
A. Yes, I do. And I think it might be 14:37:56
after they were acquired, December. 14:38:00
Q. Excuse me? 14:38:02
A. I think this is slightly after they 14:38:03
were acquired in December. 14:38:05
Q. Okay. 14:38:06
Let's move down to -- do you 14:38:13
recognize the names on the email, first of 14:38:15
all? 14:38:18
A. Yes, I do. 14:38:18
Q. And who are they, in general? 14:38:19
A. In general, they are marketers inside 14:38:20
of the USB and networking group. 14:38:26
Q. And at the bottom of the page, last 14:38:28
paragraph, the first sentence, "When 14:38:30

1 persistent USB is a requirement we definitely 14:38:38
2 have run into a wall." 14:38:41
3 Now, can you give some context to 14:38:44
4 the jurors what is meant by that? 14:38:49
5 A. Yeah. What it means, and again, 14:38:51
6 remember this is from a marketer's point of 14:38:53
7 view, right? Their job is to sell the chips 14:38:55
8 we already have and none of the chips we had 14:38:57
9 could handle this requirement from Apple that 14:39:01
10 was a dual host. So the fact that you needed 14:39:05
11 a multiple host in the system and they tried, 14:39:08
12 they tried to find potential answers, and at 14:39:11
13 the end, we said we can't do it. All the 14:39:14
14 chips we have are standard compliant. We 14:39:16
15 cannot use these chips directly. We are going 14:39:18
16 to need something different. 14:39:20
17 Q. Okay. 14:39:21
18 So was Microchip having trouble 14:39:22
19 technically with developing a persistent USB 14:39:24
20 solution at that time? 14:39:26
21 A. No, it wasn't a technical problem; it 14:39:27
22 was a matter of having something that we had 14:39:29
23 that would be, you know, available in the near 14:39:31
24 term, right. It wasn't a longer term 14:39:33

1 question, it was an immediate type of 14:39:35
2 question. Chips could not do it. 14:39:38
3 Q. Can you turn to Exhibit 36 in your 14:39:41
4 notebook, please. 14:39:43
5 (Whereupon, Trial Exhibit 36 was 14:39:43
6 introduced.) 14:39:43
7 BY MR. SLAYDEN: 14:39:43
8 Q. Do you recognize this document? 14:39:57
9 A. Yes, it's an email that I sent to our 14:39:59
10 CEO. 14:40:02
11 Q. And what is it? You said it already. 14:40:04
12 MR. SLAYDEN: Move to admit 14:40:05
13 Exhibit 36. 14:40:06
14 MS. DURIE: No objection. 14:40:07
15 THE COURT: All right. It's 14:40:07
16 admitted. 14:40:08
17 MR. SLAYDEN: Mr. Ferrer, can you 14:40:09
18 bring up 36, please. 14:40:10
19 BY MR. SLAYDEN: 14:40:11
20 Q. So I think you just stated, but is 14:40:17
21 this an email you sent? 14:40:19
22 A. Yes, it is. Right. 14:40:20
23 Q. Okay. 14:40:22
24 The second bullet point, it says, 14:40:24

"We have been working on the business case and 14:40:28
technical details to provide a single 14:40:31
connection solution similar to Unwired." 14:40:34
Do you see that? 14:40:36
A. Yeah. 14:40:38
Q. Can you explain to the jurors what 14:40:39
you meant by a "solution similar to Unwired"? 14:40:41
A. Yes. At this point, right, we had 14:40:43
our compliant solutions, we had two solutions 14:40:48
in the market, but at the end of the day, if a 14:40:50
noncompliant solution could be sold, fine. If 14:40:53
automotive manufacturers would accept it, if 14:40:56
Apple would accept it, then we should add the 14:40:58
missing features and bring out a noncompliant 14:41:03
solution. 14:41:05
Q. So was Microchip copying Unwired? 14:41:06
A. I'm sorry? 14:41:08
Q. Was Microchip copying Unwired? 14:41:09
A. No, we were listening to the 14:41:11
customers, right? This specific email was a 14:41:12
discussion with Tecvox. Tecvox said, hey, we 14:41:16
need this, and many other customers came in 14:41:20
with difficult requirements. 14:41:23
But no, at the end, we were to 14:41:24

1 provide what the market had asked for, the 14:41:26
2 spec with the requirement in place. 14:41:28
3 Automotive dealers had asked for it and we 14:41:30
4 were responding to, you know, a request from 14:41:33
5 customers. 14:41:35
6 Q. And I think that point is made later 14:41:35
7 in that paragraph, which states -- it is 14:41:38
8 talking about "The key is to develop a 14:41:41
9 solution that works for Chrysler, but also 14:41:45
10 potentially works for another ten Automotive 14:41:47
11 manufacturers." 14:41:50
12 Explain to the jury why it was 14:41:52
13 important to Microchip to find a solution that 14:41:54
14 worked for multiple auto manufacturers. 14:41:57
15 A. Yeah. So there's more here than may 14:41:59
16 meet the eye. So we knew we had had a 14:42:03
17 multi-host solution, but we also had chips 14:42:06
18 like we saw from Sandia was a variety of chips 14:42:10
19 that had -- do they want two connections, do 14:42:12
20 they want four connections, do they want to 14:42:13
21 have a car reader? 14:42:16
22 And by the way, in this period of 14:42:17
23 time, a lot of you were buying SD cards and 14:42:19
24 put your music on it and put it in to have it 14:42:23

play where car manufacturers were using SD 14:42:26
cards to load Maps. So you pay, you know, and 14:42:29
your car had the ability to run Maps, you 14:42:32
would pay 200 bucks for a Map update, put the 14:42:34
card in. 14:42:37
So each one of the automotive 14:42:37
manufacturers had different requirements. So 14:42:39
we were trying to sort out what is the chip we 14:42:41
should build and how can we get it done at a 14:42:43
cost point and reasonably quickly. But you 14:42:46
get many requirements at the same time. 14:42:48
Q. I understand. 14:42:50
Can you turn to Exhibit 41 in your 14:42:51
notebook, please? 14:42:55
A. Okay. 14:42:57
(Whereupon, Trial Exhibit 41 was 14:42:57
introduced.) 14:42:57
BY MR. SLAYDEN: 14:42:57
Q. Do you recognize this document? 14:43:02
A. Yes, I do. 14:43:05
Q. And what is it? 14:43:06
A. It's a email from myself to Ganesh 14:43:08
Moorthy, the CEO at the time. 14:43:16
MR. SLAYDEN: Move to admit 14:43:17

Exhibit 41. 14:43:19

MS. DURIE: No objection. 14:43:19

THE COURT: All right. It is 14:43:20

admitted. 14:43:21

BY MR. SLAYDEN: 14:43:21

Q. So this is another email by you dated 14:43:22

October 18th, 2015. 14:43:24

Do you see that? 14:43:26

A. Yes, I do. 14:43:27

Q. The first sentence refers to Unwired, 14:43:31

and the email reads later, "They also 14:43:33

mentioned they had been pushing for a 14:43:36

while...for lower prices, and later for a chip 14:43:39

to support single upstream head unit." 14:43:41

Do you see that? 14:43:44

A. Yes, I do. 14:43:45

Q. What pricing was Unwired pushing 14:43:47

Microchip for? 14:43:51

A. That's what -- in this period, and 14:43:51

even before the advent of CarPlay, Unwired was 14:43:54

buying chips from us and wanted them at lower 14:43:59

prices, so they were pushing for a very 14:44:01

specific subset, and they wanted to pay 14:44:03

roughly half of what we were selling them for. 14:44:06

Q. Okay. 14:44:08
Why didn't Microchip provide 14:44:09
Unwired with a single chip they requested? 14:44:12
A. So at the time when they first 14:44:14
requested, right, we didn't view it as 14:44:16
something that would necessarily be accepted. 14:44:18
Still was a lot of risk; it was one customer's 14:44:22
request. And if, at the end of the day, GM 14:44:25
and all the other car manufacturers wouldn't 14:44:28
accept it or Apple wouldn't accept it, it was 14:44:30
just not a priority for our investment, right? 14:44:33
Again, working on 12 chips, we are 14:44:35
going to continue on the ones we're working on 14:44:37
and we'll pick one of the slots in the future 14:44:40
if this becomes a viable solution. 14:44:42
Q. Right. 14:44:43
So later on in that next sentence, 14:44:44
it says -- and this was referred to in the 14:44:46
opening -- it says, "Bottom line we missed 14:44:49
it." 14:44:52
A. Yeah. 14:44:53
Q. Can you explain to the jury what you 14:44:53
meant by that? 14:44:55
A. We've seen it a couple times. What 14:44:55

1 it means is we had two solutions and, you 14:44:57
2 know, we thought they would use it. The 14:45:01
3 ability for the automotive manufacturers to 14:45:05
4 accept what we viewed as non-standard, for 14:45:08
5 Apple to accept it, we did not expect that to 14:45:11
6 happen. So that's what this refers to, right. 14:45:14
7 And so, yeah, we did not develop 14:45:17
8 that chip in that period of time because we 14:45:20
9 did not believe it was going to be accepted. 14:45:23
10 Q. Mr. Obolsky, does Microchip have an 14:45:26
11 issue with competition? 14:45:28
12 A. No, we do not. We do have an issue 14:45:30
13 with unfair competition. 14:45:33
14 Q. Okay. 14:45:34
15 So this is my last question for 14:45:35
16 you: Why is Microchip in court today? 14:45:37
17 A. Yeah, so -- so we're here because we 14:45:42
18 made a large investment in developing new 14:45:45
19 products, new features. You know, we do 14:45:48
20 things that are proprietary, and so we have 14:45:52
21 intellectual property and, you know, it's our 14:45:54
22 job to protect that intellectual property to 14:45:57
23 make sure nobody uses it without -- without 14:45:59
24 paying for it, whether it be a royalty or some 14:46:02

other way. 14:46:05

MR. SLAYDEN: Thank you. That's 14:46:06

all I have. Thank you, Mr. Obolsky. 14:46:07

THE COURT: Ms. Durie, before you 14:46:12

step up, we have been going for about an 14:46:14

hour-and-a-half. I have to stop today, as I 14:46:16

said, somewhere between 3:30 and 3:45. Do you 14:46:19

all want to take five minutes, or are you okay 14:46:22

to press on? Really up to you. 14:46:25

Anyone who wants to take a drink, 14:46:27

let me know, just raise your hand. 14:46:29

MS. DURIE: Could we take five 14:46:34

minutes? 14:46:35

THE COURT: Absolutely. We will 14:46:35

take five minutes, we'll head out. And 14:46:36

remember, don't talk about the case, okay, no 14:46:39

testimony and we are moving along. 14:46:41

(Whereupon, the jury was excused 14:46:48

from the courtroom.) 14:46:51

THE COURT: Okay. Five minutes 14:47:10

and be back at 2:50. 14:47:12

(Whereupon, a recess was taken at 14:47:33

2:45 p.m.) 14:47:41

THE COURT CLERK: All rise. 14:52:28

THE COURT: Get the jury, Mr. 14:55:20
Koehler. 14:55:21
You can be seated. I'm sorry. 14:55:22
(Whereupon, the jury entered the 14:55:24
courtroom.) 14:55:27
THE COURT: Be seated. 14:56:18
Ms. Durie. 14:56:24
MS. DURIE: Thank you, Your Honor. 14:56:24
- - - 14:56:24
CROSS-EXAMINATION 14:56:24
- - - 14:56:26
BY MS. DURIE: 14:56:26
Q. Mr. Obolsky, good afternoon. 14:56:27
You said that you are an inventor 14:56:29
on a patent; is that right? 14:56:31
A. Yes, I am. 14:56:32
Q. You said, in fact, Microchip has paid 14:56:33
maintenance fees on that patent; right? 14:56:35
A. No, not on my patent, I think that 14:56:37
one has expired already. 14:56:40
Q. That's right. You filed for that 14:56:42
patent in 2001; right? 14:56:44
A. Probably. 14:56:46
Q. And I think I heard you say you never 14:56:47

1 found a market opportunity for it; is that 14:56:49
2 right? 14:56:52
3 A. Yeah, no, it was not used. 14:56:52
4 Q. Okay. 14:56:53
5 And -- and that happens; right? 14:56:54
6 A. (Indicates affirmatively.) 14:56:56
7 Q. Now, you said, in your direct 14:56:58
8 examination, I think, that Microchip used to 14:57:02
9 control 100 percent of sales of microchips to 14:57:05
10 The Big 3; is that right? 14:57:12
11 A. Um-hmm, yes. 14:57:13
12 Q. So Microchip is the 900-pound gorilla 14:57:14
13 of the automotive microchip world; right? 14:57:17
14 A. No, that's not correct. 14:57:21
15 Q. Well, Microchip is basically a 14:57:22
16 monopolist with respect to those chips; right? 14:57:25
17 A. In this very narrow market, yes. 14:57:28
18 Q. Yes. And Microchip often would like 14:57:29
19 to keep it that way; right? 14:57:33
20 A. Not necessarily. We actually prefer 14:57:35
21 to keep a large market share. 14:57:37
22 Q. Okay. 14:57:38
23 Now, you said that Aptiv and 14:57:39
24 Boston 2 chip compete with Microchip and the 14:57:41

1 Sandia chip; is that right? 14:57:46
2 A. Yes. 14:57:50
3 Q. You said Aptiv competes with a lower 14:57:50
4 price; right? 14:57:53
5 A. Lower equivalent price, yes. 14:57:54
6 Q. Yeah. Can you name a single hub 14:57:55
7 maker that was choosing between a Boston 2 14:58:01
8 chip and a Sandia chip? 14:58:03
9 A. Sorry? 14:58:04
10 Q. Sure. 14:58:05
11 Can you name a single hub maker, 14:58:06
12 another company, that was choosing between 14:58:09
13 Boston 2 or Sandia, between Aptiv and 14:58:12
14 Microchip, for its hub? 14:58:15
15 A. When you say, "hub," this is what I 14:58:18
16 would call the break out box, just to make 14:58:22
17 sure. 14:58:24
18 Q. Sure. 14:58:24
19 A. Yeah, you want me to name one? Is 14:58:25
20 that the question? 14:58:28
21 Q. Sure. 14:58:29
22 A. So, potentially Tecvox. 14:58:29
23 Q. Okay. 14:58:32
24 But Aptiv doesn't actually sell 14:58:32

its chips to anyone else; right? 14:58:35
A. As I understand it. I don't know 14:58:37
what Aptiv does, but as I understand it, yes. 14:58:39
Q. Right. 14:58:41
So there is no other hub maker 14:58:42
that is looking at buying chips from either 14:58:44
Aptiv or Microchip, because Aptiv doesn't sell 14:58:47
anything? 14:58:52
A. Okay. 14:58:52
Q. Okay? 14:58:53
A. That's true. 14:58:54
Q. So really, when you say that Aptiv 14:58:54
and Microchip are competing, what you mean is 14:58:57
that Aptiv isn't buying that category of chips 14:59:00
from Microchip anymore? 14:59:04
A. I'm not sure I follow. Can you ask 14:59:06
again? 14:59:08
Q. When you say that Aptiv and Microchip 14:59:08
are competing, what you mean is just that 14:59:12
Aptiv isn't buying those microchips from you 14:59:14
anymore? 14:59:18
A. No, that's not what I mean. 14:59:18
Q. In August of 2016, you sent a letter 14:59:21
to your customers and to the car companies 14:59:27

1 telling them that you had sued Aptiv for 14:59:31
2 patent infringement; right? 14:59:35
3 A. Yes. 14:59:36
4 Q. You signed the letter; right? 14:59:36
5 A. Yes. 14:59:38
6 MS. DURIE: If we could please 14:59:39
7 have PX-238 marked for identification, and I 14:59:40
8 can hand copies out. 14:59:47
9 (Whereupon, Trial Exhibit PX-238 14:59:50
10 was introduced.) 14:59:55
11 BY MS. DURIE: 14:59:57
12 Q. Mr. Obolsky, you recognize what's 14:59:57
13 been marked as Exhibit 238 as a copy of the 14:59:59
14 letter that you sent? 15:00:02
15 A. Yes, I do. 15:00:03
16 MS. DURIE: We offer it. 15:00:06
17 MR. SLAYDEN: I have no objection. 15:00:07
18 THE COURT: Okay. It will be 15:00:08
19 admitted. 15:00:09
20 MS. DURIE: If we can please see 15:00:10
21 Exhibit 238. 15:00:13
22 BY MS. DURIE: 15:00:13
23 Q. You signed it; right? 15:00:14
24 A. Yes. 15:00:15

Q. And if we go back to the text of the 15:00:16
letter, you said, "Dear Valued Customer, 15:00:18
Microchip would like to inform you of legal 15:00:22
action that is being taken by Microchip 15:00:24
against a supplier of electronic components in 15:00:26
the automotive USB connectivity market," and 15:00:30
you listed three patents; right? 15:00:35
A. Yes. 15:00:37
Q. Now, you hold an engineering degree; 15:00:38
right? 15:00:44
A. Yes, I do. 15:00:44
Q. You have been working at Microchip 15:00:45
for around 27 years? 15:00:47
A. Yes. 15:00:49
Q. You are a senior vice president; 15:00:50
right? 15:00:51
A. I am today. Not at this time. 15:00:52
Q. Okay. 15:00:53
Do you report to the CEO? 15:00:54
A. I do today, yes. 15:00:56
Q. Okay. 15:00:57
And you have some technical 15:00:58
understanding of USB; right? 15:01:00
A. Yeah. High level understanding, yes. 15:01:02

Q. Now, you sent this letter to your 15:01:05
customers so that they would have a bias 15:01:07
against using -- or I should say a bias 15:01:12
towards using Microchip's solution instead of 15:01:15
buying a component from Aptiv that has a copy 15:01:19
of the Aptiv chip in it; right? 15:01:23
A. That's a narrow part of the reason, 15:01:26
yes. 15:01:29
Q. Okay. 15:01:30
But you wanted to inform them so 15:01:30
they would have a bias to use the Microchip? 15:01:34
A. Certainly. 15:01:41
Q. Now, you didn't investigate, you 15:01:43
personally as the person who signed this 15:01:46
letter -- 15:01:49
A. Yeah. 15:01:49
Q. -- you didn't investigate how Aptiv's 15:01:49
chip actually worked before you sent this 15:01:52
letter; right? 15:01:54
A. I certainly personally didn't 15:01:55
investigate, no. 15:01:58
Q. Right. 15:01:58
Your deposition was taken in this 15:01:59
case; right? 15:02:00

A. Yeah. 15:02:01
Q. And obviously, that was after the 15:02:01
lawsuit was filed and after this letter was 15:02:04
sent; right? 15:02:06
A. Yes. 15:02:07
Q. Okay. 15:02:07
And at that point in time, you 15:02:08
still didn't know any details about how the 15:02:09
Aptiv chip actually worked; right? 15:02:14
A. We didn't know, we suspected. At 15:02:18
that point, we did not have all the answers. 15:02:23
Q. And what it does, how it works, you 15:02:26
couldn't explain? 15:02:30
A. I'm sorry? 15:02:31
Q. What it does, how it works, you 15:02:32
couldn't explain? 15:02:34
A. I couldn't personally explain, right, 15:02:36
how their chip works, no. 15:02:40
Q. Okay. 15:02:42
A. I could explain what it does, not how 15:02:43
it works. 15:02:45
Q. All right. 15:02:46
MS. DURIE: Your Honor, I would 15:02:48
like to -- I'm sorry. 15:02:49

BY MS. DURIE: 15:02:50
Q. And you're saying at the time of your 15:02:51
deposition, you were capable of explaining 15:02:52
what the Aptiv chip does? 15:02:54
A. At a high level. 15:02:56
Q. Okay. 15:02:57
At a high level? 15:02:58
A. At a high level. 15:02:59
Q. Not in any detail; right? 15:03:00
A. Not in any detail, no. 15:03:01
MS. DURIE: Now I'd like to mark 15:03:06
for identification Exhibit 252. 15:03:08
(Whereupon, Trial Exhibit 252 was 15:03:15
introduced.) 15:03:20
BY MS. DURIE: 15:03:20
Q. Now, Exhibit 252 is an email exchange 15:03:29
with David Sroka and Don Perkins, among 15:03:34
others, from August of 2014 timeframe; right? 15:03:39
A. Yes, it appears to be. 15:03:44
MS. DURIE: We offer it. 15:03:47
MR. SLAYDEN: No objection. 15:03:48
THE COURT: Okay. Received. 15:03:49
MS. DURIE: If we could publish, 15:03:51
and I'd like to begin on page 2. If we can go 15:03:52

to page 2. 15:04:00
BY MS. DURIE: 15:04:01
Q. There's an email here that begins on 15:04:01
the second page from Sal Canu; right? 15:04:03
A. You want me to look here or up there? 15:04:09
I apologize. 15:04:11
Q. Sorry, it's on the second page of the 15:04:11
exhibit, about a third, quarter of the way 15:04:14
down. 15:04:16
Do you see where I am? 15:04:21
A. Yes. 15:04:22
Q. An email from Sal Canu; who is he? 15:04:23
A. Sorry? 15:04:28
Q. Who is he? 15:04:29
A. I didn't catch it. 15:04:29
Q. Mr. Canu, who is he? 15:04:30
A. Oh, yes. He's one of the sales 15:04:32
engineers. 15:04:34
Q. Okay. 15:04:35
And this is August 14th, 2014; 15:04:36
right? And it says, "We want to take a strong 15:04:41
stance going into OEMs. We went into GM last 15:04:49
week and we are going to Chrysler tomorrow. 15:04:53
At GM we brought up a design showing 1 Host 15:04:55

coming down from the Head Unit. We didn't 15:04:59
mention Unwired." 15:05:03
Do you see that? 15:05:05
A. Yes, I do. 15:05:06
Q. And if we take a look now at the 15:05:07
response that is on the first page, there is a 15:05:11
response from Don Perkins at the bottom of the 15:05:17
page and then Mr. Sroka responds to that email 15:05:22
at the top; right? 15:05:27
A. Yes, that appears right. 15:05:28
Q. Okay. 15:05:30
And if we take a look at Mr. 15:05:31
Sroka's email -- and by the way, you've seen 15:05:34
his name before; right? 15:05:37
A. Yes. 15:05:38
Q. Okay. 15:05:38
He is the person who wrote the 15:05:39
specification or the product specification 15:05:44
that we were looking at a little while ago for 15:05:45
the Sandia chip; right? 15:05:48
A. Yes. He wrote the business plan. 15:05:50
Yes. 15:05:52
Q. And you said, I think, he is both a 15:05:52
marketing person, but also an engineer; right? 15:05:54

A. Yes. He is. 15:05:56
Q. And he says, "Couple additional 15:05:57
points: Carplay REQUIRES the head unit to 15:06:01
become a USB device. This is so the Apple 15:06:04
phone is the host and controls the USB bus. 15:06:07
In your diagram, the head unit stays the 15:06:10
host...NOT COMPLIANT...right there. CarPlay 15:06:12
requires a dedicated path...this solution 15:06:17
allows other USB devices to access the 15:06:19
host...this is NOT Compliant." 15:06:22
And then he goes on to note that 15:06:23
this is a completely non-standard USB; right? 15:06:25
A. Yes. 15:06:28
Q. And he says it's a completely 15:06:29
non-standard USB because two USB hosts are 15:06:31
implementing a single transaction by splitting 15:06:35
it into two serial transactions, instead of 15:06:39
one. "This goes against the primary 15:06:42
requirement of USB; one bus/one Host." 15:06:45
So the problem that he was 15:06:50
identifying here is that the way that 15:06:51
Microchip was conceptualizing of a solution to 15:06:55
this problem, it would require two hosts to be 15:07:01
controlling a single device in violation of 15:07:05

1 the USB standard; right? 15:07:07
2 A. At a high level. 15:07:11
3 MR. SLAYDEN: I'll object, Your 15:07:13
4 Honor. That's an awful long narrative to give 15:07:14
5 the witness. 15:07:16
6 THE COURT: Overruled. 15:07:17
7 BY MS. DURIE: 15:07:18
8 Q. Now, at the time of this email, 15:07:18
9 Microchip was promoting its FlexConnect 15:07:20
10 solution; right? 15:07:24
11 A. Let me check. Yes. 15:07:26
12 Q. Okay. 15:07:27
13 And FlexConnect did not allow for 15:07:27
14 persistent USB in all of the other ports in 15:07:32
15 the car; right? 15:07:35
16 A. Yes. As I understand it today, yes. 15:07:37
17 Q. Right. 15:07:39
18 So at this point in time, 15:07:40
19 Microchip's solution offered customers a 15:07:43
20 choice between either having a single-lane 15:07:46
21 solution or having persistent USB, but not 15:07:50
22 both; right? 15:07:53
23 A. Hang on. Can you say that again? 15:07:56
24 Q. Sure. 15:07:57

At this point in time, Microchip 15:07:58
could offer its customers either a single-lane 15:08:00
solution or persistent USB, but not both? 15:08:04
A. Or two upstream solutions if you 15:08:09
wanted persistent. 15:08:12
Q. Right. 15:08:15
Two lanes instead of one, so not 15:08:15
single lane; right? 15:08:17
A. Yes. Single lane would not have 15:08:18
persistence, yes. 15:08:20
Q. Right. 15:08:22
And at this point in time when you 15:08:22
learned that Unwired had a solution that was 15:08:26
single lane, you thought at that point in time 15:08:29
that carmakers weren't really going to care 15:08:31
that much about the combination of single lane 15:08:34
and persistent USB; right? 15:08:39
A. Yes, that's correct. 15:08:42
Q. Okay. 15:08:43
You also thought, during this 15:08:44
period of time, that Unwired was never 15:08:46
actually going to finish its chip; right? 15:08:50
A. Well, we certainly weren't sure. 15:08:52
Q. Okay. 15:08:54

1 You thought Unwired wasn't big 15:08:54
2 enough to get it done; right? 15:08:57
3 A. Yeah, we thought it was hard and they 15:08:58
4 may not get there, right. 15:09:00
5 Q. Okay. 15:09:01
6 Because they weren't big enough to 15:09:02
7 get it done? 15:09:03
8 A. In essence, yes. 15:09:04
9 Q. Okay. 15:09:05
10 So you kept trying to sell the car 15:09:06
11 companies on your FlexConnect solution that 15:09:09
12 didn't provide for connectivity throughout the 15:09:12
13 car; right? 15:09:15
14 A. That's not about connectivity through 15:09:17
15 the car; it's about the persistent, right? We 15:09:20
16 could be all four ports. 15:09:24
17 Q. Fair enough. Fair enough. That is 15:09:25
18 absolutely fair. 15:09:27
19 You did not have the solution that 15:09:28
20 would provide for persistent connections 15:09:29
21 throughout the car? 15:09:31
22 A. Yeah, we didn't have the solution, 15:09:32
23 and at that point, it hadn't even been asked 15:09:34
24 for in the early part of the year, right? 15:09:37

Q. Now, you said before that you were 15:09:39
concerned that you wouldn't be able to get USB 15:09:44
certification for a one-lane persistent USB 15:09:47
solution; right? 15:09:52
A. Yeah. Not those exact words, but 15:09:55
yes, certification. 15:09:58
Q. And the way you get certification is 15:09:59
you submit your product to a USB logo place 15:10:00
that runs some tests on it; right? 15:10:03
A. Yes. 15:10:05
Q. And if it passes those tests, then 15:10:06
you get a USB logo; right? 15:10:09
A. Yes, in essence. 15:10:11
Q. Now, you said you were also worried 15:10:12
that Apple wasn't going to like your solution, 15:10:14
right, that solution of a single-lane 15:10:17
persistent USB, Apple might not like it? 15:10:18
A. I mean, allow it. 15:10:21
Q. Fair enough. I guess that's even 15:10:23
stronger than not liking it. 15:10:25
And if Apple doesn't allow it, you 15:10:27
can't sell it; right? 15:10:29
A. Yes. 15:10:30
Q. And so you didn't want to do what you 15:10:31

1 thought was going to be a noncompliant 15:10:35
2 solution until you were sure that Apple was 15:10:37
3 going to approve it; right? 15:10:39
4 A. Yeah, or at least had some 15:10:41
5 confidence, we wouldn't have done it yet. 15:10:45
6 Q. Right. 15:10:46
7 You didn't know what the rules 15:10:47
8 were going to be and you didn't want to spend 15:10:48
9 the money until you knew what those rules 15:10:50
10 were; right? 15:10:52
11 A. Yes, that's true. 15:10:54
12 Q. Okay. 15:10:55
13 MS. DURIE: Let me go to 246 in 15:11:03
14 evidence, Mr. Glass, and if we could start on 15:11:05
15 page 1. 15:11:11
16 BY MS. DURIE: 15:11:13
17 Q. So we looked at this email a little 15:11:15
18 while ago. It's from July of 2014. And if we 15:11:17
19 can pull up the paragraph that begins, 15:11:20
20 "Competitive Threats have emerged." It's on 15:11:23
21 the first page. There we go. 15:11:29
22 Now, this email is a trip report 15:11:31
23 that Mr. Perkins made from a visit to the 15:11:33
24 Detroit area; right? 15:11:36

A. Yes, it is. 15:11:38
Q. And he identified Unwired as the 15:11:39
largest threat for the USB flex hub solution; 15:11:43
right? 15:11:48
A. Yes, that's right. 15:11:49
Q. And Mr. Perkins said that he was 15:11:52
gathering information on the Unwired solution 15:11:56
and had begun to understand what their 15:11:59
architecture is; right? 15:12:01
A. That's what it says, yes. 15:12:04
Q. And what Mr. Perkins thought was that 15:12:05
the Unwired solution stepped outside of the 15:12:09
USB standard because it offered flex on every 15:12:13
port and connectivity throughout the car; 15:12:16
right? 15:12:19
A. No, that's not a car, it's just 15:12:21
combined. It did step out of Sandia. 15:12:24
Q. Okay. 15:12:29
A. I don't know that one causes the 15:12:29
other. 15:12:33
Q. Okay. Fair enough. 15:12:33
And in the last sentence there, 15:12:34
you said, "It is very important that we 'set 15:12:35
the standard' for these architectures before 15:12:38

1 Unwired has an opportunity to compete with 15:12:41
2 their ASIC solution." 15:12:44
3 So Mr. Perkins was suggesting that 15:12:47
4 Microchip try to use its position to set the 15:12:49
5 standard for what everyone was going to use 15:12:53
6 before Unwired could get their chip to market; 15:12:56
7 right? 15:12:59
8 A. Can you ask that question again? I'm 15:13:00
9 not sure I completely understood what you 15:13:02
10 said. 15:13:04
11 Q. Sure. 15:13:04
12 He was saying that Microchip 15:13:05
13 should try to set the standard for the 15:13:06
14 architecture before Unwired had an opportunity 15:13:08
15 to get its solution to market? 15:13:11
16 A. That's what it says, yes. 15:13:14
17 Q. Okay. 15:13:16
18 Now, if we go to the second 15:13:17
19 page -- 15:13:22
20 MS. DURIE: Mr. Glass, can you 15:13:23
21 pull up the paragraph that begins, "Unwired is 15:13:24
22 our largest threat." There we go. 15:13:26
23 BY MS. DURIE: 15:13:26
24 Q. And he says, "Unwired is our largest 15:13:30

1 threat for the USB Flex hub," and if we go 15:13:32
2 down a little bit, he says, "It is difficult 15:13:35
3 to believe that the car makers would commit to 15:13:38
4 an ASIC from a small company like Unwired." 15:13:39
5 That was also your view; right? 15:13:43
6 A. Yeah, that's a fair estimate. Yes. 15:13:46
7 Q. Okay. 15:13:49
8 You thought that Unwired was too 15:13:49
9 small to get it done? 15:13:51
10 A. At that time, yes. 15:13:55
11 Q. Now, if we could take a look at 15:13:59
12 Exhibit 248. 15:14:05
13 (Whereupon, Trial Exhibit 248 was 15:14:13
14 introduced.) 15:14:15
15 MR. SLAYDEN: No objection. 15:14:24
16 MS. DURIE: I hadn't offered it 15:14:27
17 yet, but I will. I offer it. 15:14:28
18 THE COURT: All right. 15:14:29
19 Since there is no objection, we'll 15:14:30
20 admit it. 15:14:32
21 MS. DURIE: Good. So if we can 15:14:32
22 put up Exhibit 248. 15:14:34
23 BY MS. DURIE: 15:14:36
24 Q. This is an email again from Mr. 15:14:37

Sroka; right? 15:14:42
A. Hang on. 15:14:42
Yes, it appears to be. 15:14:44
Q. And it's from July of 2014; right? 15:14:45
A. Hang on. I'm not on the copy, I am 15:14:52
just looking -- yes. 15:14:55
Q. Sure. 15:14:56
And the email's Subject line is, 15:14:57
"Debunking Unwired"; right? 15:15:01
A. That's what it says, yes. 15:15:04
Q. And there is an attachment, and if we 15:15:06
go to page 6 of the attachment -- actually 15:15:12
page 6 of the PDF, I apologize, before the 15:15:18
attachment, there is a slide that says, "Break 15:15:21
Out Box Alternative Approach" {sic}; right? 15:15:26
A. Yes, I found it. 15:15:26
Q. Okay. 15:15:27
And this slide reflects what 15:15:28
Microchip had learned about the Unwired 15:15:31
solution from multiple customers; right? 15:15:34
A. I would assume that's true. I'm not 15:15:38
sure if I've seen this one before, but yes, I 15:15:42
assume that's true. 15:15:44
Q. Microchip was trying to figure out, 15:15:45

as best it could, how the Unwired solution 15:15:47
worked; right? 15:15:50
A. Yes. 15:15:52
Q. And if we take a look towards the 15:15:54
bottom, and it is the text that's in red 15:15:59
there, it says, "Note if the iPhone connects 15:16:02
to a standard Hub, the architecture is 15:16:05
flawed." 15:16:08
Do you see that? 15:16:09
A. Yes, that's what it says. 15:16:11
Q. Okay. 15:16:12
Microchip thought that the 15:16:13
architecture of the Unwired product was flawed 15:16:14
because it was not USB compliant; right? 15:16:19
A. Yes, that's at least what someone 15:16:23
thought, whoever wrote this. 15:16:27
Q. Well, it was apparently what Mr. 15:16:28
Sroka thought, if we go to the first -- or Mr. 15:16:35
Steele thought, if we go to the first page of 15:16:42
the exhibit, it is an email from Brigham 15:16:44
Steele, and is it Sroka or Sroka? 15:16:48
A. Either way is fine with me. 15:16:50
Q. Mr. Steele wrote, "More new slides, 15:16:53
you may want to clean them up a little," and 15:16:56

1 then Mr. Sroka is the one who sent them 15:16:58
2 around; right? 15:17:01
3 A. Yeah. 15:17:09
4 MS. DURIE: Now, let's go to 15:17:09
5 Exhibit 62. 15:17:11
6 (Whereupon, Trial Exhibit 62 was 15:17:12
7 introduced.) 15:17:16
8 BY MS. DURIE: 15:17:16
9 Q. Exhibit 62 is another email exchange 15:17:26
10 among various individuals at Microchip in 15:17:29
11 October 1, 2014; right? 15:17:32
12 A. Yes, it appears to be. 15:17:36
13 MS. DURIE: We offer it. 15:17:37
14 MR. SLAYDEN: No objection. 15:17:39
15 THE COURT: Okay. It is admitted. 15:17:40
16 BY MS. DURIE: 15:17:42
17 Q. And this is an email from October of 15:17:42
18 2014, if you look at the top, talking about 15:17:45
19 "project for fiat and Chrysler"; right? 15:17:51
20 A. Hang on. Yes. 15:17:57
21 Q. And if we take a look at the second 15:17:59
22 page, there is an email from Chris, is it 15:18:02
23 Behal? 15:18:07
24 A. I don't know how to pronounce the 15:18:07

name. That's good. 15:18:09
Q. Well, he is a senior field 15:18:10
applications engineer at Microchip; right? 15:18:12
A. Okay. 15:18:16
Q. And I am cheating because it's on the 15:18:17
signature line. 15:18:19
A. Yeah. I trust you. 15:18:20
Q. And if we take a look at the email 15:18:21
from Mr. Behal, he is reporting on what he has 15:18:23
been told and he says, "Stefan, this does not 15:18:32
make sense to me and I believe Brigham 15:18:35
either" -- it is missing not -- "when this 15:18:37
came up a few months ago... 15:18:40
"However, Delphi is given that 15:18:41
requirement by their OEM's (Chrysler) and it 15:18:43
appears Fiat is wanting the same thing. They 15:18:46
somehow believe with carplay on one of the 15:18:50
Break Out Box's ports that they can still have 15:18:54
access data connectivity to the other Break 15:18:57
Out Box's ports." {Sic} 15:19:03
So this is saying Delphi has been 15:19:04
given the requirement by their customer, that 15:19:07
their customers want to have this persistent 15:19:10
USB solution; right? 15:19:14

A. Yes. 15:19:17
Q. And if you go down a little bit, a 15:19:18
couple paragraphs down, there's a paragraph 15:19:21
that begins, "It appears to me," four 15:19:25
paragraphs down. 15:19:29
A. Okay. I found it. Yep. 15:19:30
Q. And he says, "It appears to me that 15:19:33
the OEM's do not have good understanding of 15:19:37
what is possible with Carplay... all they know 15:19:41
is they want Carplay AND they want additional 15:19:43
connectivity to head unit to other devices. 15:19:47
"How is that possible without an 15:19:51
Iphone allowing it? I have no idea. Is it 15:19:54
possible they know something about Carplay we 15:19:57
don't? I don't think so but I can't figure 15:19:59
out why they want this either..." 15:20:01
Now, at this point in time, 15:20:07
Microchip was telling its customers that this 15:20:09
solution wouldn't work; right? 15:20:12
A. Potentially, yes. 15:20:15
Q. Okay. 15:20:16
Mr. Behal is wondering how it 15:20:17
could be possible to have persistent 15:20:20
connectivity on downstream devices without the 15:20:22

1 iPhone allowing it; right? He says he has no 15:20:25
2 idea? 15:20:28
3 A. Yeah. He didn't, yes. 15:20:29
4 Q. Okay. 15:20:30
5 MS. DURIE: Let's go to 15:20:35
6 Exhibit 58. 15:20:37
7 (Whereupon, Trial Exhibit 58 was 15:20:37
8 introduced.) 15:20:40
9 THE WITNESS: Are we done with 15:20:41
10 this one? 15:20:42
11 MS. DURIE: We are. 15:20:43
12 Exhibit 58 is another email chain. 15:20:55
13 This time, Brigham Steele and Mark Orlosky 15:21:00
14 copying Chris Behal in some of it from the 15:21:04
15 June 2014 timeframe. 15:21:07
16 BY MS. DURIE: 15:21:09
17 Q. Do you see that? 15:21:10
18 A. Yes, I do. 15:21:10
19 MS. DURIE: We offer it. 15:21:11
20 MR. SLAYDEN: I have no objection, 15:21:12
21 Your Honor. 15:21:13
22 THE COURT: All right. It is 15:21:13
23 received. 15:21:14
24 BY MS. DURIE: 15:21:15

Q. Now, Brigham Steele is another 15:21:15
Microchip engineer; right? 15:21:18
A. Yes, he is an applications engineer. 15:21:19
Q. Right. 15:21:21
And he is talking to Mark Orlosky; 15:21:22
right? 15:21:28
A. Yes. 15:21:28
Q. And Mark Orlosky was at Delphi; 15:21:28
right? Actually the email at the very top, 15:21:32
but that's fine. 15:21:34
A. Hang on. 15:21:36
Q. And Delphi was one of Microchip's 15:21:36
customers at this time; right? 15:21:39
A. Yes, they were. 15:21:40
Q. This is before -- this is before 15:21:41
Delphi bought Unwired; right? 15:21:44
A. Yeah. In June of 2014, yes. 15:21:48
Q. Right. 15:21:50
And if we look at the email that 15:21:51
appears from Mr. Orlosky on the second page, 15:21:53
it is the email in the middle of the page, and 15:22:02
Mr. Orlosky writes, "Hi Brigham. Just ended a 15:22:04
multiparty meeting with Chrysler and Harman." 15:22:10
Do you see where I am? 15:22:13

A. I found it, yes. 15:22:14
Q. Sorry. 15:22:15
"You were at Chrysler on the 18th 15:22:16
for a demo. Dave Diovardi does not want to 15:22:18
lose data capability on other ports not tied 15:22:21
to the Apple device. Is this an Apple CarPlay 15:22:24
spec requirement?" 15:22:27
Now, Dave Diovardi was from 15:22:29
Chrysler; right? 15:22:33
A. Yes. 15:22:34
Q. And if we turn to the response to 15:22:34
this from Mr. Steele at Microchip, it begins 15:22:36
on the first page; right? 15:22:39
A. Hang on. From who? 15:22:42
Q. Go to the first page of the document. 15:22:45
There is an email that begins in the middle of 15:22:47
the page, so we're going up, forward in time. 15:22:50
A. Okay. 15:22:53
Q. So there is a response from Brigham 15:22:53
Steele, June 18th, 2014, at 2:33 p.m.; right? 15:22:56
A. Okay. Yep. 15:23:01
Q. And he says, "Mark" -- so this is 15:23:02
back to Mark at Delphi -- "Just to be clear, 15:23:05
we need to make sure that the message is 15:23:07

1 consistent to Dave" -- at Chrysler -- "from 15:23:09
2 his vendors. Dave likes to look at the big 15:23:12
3 picture, so I love his ideas, but some items 15:23:15
4 may be physically outside the capabilities of 15:23:18
5 ANY USB system, and I think he needs to 15:23:21
6 understand the capabilities of USB and some of 15:23:25
7 the low level details. This is how I would 15:23:28
8 break it down, let me know if you disagree 15:23:30
9 with my analysis or if you have other 15:23:33
10 questions." 15:23:35
11 And then he has a series of 15:23:36
12 numbered paragraphs in which he is, in 15:23:38
13 substance, explaining why this won't work; 15:23:41
14 right? 15:23:46
15 A. I have not read this before, so I 15:23:47
16 don't remember. 15:23:52
17 Q. Sure. 15:23:52
18 Let's take a look at it together. 15:23:52
19 No. 1, "With USB, you are only allowed 1 Host 15:23:55
20 and multiple devices on a bus. This message 15:23:57
21 is critical, so we need to make sure Dave 15:24:01
22 understands this fact." 15:24:03
23 A. Okay. 15:24:05
24 Q. That's No. 1. 15:24:05

1 No. 2, "CarPlay passes the Host 15:24:06
2 role from the head unit to the Phone itself." 15:24:09
3 {Sic} 15:24:09
4 "3. Once the head unit has given 15:24:11
5 up the Host role, it will not see any other 15:24:14
6 ports. If the iPhone doesn't want to see the 15:24:16
7 other ports, it will ignore them." {Sic} 15:24:19
8 And then it goes on to talk about 15:24:21
9 the initial development that had been going on 15:24:23
10 at Microchip; right? 15:24:26
11 A. Hang on. Where is that? 15:24:28
12 Q. A, "In our initial development we 15:24:30
13 would plug in USB speakers and thumb drives 15:24:33
14 into the other Hub ports. The iPhone would 15:24:36
15 display a message that the speakers and thumb 15:24:39
16 drive were not authenticated devices, so it 15:24:42
17 would not support them. 15:24:45
18 "To avoid these annoying messages 15:24:46
19 displayed on the phone, the head unit can 15:24:48
20 disable those ports when entering Carplay." 15:24:51
21 {Sic} 15:24:54
22 So Microchip had identified this 15:24:54
23 issue in development, and its solution to the 15:24:56
24 annoying messages that came up was to disable 15:25:00

1 those other ports; right? 15:25:03
2 A. That was one possible solution, yes. 15:25:04
3 Q. Okay. 15:25:07
4 So at this point in time, 15:25:09
5 Microchip was telling its customers this one 15:25:20
6 lane persistent USB thing isn't going to work 15:25:24
7 and you should go with the FlexConnect 15:25:28
8 solution instead? 15:25:30
9 A. That's about right. 15:25:32
10 Q. Okay. 15:25:33
11 Let's fast forward to 15:25:35
12 December 2014, and let me mark for 15:25:37
13 identification Exhibit 260 -- actually, it's 15:25:49
14 261, I believe, is in evidence. I apologize. 15:25:51
15 You know what, it may not be. 15:25:55
16 THE COURT: I don't think so. 15:25:58
17 MS. DURIE: No, you know what, 15:25:58
18 it's Exhibit 66. We have a couple of emails 15:25:59
19 that are duplicates of each other. I 15:26:03
20 apologize. 15:26:05
21 Let's take a look at Exhibit 66 15:26:06
22 which has been handed out. 15:26:08
23 BY MS. DURIE: 15:26:10
24 Q. Now, if we go to the second page of 15:26:11

1 this exhibit, the top of the second page -- 15:26:15
2 actually, I take it back. The bottom -- there 15:26:26
3 we go. The middle of the second page -- I'm 15:26:28
4 sorry, go back. The second page is on the 15:26:31
5 left. 15:26:36
6 In the middle of the second page 15:26:36
7 towards the top, it says, "It appears that 15:26:38
8 Chrysler is committed to the Unwired solution 15:26:40
9 and Microchip Flex Connect solution is no 15:26:44
10 longer being considered." {Sic} 15:26:46
11 This is from December of 2014; 15:26:48
12 right? 15:26:52
13 A. Yes. 15:26:53
14 Q. Now, at this point in time, Tecvox 15:26:53
15 was one of Microchip's customers; right? 15:26:57
16 A. Yes. 15:27:00
17 Q. And Microchip had been selling Tecvox 15:27:01
18 on the FlexConnect; right? 15:27:04
19 A. Yes. 15:27:06
20 Q. And Tecvox was then trying to sell 15:27:07
21 Chrysler on a module that incorporated that 15:27:10
22 FlexConnect; right? 15:27:15
23 A. Yes, that's correct. 15:27:17
24 Q. And they were not successful in 15:27:17

1 convincing Chrysler to use that solution; 15:27:19
2 right? 15:27:23
3 A. Yes, that's correct. 15:27:25
4 Q. And then if we take a look at the 15:27:27
5 response to that up at the top of the first 15:27:31
6 page, if we go to page 1, it says -- actually 15:27:36
7 at the bottom, it says at the bottom there, 15:27:45
8 from Mr. Sroka, "When persistent USB is a 15:27:48
9 requirement we have definitely run into a 15:27:52
10 wall." 15:27:56
11 Now, you said in your direct 15:27:57
12 testimony that the wall that had been run into 15:27:59
13 was just a marketing wall, not a technical 15:28:04
14 wall; is that sort of the gist of it? 15:28:08
15 A. Well, I think in this context of this 15:28:12
16 message right from a marketer, it was a 15:28:14
17 marketing wall. The chips we had to sell 15:28:16
18 couldn't do it. 15:28:19
19 Q. Right. You had run into a wall when 15:28:20
20 it came to supplying a chip that was single 15:28:22
21 lane and that had persistent USB? 15:28:26
22 A. Yes. 15:28:28
23 Q. Okay. 15:28:29
24 And right around the same time, 15:28:30

1 December of 2014, is when Mr. Sroka asked Mr. 15:28:33
2 Bohm for a copy of his patent; right? 15:28:39
3 A. I don't remember the timeline, but 15:28:43
4 yes, I believe that could be true. Yes. 15:28:45
5 Q. Okay. 15:28:47
6 THE COURT: Ms. Durie, before you 15:28:49
7 move on to something new, can I give you a 15:28:51
8 five-minute warning? 15:28:54
9 MS. DURIE: This is a perfect time 15:28:56
10 to break. This would be a nice place. 15:28:57
11 THE COURT: All right. Then why 15:28:59
12 don't we break for the day now. So as we 15:28:59
13 break for the evening, I'm just going to 15:29:02
14 repeat the caution I've given you about the 15:29:05
15 testimony. You should not be conversing or 15:29:07
16 talking about it among yourselves. 15:29:11
17 Second, I know it's tempting to go 15:29:13
18 home and tell the people at home what you're 15:29:15
19 listening to in court. I'm going to caution 15:29:17
20 you not to do that because it will inevitably 15:29:19
21 invite their responses and their thoughts to 15:29:22
22 weigh in, and that is not what is going on in 15:29:24
23 court. 15:29:28
24 And third, I'll repeat the caution 15:29:28

again. Don't go home and start looking things 15:29:30
up. Google is not your friend in this 15:29:32
context. Okay? You need to constrain what 15:29:35
you know to what you hear in court. 15:29:39
So with that, I'll let you go. Is 15:29:41
9 o'clock good again for everybody tomorrow 15:29:44
morning? Okay. Great. Let's plan to start 15:29:46
at 9 tomorrow. We will have a full day 15:29:48
tomorrow, and with that, we can let you step 15:29:51
out and have a good night. Be safe with the 15:30:00
weather. Okay. 15:30:06
(Whereupon, the jury was excused 15:30:07
from the courtroom.) 15:30:09
THE COURT: Mr. Obolsky, you can 15:30:20
step down. I am just going to caution you 15:30:23
that you are still under oath and in the 15:30:25
middle of cross-examination. You should not 15:30:26
be discussing your testimony with anyone over 15:30:28
the course of the evening. 15:30:30
THE WITNESS: I will go somewhere 15:30:32
else. 15:30:33
THE COURT: Okay. All right. So 15:30:33
you can step down. I don't know if there's 15:30:35
any particular housekeeping? 15:30:37

1 MS. DURIE: I have one trivial 15:30:40
2 one. This probably doesn't require Your 15:30:41
3 Honor's attention. We have some physical 15:30:43
4 devices that were admitted into evidence and I 15:30:45
5 just want to make sure that we tender them for 15:30:46
6 safekeeping. 15:30:49
7 THE COURT: That's fine. Mr. 15:30:50
8 Koehler, can you take those and hang on to 15:30:52
9 them? 15:30:54
10 THE COURT CLERK: Sure. 15:30:55
11 THE COURT: Okay. Anything else 15:30:59
12 from the plaintiffs' side? 15:31:01
13 MR. RUSSELL: Your Honor, we did 15:31:03
14 have one regarding particular 15:31:04
15 exhibits...(inaudible). 15:31:12
16 THE COURT: That's fine. As long 15:31:12
17 as there are no objections, that's fine. I 15:31:12
18 mean even at the beginning of the examination, 15:31:15
19 if you know you are going to use it, just let 15:31:17
20 me know and I'll admit it then so you don't 15:31:19
21 have to deal with that. I will just say give 15:31:21
22 some thought to how you want to deal with 15:31:24
23 those in terms of handing them amongst the 15:31:25
24 jury when we submit the evidence. I don't 15:31:30

1 know whether you want to submit everything 15:31:32
2 electronically or whether you plan to send 15:31:33
3 back paper copies with them. If it's the 15:31:36
4 latter, then there's no problem. Okay. All 15:31:38
5 right. 15:31:40
6 So with that, again, if there are 15:31:41
7 issues that I am going to need to take up 15:31:44
8 tomorrow for conditional relevance kind of 15:31:45
9 determinations, I would appreciate an email by 15:31:47
10 about 9 o'clock to my chambers email and, you 15:31:50
11 know, I certainly would appreciate the revised 15:31:53
12 amended jury instructions tonight as well. 15:31:58
13 Again, if you can email them, fine, just email 15:32:01
14 them to chambers. That's fine, too. But I 15:32:04
15 just want to be able to look at them and 15:32:07
16 incorporate them into what I get you by the 15:32:09
17 end of the day tomorrow. 15:32:12
18 MS. DURIE: Thank you. 15:32:14
19 THE COURT: All right. With that, 15:32:15
20 we will stand in recess until tomorrow. I 15:32:16
21 will see everyone here a few minutes before 9 15:32:18
22 in case there are any issues we need to take 15:32:21
23 up. 15:32:23
24 MS. DURIE: Thank you, Your Honor. 15:32:23

THE COURT: All right. Everybody 15:32:24
have a good night. 15:32:26
(Whereupon, the Court adjourned 15:32:27
proceedings at 3:33 p.m.) 15:32:31

C E R T I F I C A T E

I do hereby certify that I am a Notary Public in good standing, that the aforesaid testimony was taken before me, pursuant to notice, at the time and place indicated; that said deponent was duly sworn to tell the truth, the whole truth, and nothing but the truth; that the testimony of said deponent was correctly recorded in machine shorthand by me and thereafter transcribed under my supervision with computer-aided transcription; that the deposition is a true and correct record of the testimony given by the witness; and that I am neither of counsel nor kin to any party in said action, nor interested in the outcome thereof.

WITNESS by hand and official seal this 7th day of April, 2022.

Notary Public

Job No. 5162168

&

& 2:9 3:2 52:3

1

1 5:6 24:11 31:16 36:3,8,9,12,19 42:5,5 45:12 46:12,18,21 47:4 55:20 68:9 74:17 75:10 127:7 139:3 139:21,23,24 140:3,10,13 141:12,17 142:2 142:14,17 143:8 143:24 144:3 145:3,15 146:9,10 146:17,22 147:1 148:4,6,17 149:6 149:10,20,23,24 154:18 156:12,15 156:24 158:3 159:24 163:2 172:1,6 190:16,16 190:20,24 191:17 191:19 192:4,11 193:3 204:23 205:2,4 272:5 291:24 298:15 304:11 310:19,19 310:24 314:6
1.1 116:14
1.60 233:3
10 10:8 108:19 150:10 152:11 160:17,17 161:19 181:17 182:16 213:14,20 219:15 248:1,6 255:24 258:16
100 212:4 220:13 222:2 283:9
102 47:5
104 47:6
106 47:2 71:2
108 46:24 53:2 142:7,15 143:17 144:12
10:30 10:7
10:45 108:22
11 192:11
1105 2:4
114 5:10
115 5:10
118 5:11
119 5:11
12 4:5 220:19 251:18 252:2 279:12
120 47:20
1201 171:12
121 5:12
122 5:12 47:18
123 47:18
124 47:21
128 4:6
12:30 183:17
12th 2:5 123:2 178:11
13 122:17 124:9 188:18,20
1300 80:14 169:1
1313 3:3
133 5:13
134 5:13
13th 123:16
14 128:11,12
14th 291:20
15 10:8 33:23 108:21 182:15
150 5:14
1500 80:9
151 5:14
1544 81:23
158 172:1,6
159 172:1,6
16 199:18 210:4,5 210:5 259:12
1650 2:11
17-1194 1:4
175 5:15
176 5:15
177 5:16
178 5:16
18,000 219:13
180,000 199:8 219:14
1800 1:23
1801 1:23
181 5:17
184 170:11
185 170:12
186 5:17,18,18
188 15:6
18th 97:5 278:7 309:3,20
19,000 219:14
190 4:7
19103 1:24
194 4:11
19801 1:17 2:5
1983 197:7
19899 3:5
1995 18:4 195:2 198:1
1999 220:3
1:15 182:10
1st 231:15

2

2 22:1,4,9 23:5 31:16 40:9,12 41:24 42:1 47:7 49:8,14 123:11 127:8 141:12 248:16 257:4 260:14 283:24 284:7,13 290:24 291:1 311:1
2,000 195:21
2.0 19:8 21:8,12 22:1 23:15 31:13 40:17 115:23 135:15,17 136:14
2.1. 119:21
20 33:23 80:19,23 80:24 127:9 200:12 213:18 257:1 258:17
200 73:5 213:12 277:4
2000 18:14
2000s 24:18
2001 282:22
2001-2002 21:4 23:1
2005 39:10 43:23 152:7,20 153:9 154:4,21
2006 37:14 210:3
2010 226:13
2012 19:17 83:18 205:18 208:16
2013 84:10,18 88:15
2014 123:3,16 216:2,5,10 217:6 227:2 228:1,6,10 228:18 229:11,15 230:18 231:15 235:8,10 237:23 241:7 243:18 257:3 266:3 267:4 268:2 272:5 290:18 291:20

298:18 302:4 304:11,18 307:15 308:17 309:20 312:12 313:11 315:1
2015 97:5 175:14 176:12 178:11 245:24 278:7
2016 126:10 186:10 208:16 247:6 285:23
2017 213:13 247:6 258:24
2020 13:21,22 19:13
2021 76:13 213:13
2022 1:14 320:12
20th 267:4
20x 200:12
21 37:14
217 3:10
23 146:14,18,22 147:1,5 148:4,8 149:5 158:12 190:16,20,24 191:18,20 192:4 192:24
231 5:19,19
238 6:6 286:7,9,13 286:21
24 5:14 12:24 146:14 150:9,13 150:20,21 151:6 152:20 153:9 158:22 164:8
241 5:7 38:24 39:1 39:2,4,14,17 40:12 42:1 150:17 154:15,17
243 36:17,24 37:5 38:11,21 39:21 43:14,20 45:12,15 49:23 53:5 57:19 79:11 83:2 89:19 123:5 128:3,9 136:17 138:2,6,17 138:24 140:4 151:3 152:23 155:6,7 156:9 163:6 179:4 190:21,24 203:20 206:13 239:10 240:4
245 5:19 230:24 231:2,10
246 6:2 266:10,13 266:20 267:1,3 298:13
248 6:8 301:12,13 301:22
249 117:19
25 5:9 15:21 74:23 75:4 93:12,14,23 94:23 101:21 113:13 146:14 170:12 172:1,6 199:3 220:8,19 244:17,19 245:1 245:22 246:2 248:10
252 6:7 290:12,13 290:16
2524 154:24 155:4 155:9,21
26 5:11 118:21,23 119:6 120:17
260 312:13
261 312:14
262 5:20,20
263 5:21,21
264 5:22,22
265 5:23,23
266 6:2,2
268 5:15 175:21,22 176:5
27 5:3,4,5 198:3,4 198:6,15,18 203:22 204:11 220:7 287:13
271 6:3,3
274 6:4,4
277 6:5
278 6:5
28 5:3,4,5
282 4:13
286 6:6,6
287 5:18 181:12 186:4,5,14,14,20
288 5:17 181:2,3,7 186:13,15 187:9
290 6:7,7
292 5:10 114:17,19 115:2
298-0700 2:6
2:33 309:20
2:45 281:23
2:50 281:21

3

3 5:8 22:11 40:9 46:14 49:23 63:14 65:19 66:20,22,24 67:3,20 70:20 73:8,19 79:2,6,12 79:15 80:19 82:19 116:11 140:6,10 140:12,24 141:4 141:14,19 142:7 142:14,24 143:17 145:1,13 146:8 157:15,19,22 158:3,7 189:7,11 189:13,16 211:16 212:4 215:8 228:8 228:24 229:14 233:10 235:10 236:22 237:22 238:19 241:7 249:9 257:4 268:4 283:10 311:4
3's 236:4
30 198:22 227:21
301 6:8,8
302 2:6 3:5 50:9 51:4 68:21 70:2 141:13
304 6:9,9 50:9 51:4 70:15 141:13
306 50:13 52:2 68:22 70:3
307 6:10,10
308 50:13 52:2 70:15
312 53:15,16 141:20
32 199:18
349 5:3 27:1,5,7,24 34:21
35 211:13 213:10
350 5:5 27:2,5,17 27:24 29:10
359 5:4 27:2,5,10 27:24 30:13
36 5:6,6 6:4 274:3 274:5,13,18
362-6666 3:11
371 5:13 133:21,23 134:18
39 5:7,7
3:30 281:7
3:33 319:4
3:45 281:7

4

4 22:11 64:7 70:22 115:12,17 172:2,6 211:22
40 197:8,15
401 2:11
402-3550 2:12
41 6:5 277:13,16 278:1
415 3:11
45 5:20 182:9 183:16 262:2,4,21
46 5:21 263:2,5,18
48 5:22 263:22 264:1,13
4914 115:18 116:19 118:4
4916 27:9 114:23 115:19 117:24 118:2

5

5 44:9 54:10 64:8 110:4 164:9
5/29/03 151:17,20
50 227:22
512 2:12
5162168 320:17
54 45:17 55:21
58 6:10 56:16 307:6,7,12
5th 175:13 176:12 176:19

6

6 44:1,3,9 63:12 115:17 119:20,24 139:24 170:12 302:12,13
62 6:9 304:5,6,9
65 148:6
66 6:3 271:11,14 271:21 272:1 312:18,21
67 5:12 121:20,23 122:2,12 188:14 188:16,19
6b 1:17
6th 3:4

7

7 1:14 101:21 140:1
7,000 204:9
708 184:1 189:24
750 205:22 206:1
78701 2:12
79 5:8,8
7th 320:12

8

8 75:1,1 108:12 110:5 199:17
800 248:7
8008 320:13
844 1:16
88 5:23 264:17,20 265:9

9

9 1:15 5:16 7:2 75:11,11,14,15,16 113:12 177:20,21 178:5 316:6,8 318:10,21
900 219:8 283:12
93 5:9
94 5:9
94111 3:10
951 3:4
984-6114 3:5

a

a.m. 1:15 7:2 108:22
ability 38:16 48:4 63:8 77:4 87:2,23 102:19 277:3 280:3
able 23:24 33:7 49:4 50:24 65:15 83:10,14,21,23 84:16 89:16 91:13 91:18,21 109:16 116:8 126:4 127:4 148:12 161:16 180:20 223:20 239:24 270:14 297:2 318:15
absence 233:9 249:16
absolutely 32:1 45:16 65:4 110:13 145:14 159:13 211:3 221:21,21 223:7 226:18 234:12 281:14 296:18
accelerate 31:18
accept 91:21 92:21 241:6 243:4 275:12,13 279:10 279:10 280:4,5
accepted 18:9 279:6 280:9
access 29:20 48:23 49:6 52:18 57:11 57:14 62:8 66:8 66:11,15 67:19 69:20 70:1,4,7 91:11 127:22 144:6,14,20 145:4 145:8 148:7,9,20 293:9 305:19
accessed 45:2,5 56:7,13 57:5,13
accessing 59:4 69:4
accomplish 166:9 171:7 242:11
accounts 267:23
accurate 159:18
accurately 159:12
accused 172:10
accuses 248:17
achieve 90:8
acquire 206:10
acquired 19:18 121:10 224:18 226:16 227:2,6 231:16 234:18 235:8 272:7,11,14
acquisition 19:19 83:18 84:9 206:10 207:6 259:10
act 60:7
action 80:4 145:18 149:18 158:8 177:15 207:21 287:4 320:10
actions 80:14
active 89:14 105:11 157:17 238:8
activities 84:21
activity 21:11
actual 23:24 28:10 29:3 51:15,18 54:3 96:9 117:18 155:1 162:19 248:8
adaptive 33:12
add 23:18,19 69:13 91:13

213:20 246:19 264:9 275:13
added 65:12 101:20 243:8,11 252:22
addition 76:24 100:9
additional 25:20 84:16 118:14 213:14 214:4 242:11 243:11 251:16 293:2 306:10
additionally 100:24
address 67:12,17 68:11,13,16 71:19 72:1,2,5,8,10,12 72:19 73:15,23
addressed 71:3 72:24
addresses 67:13 68:10 73:1,8,20,22
addressing 72:23
adhered 101:4
adjourned 319:3
adjusted 260:15
admission 265:12 265:15
admit 27:24 36:19 39:14 79:15 93:23 94:22 115:2 119:6 122:12 151:5 176:5 178:4 231:10 262:20 263:17 264:12 266:19 271:20 274:12 277:24 301:20 317:20
admitted 5:2 28:2 36:22 39:16 95:5 95:9 115:5 122:15 151:9 176:7 178:8 186:18 231:13 262:24 263:20 264:15 265:17 266:23 271:23 274:16 278:4 286:19 304:15 317:4
adoption 31:19
advance 139:5
advantage 62:12 250:18
advantageous 259:22
advantages 250:6 250:9 252:21
advent 209:11 278:20
advertise 121:11
advertised 174:15
advertising 174:14
aerospace 18:2
affirmatively 283:6
affirmed 11:12 82:14 194:16
aforesaid 320:4
afternoon 10:14 10:16 282:13
aggressive 249:8
ago 14:13 37:19 38:15 56:4 80:5 264:11 292:19 298:18 305:13
agree 176:21 246:23
agreed 14:19 78:15 259:2
agreeing 81:4
agreement 14:19 15:7 202:11 203:17 227:16 257:10 259:22
agreements 202:12 203:1,6 258:20,21
ah 27:6
ahead 124:20 132:4 143:21 164:3 168:9 171:8 228:16
ahold 180:11,15 180:17
aided 320:8
aipd 267:21
air 17:12,13,15,24
alive 209:2
allayed 91:23
allow 35:22 57:2 89:5 103:22 108:1 143:24 144:3,19 145:4 148:19 165:7 166:2 235:24 236:1 237:20 238:4 242:14,15,24 270:14 271:8 294:13 297:18,21
allowed 85:13 137:19 168:2 310:19
allowing 89:9 127:22 306:13 307:1
allows 35:9 61:17 63:6 102:18 133:8 144:5,12,12 145:1 145:13 247:17 293:9
alongside 49:1
alternate 59:4 234:6 257:24 259:19
alternately 144:20
alternating 145:4
alternative 302:15
alternatively 148:7
alternatives 239:5 240:11
amcore 212:22
amended 318:12
amount 71:13 90:9 113:19 183:14 214:1,20
analysis 171:20 172:9,19 174:8 310:9
analyze 172:21 239:7
analyzed 172:17 172:24 173:3,14 173:17
analyzing 171:17
anderson 3:2
andrew 2:3
announced 85:19 229:6
announcements 84:22
annoying 311:18 311:24
annual 15:3 202:24 222:17 248:4
annually 223:1
answer 103:17 135:22 137:11 166:24 169:4,23 170:15,19 180:21

answered 164:1 166:19 172:11 185:2
answering 190:19
answers 273:12 289:11
anybody 182:24 229:23 235:21
anymore 256:23 285:15,21
anyway 181:17
apologies 117:16 145:23 147:20 150:15,16 161:22 173:12 180:14 182:21 190:15 264:23
apologize 46:10 160:16 165:21 177:6 225:19 265:23 291:6 302:13 312:14,20
apparent 64:19 89:17
apparently 303:17
appeal 82:14
appear 129:17 191:22
appeared 149:5
appears 162:23 232:10 233:17 234:19 245:23 290:19 292:10 302:3 304:12 305:16 306:4,7 308:20 313:7
apple 85:10,15,16 85:18,19,23 87:18 89:5,9 90:2,11 91:11,14,21 92:21 108:2 113:22 120:23 218:20,22 235:24 237:16 242:15 271:6 273:9 275:13 279:10 280:5 293:4 297:15,17 297:21 298:2 309:6,6
apple's 86:3 90:24
applicability 204:18
applicable 162:3
application 37:11 77:12 81:13,18 84:1,3,7 86:10 89:2 201:22 267:14
applications 49:3 120:11 204:5 223:21 225:9 232:1 305:3 308:3
applied 83:2
apply 65:14 82:24 159:15
applying 78:18
appreciate 9:23 318:9,11
appreciated 64:20
approach 11:16 26:20 170:5 302:15
appropriate 138:11
approve 246:2 298:3
approved 208:10
approving 208:6
april 1:14 320:12
aptiv 1:8 92:6,10 92:16 120:24 121:6,6,10 128:3 161:11 173:4,14 173:18 174:1,14 174:22 177:11,14 180:16 214:11 219:11,14,16,17 219:20,21,24 220:4,11,14,17,20 220:22 221:5,8,12 222:7,9,12,13 223:4,6,10,14 224:18 226:14,15 227:3,24 228:5 230:18,19 231:16 234:14,16,20 235:5,7,9 249:2,9 249:23 250:9 253:11 254:7 255:9,11,22 256:5 256:7 257:3,6 259:24 260:12,23 261:3 266:1 269:4 272:6 283:23 284:3,13,24 285:3 285:7,7,12,14,18 285:20 286:1 288:5,6 289:9 290:4
aptiv's 171:17 172:21 175:4,14 177:5 178:15 180:10 188:8 216:24 219:7 240:1 248:16 249:4,7,13 250:6 256:10,14 259:21 261:11 266:7 288:17
architect 18:20,23 19:2 97:11
architecting 97:7
architectural 207:11
architecture 91:3 96:1 97:21 98:6 98:23 99:7,24 100:2 125:5,8 244:1,7,8,10 246:6 299:9 300:14 303:7,13
architectures 299:24
area 179:2 258:12 298:24
arguments 26:7
arrangement 131:18
arrow 143:1
arrows 50:8
art 49:11 54:22,23 54:24 57:23 64:19 78:17 80:16,17 130:9 137:20 157:10 166:1 167:5,10,15,18 168:2,12,14 169:2 169:3,11
arussell 2:7
asap 234:1
asc 212:24
asia 215:13
asic 300:2 301:4
aside 36:6 169:9 238:17
asked 14:17 28:5 69:7 118:6 124:5 128:2 136:23 147:12 153:22 158:15 164:1 172:8,17 242:19 256:5 266:1 271:4 276:1,3 296:23

315:1
asking 123:3 124:21 132:19 147:13 167:20 169:5,6 223:10 228:23 234:8,10 234:12 265:2
asks 153:4 160:19 189:3
aspects 55:4 179:6 179:8
asserted 131:13 136:18 137:6,13 157:1 163:9 179:4 189:23
assign 67:12,13 184:14
assigned 67:17
assignee 205:8
assigning 68:10
assignment 68:13
associated 42:18 66:19 267:21
assume 183:11 302:21,23
assumed 47:1
assuming 222:19
athens 35:19 86:14,15,16,17,18 87:1,3,7,16 88:1 88:22 101:15 102:7 104:16,17 104:21 105:22 106:5,14,14 107:2 107:5,12 108:5 110:14,16,17,18 110:23 111:15,18 165:17 166:7,11 216:14 217:4,5,7 217:11,16 230:13 247:11
atish 37:10 38:8
atlantic 1:23
attach 48:3 60:3 67:5 131:1,4 161:3
attached 28:18 41:14 43:12 51:15 160:21 161:1
attachment 161:12 186:13 302:11,12,14
attachments 160:18
attempted 164:13 164:17
attempting 100:19
attend 197:1
attended 197:2
attention 10:21,21 85:9 160:1 164:10 168:18 188:21 317:3
attorney 78:21 128:5 162:20
attorneys 162:8,11 162:13,14,20 167:16 168:13 169:9
audi 215:10
august 97:5 245:23 285:23 290:18 291:20
austin 2:12 12:21 18:10,21
authenticated 311:16
auto 276:14
automakers 91:19 120:22 212:1 228:8,21
automated 212:7
automatically 155:21
automobile 30:8
automotive 27:12 30:3,20 83:20 84:1,11 118:9 179:11 180:3 196:10 201:8 210:9,12,20,24 211:1,10,20 213:7 213:11 215:22 216:2,4 218:16 221:6 223:13,19 224:3,9 226:8,10 226:20 235:24 241:10 242:13 262:13 267:23 271:1 275:12 276:3,10 277:6 280:3 283:13 287:6
available 25:22 32:18 57:24 101:13 104:20 107:3,5 120:13 126:16 127:5 166:15 199:9 248:24 270:3 273:23
avenue 2:11
average 200:14
avoid 311:18
aware 18:24 38:18 43:7 53:9 55:3 89:15 92:8 165:9 165:10 167:1,5 169:8,17 170:16 248:24
awful 294:4
awhile 56:4

b

b 5:1 6:1 11:9 31:3 31:3 161:19,21,22 164:11 194:13
bachelor's 18:5
back 9:21 10:10 13:13 17:11 24:4 28:4 29:18 41:24 45:12 46:19 51:12 61:24 66:24 70:20 80:3 82:20 92:15 103:4 105:21 108:20 109:2,14 109:21 110:4 118:10 124:2,8 127:7 148:23 156:5,23 158:22 163:1 164:7 167:13 181:13 182:9 183:22 185:21 188:13 193:21 196:23 212:17 213:3 230:17 237:23 238:7 241:7 243:18 266:2 281:21 287:1 309:23 313:2,4 318:3
background 17:8 20:2 54:14,19 224:14 239:15
bad 73:12 192:8
ballpark 182:13
band 87:22
bank 2:10
banner 2:10 4:5,8 7:7 8:7,12 9:6,11 11:3,15,18,19 12:3 12:12,17 24:10,12

24:24 25:24 26:19 27:3,23 28:3 36:14,18,23 39:6 39:13,17,19 40:8 40:10 41:23 42:2 44:2,6 45:11,13 46:14,16 49:22,24 54:9,12 55:19,23 56:15,19 58:12,16 61:1,4 63:12,17 64:5,11 65:20,23 66:23 67:1 68:20 69:1 70:19,23 74:9,11 75:9,12,23 76:2 79:14,19,21 80:18,20 81:22,24 82:8,10,18,23 93:16,22 95:10,12 95:14,17,19 101:22 102:1,11 102:14 103:1,6 104:1,3,23 105:2 105:15,18 108:11 108:13,16 109:4 109:23 110:1,7 111:22,24 113:11 113:15 114:21 115:1,6,8 116:10 116:12 119:1,5,10 119:12,20,22 122:1,11,16,20 123:10,12 124:13 124:15 127:6,13 128:18 129:1 131:14,22 134:5 134:19 136:20 143:18 147:11 150:7,11 151:7 164:1 170:14 175:16 176:6 178:6 180:4 182:18 183:11,13 184:2,18,21 185:16 186:16 188:15 190:6,10 190:14,18 192:10 192:13 193:6,17 265:3

base 17:15,19 20:20

based 15:18 16:18 17:15 28:9 35:21 88:1 107:8,19 174:13,15 179:9 203:10 222:22 224:20,21 227:12 258:21

basic 68:5 123:19

basically 27:12 60:4,8 67:4 123:15 199:18 283:15

basis 185:14

bbanner 2:13

bear 12:21 14:4

beard 2:9

beauty 241:22

beep 187:11

began 17:23 23:11 23:12 84:10,14 88:17 93:3 211:23 236:8 239:6,6 247:6

beginning 121:13 229:6 244:14 317:18

begins 64:3 65:18 291:3 298:19 300:21 306:4 309:12,16

begun 121:11 299:8

behal 304:23 305:9 306:22 307:14

behalf 46:10 223:5

behavior 20:16

belief 81:17 268:5

believe 18:4 27:8 29:8 30:13 54:7 55:6 62:14 76:18 82:5 85:22 94:17 118:7 126:10,16 128:11 129:16 130:13 131:4 132:11 137:9,16 139:4 141:21 152:13 174:13,18 175:9 176:23 188:9 208:22 225:1 226:7 268:15 280:9 301:3 305:11,17 312:14 315:4

believed 229:7

belong 187:23

benefits 15:4 76:22

best 22:20 229:7,9 303:1

better 7:24 75:20 78:13 90:11 100:22 156:4 180:21 202:23 259:7

beyond 53:6 65:14

bias 242:7 288:2,3 288:11

bid 226:19

big 31:17 67:23 79:3,5 140:24 199:7 211:15,22 212:1,4 214:13 215:8 228:8,20,24 229:14 235:10 236:4,22 237:22 238:19 241:7 257:4 268:4,22 283:10 296:1,6 310:2

bigger 199:4

billion 200:17 213:11,17 248:6

binder 36:3,4 38:24 79:3,3 82:20 93:12 114:17 118:20 121:21 154:15 158:23 163:2 188:14 230:24

binders 193:16

bit 12:18 15:19 17:4,6 20:2,8 22:22 24:3 25:7 31:6 39:22 47:11 50:4 51:3 56:23 79:2 83:6 84:5 96:18 107:10 108:14 113:3,24 125:22 133:22 137:23 138:15 180:19 183:12 196:4,23,24 199:18 209:17 214:6 217:22 221:2,22 224:11 241:4 253:10 255:1 257:2 261:2 270:24 271:7 301:2 306:2

black 28:14 41:2,4 47:23

block 46:21 66:16 116:16 120:2

141:18 142:4,19 143:11,17 144:7 144:21 145:5,7,9 148:8
blocks 50:14,20 68:3
blow 76:1 102:12 124:13 127:9 172:5 189:18 192:11
blue 110:24 111:5
bmw 215:10
board 27:18 28:15 28:19,24 29:13 187:12
bob 31:2 186:24 268:10,11
boggs 1:16
bohm 4:3 9:5 11:4 11:8,11,23 12:4,8 27:4 28:4 30:13 31:4 36:2,24 38:23 39:20 40:11 42:3 45:10,14 46:17 47:9 50:1 51:2 54:6,13 55:24 56:20 57:18 61:5 63:18 64:12 65:24 67:2 69:2 70:24 74:14 75:4 75:13 76:3,21 79:3,22 80:8,21 82:1 93:11 95:15 95:20 102:2,16 103:7 104:5 105:3 105:14,19 109:6 109:15 110:8,22 111:21 112:2 113:16 114:16 115:9,22 116:13 118:21 119:15,23 120:18 121:20 122:21 123:13 127:14,24 128:8 128:23 150:19 154:14,20 170:1 171:16 175:20 176:11 177:19 181:1 182:19,20 186:3,22 188:17 190:11,19 192:14 193:11 207:4 225:1 244:6 315:2
bohm's 171:24 185:22 207:17,22 208:1,11,16,20,21 209:10 246:5 247:12 255:9
bohn 11:8
bond 117:20
bonded 117:5,9
boston 174:23 248:16 257:4 260:14 283:24 284:7,13
bother 253:24
bothered 253:17 254:4
bottom 28:12,17 41:10 42:1 53:15 55:20 63:13 65:19 70:21 74:10 80:9 102:12 105:17 106:19 107:23 113:14 116:21 120:5 122:17,18 123:11 140:23 141:19 151:15 188:22 260:5 272:23 279:19 292:7 303:5 313:2 314:7,7
bought 53:19,20 54:4 199:24 230:18 308:16
box 3:4 26:9,11 27:11,19 29:18 30:14,24 31:1 40:16 46:24 50:9 50:9,13 51:13 53:2,15 68:21 70:2,15 88:6,12 102:12 103:3 104:2,23,24 106:17,19 111:5 118:10 121:19 125:21 140:24 141:19 142:15 175:11 180:11,12 180:15 186:24 187:2 188:4 212:6 218:8,14 224:24 225:2,7,10,14 226:15 254:20 268:12 269:1 284:16 302:15
box's 305:18,20
boxes 51:3 52:1 102:5,6,10 110:24 141:13 224:19 226:7,23
bracket 117:4
bracketed 117:12
brains 26:13
brand 217:6
break 8:18 10:6,9 10:11,16,19 11:1 27:11,19 29:18 30:14,24 31:1 51:2 88:6,11 108:15,17 118:10 121:19 125:21 175:10 180:11,12 180:15 181:13,17 182:23 186:24 187:2 188:4 212:6 214:7,9 218:8,14 224:19,23 225:2,7 225:10,14 226:6 226:15,23 254:20 268:11 269:1 284:16 302:14 305:18,19 310:8 315:10,12,13
breaks 225:15
brian 2:10 11:19
bridge 112:15,18 112:20,24 113:9 114:11
bridges 169:18
bridging 102:22 112:20
brief 12:15 94:4 180:23 181:10 193:22 261:1 264:21,24
briefly 40:4 105:19 110:11 247:14 252:17
brigham 303:20 305:11 307:13 308:1,22 309:19
bring 25:9 29:6 109:2 115:7 183:22 184:17 209:6 212:16 213:2 225:12 236:2 244:17 261:20 267:1 272:1 274:18 275:14
brings 225:12
broader 173:8

brought 26:17 28:5 253:7 291:24
bruce 2:9
bslayden 2:13
bucks 277:4
buffer 136:11
buffers 136:8
build 246:23 277:9
building 1:16 2:4
built 26:7 44:23 53:13 107:15 135:23 155:18 162:4 166:12 198:9
bullet 274:24
bump 183:5
bunch 28:18
burden 239:18
buried 51:20
bus 20:7,14 35:5 293:5,19 310:20
business 23:22 34:6 77:19,23 78:8,11 83:8,14,22 92:22 93:8,20 96:6,9,10 99:15 105:24 114:15 195:7,11 196:6,9 196:11,13 199:2,3 203:9 206:23 207:1,14 208:7 209:14 210:20 211:9 212:4 218:1 220:16,19 221:19 229:4,15 235:10 236:5,7 238:10,13 238:20,22 241:8 243:24 244:4,9 245:13,22 246:1,4 246:10,11 248:9 251:13,15,18,24 255:18 257:4,16 259:17 261:8,16 262:1 275:1 292:21
busy 13:16 93:7
button 221:15 222:5
buttons 221:13
buy 53:22 201:4 202:16,17,22 206:3 210:16 218:17 222:2,2,18 222:24 226:3 235:21 243:14 251:3 256:21 258:1,14
buying 201:10 206:4,5,6,6 222:23 226:22,24 227:13 227:15,19 229:9 258:9 276:23 278:21 285:6,14 285:20 288:5
buys 206:2 258:10

c

c 2:1 3:1,9,9 153:1 194:12 320:1,1
c.a. 1:4
c4 187:18
cable 25:4,15 29:17 41:2,5 88:5 121:18 131:2,19 133:14 134:4,13 134:15,16
cables 20:10 29:19 41:13 88:11 218:13
caleb 1:16
california 3:10 18:7
call 9:4 11:3 18:16 24:21 27:11 31:2 54:23 91:10 114:4 160:1 194:4,5 205:14 206:20 216:17 225:7,14 225:17,18 284:16
called 12:21 30:14 35:19 36:24 37:1 38:13 47:4 48:20 54:14 61:21 65:17 77:15 88:9,10 117:20 125:20 135:14 154:24 170:10 196:10 199:1 211:21 217:15 223:18 232:5 252:19
calling 103:16 174:24
calls 131:15,22 143:18 160:18 175:16 214:3
camera 41:9,16
cancelled 76:17 192:22 193:4
canu 291:4,12,16
capabilities 55:4 310:4,6
capability 57:8 88:23 107:15 309:5
capable 101:10 118:18 169:11 290:3
capacity 95:23 200:6 213:14
capped 172:23
car 16:8,15,17 27:13 29:16 30:4 86:10,23 118:16 215:2,4,7 216:11 216:19,22 218:3,6 218:6 219:3 221:13 225:10 226:9 230:9 236:15 237:1 241:5 250:21 251:4 252:23 276:21 277:1,3 279:9 285:24 294:15 296:10,13 296:15,21 299:14 299:16 301:3
card 277:5
cards 276:23 277:2
care 295:15
career 17:5 18:18 113:2 128:17
carmaker 85:12
carmakers 85:13 88:18 89:5 90:13 90:24 92:20 256:11 295:15
carplay 84:2,7,12 84:13,17 85:6,10 85:18,21 86:1,2,7 86:9 87:15,15,17 88:1,13,15 89:11 90:7 101:10,12,16 102:20,23 103:8 103:12,17,19 104:9 105:8 108:4 108:6,8 111:9,11 115:18,20 117:2 117:23 118:17 120:7,12 121:17 216:16,22 218:21 229:6,14 230:5,7 232:23 233:2 235:10 236:16

237:24 238:2,4 244:2 247:8,10 248:20 268:5 278:20 293:3,7 305:17 306:9,10 306:14 309:6 311:1,20
cars 16:2,6,7,10 215:12
case 11:22 12:11 14:12,16 15:9,16 23:22 29:11 34:6 34:24 47:13 53:17 83:8,10,15,22 93:8 106:6 107:6,22 110:16,18 112:7 113:7 115:18,19 122:5 130:4 132:9 137:6 146:5 157:7 161:12 169:24 171:18 191:12 192:21 196:19 203:20 248:18 260:8 266:1 275:1 281:16 288:24 318:22
cases 32:15 33:11 47:13 65:11 201:19
catalyst 31:20
catch 291:15
category 54:20 285:14
cattle 13:12
causes 299:19
causing 224:4
caution 181:19 315:14,19,24 316:15
celebrate 76:19
center 18:21 27:14 30:22 46:24 48:11 195:6 196:14
ceo 274:10 277:23 287:19
certain 49:3 71:12 71:13 100:13 168:17 240:24 246:17
certainly 17:9,9 20:4,4 30:1 34:19 40:13 42:12 51:10 76:17 96:8 97:20 147:6 163:17 164:22 168:20 180:22 202:5,24 211:5 213:16 215:20 219:4 220:8 222:9 226:2 226:2 229:8 235:6 241:9,14 249:16 250:1 251:12,17 255:13 288:12,20 295:23 318:11
certificate 75:16 76:4 192:17
certification 297:3 297:6,7
certifications 93:2
certify 90:2 320:3
ces 268:10
chain 118:16 122:3,7 307:12
chair 148:12
challenge 204:18 237:1
challenges 31:23 217:14 261:15
challenging 33:3
chambers 318:10 318:14
chance 197:21
change 18:19 43:17 79:1 87:24 115:16 198:19 203:6,13 242:17 243:15 250:13 257:1,5,8,18 261:5 261:10
changed 198:14 243:22 259:1
changes 32:19 33:12 203:9
changing 241:4 253:10
charge 8:20 35:5 97:10 103:21 196:16,17
charged 106:21 257:6
charging 106:19 106:23 252:24 253:5
chat 182:6
chatting 182:24
cheaply 66:7
cheating 305:5
check 220:12 261:1 294:11
checked 217:19
chew 223:1
chief 153:13
children 12:24 13:2
children's 13:5
chip 22:12 26:8,8 26:11,12,16 28:6 28:10 29:2,11 31:10,24 32:5 36:1 44:22 51:21 86:17,18 87:7,8,16 97:16 101:6 102:3 106:7,24 110:19 117:18,20 174:23 175:11 178:15 179:23 180:13,16 187:14,17 196:18 200:22 209:15,18 209:20,24 210:6,8 210:10,12 212:6 212:10 213:7,7 216:2,5,14 217:4 217:16 218:18 225:6,6 230:11 235:14 239:7,18 240:8 241:6 244:2 244:11,15 248:4 248:16,16 249:5,6 249:15,24 252:6 253:8,22 254:20 254:24 255:1,3,5 256:8 257:5 258:9 266:2 270:11,12 270:21 277:8 278:13 279:3 280:8 283:24 284:1,8,8 288:6,18 289:9,18 290:4 292:20 295:22 300:6 314:20
chips 19:4 27:8 34:1 110:23 111:15 180:10 200:14,22 202:22 202:22 210:2,14 211:4,9 212:1,8,14 213:10,12,15,17 213:18,20 215:2,5 215:11,19,22 216:12 217:11 221:3,5,7 225:8 226:23 227:3,7,18 228:7,12,20

229:22 233:7 246:24 247:4,23 248:7 249:22 250:19 251:11,16 254:19 256:6 258:1 259:12,23 269:4 271:8 273:7 273:8,14,15 274:2 276:17,18 278:21 279:12 283:16 285:1,6,14 314:17
choice 294:20
choose 48:23
chooses 41:14
choosing 284:7,12
chose 45:21
chris 304:22 307:14
christmas 201:7
christmastime 201:5
chrysler 211:21 232:14 235:1 276:9 291:23 304:19 305:15 308:23 309:3,9 310:1 313:8,21 314:1
circuit 27:18 28:15,19,24 29:13 135:13
circuitry 135:11
circuits 135:9
circumstances 89:6,13
cirrus 18:11,11
city 14:3 86:15
civilian 17:20
claim 46:4 58:8 64:2 74:18 75:4 139:15,21,23 140:3,10,13 141:17 142:2,14 142:17 143:8,24 144:3 145:3,15 146:9,10,17,18,22 146:22 147:1,1,4 148:4,4,6,8,17 149:5,6,10,20,23 149:24 156:12,15 156:24 157:4,10 158:3,12 184:1 190:20,23,24 191:11,17,17,19 191:20 192:3,3,4 192:24 193:3
claims 64:7,21 74:15,21 76:11,15 76:18 82:16 128:6 146:14 157:17,18 158:5,7,20 173:10 190:16,20,23 191:2,4,8,13 192:21,22,23,24 193:3
clarification 167:24 181:24 183:22
clarifications 75:22
clarifies 171:3
clarify 167:19
classic 206:20
classically 48:19
clean 60:4 303:24
cleans 60:9
clear 63:23 110:22 155:4 167:4 209:5 230:4 234:10 249:21 250:1 309:23
clearly 183:2 208:4
clerk 7:3 11:5 108:23 183:15,18 194:8 281:24 317:10
clever 107:24 241:1
clip 171:12
close 15:12
closed 205:19
closely 34:7 232:19
closer 109:5,8 133:22
clue 180:19
cm 1:20
codes 138:9
coincidence 74:6
colleague 76:23
colleagues 89:17
college 17:14,23 197:1,2
column 37:14 45:17 55:20 63:14 64:7 65:19 70:20 70:22 75:1 127:8
combination 295:16
combined 259:10 299:17
combo 226:9
come 10:10 14:15 32:11 38:10 48:10 50:9 65:6 67:5 71:22 92:14 94:2 101:1 108:20 119:9 121:6 134:20 136:3 148:13 181:13 194:7 196:6 203:15 235:18 238:7 239:9 241:22 251:2 261:20
comes 67:11 74:12 96:24 167:7 183:5 236:18 251:2,4
comfort 93:1
coming 10:24 40:16 68:3 147:2 154:1 181:22 182:7 203:16 292:1
commenced 7:1
comment 40:7
commit 301:3
committed 258:14 313:8
common 191:23
commonly 20:11 112:24
communicate 72:2 73:18 101:18 116:8
communication 50:16 72:21 163:12,24 165:8 167:6 169:12
communications 52:10 168:23
compact 62:24 127:21
companies 15:22 18:1 22:15 26:5 32:7 201:8 206:2 206:3 218:19,24 219:1 258:7 259:10 285:24 296:11
companion 19:4

company 18:10,14 77:20 85:16 121:9 153:6 198:8,22 199:4,17 200:8 205:10 206:17 224:12 227:11,14 258:6,8,12 284:12 301:4
company's 48:14
compare 248:9 249:5
compared 219:11 233:6 249:12
compares 126:18
comparison 158:14
compatibility 250:17 251:3,8
compensation 15:4,8,14,17
compete 234:9 248:16 249:19 283:24 300:1
competes 284:3
competing 254:11 258:13 285:13,19
competition 280:11,13
competitive 100:10 255:7 298:20
competitor 92:6 101:2 229:22 234:15,17 249:17 250:2 256:19
competitors 96:12 100:20,23 188:8 214:20 226:16,18 233:9 253:24 254:1
complete 14:14 80:5
completed 18:4
completely 89:6 293:12,14 300:9
completeness 185:10
complex 62:19 63:6,7 209:12 212:9 214:6 241:20
complexity 243:9
compliance 132:12 133:2 217:21 271:9
compliant 26:14 132:8,14,23 217:11,17 235:18 270:4,22 271:5 273:14 275:9 293:7,10 303:14
compliantly 33:17
complicated 16:10 113:19
complied 217:19
complies 131:20
component 77:19 288:5
components 111:15,17 112:10 112:12 166:9 253:5,7 287:5
computer 24:15 24:19,23 25:5 30:3,5,6,22 35:8 40:21,21 47:17 51:23 67:16 130:8 130:11,16 132:9 133:5,8,8 209:19 270:10,12,17 320:8
computers 16:2,12 40:24 48:9,13,15 48:18,22 49:6 77:7 129:5,24 133:4 218:5,6
conceived 152:17 153:11 160:20
concept 40:5 43:13 135:12 136:10 153:20
conceptual 112:5
conceptualizing 293:22
concern 90:1 271:7
concerned 183:7 243:6 297:2
concerns 91:23 254:5
conclave 154:4,9 154:21
concluded 171:10
conclusion 143:19 184:11
conclusively 174:17
concurrent 143:10
conditional 318:8
conference 8:20
confidence 298:5
confidential 175:9
configuration 60:10 66:8,10,14 69:4,20,24 70:4,6 102:3,15 132:12 133:3
configurations 67:3 101:12
configured 45:4 56:7 57:5,16 59:3 141:8 143:9 148:18
confirm 125:10 126:4 179:23 227:24
confirmed 175:14 176:17,20 177:5,7 177:13 178:15 179:21
confirming 81:12
confused 225:1
confusion 225:5
congress 2:11
connect 29:17 35:6,20,22 40:20 48:8 49:6 51:21 87:20 118:10 129:14 130:10,16 216:10 313:9
connected 41:1,6,8 41:18,19 73:20,21 86:21 87:4 111:11 134:3,12 144:13 237:3 238:5 270:15
connecting 133:12
connection 29:24 51:14 103:22 104:12 112:6 121:18 132:16 209:19 238:4 253:1 270:17 275:3
connections 50:6 104:11 143:11 209:20 242:1 276:19,20 296:20
connectivity 16:16 28:20 29:14 35:24 50:11 61:17 88:21 118:12 121:16 195:12 196:2,11

287:6 296:12,14 299:14 305:19 306:11,24
connector 218:7
connectors 29:14 218:12
connects 303:6
conscious 109:8
conservative 241:11
consider 35:1
considerable 64:16
considerably 201:2
considered 313:10
consistent 310:1
console 27:14
constrain 316:3
constrained 240:9 240:10
constructed 161:24
construction 191:12
consultant 14:21 14:23
consulting 14:19 15:2,7,9
consumer 199:16 200:1,4 201:5 210:14 211:4,7 224:1 250:19 268:21
consumption 99:16
cont'd 3:1 6:1
contact 230:19
contacting 232:9
contained 25:16 38:21 45:23 47:1 80:5 187:2 192:6
contains 96:10 167:15
contemporaneous 160:11
contend 148:14
context 51:9 136:17 137:6,12 156:3 166:7 169:15 233:4 241:18 258:24 273:3 314:15 316:3
continue 145:3 185:21 187:22 237:10,14 249:19 261:24 279:13
continued 18:2 260:13 261:22
continues 217:9
contract 91:12 218:15
contributed 37:22
contributing 22:18
contributions 22:10
control 53:9 77:9 89:8 113:19 283:9
controller 24:22 25:16 34:23 35:5 35:9 42:6 45:18 46:22 53:13 56:8 60:23 61:6,14,24 62:3,7,9,13 63:10 69:16 83:24 84:15 88:20 89:1 92:5 105:6 112:14,16 115:24 116:5 125:12 126:22 127:22 129:6,8,11 129:13,15 130:8 130:11,17,23 141:24 142:3,7,13 142:18 143:2,5,9 143:16 144:11,19 144:24 145:12 148:18 179:9 180:2
controllers 50:15 57:4,9 129:2 131:20 133:13,14 134:3,12,24 135:5 135:7 179:2,7
controlling 130:22 271:7 293:24
controls 44:23 130:21 155:11 293:5
convenient 27:15 30:12
conversation 153:15
conversations 90:17 124:1,23
conversing 315:15
convinced 78:15
convincing 83:7 83:10,21 314:1
copied 267:12
copies 286:8 318:3
copy 150:2 265:6 286:13 288:5 302:5 315:2
copying 275:16,18 307:14
cords 102:20
core 179:1
cornell 197:3
corner 32:15 37:3
corporate 61:18 98:15
corporation 205:12
correct 19:22,23 23:1 30:15 44:10 94:7 98:6,7 103:9 107:4 129:7 131:21 132:10,21 133:6,15 134:24 135:21 136:19 137:15 138:2,9 139:1,13 140:14 141:5,20,21 142:16 144:12 145:1,2 149:12 151:24 152:5,21 152:24 154:5,22 155:3,12 156:1,7 159:8,9 162:1,24 165:2,6 166:22,23 176:13 177:1 187:1 202:21 203:13 254:21 266:3 283:14 295:18 313:23 314:3 320:8
correction 75:17
corrections 75:21
correctly 320:6
correspondence 80:3
corresponding 144:1 148:19
corresponds 141:18
corroon 3:2
cost 62:16 96:19 107:10 211:6 240:9 246:14,19 262:19,19 263:14 277:10

costing 172:24
costly 62:1,5,8 63:8
costs 254:10 262:12
counsel 109:21 161:8 178:3 184:22 191:5 193:15,20 216:24 219:7 266:8 320:9
count 45:8 219:12
couple 28:8 74:20 75:19 76:9 82:21 127:24 141:8 172:14 187:6 279:24 293:2 306:3 312:18
coupled 142:18
coupling 142:3 143:5
course 24:20 27:6 32:2 46:24 58:7 62:23 93:9 96:17 97:15 159:20 218:16 316:19
court 1:1 7:1,3,5 7:11,20 8:10,14 9:1,7,14,20 11:5 11:17 26:21 28:2 36:21 39:16 76:9 79:17 80:4,14 82:7,15,17 94:2,5 94:10,12,19 108:13,18,23,24 109:3,13 115:4 119:8 122:4,14 129:19,21 131:16 132:2 134:7,20 136:21 143:20 145:17 147:15 149:17 150:13 151:8 158:8 164:2 170:6,18,23 171:4 172:3 175:18 176:7 178:7 180:5 181:15 182:13,17 182:20 183:7,15 183:18,19 184:4 184:16,20 185:7 185:19 186:1,17 190:5 191:11,13 192:20 193:8,11 193:15,19,23 194:3,6,8 228:15 231:12 262:23 263:20 264:15 265:1,11,17 266:22 271:23 274:15 278:3 280:16 281:4,14 281:20,24 282:1,6 286:18 290:22 294:6 301:18 304:15 307:22 312:16 315:6,11 315:19,23 316:4 316:14,22 317:7 317:10,11,16 318:19 319:1,3
courtroom 1:17 9:19 109:12 182:12 185:18 219:6 281:19 282:5 316:13
cover 179:8 210:22
covered 20:7 131:12 146:8 180:1
covers 163:21
covid 14:15
cpus 19:4
create 21:15 24:1 33:4 78:1 137:20 187:12
created 39:10 89:12 262:16,17
creation 176:16
creative 113:7
creek 12:22 14:4
critical 96:21 310:21
cross 4:6,12 128:20 185:22 282:10 316:17
crossover 131:1 131:19 133:14 134:4,13,15
crr 1:20
culture 198:9
current 195:3,5,14 195:15 217:19 228:22
currently 13:17 14:22,23 57:2 200:16 204:8 219:17 222:23 248:21
custom 23:20 45:6 45:7 127:2 243:12
customer 99:18,22 100:4,18 107:20 117:22 124:3 201:14,15 202:5 203:18 204:20 213:5 214:5,10,11 219:17 220:5,7 223:24 224:18 225:23 226:12 227:9,24 228:2 229:21 255:22 287:2 305:22
customer's 279:7
customers 23:13 23:13 26:10 34:7 89:4 90:10 91:6,8 96:13 98:20 107:11 110:20 118:9 119:17 121:9 126:16,23 201:1,4,11,13,16 202:2,9,10 203:9 206:7 214:23 215:16 222:4,12 223:13,15 224:9 228:23 250:16 260:1,5,10 268:3 271:1 275:20,22 276:5 285:24 288:2 294:19 295:2 302:20 305:23 306:18 308:13 312:5 313:15
cutting 18:22

d

d 1:19 4:1 7:4
daily 16:2
daisy 118:16
daralyn 3:8
darker 40:16
dashboard 16:15 27:13 30:4
data 48:11 52:11 52:12,18 53:11,23 112:21 113:19 114:3,23 115:21 119:3 133:5,9 172:24 195:6 196:14 262:18,18 262:19 263:12 305:19 309:5

database 262:18 262:19
date 1:14 37:14 76:12 81:3 97:2,6 99:13 151:23 152:3,8,17
dated 160:6 176:11 178:10 231:15 278:6
dates 96:22 177:17
daughter 13:5
dave 123:2 125:3 245:9,11,12,21 309:4,8 310:1,2,21
david 122:24 176:2 290:17
day 10:2,4,15 17:17,22 123:16 153:11 160:22 200:10 204:20 211:22 213:19,23 235:23 254:23 261:16,23 275:10 279:8 315:12 316:8 318:17 320:12
days 10:15 62:1
ddurie 3:11
de 172:23
deal 71:12 205:18 237:18 317:21,22
dealers 276:3
dealing 80:15
dealt 91:6
dear 287:2
debated 252:3
debunking 302:9
decap 187:22,24 188:11
decapping 188:10
december 13:21 201:6 272:5,11,14 312:12 313:11 315:1
decided 191:13 203:1 224:21 253:21 257:12,21
decision 150:2
declaration 81:4
dedicated 48:16 104:11 143:10 223:16 293:8
deemed 77:18
deeply 37:19 60:1
defend 179:15
defendant 1:9 3:14 92:16 120:24 121:6 266:1
defendant's 179:24
deficiencies 38:18 40:1,2
define 88:5 117:15 241:24 246:13
defined 52:6 77:13 112:12 136:5,12 246:6
defines 76:12
defining 99:9 192:21
definitely 98:10 125:23 187:13 273:1 314:9
definition 20:23 46:2 58:9 99:20 198:10
definitions 20:15 32:3
degree 18:3,5 287:9
delaware 1:2,17 1:21 2:5 3:5 14:11
delay 60:17
delayed 14:16
deliberations 182:5
deliver 16:3 52:11
delivery 23:24
delphi 124:19 178:3 219:24 220:4 232:5,8,12 232:20 233:19,20 259:11 268:10,13 268:24 269:1 305:14,21 308:8 308:12,16 309:23
delphi's 235:3
demand 34:11 248:8
demo 309:4
demonstration 268:24
demonstrative 24:6,14 26:3
demonstratives 26:18
department 13:4 38:7 125:13
depend 15:14
depending 8:18 52:13 54:3 60:17
depends 225:4
depicted 142:14 143:1,16
deponent 320:5,6
deposed 169:24
deposition 170:13 170:17 171:24 172:9 173:7 184:22 185:3 288:23 290:3 320:8
describe 27:4 30:3 37:1 43:23 54:21 60:19 72:7 96:5 102:2 105:19 113:8 195:8,22 199:10 217:23 267:8
described 43:5 64:16 65:9 125:16 165:4 199:17 209:17
describes 61:9
describing 71:6
description 63:15 65:17 74:13
descriptive 45:22 114:12
descriptors 137:15 138:8,19 139:11
design 18:21,22 33:21 38:19 100:14 107:11,19 201:23 268:10 291:24
designation 47:4,6
designed 26:1 35:7 42:4 43:8 56:12
designing 31:9,24 34:1 97:14 99:7 244:1
despite 177:11,13
detach 59:7
detail 64:16 71:9 196:3 290:9,10
detailed 63:15 65:17 74:12
details 85:2 90:10 91:12 256:23 275:2 289:8 310:7

detect 60:18 87:24
detection 108:1
determination 238:18
determinations 318:9
determine 15:1 236:3 238:10,11 240:3 244:9
determined 43:16 238:21
detroit 298:24
develop 160:7 201:23 246:15 276:8 280:7
developed 252:3 254:3,24
developing 33:1 83:15 97:14 236:7 252:5 256:22 273:19 280:18
development 37:24 43:20 83:12 97:15,23 204:2 251:14,16,23 252:11 311:9,12 311:23
device 20:17,24 21:15 23:12 24:22 25:16 26:9 27:8 29:3 30:12 33:8 34:21,22 35:8,9,14 35:22 38:15 41:12 42:4 43:11 44:14 44:14,17,21,23,24 45:1,3,6,7,17 46:23 50:16,24 51:15 52:9,11,14 53:12,16,21 54:1 56:7 57:2,4,8,11 57:13,15,15 59:1,5 59:6,8 60:3,4,5,9 60:18 62:7,19 63:6 66:5 67:11 67:12,14,19,21,22 68:4,6,12,14 69:14 69:15,17 71:2,11 71:20,24 72:3,4,7 72:22,24 73:8,15 73:18 74:2 77:4 83:3,9,15,24 84:15 87:20,21 88:20 89:1 90:3,5 92:5 92:21 93:5 99:11 99:24 103:21,23 105:6,13,23 106:14,20 108:10 110:19 111:9 112:14,16 115:15 115:24 116:5,17 116:18 119:18 125:11 126:15,22 127:23 129:9,12 130:3,12,21 131:3 131:4 132:6,10,17 132:17,20 136:19 137:7,8,10,13,14 138:7,8,18,19 139:10,11,16 140:21 141:1,18 141:20,24 142:3,4 142:6,13,18,19 143:2,4,5,9,11,16 144:7,11,15,21,24 145:4,6,9,12 148:18,21 155:1 155:22 156:4,22 161:20,23 162:5 164:18 174:23 175:15 176:20 177:5,14 179:2,7,9 180:1 187:3 293:4 293:24 309:6
devices 25:3,4,21 33:15 35:6,7 38:16 41:9,15,18 41:22 43:6,18 47:19 48:2 55:14 55:16 56:11 57:2 60:20 62:10,21,21 63:2 66:7 68:10 85:22 106:21 131:2 135:23 165:4,15 169:11 199:21 293:9 306:11,24 310:20 311:16 317:4
diagram 40:23 41:1 46:22 47:12 50:8 68:5 110:4 112:5 116:16,21 120:2 176:15 293:6
diagrams 51:13
dialogue 91:13
dialoguing 50:18
dickens 149:15,20 157:4
die 28:10 101:7 187:18
differ 67:20
difference 58:18 87:12 104:17 146:21 147:1,5,24 148:3 155:9 158:11
differences 127:1 148:24
different 18:1 22:16,17 30:5 32:6,7 35:20 47:12 48:9,12,22 53:10 58:4 61:16 65:11 67:17 68:7 68:17 74:7 76:9 77:7 84:20 86:8 97:17 98:8,10 106:20 114:6 115:14 137:14,15 137:24 138:8,8,14 138:16,19,19 139:11,11 145:7 149:3 155:5 163:20 165:20 169:7 171:1 180:17,18 189:22 199:5,8,23 201:11 210:20 216:15 217:23 218:19,24 219:22 220:10,14 230:7 239:11 240:18 241:21 247:7,10,15,18 251:19 256:1 261:2 273:16 277:7
differentiate 23:16
differently 32:10 172:19 223:14
difficult 148:11 275:23 301:2
digit 115:16
digital 41:16
digits 37:5
dimer 215:10
diovardi 309:4,8
direct 4:4,11 12:1 48:3 140:7 164:10 188:8,21 194:19 199:13 234:15 283:7 314:11
directed 162:11
directly 32:21 33:9 47:8 48:5

49:7 50:18 51:21 98:20 100:6 127:23 162:11 221:1 243:6 245:20 258:13 273:15
director 232:4 233:18
disable 311:20,24
disagree 310:8
disclose 138:7,18 159:7
disclosed 55:5 137:9 138:2 153:5 153:8 167:2,11,21 167:21 168:2,10 168:12,23
disclosing 57:23
disclosure 64:20 77:15 78:6 150:6 151:2 156:11 158:23 161:11 163:23 164:8 166:16,21
disconnecting 60:7
discounts 202:3
discover 60:13
discovered 89:4 113:23
discovery 71:23
discuss 55:13 62:11 95:1 122:22 209:13
discussed 42:11 57:21 95:7 105:9 120:23 135:20 150:6 222:17 230:14 257:11
discussing 153:24 316:18
discussion 34:23 95:2 124:23 139:10 170:7 171:9 173:8 217:15 218:4 240:23 275:21
discussions 230:15 261:21
display 119:11 236:18 311:15
displayed 311:19
displaying 50:2
dispute 255:23
distinguish 87:12
distract 14:1
district 1:1,2
dive 60:1
divided 15:5
division 16:24 17:3 98:15 206:19 221:4,6,7,11
divisions 221:10 221:10
dockets 250:3
document 36:15 39:7 79:9 93:17 95:21 96:10 114:22 119:2 159:7 161:5,17 169:2 175:9 178:1 189:8 231:5 244:22 245:8,9 262:7,10 263:9 264:4 265:6 266:16 271:17 274:8 277:19 309:15
documentation 80:1 125:16 151:2 175:4,11 242:20
documents 161:3 188:15 266:7
doing 14:6 18:22 21:10 48:13 50:15 51:14 52:10,14 60:16 62:20 96:11 96:19 113:8 128:17 138:21 176:17,24 192:2 230:20 238:18 240:18,19,23 251:23
dollar 249:11
don 290:17 292:7
door 221:14
dot 172:24
doug 153:16,17 154:12 161:8 162:11
downstream 57:12 104:10 111:10 112:7 115:19,20 270:5 306:24
downward 50:12
dozen 16:9
draft 8:16
drag 68:23
drink 281:10
drive 199:20 311:16
driven 24:21
driver 127:2
drivers 127:4 243:12
drives 311:13
driving 21:11
drop 184:1 238:6 259:17
dropped 184:2,8 259:13
drove 31:20 49:20
dual 88:9,10 101:18 104:6 110:16 123:4 171:17,21 172:10 172:22 174:21 189:4 211:23 216:18,20 247:19 273:10
due 41:22 74:4 157:10
duly 11:12 320:5
duplicated 50:23 68:9
duplicates 312:19
duplicating 53:6
durie 3:8,8 4:13 7:10,19 8:24 228:13 231:11 262:22 263:19 264:14 265:16 266:21 271:22 274:14 278:2 281:4,12 282:7,8 282:12 286:6,11 286:16,20,22 289:23 290:1,11 290:15,20,23 291:2 294:7 298:13,16 300:20 300:23 301:16,21 301:23 304:4,8,13 304:16 307:5,11 307:16,19,24 312:17,23 315:6,9 317:1 318:18,24
durietangri.com 3:11,12,12
dust 88:10 104:7

e

e 2:1,1,3 3:1,1 4:1 5:1 6:1 320:1,1
earlier 34:5 71:22 80:15 82:7,16 87:9 104:7 106:18 117:19 120:18 123:9 127:15 149:9 156:13 188:12 207:10 209:17 216:14 222:16 229:23 230:14 235:7 244:6,15 247:9 258:20 265:24 270:24
early 17:7,16 84:10,22 97:20 99:20 186:10 226:5,6 251:22 256:21 296:24
earn 202:22
easier 82:3 122:21
easiest 51:11 53:18
easily 261:17
easy 10:2 33:2 250:12 254:14
ecosystem 241:20
edge 18:22
educational 17:7
effectively 27:19 67:24 69:11,14 88:6
effects 33:19
effort 109:9 214:20
eight 200:17 213:11,17 248:6 259:13
either 22:4,5 30:17 40:20 41:17 52:11 109:6,7 135:9 145:5 161:8 163:15,24 191:6 216:21 254:24 285:6 294:20 295:2 303:22 305:12 306:16
elaborate 246:9
electrical 18:6 28:20 197:5 242:1
electrically 41:14
electronic 18:6 161:4 199:21 287:5
electronically 318:2
electronics 50:10 51:18 268:22
element 140:20 141:3,7,17,23
elements 100:13
eliminate 49:21
eliminated 157:9
email 122:3,7,18 122:23 124:2,8 176:1,11 186:8,13 186:22 188:22 231:8,15,21,22 266:18 267:3,6,9 267:10 271:19 272:4,9,17 274:9 274:21 275:20 277:22 278:6,11 290:16 291:3,12 292:8,13 294:8 298:17,22 301:24 303:20 304:9,17 304:22 305:8 307:12 308:9,19 308:21 309:16 318:9,10,13,13
email's 302:8
emails 312:18
embodied 156:12 156:24
embodiment 59:12,14,16 63:20 138:22
embodiments 58:24 63:16 64:15 65:9,18 66:4 74:13 127:10,11 127:19 138:3 139:14
embrace 64:22
emerged 298:20
emphasis 34:2
employed 13:17
employee 19:20 198:11
employees 219:14 219:15
employers 150:1
enable 50:10 60:13 84:16 89:10 101:17 102:20 117:2 120:7,10
enabled 35:17,24 85:21 86:20 101:16 105:6 107:17 108:9 116:5 118:4
enablement 71:23
enables 25:17 40:20 67:11 104:9 104:12 105:7,8,10 106:20 108:4
enabling 84:11
enclosure 27:21 27:22
encountered 35:14
endeavor 164:17
ended 308:22
endpoint 50:14 52:3,4,7,8,15,20 53:1,3 66:18 67:6 112:20,21,22 113:4,9 114:2,5,11 123:4 136:7,11 189:5
endpoints 113:20 270:6
ends 75:1
enforcement 13:3
engage 88:17
engagements 91:7
engineer 245:14 245:15 292:24 305:3 308:2,3
engineering 18:3,6 18:19 113:1,2 128:17 197:5 207:12 287:9
engineers 39:12 159:7 160:5 195:18,21 201:22 204:1 206:5 223:11,19 232:1 246:12 267:14 291:18
enhanced 111:19
enhancement 31:17 104:20
enhancements 23:20
enjoy 13:9
enjoyable 198:10
enjoyed 128:17
ensure 34:11
entail 19:2

entered 9:18 17:12 109:11 185:17 212:2 282:4
entering 311:20
entertainment 30:22
entire 83:11 213:19
entitled 46:23
entries 160:21
entry 16:8
enumerate 59:22 60:12 105:12
enumerated 42:5 42:15 43:8,10,11 44:18 48:4 59:3,6
enumerates 67:14
enumeration 43:3
environment 33:5 48:14 179:11
environments 33:6
envisioning 10:4
ep 112:15,18,19
equipment 17:19 213:24
equivalent 15:9 249:10 284:5
erase 69:11
eric 3:9
especially 88:17 169:1
esquire 2:3,3,9,10 3:3,8,9,9
essence 202:12 260:20 296:8 297:13
essentially 214:22 223:11
establish 143:10
estimate 33:24 200:9 202:18 301:6
ethernet 60:23 61:6,14,16,24 62:3 62:9,13,18,21 63:1 63:10 127:20 129:2,6,8,11,13 130:5,8,11,17,22 131:3,20 133:7,7 133:11,13,13 134:3,16 196:7 207:3 221:4 223:12
europe 215:10
evaluation 151:2
evening 16:4 315:13 316:19
eventful 106:13
eventually 78:14 89:22 180:9
everybody 7:6 9:21 12:12 32:8 214:14 224:3 241:20 316:6 319:1
evidence 36:19 39:14 79:15 93:23 115:2 119:6 122:12 139:23 150:10,12,13 154:18 181:21,24 182:7 188:16 298:14 312:14 317:4,24
eweiner 3:12
exact 28:9 72:12 72:14 258:9 297:5
exactly 32:8,22 37:22 38:5 58:9 84:24 113:8 135:22 136:24 162:9 221:12 258:18
examination 4:4,6 4:7,11,12 9:10 12:1 128:20 185:22 190:8 194:19 282:10 283:8 316:17 317:18
examined 194:16
example 16:11 25:2,18 41:17 48:7 50:22 59:17 60:24 61:6 63:21 63:24 138:4 201:3 208:10 214:11 237:11 258:23,24 269:3
examples 34:14,16 59:17 60:20 65:14 199:11
exchange 133:8,9 290:16 304:9
excuse 27:21 38:9 56:22 62:10 65:8 168:16 174:11 225:22 243:24 251:14 272:12
excused 182:11 193:14 281:18 316:12
exercise 147:12 158:2,6,14
exhibit 27:7,10,17 29:10 30:13 34:21 36:3,8,9,12,19 38:24,24 39:4,14 40:12 42:1 45:12 75:10 79:2,12,15 80:19 81:23 82:19 82:20 87:11 93:12 93:14,23 94:6,22 94:23,24 97:3 101:21 110:4,4 113:13 114:17,19 115:2 117:19 118:21,23 119:6 120:17 121:20,23 122:2,12 127:7 133:21,23 134:18 139:3,24 147:10 147:17 150:9,20 150:21 151:6 154:15,17 158:22 163:2 164:8,24 175:21,22 177:20 177:21 178:5,20 181:2,3,7 186:4,5 186:13,14 187:9 188:14 190:16 192:11 204:22,23 205:2,4 230:24 231:2,10 244:17 245:22 246:2 248:10 262:2,4,21 263:2,5,18,22 264:1,13,17 265:9 266:10,13,20 267:1 271:11,14 271:21 272:1 274:3,5,13 277:13 277:16 278:1 286:9,13,21 290:12,13,16 291:8 301:12,13 301:22 303:20 304:5,6,9 307:6,7 307:12 312:13,18 312:21 313:1
exhibits 27:1,5,24 36:6 317:15

exist 56:17 57:6 241:23
existed 169:18
existence 226:6
existing 63:2 157:18 169:11 214:4,5
expand 32:18
expanded 47:12
expect 23:9 32:22 73:9 198:11 255:11,19 280:5
expectation 60:3 229:4
expected 14:13 32:16,17 96:20 248:13 255:14
expecting 138:12
expense 63:9 214:13,15
expensive 78:1 127:21
expert 131:23 147:13
experts 22:17 158:9
expired 282:20
explain 14:11 19:15 21:18 24:7 29:23 30:16 40:11 42:9,14 44:12 46:17 50:1 51:8 52:4 54:24 56:1 58:3 59:11 61:8 65:2 66:2 79:22 82:1 84:5 110:11 116:20,22 124:17 164:17 202:8 205:24 207:24 208:18 210:11 241:16 253:15 267:24 268:17 269:23 270:20 275:6 276:12 279:22 289:13,16 289:17,20
explained 235:7 265:24
explaining 59:23 59:24 71:1 290:3 310:13
extends 252:8 264:8
external 63:2,5 104:18 112:9 162:18 191:6 253:6
externally 253:4
extra 34:9
extremely 241:11
eye 84:21 276:16

f

f 320:1
faced 31:23
facilities 212:20
facility 213:3
fact 95:7 129:14 155:18 161:22 172:21 175:13 188:10 217:9 223:9 239:12,23 241:13 253:11 273:10 282:17 310:22
factories 213:1
fail 57:10 224:1
fair 90:9 154:13 187:24 296:17,17 296:18 297:19 299:21 301:6
fairchild 17:15
fairly 23:6 62:1,19 63:7 87:11 113:19 126:24
fall 39:10 154:4 195:23
falls 196:20
familiar 61:21 149:16 174:4 224:12 244:21 245:4
family 35:18 197:9 214:17,22 222:19 230:13
fan 209:21 221:1
far 78:18 84:23 138:3 167:20 168:5,8,10,11 180:19 183:24 197:24 223:23 249:19 250:11 258:1
fast 312:11
feature 35:18 85:6 85:8 100:2 125:20 236:20 242:11 246:18,19 254:3
features 23:17 34:10,22 84:16 96:14 99:10,22 100:17 120:2 126:5,20,21 174:15 175:10 204:2 239:8 246:18 254:10 275:14 280:19
february 76:13
federal 1:16
feedback 7:22 107:20
feel 37:23 69:9 183:5
fees 208:7,11,19 209:1 282:18
fellow 12:9
felt 21:13 38:19 62:5 63:10
ferrer 24:10 40:8 41:23 44:2 45:11 46:15 49:22 54:9 55:19 56:15 58:13 61:1 63:13 64:5 65:20 66:23 68:20 70:19 74:10 75:10 75:24 79:19 80:18 81:22 82:9 101:22 102:13 103:2 104:1 105:1,15 108:11 110:3 111:23 113:12 115:6 116:10 119:10,21 122:16 123:10 124:14 127:6 190:14,15 192:11 205:1 244:16 266:24 271:24 274:17
fiat 304:19 305:16
field 96:12 241:13 305:2
fields 261:17
fight 234:1
figure 33:7 40:9 40:12,15 42:24 46:9,12,18,21 47:7 47:10 49:8,14,23 50:1 66:20,22,24 67:3,20 68:23 73:8,19 76:10 85:3 105:16,21 110:8,10 113:12 113:16 116:14,14 118:1 119:21,23

140:6,10,12,24 141:4,14,19 142:7 142:14,24 143:17 145:1,13 146:8 157:15,19,22 158:3,7 184:11 254:14 302:24 306:15
figures 54:5
figuring 93:4
file 79:10,23 80:6 161:4 167:14 204:4
filed 37:12,14 77:12 80:1 282:21 289:3
fill 77:14
filled 152:3 159:12
final 8:6 82:13 160:1 213:2
financial 96:18
find 23:22 38:19 83:10,21 100:10 203:1 204:18 230:24 233:23 234:8 240:13 256:3 260:17 273:12 276:13
finding 191:22
fine 56:22 61:12 66:3 111:13 171:5 181:15 183:8 184:16 236:2 253:21 256:19 258:10 265:17 275:11 303:22 308:10 317:7,16 317:17 318:13,14
finish 128:1 295:22
finished 126:15
firm 162:18
first 9:5 10:6 11:4 11:11,22 23:4,5 29:11 37:16,21 42:13 43:2 50:7,9 51:12 58:14 59:12 65:21 70:21 74:2 74:18 79:8 92:1 92:14,19 103:5 125:14 135:1 140:20 141:3,7,9 142:4,19 143:12 144:1,5,19 145:5,7 148:19 149:21 151:11 152:17 153:5,8 156:17 157:4,8,14 160:20 176:14 192:15 194:16 198:23 200:11 203:12 205:7 211:24 212:12 218:2 232:3 233:15 247:5 256:15 257:12,20 267:10 272:17,24 278:10 279:4 292:6 298:21 303:18,19 309:13,15 314:5
fit 77:3
fits 29:4 54:21 218:3
five 67:15,16 68:9 203:13 259:16 261:6 281:8,12,15 281:20 315:8
fix 184:5
flawed 303:8,13
flex 116:21 117:1 118:3 120:6,15 216:18 267:17,20 268:5 269:2,13,18 299:3,13 301:1 313:9
flexconnect 102:19 103:8 107:16 216:17 232:13,22 234:21 247:16 294:9,13 296:11 312:7 313:18,22
flexibility 66:6 250:11
flexible 201:12
flexing 270:8
flip 46:19 87:22 152:11 154:14 164:7,9
floor 2:5 3:4
flow 162:12
fly 59:8
flying 84:23
fob 221:14
focus 16:5,14 34:2 173:9
focused 85:9
follow 32:4 143:3 187:13 242:4 248:5 267:16 285:16
following 23:10 64:21
follows 11:13 170:8 194:17
force 17:12,14,15 17:24 250:15
ford 211:20
forecast 202:15,20 203:9 248:9 259:1
forecasted 258:22
forecasting 259:4
forecasts 257:22 259:17
foremost 42:14
foreseen 25:10
forget 174:23
forgetting 73:4 96:23
forgot 69:6
fork 120:19 121:1
form 150:6 151:2 151:24 152:4 158:23 159:4,12 160:16 162:8
formal 202:12
formatted 30:8
forth 46:2 80:3 109:21 156:5,23
forward 22:5 23:21 72:3 78:16 83:11,22 89:23 254:7 256:19 309:17 312:11
found 82:17 102:3 140:13 141:3 145:20,24 158:3 191:18,20 192:23 193:1 229:21 231:1 283:1 302:16 306:6 309:1
foundation 265:13
four 17:13 25:13 25:13,20 40:18 115:19 116:21 117:6 118:2,3 120:14,15 195:11 195:16 197:23 202:17 222:20 225:13 234:18 251:21,21,22,24

276:20 296:16 306:4
francisco 3:10
free 69:9
fresh 60:11
friend 316:2
frog 56:23
front 24:19 25:13 29:14 34:20 51:22 118:13 139:1 171:8
fronts 253:17
frost 2:10
fulfillment 98:21
full 15:3 22:3 37:23 115:12 124:20 316:8
fully 41:19 64:20
function 28:21 53:17,21 54:1 55:6 68:4 98:16 103:14 129:24 130:1,2,3 137:7,8 137:10,14 138:7 138:18 139:10 141:18,20 142:4 142:19 143:5,15 144:21 145:9 166:14
functionality 173:4 225:15
functionally 112:13
functioning 72:13
functions 48:6 50:19 99:11 136:19
fund 78:15 83:8,9
fundamental 179:6
further 113:21 124:2 190:3 193:6 193:9 238:9
future 44:15 204:16 208:23 209:4,6 222:18 279:14

g

g 62:20
ganesh 277:22
garage 221:14
gather 100:2
gathered 167:16
gathering 39:11 99:21 100:17 154:10 299:7
gears 79:1 217:22 221:22 224:11 241:4 253:10 257:1
general 54:20 55:22 56:5 211:1 220:2 221:10 272:20,21
generally 50:17 54:19 57:4 59:18 98:24 248:23 267:9,21 271:1
generation 96:14 102:8 104:16 105:23 228:24 251:11 252:5,15 253:6
generations 249:8
generically 66:17
gentlemen 94:23
getting 7:22 8:3 52:18 72:16 176:22 188:23 265:8,21
ghosh 37:10,16 38:1,10 39:24
gigabit 62:9
gist 314:14
give 10:3 20:1 23:20 25:19 34:14 34:16 45:19 48:7 72:1 73:14,15 115:11 178:18 180:18 196:2 201:17 202:14,15 202:18,19 215:3 217:16,20 224:14 244:13 256:23 257:13,21 258:23 273:3 294:4 315:7 317:21
given 8:18 57:6 78:21 145:8 155:23,24 246:17 255:15,16 257:22 305:14,22 311:4 315:14 320:9
gives 76:12 118:14
glass 139:22 146:16 150:8 151:11 154:16 159:1,22 171:11 172:4 176:8 186:19 189:11,16 298:14 300:20
glasses 26:23
gm 211:21 232:14 279:8 291:22,24
go 7:23 8:22 17:11 23:24 25:6 27:18 33:7 40:8 42:17 42:24 44:2 45:12 49:23 55:20 60:23 63:13 66:23 68:24 70:20 71:8 75:3,9 75:11,24 79:2 82:9,21 89:10 100:7 101:23 103:1,4 104:1,24 108:3,11 110:6 117:20 119:20 127:8 132:4 134:9 143:21 158:22 160:15,19 161:19 164:3 167:18 168:9 171:8 186:20 187:13,16 189:10,19 192:10 210:15 214:14 215:10,13 218:10 221:24 222:4 225:8 228:16 243:15 250:3,19 260:3 268:21 269:17 287:1 290:24 298:13,21 300:18,22 301:1 302:12 303:18,19 304:4 306:2 307:5 309:15 312:7,24 313:3,4 314:6 315:17 316:1,5,20
goal 8:15
goes 28:11 54:21 74:20 142:2 143:8 143:24 179:5 225:6,11 232:12 293:11,18 311:8
going 9:4 10:1,5 11:21 16:14 17:14 17:23 22:5 23:21 28:4 34:10,15 47:23 50:5 51:15 53:14 60:6 61:15 72:3 79:1,2 80:3 82:21 85:4,20

92:3 94:24 100:11 105:21 106:7 124:19 128:6 143:1 147:11 171:5,6 181:18 184:9 185:21 189:19 191:9 194:1 202:16 203:3 224:4 229:12 230:17 235:21,24 236:1 239:17 242:24 246:13 251:2,3 254:7 256:19 257:23 258:1,14 258:15 259:9 265:14 269:20 273:15 279:13 280:9 281:5 291:22,23 295:15 295:22 297:15 298:1,3,8 300:5 309:17 311:9 312:6 315:13,19 315:22 316:15 317:19 318:7
good 7:5,7,8,9,10 9:2,20 10:1 11:18 12:4,5 21:14 23:22,23 78:11 83:7 101:1 109:18 128:23,24 154:2 189:17 212:18,18 261:19 282:13 301:21 305:1 306:8 316:6,10 319:2 320:3
google 316:2
gorilla 219:8 283:12
gory 71:9
grade 13:13
graduate 197:6
graduated 17:11 18:5 197:7
graduation 18:9
grandchildren 197:22
granddaughters 197:23
granted 204:12
graphic 102:2 112:1
great 9:14 62:5 65:1 70:14,18 76:20 89:18 92:4 316:7
greece 86:16
green 102:6
grew 83:19
groundbreaking 85:12
group 125:2 196:11,17 207:12 207:13 223:11,19 243:24 245:19 251:18 267:11 272:22
grow 217:9
growing 21:13
grown 13:2 198:18 198:20 200:7
grubert 2:9
guess 7:21 20:5 30:16 44:20 61:13 72:6 73:10 75:19 78:13 152:2 167:13,19 184:8 198:1 233:23 261:9 297:19
guesses 176:22
guys 239:19

h

h 5:1 6:1 11:9 194:12
half 14:6 213:23 222:14 227:6 233:11 249:11 259:18 278:24 281:6
hall 153:14
hand 67:24 68:22 69:3 155:10 194:9 281:11 286:8 320:11
handed 27:5 150:19 161:6,7 175:20 177:19 181:1 186:3 187:8 312:22
handing 161:2 317:23
handle 270:8 273:9
handles 106:24
handling 9:9,15
hands 180:10
hang 294:23 302:2 302:5 304:20 308:11 309:14 311:11 317:8
happen 121:7 280:6
happened 92:22 107:19 261:22
happening 10:20 146:20
happens 214:2 283:5
happy 58:23 76:14
hard 72:13,16 87:12 187:19 203:13 256:18 296:3
hardcopy 160:6
harman 308:23
head 16:15 29:18 29:21,24 30:2,23 55:17 85:11,14 86:24 88:7,12 89:7 90:3 103:23 104:12 105:10 106:8 121:19 127:3 147:21 174:10 196:12 218:5,11 219:12 225:11 237:1,5,14 237:18 243:5,21 250:3,3,13 253:2 268:11,24 269:5 270:10,16 278:14 281:15 292:1 293:3,6 306:11 311:2,4,19
headings 64:23
heads 170:11
hear 12:12 84:10 94:11 95:1 109:16 109:21 181:20 316:4
heard 24:4 84:22 207:10 211:15 216:13 218:4 239:14 282:24
hearing 109:4 174:14
held 29:12 170:7 195:15
hello 9:12
help 16:3 20:2 24:7 99:2,3 109:9

201:22 223:11 250:16
helped 22:10 31:18
helpful 167:23
helping 11:21
helps 251:7
hercules 3:4
hesitancy 91:23
hey 275:21
hi 115:23 308:22
hidden 199:24
high 15:23 17:11 22:12 68:5 85:5 196:1 200:16 209:16,17 210:13 213:9 217:8 220:18 250:14,15 251:6 259:3 287:24 290:5,7,8 294:2
higher 203:12 210:21,21 260:11
highest 195:10 260:8
highlight 55:22 56:17 61:2 64:6 65:21 68:21 69:7 184:14 269:21
highlighted 62:15 69:12 70:2,9,13
historical 206:20 211:19
historically 241:10 242:17
history 210:1 219:23 251:6 259:8
hit 99:13
hmm 23:2 131:6 283:11
hold 29:1,9 67:24 94:19 132:2 182:4 207:8 287:9
holding 133:3
home 13:1 72:19 197:19 315:18,18 316:1
homes 61:19
honda 215:14
honest 37:18 78:6 140:15 146:23 168:24
honestly 31:1 37:20 52:23 146:2 161:13
honor 7:18 8:7 9:6 9:11,12 11:15 26:19 27:23 36:18 39:13 79:14 93:22 94:1,18 95:13 110:2 119:5 122:11 131:15 134:6 147:11 150:12 170:4 171:23 181:11 182:18 184:3,15 184:18 185:24 186:11 193:7 228:13 265:3 282:8 289:23 294:4 307:21 317:13 318:24
honor's 185:4 317:3
honorable 1:19 7:4
hope 7:23
hoped 260:17
hospital 13:6
host 20:24 24:21 25:16 32:21 33:10 34:22 35:4,8,8,10 35:22 38:17 40:20 40:21 41:18,20,21 42:5,19,24 43:8,9 43:12 45:2,17 46:22 47:3,4,5,24 50:7,17 51:1 52:10,11,14,16 56:8,10,12,14 57:3 57:5,9,14 59:5 60:2,6,8,11,16 62:7 66:5,9,11 67:10,10,13,17 68:9,12 69:21 70:1 71:2,3,4,19 71:19,22 72:10,20 72:23,24 73:1,7,14 73:14 74:3 83:3 83:15,24 84:15 85:10 86:4,23 87:1,5,19,23 88:20 89:1,8,9,10 92:5 92:21 101:19 102:21 104:12 105:6,11,11 112:13,16 115:24 116:5 123:4 125:11 126:22 127:21,22 130:12 130:21,22 132:9 132:16,17,20 133:1 134:23 135:4,6 138:11,12 139:17 140:21 141:1,23 142:3,6 142:13,18 143:2,4 143:9,16 144:11 144:19,20,24 145:12 148:18,20 155:11,11,22 163:11,11,24,24 165:8,8 167:6,6 168:23,23 169:12 169:12,17,17 179:2,7,9 180:1 189:4 196:10 207:18 209:10,21 217:16,16 237:2,5 237:7 239:13 240:16 241:2 244:10 247:12,19 248:20 249:24 255:9 256:8 270:5 273:10,11 276:17 291:24 293:5,7,10 293:19 310:19 311:1,5
hosts 35:15,20 41:5,8 44:18,24 45:5 47:13,15 48:5,5 50:22 53:10 59:2,4 66:7 73:20,21 86:22 87:2,3 88:22 89:14 101:17 105:10,12 113:21 116:7 121:17 137:15 138:20 139:12 141:9 144:1,13 145:6,8 156:4,22 164:19 239:13 247:22 293:15,23
hour 15:6 281:6
hourly 15:5
hours 15:18
house 12:22 13:11 162:19 191:6
housekeeping 8:1 109:1 151:14 316:24

houses 72:14
hub 20:20,23 21:10,12 22:23 23:5 24:7 25:13 26:1,2,14,16 27:12 28:6,20 30:24 31:10,21,24 32:5 32:17,23 33:9,12 33:14,14 34:1,18 38:14 39:9 40:18 40:18 41:17 44:22 51:13 57:12 86:6 86:9,17,18 87:16 102:3 103:13 107:15 108:3 118:8 123:18 153:20,23 154:23 155:8 171:17,21 172:10,17,22 173:5,15,18 174:21 175:4,6 209:14,15,18,20 209:24 210:2,6,8 210:10,12,14,15 210:24 211:4,9,24 211:24 212:6,8,14 213:7 215:18,22 216:2,5,11 217:4 217:11,24 225:6,8 225:17,18 226:8,8 226:9,14 227:3,18 228:7,11,12,19,20 229:3,14,22 230:11 233:7 241:6 242:19 244:2,10 246:24 247:4,20,23 248:15,16,21 249:5,13 250:5,6 251:11 252:5 254:20 256:6 257:5 259:12,23 262:13 267:17,20 268:6 284:6,11,14 284:15 285:5 299:3 301:1 303:7 311:14
hub's 107:18
hubs 19:8,9,11,22 20:3 21:3 31:15 33:1,21 165:18 188:3 211:1 213:11 226:10,23 227:1 228:7,20,23 270:3
hundred 199:23 214:12 261:2,5
hundreds 16:11

i

i.m. 2:4
icu 13:5
idea 29:3 35:9 37:17,21 38:3,11 44:16 45:22 46:6 77:18,21 78:5,10 78:12 92:22 129:23 136:3 149:22 152:7,22 153:8,19 154:1,2 156:9,12,21 157:5 161:13 221:2 270:8 306:13 307:2
ideally 182:16
ideas 65:14 129:4 310:3
identical 191:24
identification 286:7 290:12 312:13
identified 149:1,2 166:1 299:2 311:22
identify 158:11 205:10 220:21 225:9 247:14
identifying 293:21
ignore 311:7
images 186:12
imagined 33:4
immediate 274:1
immediately 83:5 207:21
impact 246:21 249:13
impeach 185:14 185:15
impeachment 170:15 171:7 184:24
implement 250:13
implementation 97:22 126:2
implemented 65:7 65:8 114:1 179:10 180:2
implementing 293:16
importance 160:5
important 109:20 159:11,18 160:10 201:19 233:14 276:13 299:23
impossible 65:5
impressions 182:1
impressive 249:12
improper 170:14
inaudible 317:15
include 15:24 99:20 160:22 182:1 263:13
included 78:22 122:10 145:17 149:6
includes 181:22
including 15:4 210:1
incorporate 96:16 318:16
incorporated 1:5 313:21
increase 258:17
increases 260:6
incremental 214:15
indicated 320:5
indicates 115:17 283:6
indicating 43:5 65:13 121:15
individuals 304:10
industry 18:2 22:20 26:15 27:12 30:20 31:19 32:6 100:12 201:9 211:10 223:13 241:10,24
inevitably 315:20
inform 255:9 287:3 288:10
information 57:17 96:18 99:22 100:6 100:10,17 120:23 126:1 233:24 254:6 299:7
informed 235:9
infotainment 179:11 180:3 196:10 221:7
infringement 174:1,8 248:17 255:12 261:14 286:2

infringes 128:3
infringing 174:17 224:22 240:20 241:1,3
initial 93:4 192:1 311:9,12
initially 19:3 23:5 87:19 113:17
innovation 151:1 158:23 162:7 203:23
innovations 38:21 159:8 179:1 204:5
innovator 128:15
inside 24:22 26:9 26:12 27:18 28:11 52:9 129:17 199:24 254:21 272:21
inspection 148:13
instance 99:14 218:21 223:17 259:4
instances 110:18
instruct 184:6
instruction 94:1,6 94:9,15
instructions 8:4 8:16 135:23 184:5 184:7,11 318:12
integrate 107:7 219:2
integrated 104:19 112:9
intel 19:4
intellectual 179:16 280:21,22
intelligence 53:23
intend 202:17 208:24
intended 64:21
intent 258:4
inter 22:12 76:4,6 192:16
interact 23:12 98:19,23 99:1
interest 84:11
interested 320:10
interesting 46:5 172:13 258:8
interests 179:17
interface 66:9,11 66:15 69:20 70:1 70:7 135:8,10,12 135:20 136:4
interfaced 91:4
interfaces 69:5 70:4
internal 39:11 57:16 86:13 125:15,16 173:9 173:14,16,17 178:3 231:8 266:17 271:18
internally 35:19 114:4 115:11 254:24
internals 173:4
international 20:19
interoperability 33:5
interpret 32:9 59:18
interpretation 176:16
interpreted 64:22
interpreting 172:19
interrupt 10:23 28:23
intervals 71:12
intrinsic 210:18
introduce 12:6 40:5 209:23 242:5
introduced 27:2 36:13 39:5 76:7 79:13 93:15 114:20 118:24 121:24 133:24 150:22 175:23 177:22 181:4 186:6 231:3 262:5 263:6 264:2 265:10 266:14 271:15 274:6 277:17 286:10 290:14 301:14 304:7 307:8
introduces 54:20
introducing 13:14
invalid 145:16,22 145:23 146:1,9,22 148:5
invalidate 149:23
invalidated 149:10 149:24
invasive 250:12
invent 52:19 130:7 130:15,17 133:11 133:12,19 134:23 135:4,6,8,17,19 136:7,10,16,18 137:13 157:3,8,14 157:22
invented 131:9 133:10 135:10 137:7,18 139:15 149:20 160:12
inventing 32:7 55:7 78:5 131:10
invention 24:17 49:20 54:15 55:15 57:19 58:4,13,18 60:21 62:6,12 66:12 69:18 76:22 77:11 127:11,19 150:5 151:1 153:12 158:19,20 161:11 163:23 164:8 169:19 204:14 208:21 209:10
inventions 37:20 46:2 77:14
inventor 37:6,8,10 78:7 128:8 207:4 282:14
inventors 12:10 37:15 55:9
invest 203:23
investigate 90:23 234:11 235:4 240:2 288:13,17 288:21
investigated 238:9
investigating 230:19
investigation 91:16 120:21 121:5 236:8
investment 77:24 96:20 279:11 280:18
invite 315:21
involved 20:19 22:7,16 31:9 37:19 78:2 84:20 90:17 97:14 146:2 146:4 150:4 155:15 158:10 161:14 162:15

171:17 174:7 196:19 218:19 239:10 244:1,5
involving 32:3
io 102:21
ip 179:24 239:19 239:23
iphone 85:21 86:3 86:24 89:10 103:12 105:11 108:2 117:3 120:8 216:10 237:4,5 241:18 270:11,16 271:10 303:6 306:13 307:1 311:6,14
ipr 82:6
ish 226:13
issue 25:11 33:2 88:15 215:18 224:6,7,7 280:11 280:12 311:23
issues 7:16 124:3 202:1 224:8 318:7 318:22
item 14:2 45:17 49:12 62:1 114:6 223:9 237:2,6
items 53:7 55:2 57:24 58:1 238:5 310:3

j

j 1:16 3:8
january 175:13 176:12,19 178:11 268:23
job 17:17 18:24 62:20 273:7 280:22 320:17
jobs 204:1
john 2:3
join 18:17 195:1 207:5
joined 195:2 198:21,23 200:11 207:9
joshua 1:19 7:4
jshaw 2:6
judge 1:19
july 126:10 267:4 298:18 302:4
jump 122:17 123:11 127:7
jumping 269:12
june 37:14 126:10 201:9 307:15 308:17 309:20
juror 8:22
jurors 7:13 198:5 202:8 230:4 233:5 241:16 249:21 253:15 270:20 273:4 275:6
jury 8:3 9:17,18 11:19 12:7 14:11 15:19 17:6 19:15 20:1 28:7 45:14 65:2 80:21 87:8 96:5 109:2,11 171:14 182:11 183:4,22 184:6 185:17 195:9,22 196:24 199:10 205:24 207:24 208:18 215:3 217:23 220:21 224:24 258:24 267:8,24 269:23 276:12 279:22 281:18 282:1,4 316:12 317:24 318:12
justification 93:8 96:11

k

k 11:8 194:13
keenly 38:18 89:15
keep 53:10 84:21 189:19 209:2 238:8 258:10 269:20 283:19,21
keeping 160:5
keller 2:2
kept 125:23 261:19 296:10
key 93:9 96:14,21 99:12 179:8 199:17 221:14 232:14 254:3 276:8
keyboard 30:10 48:16,20,24
kia 215:13
kids 8:22 197:16
kin 320:9
kind 21:11 22:5 23:3,8,19 24:7,15 28:7 34:15 41:12 45:7 46:8 47:21 48:11,24 53:5 60:10 63:3 65:12 67:24 69:6 74:10 77:19,23,24 91:24 98:16 105:16 110:9 120:4,10,18 125:19 136:22 156:17 169:14 185:3 221:1 318:8
kinds 71:15 106:21 161:17 199:15
king 1:16
knew 55:14 65:5 89:24 124:23 184:8 253:19,20 255:16 257:11 276:16 298:9
know 8:8 9:8,14 9:23 10:15 20:9 20:10 23:22 24:4 25:5 32:2,2,12 33:6 34:10 42:13 42:20 43:17 48:12 48:17 50:3 52:8 52:17 53:4,8,22 54:17 55:8 56:3 56:12 57:24 59:12 59:21 60:13,16 65:9,13 67:22 68:4 72:15 74:21 77:2,8 79:8 80:10 83:6 84:17 85:20 89:23 90:1 92:24 99:2,11,12,16 100:9 105:24 108:14 109:19 118:13 120:24 125:18 127:14 129:16 132:1,4,5 132:13 134:14 137:5 145:17 146:3,4 147:5,19 147:23 149:17,23 152:1 157:3,16 158:5,13 161:10 161:16 165:21 167:14,17,23 168:13,15,24 169:8,10,21 171:6 172:18 173:7 177:1 179:14 181:19,23 182:19

184:21 187:10 196:24 198:7,12 198:21,24 199:1 202:16 203:8,10 204:7,17 205:17 205:20 208:23 211:8 213:17 215:14 216:16,23 219:10,21 220:9 220:18 221:11 222:1 223:1,7,21 223:24 224:4 225:4 226:5 227:6 227:11 229:5 231:21 234:24 235:13 239:2 240:13,24 242:1,6 242:8 243:15 246:16,22,23 248:11 249:9,17 250:20 251:1 252:14 253:18 254:14 256:15,20 257:20 258:4 260:10 261:13,15 268:4 269:3 270:24 273:23 276:4 277:2 280:2 280:19,21 281:11 285:2 289:8,10 298:7 299:19 304:24 306:9,14 310:8 312:15,17 315:17 316:4,23 317:19,20 318:1 318:11
knowing 177:11
knowledge 22:19 55:10,10
known 135:13 167:8 219:24 225:2
knows 52:16 67:18 72:22 214:14 261:21
koehler 282:2 317:8
kvm 48:20 49:9 63:3

l

l 194:13
lab 17:19 217:18
label 115:12
labeled 51:4 52:2 74:17 107:17 111:11 113:9 140:24 141:13,19 142:15
labels 114:6
labs 132:12 133:2
lack 75:20
ladies 94:23
lane 294:20 295:2 295:8,9,14,16 297:3,16 312:6 314:21
lanes 295:7
language 75:22 162:23
laptop 30:6,10
large 40:17 199:19 199:20 201:20 202:10 203:24 211:19 222:12 250:15 258:6 280:18 283:21
larger 201:16 202:4
largest 28:11 299:3 300:22,24
las 268:23
lasted 19:6,12
late 152:7 239:19
latest 100:15
law 13:3
lawsuit 255:21 289:3
lawyer 59:11
lawyers 46:6,11 159:15
layman's 117:11
lead 43:20
leadership 17:2
leading 174:8 228:14
leads 47:24
learned 23:13 92:6 121:8 229:18,18 235:12 259:16 295:13 302:19
leave 146:17 193:15,20
led 37:11 38:9,10 38:20 76:17 87:15 156:10 261:15
left 37:13 40:21 41:19 45:16 47:4 47:15,17 54:14 68:11,22,22 102:6 108:15 111:3 118:4 146:17 168:13 182:14 197:20 313:5
legal 1:22 46:1,6 58:9 76:8 131:15 143:19 177:15 178:16 191:7 287:3
leidesdorff 3:10
letter 173:23,24 174:4,9,20 175:5 177:15 178:2,10 178:16,17 179:24 285:23 286:4,14 287:2 288:1,15,19 289:3
letters 20:6
letting 182:19
level 16:8 38:2 68:5 85:5 91:10 93:1,5 98:16 99:10 195:10 196:1 200:16 209:16,18 213:9 220:18 259:3 287:24 290:5,7,8 294:2 310:7
levels 20:18 144:8
lid 28:16
light 146:1 149:14
likes 310:2
liking 297:20
limit 73:3 99:17
limiting 94:1
limits 71:5
line 10:23 34:6 47:23 55:21 56:16 70:22 127:9 148:6 148:23 170:12,12 172:1,6 207:2,3 262:14 279:19 302:8 305:6
lines 41:4 70:21 187:13
lingo 21:21
link 87:2
list 144:2 202:6 221:23,24 222:14 227:12,13,18,20 227:22 267:13
listed 37:6,9 175:10 238:18 287:7

listening 183:23 275:19 315:19
lists 205:8,11
litigation 223:3 261:10
little 12:18,20 13:10 15:19 17:4 17:6 19:6 20:2,7 22:22 24:3 26:6 26:24 31:6 32:14 33:16 36:5 39:22 46:8 47:11 50:4,8 51:3,13 52:8 56:23 79:1 83:6 83:13 84:5,24 87:7 89:22 107:10 107:24 108:14 109:3,5 117:3,19 117:21 123:9 133:22 137:23 138:15 148:11 165:20 168:20 180:19 183:12 196:3,4,23,24 212:9 217:22 221:2,22 222:16 224:11,14 225:5 241:4 243:6 253:10 257:2 261:1,15 270:24 292:19 298:17 301:2 303:24 306:2
live 12:20,22 14:4 51:18
lives 16:2
llc 1:8
llp 2:2
load 277:2
loaded 127:3
local 242:20
located 29:12
location 52:9,12 52:13
locations 50:17 203:2
logic 18:11 53:9
logo 217:17,20 297:8,12
long 14:12 19:5,9 37:18 164:21 195:13 197:13 202:11 203:5 220:4 227:8,12,16 252:13 257:10 258:10,19,21 259:22 294:4 317:16
longer 112:8 237:6 257:23 258:14 273:24 313:10
look 8:15 26:16 28:6 36:3 37:13 46:12 54:10 63:12 63:13 74:8 79:7 80:9 82:3 84:14 93:6 116:13 124:12 134:6 139:19,20 147:4 150:5,9 153:1 156:15 159:21,24 161:18 165:15 170:18 180:22 188:16 191:9,17 205:2 213:16 219:12 234:13 236:16 238:23,24 239:6,12 244:19 244:24 245:1 259:7,8 260:3 266:2 267:3 291:5 292:5,12 301:11 303:4 304:18,21 305:8 308:19 310:2,18 312:21 314:4 318:15
looked 21:14 28:15 157:18 165:11 229:5,24 239:2 298:17
looking 65:16 88:15 94:16 100:11 102:16 122:22 125:23 148:16 150:17 152:14 158:15 170:23 178:17 240:8,11 285:6 292:19 302:6 316:1
looks 80:8 181:12 231:23
lose 8:23 229:24 255:3,6 257:17 270:17 309:5
losing 57:16
lost 229:19 235:13 241:7
lot 7:22 14:8,15 20:15,18 21:21 23:14 32:3 33:3,6 46:6 50:15,18 54:3 59:10,11 61:15 71:10 72:11 82:4 84:20,23 85:9 100:5 196:7 201:3,4 209:21 210:23 215:2 218:19,23 221:7 223:10 243:11,13 250:10,18 253:7 276:23 279:7
lots 22:15 76:15 169:2 239:3
love 128:16 310:3
low 310:7
lower 37:13 203:12 211:6 249:23 250:2,4 278:13,21 284:3,5
lowest 260:7
lunch 10:9,10 181:13,16 182:6,8 182:23
luncheon 183:16

m

m 11:8,9 194:12
machine 320:7
mail 72:17
mailbox 72:15
main 85:8 97:20 127:1
maintain 78:1 88:21 89:7
maintenance 208:7,11,19 209:1 282:18
majority 80:12 110:20
maker 284:7,11 285:5
makers 301:3
making 126:15 270:23
manage 195:18
managed 38:8
management 232:4 233:18
manager 38:7 78:9 95:24 123:1 207:11
managers 77:17 83:7 245:13

267:11
mandates 56:9
mandatory 81:1
manufacturer 212:23 215:7 218:11,12,13,13 218:17 226:15 230:9
manufacturers 210:6,9,10,12 211:20 212:5 215:3,4 218:15 226:21 228:11,19 229:3 236:1 241:5 242:14 243:3,5 275:12 276:11,14 277:1,7 279:9 280:3
map 277:4
maps 237:12 277:2,3
march 201:10
mark 4:3 11:4,8 11:11 12:8 207:11 239:14 246:5 247:12 290:11 307:13 308:5,8 309:22,23 312:12
marked 5:2 133:20 150:20 175:21 177:20 181:2 186:4,12 286:7,13
market 1:23 2:4 3:3 21:13 34:12 58:1 83:18 84:11 84:21 114:13 125:19 204:16 206:8 208:4 209:4 209:9 210:19 212:2 226:17 229:8 236:2 239:20 248:22 249:20 257:14 260:14 275:10 276:1 283:1,17,21 287:6 300:6,15
marketer 314:16
marketer's 273:6
marketers 107:17 214:18 223:20 231:24 267:13 272:21
marketing 91:5,9 93:6 97:21 98:9 98:12,14 99:1,2,4 100:6 123:1 125:3 173:1 176:23 214:3 245:12 267:11 292:24 314:13,17
marketplace 23:17 33:16 106:2 216:15 250:4 252:20
married 197:11,13 197:14
master 24:22
match 235:19
matched 23:7
material 214:19
materialize 209:4 209:9
math 198:1 248:6
matter 29:5 109:1 217:8 223:9 273:22
maximum 66:5
mayor 14:5
mazda 215:13
mcm 187:18
mean 15:8 20:14 21:18 71:18 79:23 84:6 97:19 117:11 171:4,5 185:12 241:17 249:22 285:13,19,22 297:18 317:18
meaning 137:1 191:7
means 42:10 59:14 66:6 71:1 82:12 155:19,20 191:14 217:18 232:18 268:1 269:24 273:5 280:1
meant 56:11,13 120:10 249:14 273:4 275:7 279:23
measure 198:12
measurement 17:22
measuring 17:19
mechanical 155:16,19
mechanism 87:21 155:13
medium 199:19
meet 23:24 230:2 276:16
meeting 308:23
meetings 78:8
member 16:22
members 11:18 126:7
memorized 33:22
memory 50:17 52:9 185:2
mention 163:11,14 163:18,24 168:5 292:2
mentioned 20:10 31:12 34:15 38:15 39:23 58:7,19 71:9 83:5 92:13 93:9 101:14 103:7 105:22 111:8 113:4 120:21 175:7 203:6 206:9 215:1 219:2 220:9 224:23 225:24 226:1,14 227:23 243:17 252:17 260:21 278:12
mentioning 62:16 82:7
mentions 124:19 167:5
mercedes 215:11
merged 206:18
mesh 78:10
message 233:17 309:24 310:20 311:15 314:16
messages 311:18 311:24
messaging 87:22
met 242:21
method 256:16
metrology 17:21
micro 221:10
microchip 1:4 11:20 12:9 13:18 14:17,22,24 15:11 15:20,21 16:19,21 17:1,5 19:13,16,17 19:20 26:4 83:17 86:6 88:2,13 89:20 96:7 97:13 97:17 126:6 150:1 159:5 161:16 173:24 175:14

176:2,19 177:14 178:14,24 179:15 179:21,23 195:1,2 195:4,11,24 198:2 198:6,7,14,20,20 199:6,11,23 200:1 200:3,14,21 201:14 202:3 203:23,24 204:4,8 204:14 205:15,20 206:2,10,19,20,21 207:5,16,19,21 208:15,19,20 209:23 210:1 211:10 212:3,20 213:13 214:1,3 215:4 216:1,4 217:3 218:18 219:7,11,13,18 220:5,6,11,16,22 222:1,8 223:14 224:6,19 225:23 226:4,22,24 227:4 227:9,18 228:2,3,6 228:11,19 230:5 230:19 231:8 232:9 233:23 235:4,9,11 236:3 237:23 238:12,22 239:4 241:5 243:2 243:3 246:24 247:3,7,24 248:17 249:1,22 250:8,24 251:10 252:4 253:13,16 254:2 255:8 256:5 257:5 260:23 266:2,7,17 269:4 270:21 271:18 273:18 275:16,18 276:13 278:18 279:2 280:10,16 282:17 283:8,12,13,15,18 283:24 284:14 285:7,13,15,18 287:3,4,12 288:11 293:22 294:9 295:1 300:4,12 302:19,24 303:12 304:10 305:3 306:18 308:2 309:12 311:10,22 312:5 313:9,17

microchip's 95:3 119:17 159:15 198:17 200:6 203:20 209:14 212:6,7 213:6 214:2 215:2 216:11 217:1 229:20 232:22 233:6 234:21 248:3,15 249:5,14 250:5 253:12 256:13 260:1 269:2 288:4 294:19 308:12 313:15

microchips 200:7 283:9 285:20

microcontroller 16:18

microcontrollers 15:24 16:1,9,12 199:1,15,16

microphone 94:13 109:5

microsystems 18:15 205:11

mid 1:23 24:18

middle 10:23 47:21 81:9,10 90:6,12 91:22 103:2 106:17 112:11 117:4 229:11,16 308:21 309:16 313:3,6 316:17

midyear 268:2

milestones 99:12

million 200:10,12 205:22 206:1 211:13 213:10,15 213:18,20 227:7 248:2,6 259:5,6,12 259:13,16

mind 48:10 55:24 56:21 58:22 70:24 76:21 88:14 96:24 127:14,17 135:2 147:6 167:7 174:11 182:19

minivan 118:11

minor 33:12 75:21 236:20

minute 29:2 108:21 183:16 242:2 264:22 265:22 270:16 315:8

minutes 10:8,8 38:15 80:4 108:19 181:17 182:9,15 281:8,13,15,20 318:21

mirror 114:2

mirrored 114:3

missed 90:22 135:1 142:10 148:22 156:17 279:19

missing 275:14 305:12

misunderstood 73:10 177:7 192:7

mitch 186:9 194:11,24

mitchel 4:10 194:15

mode 87:5,19,20 87:23 89:10 116:6

model 162:5

modifications 64:18,23

modified 44:17

module 225:10 254:22,23 313:21

modules 249:10

moment 159:3 178:18 184:14

monday 8:21

money 298:9

monitor 47:21 48:8,17,21,24

monitors 210:15

monopolist 283:16

month 160:22 200:22

months 234:18 305:13

moorthy 277:23

morning 7:5,7,8,9 7:10,16 9:5,20 11:18 12:4,5 56:24 109:15 128:23,24 187:3 316:7

mornings 9:24

motorola 18:13

motors 220:2 221:11

mouse 42:21 48:16 48:24 53:20,20,21

mouthful 228:21
move 12:14 27:23 36:18 39:13 47:7 50:12 79:14 83:11 83:22 93:22 109:7 109:8 111:22 115:1 119:5 122:11 134:17 151:5 176:4 178:4 231:9 262:20 263:17 264:12 265:15 266:19 271:20 272:16 274:12 277:24 315:7
moved 13:3 78:16
moving 89:23 124:20 148:23 265:11 281:17
mp3 236:24
multi 34:22 35:8 45:17 46:22 48:5 53:12 62:7 66:5 69:15 71:2,19 72:23,24 73:7 83:3,15,24 84:15 88:20 89:1 92:5 92:21 101:19 105:6 112:13,16 115:24 116:5 123:18 125:11 126:22 127:21 140:21 141:1,23 142:3,6,13,18 143:2,4,9,16 144:11,19,24 145:12 148:18 179:2,7,9 180:1 207:18 209:10 239:13 240:16 241:2 247:12,20 249:24 255:9 256:8 276:17
multiparty 308:23
multiple 44:24 45:5 48:5 57:3 59:2 62:10,10 66:7 78:8 112:6 113:21 164:19 220:16 244:10 248:20 270:5 273:11 276:14 302:20 310:20
music 236:24 237:10 253:2 276:24

n

n 1:16 2:1,4 3:1,3 4:1 162:2
name 11:6,19 12:8 18:15 22:3 30:21 30:23 45:19,21 85:23 86:12 194:10,11,12,22 194:24 215:7 219:22 225:2 244:13 247:15 284:6,11,19 292:14 305:1
named 207:1 224:12
names 81:3 267:5 272:8,17
narrative 294:4
narrow 198:24 223:8 258:12 283:17 288:7
native 13:14 265:5
natively 108:9
natural 60:17
nature 100:16
near 43:24 123:11 260:16 273:23
necessarily 42:17 185:8 279:6 283:20
necessity 107:9
need 10:19 11:1 44:15 45:4 49:21 59:7,21 61:13 72:4 77:1 93:5 94:12 100:4,12 112:8 138:10 146:23 172:16 189:1 208:4 209:19 210:21 211:5 219:2,4 239:13 273:16 275:22 309:24 310:21 316:3 318:7,22
needed 26:13 43:17 62:2 99:2,4 144:2 168:15 236:4 237:2,8,9,13 238:12,19 239:1,1 250:4 273:10
needing 59:2
needs 20:16 23:14 34:8 50:20 67:18 68:11 99:11 201:3 223:23 230:1 243:16 257:17 310:5
neither 37:20 320:9
net 205:22
network 48:13 61:17,18
networking 16:24 195:6 207:1 221:4 243:24 251:17 272:22
never 85:13 89:15 100:21 125:15 126:3 132:6 158:6 174:21,22 191:15 242:5 282:24 295:21
new 60:3,11 72:7 112:4 136:18 137:7,8,9 186:24 197:2 204:2,2 217:6 224:21 244:2,10 251:4 256:22 257:4 261:24 268:20 280:18,19 303:23 315:7
news 16:4
nice 315:10
nickname 205:13
night 17:14,23 18:3 316:10 319:2
nissan 215:14
non 34:22 35:2,14 241:6,17 242:12 243:4 271:8 280:4 293:12,15
noncompliant 235:19,22 239:1 275:11,14 298:1
normal 17:17 65:12 202:6 237:19
normally 26:10 103:14 209:18 236:12,23
notary 1:21 320:3 320:13
note 64:23 293:11 303:6

notebook 160:5,21 204:23 262:3 263:3,23 264:18 266:11 271:12 274:4 277:14
noted 249:8
notice 47:22 117:3 120:8 158:17 255:12 320:4
notion 237:9
november 123:2 123:16
nowadays 61:20
number 15:6,6,23 32:6,18 33:23 37:4 47:20 72:15 73:5,15,16,17 119:13,17 123:3 123:21 124:4 155:3,14 165:21 189:4 199:7,20 200:21 201:21 203:24 219:15 251:7
numbered 159:24 310:12
numbers 115:13 116:1 199:8 213:10 220:14 227:14 261:2,6 269:8
numerous 64:17
nurse 13:5

o

o 11:9 31:3 194:13 194:13
o'clock 1:15 7:2 316:6 318:10
oath 182:23 316:16
object 147:12 294:3
objection 28:1 36:20 39:15 79:16 115:3 119:7 122:13 131:14,22 132:3 134:19 136:20 143:18 150:11 151:7 175:16 176:6 178:6 180:4 186:16 228:13 231:11 262:22 263:19 264:14 265:7,16 266:21 271:22 274:14 278:2 286:17 290:21 301:15,19 304:14 307:20
objections 317:17
obolsky 4:10 186:9,23 194:5,7 194:12,15,24 205:5 265:22 280:10 281:3 282:13 286:12 316:14
obtained 126:1
obvious 240:6,13 256:17
obviously 54:2 60:16 69:15 78:4 84:19 109:20 124:21 148:10 185:9 261:12 289:2
occupy 14:8
occur 50:20 126:9
occurred 76:12 103:20 156:2 161:15 162:12
occurring 72:21
occurs 87:22
october 152:20 153:9 201:6 278:7 304:11,17
oem's 305:15 306:8
oems 85:3 232:14 291:22
offer 88:2 128:2 186:14 199:6 247:7,10 250:6,14 256:20 286:16 290:20 295:2 301:17 304:13 307:19
offered 216:15 238:21 243:11 248:21,24 294:19 299:13 301:16
offering 92:6 100:23 129:19 198:24 237:24
offerings 198:17
offers 249:1,2 250:8
office 78:18 81:6 145:21,24 149:11 149:22 159:19 167:11,22 168:12 193:1,4
officer 13:3 153:13
offices 21:21
official 320:11
oh 21:20 30:1 73:10 79:5 117:15 126:21 147:18 161:21 166:4,17 172:18 221:21 234:12 245:16 291:17
okay 7:20,23 8:10 11:1 13:23 19:14 19:24 21:16 26:22 30:18 31:8 36:11 39:3,3 44:11 49:13,16 54:8 58:11 59:19 61:1 61:12 64:4 67:8 68:24 69:10 70:10 73:6,13 74:16,24 75:2,8 79:5,6 82:22 84:4 85:24 87:6,13 92:17 93:13 94:2,19,21 95:6 97:9 98:17 99:5 102:9,24 103:24 106:16 108:18 109:16,18 109:22 114:18 117:7 118:22 121:4 124:7,12 129:18,21 130:6 130:14,20,24 131:7,11 132:15 132:22 134:17,20 138:5,23 139:8 140:19,22 141:6 141:16,22 142:10 142:23 144:17 145:19 146:6 147:18 149:7,13 151:22 152:10,12 153:3,18 156:16 157:12,24 159:10 160:14 162:6 163:22 165:23 167:9 170:3 172:3 173:2,22 174:6 175:2 176:4 182:6 182:10,17 184:4

184:17 185:16 186:11,17 189:2 190:5 191:16 193:8,19 196:5,22 197:18 200:5 204:21 206:15 209:8 210:4 215:24 218:8 229:1,24 230:16 230:22 231:9 232:2,11,24 240:17 245:3 246:13 247:13 248:14 249:3 251:9 253:9 255:20 256:4,24 262:15 263:4,8,20 263:24 265:19 266:5,12 268:16 269:10 270:19 271:13 272:15 273:17 274:23 277:15 279:1 280:14 281:8,16 281:20 283:4,22 284:23 285:9,10 286:18 287:18,21 288:9 289:6,19 290:6,22 291:19 292:11,16 294:12 295:19,24 296:5,9 298:12 299:18,21 300:17 301:7 302:17 303:11 304:15 305:4 306:6,21 307:4 309:18,21 310:23 312:3,10 314:23 315:5 316:3,7,11 316:22 317:11 318:4

old 13:12 217:1
olympus 252:19
once 64:19 88:17 92:20,24,24 103:19 113:22 202:13 235:12 311:4
ones 97:20 196:5 199:12 220:24 256:22 279:13
ongoing 223:4
open 79:7 125:18
opened 187:5
opener 221:14
opening 18:23 20:8 24:5 26:7 29:23 50:4 76:8 173:19 175:1 217:2 266:8 279:19
openings 183:23
operate 33:8
operated 43:18
operating 218:23
opinion 128:3 131:15 147:14
opportunity 21:14 85:3 89:18 92:4 283:1 300:1,14
options 124:22,24 240:9
order 33:14 34:11 43:18 62:2 80:13 119:18 191:12 248:12
originally 78:9 198:21 224:20 240:15 248:13
orlosky 307:13 308:5,8,20,22

outcome 15:15 146:4 192:20 320:10
outlined 240:15
outlines 58:8
outside 23:14 34:9 34:15 35:11 45:8 243:7 269:12,17 299:12 310:4
overruled 132:3 136:21 143:20 147:15 164:2 180:5 228:15 294:6
overstated 160:7
ownership 41:21
owns 204:8

p

p 2:1,1 3:1,1
p.m. 183:17 281:23 309:20 319:4
p.o. 3:4
package 29:4,6 69:19 98:2 99:17 117:18,21
page 4:2 40:9 41:24,24 44:1,3,7 46:14 53:24 54:10 54:10 63:12 74:9 75:1,10,11,11,13 75:14,15,16,24 79:8 80:19,22,23 80:24 81:5,23 82:2,6,9 101:21 105:17 108:12 110:5,9 111:23 112:2 113:12,12 116:11 119:20,24 122:8,17 123:8,11 124:9 139:24 140:1 150:10 151:11,16 152:11 153:2 154:18,20 160:17,17 161:19 164:9 169:1 177:3 177:10 188:18,20 189:7,11,13,16 192:11 205:7 272:23 290:24 291:1,4,7 292:6,8 298:15,21 300:19 302:12,13 303:19 304:22 308:20,21 309:13,15,17 312:24 313:1,3,4,6 314:6,6
pages 74:20 80:9 80:11,14,17 82:4
paid 15:1 205:20 205:22 282:17
panel 24:20 25:14
paper 39:8,20 40:3 40:7 43:22 265:6 318:3
paragraph 42:3 44:8 64:2,7 65:11 159:24 160:15,19 164:16 178:24 187:17 267:15 268:8 269:16 272:24 276:7 298:19 300:21 306:3
paragraphs 306:3 306:5 310:12
part 12:11 14:18 16:6 19:18 22:7 22:14 28:14 49:19 51:17 62:20 66:11 69:18 81:2 90:22 91:2,4 98:5 99:23

101:1,23 110:15 112:15 115:13 116:1 119:16 125:5,7 156:17 162:7 172:23 192:15 199:8,24 206:9,20 207:5,13 208:13 220:14 226:5 227:13 236:19 251:22 252:11 258:8,12 261:2,6 269:8 288:7 296:24
partes 76:4,6 192:16
participating 22:18
particular 24:18 25:2,18 34:2 41:17 50:21 74:3 74:3 77:2 90:1 97:4 110:18 115:14 120:9 230:11 316:24 317:14
partners 221:18 221:19 253:18 254:8 257:16 268:20
parts 199:23 200:10,12 202:13 214:12 222:17 225:22 226:3 251:7 258:5 261:4 261:7,11
party 217:18 320:9
pass 125:24 128:18 133:5
passage 69:23
passengers 118:14
passes 297:11 311:1
pasted 123:19
patent 36:17 37:1 37:4,7,12,17 38:11 39:21 43:14,21 45:12,15,20,23 46:3,13,18,23 47:10 49:9,23 53:6 54:6,11,20 55:5 57:20 58:3 58:10 60:19 61:8 62:11 63:22 65:3 65:7,17 66:20 69:23 70:20 71:7 71:18 73:19 74:22 75:18 76:1,11,16 77:12 78:16,18,19 78:21 79:11 80:1 80:6 81:6,13,18 83:1,3,8 84:15 89:15 92:5 95:3 123:3,4,5,18 124:4 124:24 125:9 128:4,5,9 131:12 136:17 137:6,10 137:12 138:2,6,17 138:24 140:4,7,13 145:16,21,24 146:1 149:11,15 149:17,22 151:3 152:23 155:5,6,7 156:9,10 157:1,10 159:15,19 162:16 162:18,21,23 163:7,9,12,14,18 163:20 167:11,16 167:22 168:12 173:10 179:4 184:1 189:4,22,23 189:24 190:1,21 190:24 191:5,14 191:19,20 193:1,4 203:21 204:4,12 204:13,17 207:5 207:18,22 208:2,7 208:11,16,20,22 209:1,7 239:10 240:4,16,20 241:2 241:3 247:12 255:9 261:14 282:15,18,19,22 286:2 315:2
patent's 81:2
patentable 77:18 77:21 192:23 193:1
patented 76:23 86:19 92:11 253:12
patents 12:10 34:24 38:22 65:13 77:24 89:19 128:10,11,12 146:3,3 159:8 179:3,6,8 180:1 191:8 204:7,10 206:11,12,13 208:12 224:22 287:7
path 235:13 236:7 293:8
pattern 201:12
pause 12:15 94:4 108:15,16 180:23 181:10 193:22 264:21,24
pay 78:12 202:19 203:3,4 206:1,4 208:19 209:1 222:6,7,10 227:17 227:20 277:2,4 278:23
paying 259:24 260:11,12 280:24
pays 222:13
pc 211:4
pcs 199:15 210:14 250:19
pdf 302:13
pei 2:4
pendrive 29:16
pennsylvania 1:24
people 11:21 77:1 91:14 93:3 198:13 201:21 219:16 231:21 243:13 267:9,12 315:18
percent 212:4 227:22 258:17 283:9
percentage 248:3
perfect 8:24 32:20 315:9
perform 55:6
performance 31:17
performed 147:13
period 180:20 232:19 255:13 256:7 264:8 276:22 278:19 280:8 295:21
peripherals 48:3
perkins 290:17 292:7 298:23 299:6,11 300:3
permission 170:9 171:24
permit 57:10
persistence 104:13 105:7 121:17

237:9 238:6 295:10
persistent 103:16 236:11 273:1,19 294:14,21 295:3,5 295:17 296:15,20 297:3,17 305:23 306:23 312:6 314:8,21
person 37:16 200:18 214:21 288:14 292:17,24
personal 91:22
personally 12:19 78:2 90:16 171:16 172:11 174:22 255:22 288:14,20 289:17
phase 251:16
philadelphia 1:24
philip 3:3
phone 27:16 29:15 87:1,18 90:3 219:3 236:17,24 251:1,4 252:24 293:5 311:2,19
phones 106:21
photos 181:6,8
physical 87:8 317:3
physically 41:13 310:4
pick 8:22 63:9 252:23,24 253:1 279:14
picture 47:16 49:2 105:20 310:3
pictures 187:6,8
piece 13:11 32:9 37:22 257:14,19
pieces 214:9 218:9 241:21 242:6
pins 28:18 29:5 117:21
place 1:16 46:1 62:6 159:6 174:2 223:17,22 276:2 297:8 315:10 320:4
places 212:22
plaintiff 1:6 2:14 11:20
plaintiffs 317:12
plan 93:20 96:6,9 97:22 99:15 105:24 114:15 182:9 222:18,23 236:8 245:22 246:2,4,10,11 248:10 252:12 292:21 316:7 318:2
planet 200:19 247:3
planned 230:10 253:20
planning 235:2 251:10,24
plans 14:14 184:22 203:12
plants 13:15
plastic 27:20,22 28:16 212:19,21 212:23 225:10
play 8:17 114:9 170:10,11 171:5 171:12 253:2 261:18 277:1
played 171:13
player 236:24 237:10
players 217:24
playing 184:22 236:23 237:1
plaza 3:4
please 7:11 11:5 11:17 12:6 36:4,8 38:23 39:18 54:10 55:20 64:6 65:20 66:24 76:1 79:8 79:20 80:19,21 93:11 95:18 101:23 108:24 115:7 123:10 127:7 136:1 139:23 140:10 146:17 150:9 151:10 152:11 154:14,17 156:15 163:1 164:9 171:12 172:5,5 176:8 179:14 183:20 186:20 188:13,18 189:11 190:17 194:7,8,9 194:22 195:9 204:24 217:23 244:17 262:3 263:23 264:17,18 267:1 269:21 271:12 274:4,18 277:14 286:6,20
plug 25:3,4,15,20 27:15 32:21,23 42:19 43:9 51:16 72:8 117:2 236:17 237:4 242:2 250:20 251:4 252:23 270:9 311:13
plugged 42:20 43:1 67:15 72:9 74:2 103:12,19 250:22
plugging 29:15
plugs 20:16
point 10:12 51:14 92:15 109:19 169:1 204:19 208:3 209:22 231:16 233:8,14 234:4,22 237:19 238:4 239:14,17 240:4 243:21 253:23 255:2 257:9 258:7 268:19 270:2,7,23 271:3 273:6 274:24 275:8 276:6 277:10 289:7,11 294:18 295:1,12,14 296:23 306:17 312:4 313:14
pointed 82:16
pointing 30:12
points 293:3
port 25:13,19 32:21,23 40:18 51:5,8,18 52:2 67:5 68:2 69:21 103:13 106:7,19 107:16 108:3,8,9 111:11 116:22 118:7,8,17,18,19 120:9 225:11 269:13,18 270:5,8 299:14
portion 8:21 37:21 68:14 70:2 71:24 80:16 122:7 213:6 220:2

ports 24:19 25:6 25:13,20,22 32:18 50:11 51:22 68:8 86:20 102:22 103:9,13,18,19,20 104:10 105:9 107:18,23 111:10 112:7 115:18,20 116:20,22 117:1,2 117:6,13,23 118:3 118:14 120:5,6,7 120:12,15 141:8 141:12 142:5,20 143:6,12 144:13 166:12 209:22 247:18 270:5,14 294:14 296:16 305:18,20 309:5 311:6,7,14,20 312:1
position 14:7 17:20 18:10,13,14 18:20 195:14,15 207:8 300:4
positive 7:14 55:18
possibility 208:24
possible 8:15 44:21 64:17 65:6 159:8 306:9,12,14 306:23 312:2
possibly 256:16
postman 72:16
potential 273:12
potentially 204:17 276:10 284:22 306:20
potter 3:2
potteranderson.c... 3:6
pound 219:8 283:12
power 62:23 99:16 106:23 112:10
practice 185:8
preceded 124:11 172:15
preceding 38:13
precision 17:19
precludes 137:17
predates 113:3
prefer 283:20
preferred 63:15 65:18 74:13 201:14,15,18,18 202:2,4,9
prepare 24:6
prepared 214:18
preparing 220:13
present 127:11,19
presentation 153:21,23 154:3
presented 154:21 154:23
presenting 11:22
presently 251:13 251:15
president 195:6,17 287:15
presiding 7:4
press 281:9
pretrial 8:6
pretty 19:12 31:17 32:13 33:4 37:23 40:18 56:3 68:5 85:12 89:17 149:6 215:6,14,23 216:22 230:9 251:1 252:2 254:14 271:1,3
prevent 74:1
preview 10:3
previous 58:19 60:9 82:15 96:14 102:7 104:8,16 105:23 110:10 120:1 175:8
previously 43:6 95:15,20 101:15 116:4 133:16 219:21 247:11 259:2 260:22
price 202:5,7 203:15 204:19 206:4 221:23,24 222:3,5,7,11,14,15 222:21 227:18,20 227:22 249:4,18 249:22 250:2,4 260:6,7,8 261:5 262:11 263:15 264:10 284:4,5
prices 202:14 257:5 258:3 260:12,15 261:11 278:13,22
pricing 202:2,9,23 233:5,6 249:7,13 249:14,15 254:6 254:14,15 257:2 257:13 258:11,15 259:15,22 260:3 278:17
primary 210:13 293:18
principally 89:23
print 77:6,10 151:16
printer 41:9,16 42:21 47:20 53:22 77:7
prior 21:10 35:18 49:11 54:23,24 57:23 78:17 80:16 80:17 97:8 107:21 123:24 124:22 130:9 147:2 157:10 165:4 166:1,1,15 167:5 167:10,15,18 168:2,11,14 169:2 169:3,11 224:17 249:8 263:13
priority 279:11
probably 8:13 10:12 16:8 17:10 19:7 42:13 53:17 59:10 61:21 69:7 73:12 82:3 113:3 168:19 191:9 192:8 199:22 200:10 222:13 227:21 282:23 317:2
probe 212:17,19
problem 25:8,10 49:4 135:3 142:12 147:8 156:19 164:13,18 183:9 241:12 253:22 255:1 270:9 273:21 293:20,23 318:4
problematic 254:9
problems 13:9 128:16 271:2
procedures 76:10 82:7 159:6
proceed 95:11 185:20
proceeding 268:12

proceedings 1:11 7:2 319:4
process 22:15 76:8 77:14,16 78:3,16 92:3 122:4 150:4 184:24 252:13
processing 136:23
produce 200:7,11 207:22 208:1 212:13 213:14 242:20
produced 16:24 200:10 212:8,11 212:14
product 16:18 23:7 32:20,22 34:11,20 35:21 38:13 39:23 41:6 47:2 51:16 52:17 52:23 53:13,19 54:3 77:22 83:4 83:16 84:12 86:14 92:19,22 93:1,20 96:11,15 97:23 98:1 99:19 100:22 102:8 104:16 105:22 106:4 116:8 117:24 118:16 120:3,9,13 121:11 123:1 125:11,17 126:2,5 126:12,14,18 137:20 171:21 172:10 198:17,24 201:10 203:2 206:6 207:2,3,22 208:1 211:7 214:4 214:17,22 222:19 223:4,19 224:2,3 228:24 246:14 250:7,10,21 252:9 252:18 254:3,10 254:13 256:6,20 262:13 292:18 297:8 303:13
production 97:24 201:23 213:7,8,17 213:24 217:7 248:4,4 252:10
products 15:23 16:24 20:21 23:16 25:22 32:7,12 33:18 35:18,19 47:22 96:15 98:21 100:19 101:8,9 103:18 127:5 195:23 196:14,15 199:5,11,14,16,19 200:2,3,4 201:4,5 202:3 204:3 207:17 208:15 210:14 216:8 219:19 220:10,17 220:22 221:17 222:8 223:5,12 227:12,15 229:2 233:10 237:20 250:20,22,23 251:19,21,22 254:6,16 257:15 259:24 260:2,23 262:1,13 263:16 280:19
profit 263:14
profits 262:12
program 21:12 31:22 232:4 233:18
programming 86:13
programs 226:19 261:24
progress 9:3
project 23:3 35:13 96:19 101:5 304:19
projects 13:10 24:2
promised 71:8
promoted 38:7
promoting 232:13 234:20 294:9
prompt 9:23
pronounce 304:24
proper 85:1
property 179:16 280:21,22
propose 89:21
proposed 8:3,16 94:8,14 239:5 268:9
proprietary 280:20
protect 179:6,16 204:5 280:22
protocols 20:17
prove 217:20 242:20
provide 29:13 55:9 57:7 65:15 66:5 150:1 165:12 204:2 227:4 233:4 275:2 276:1 279:2 296:12,20
provided 16:17 161:11 189:22
providing 66:8 69:19,24
provner 3:6
public 1:21 13:4 320:3,13
publish 154:17 245:21 290:23
published 245:23 246:5
pull 52:12 80:19 81:23 109:4 190:15 298:19 300:21
pulled 262:17
pulling 99:14
purchase 205:15 206:16 207:20 259:5
purchased 13:11 207:16 228:1,4 259:11
pure 28:13 74:5
purple 40:17
purpose 107:13 159:4,17 170:20 198:9 246:11
purposes 13:14 14:20 16:13 265:13
pursuant 320:4
pursue 18:2,18 154:2
pursued 18:24
push 221:14 222:5
pushing 278:12,17 278:22
put 24:11 25:23 26:23 29:7 31:5 33:10 36:5 39:17 46:6 53:14 58:14 65:3 79:20 82:19 83:11 90:3 93:3 110:20 117:17 146:18 171:8 174:10 185:3 186:20 189:16 190:16 212:18,20 223:16,22 226:23

239:18 241:12 265:4 276:24,24 277:4 301:22
puts 212:23 218:17
putting 69:3 90:5 139:14 265:12
px 286:7,9

q

qualification 201:24
qualities 210:21
quality 210:18 250:14
quandary 257:11
quarrel 223:8
quarter 291:8
quarters 264:11
question 8:2 28:5 73:11,12 80:15 90:21 132:18 134:11 135:24 136:23 137:23 138:15 142:8,11 147:23 148:3 156:18,21 157:19 157:21 161:20 165:20,24 166:23 169:4,7 177:8 180:21 185:10 192:7,9 213:21 214:6 238:14 239:11 274:1,2 280:15 284:20 300:8
questioning 10:24 173:6 175:8
questions 128:1 165:22 172:15 182:2 190:4,12,20 193:6,10 257:2 266:7 310:10
quick 10:3 124:12 148:13 151:13 183:21 220:12
quickly 158:17 224:8 239:21,24 250:16 277:10
quite 8:9 20:13 23:12 33:8 80:6 83:10 91:5 96:18 113:3,24 125:22 128:14 132:18 201:12 214:21 239:24 271:7
quote 202:13 228:7,11,19,23
quoted 229:2

r

r 2:1 3:1 11:8 320:1
rack 48:17
raise 185:10,11 194:9 258:3,15 281:11
raised 12:24
ramp 201:9
ran 91:3
ranch 13:12
randomness 74:4
range 10:7 210:17 210:22 231:23 233:3
raw 219:12
reach 72:22
reaching 217:6
reaction 229:20
read 44:20 56:5 61:10 64:12 65:24 66:1 69:19,23 127:17 233:17 310:15
reader 276:21
reading 56:21 58:22 61:12 70:24 127:17 158:20 164:20
reads 32:8 233:22 278:11
ready 23:23
real 60:20 77:3 85:2 124:12 259:8
reality 235:16
realization 89:21
realize 166:22
realized 32:24 40:5 92:20 117:14
realizing 79:6 92:3
really 28:16 29:5 30:2,16 31:18 32:15 33:3 53:17 65:14 72:12 76:14 78:10 85:9 90:8 91:17 100:24 114:10 169:4,22 170:22 243:14 250:12 255:14,18 281:9 285:12 295:15
rear 25:14 118:15 120:10
reason 10:19 95:8 173:11 206:3 288:7
reasonable 152:2 227:19 233:9
reasonably 249:7 249:11 277:10
recall 21:5 27:9 73:5 74:23 80:12 81:1 84:8 121:1 125:20 131:10 137:10 138:21 139:9,14 155:3 158:1 163:13 164:4 166:6 168:4 169:3 173:23 181:8,9 189:9
recalled 169:20
recalling 44:4
received 79:18 122:24 186:23 267:22 290:22 307:23
recess 108:21 183:17 281:22 318:20
recipients 122:6
recognize 36:15 39:7 79:9 93:17 114:22 119:2 122:2 134:2,11 140:3 150:24 163:6 176:1 177:24 178:1 181:6 186:8 205:4 231:5 262:7 263:9 264:4 266:16 267:5 271:17 272:8,17 274:8 277:19 286:12
recognized 31:12
recognizing 40:1 88:18
recollection 178:13 179:20
reconfigure 59:7 59:22
reconfiguring 145:6
reconnecting 60:8
record 11:6 110:23 127:16 160:11 194:10,23

265:8 320:8
recorded 320:6
records 160:22
recover 161:16
red 102:6,10,12 103:2 303:5
redirect 4:7 183:12 185:11 190:8
reduce 107:9
reduced 249:18
refer 22:3 25:12 31:1 32:14 36:16 37:4 40:14 50:13 53:1 87:20 102:18 114:2 211:18
reference 119:15 139:18 166:20 215:21 225:16 268:10 272:5
referenced 266:8
references 233:2
referred 43:3 52:15 54:22 80:4 88:4 104:7 106:18 154:6 188:12 217:1 219:7 225:1 279:18
referring 39:23 44:16 53:16 61:6 61:23 66:21 71:16 71:21 103:15 133:18 135:14 188:6 232:8,17 233:15 234:3 268:11,13,18
refers 179:3 211:19 233:2 269:12,17 278:10 280:6
reflector 114:5
reflects 302:18
refresh 178:13 185:1
refreshes 179:20
regard 169:13
regarding 80:16 92:15 101:15 192:21 317:14
region 1:23
registers 52:16 66:18 67:7
regular 67:21,22 118:8,19
regularly 91:5 198:12
relate 43:13 77:22
related 7:16 54:22 128:12 195:12
relates 42:10 158:7
relating 240:3
relation 215:18
relationship 201:17 227:9 261:19
relationships 258:5 260:11
relative 219:10
relatively 10:2
release 85:1,20
released 21:9 252:9,10
relevance 236:14 318:8
reliability 210:21 250:15
remain 89:9 206:17
remaining 158:5,7
remember 22:13 37:21 38:5 43:24 97:19 162:9,10 166:5 177:17 190:19 192:16 258:17 273:6 281:16 310:16 315:3
remind 147:22 181:18
reminder 182:22
remodeling 13:10
remove 107:8
removed 27:22 108:6
removing 259:21
renewal 257:10
repeat 12:16 90:21 135:24 163:16 216:3 315:14,24
repeating 135:2
rephrase 69:22 136:9 137:2 238:15
replace 96:15 106:4
replaced 127:20
replied 189:21
reply 189:7,13
report 76:14 188:1 245:18,19,20 263:13 287:19 298:22
reporter 1:20 94:10 109:3
reporting 305:9
reports 137:14 138:7,18 139:10
represent 41:5 186:12
representations 159:19
representing 2:14 3:14
reproduce 112:13
request 123:7 144:6,14 148:20 235:3 236:22 240:2 256:14 276:4 279:8
requested 233:15 233:22 279:3,5
requests 256:10
require 49:18 237:21 293:23 317:2
required 50:19 69:16 86:3 111:20 121:10 155:10 159:6 168:18 179:15 250:11
requirement 99:18 132:24 144:18 273:1,9 276:2 293:19 305:15,22 309:7 314:9
requirements 50:24 87:15 90:24 91:1 99:23 100:3 100:18 210:18,23 275:23 277:7,11
requires 127:2 184:24 293:3,8
rerouting 111:9
research 204:1 251:23
reset 259:15
resolve 224:8 255:23

respect 126:1 140:16 148:9 158:12 165:24 168:1 171:20 172:10 283:16
respective 48:6 143:10
respond 71:4 123:6 201:3 224:2 235:14
responded 123:14 123:15 124:6
responding 141:9 276:4
responds 292:8
response 162:2 167:19 235:5 240:1 255:12 256:13 292:6,7 309:11,19 314:5
responses 138:10 315:21
responsibilities 83:19,20 195:9 223:18
responsibility 55:9 91:4 96:2,4 195:24 196:18,21 199:13 208:14
responsible 206:22 207:2 208:6 244:7
responsive 223:23
rest 161:18 168:11 185:22
restriction 43:19
result 77:11 256:2
resulted 152:23
results 82:15
resume 109:14,24
rethink 77:5
retired 13:21 14:3 14:10 19:13
retirement 14:1 14:14
return 77:24 96:20
rev 187:18
revelation 91:24
revenue 262:11 263:15 264:9
reversal 163:15,19 165:13,16,19 166:3,10,11,14 167:12 168:3
reverse 102:20
reversing 107:16
revert 103:20
reverting 13:13
review 76:4,6 77:16 167:18 168:17 185:1 192:2,16 203:14 222:17,24
reviewed 95:16,21 139:5 191:11,15
reviewing 96:2 191:21
reviews 147:9,16 164:23 178:19
revised 8:3 151:17 151:20,24 318:11
revision 97:4,5
rf 221:11
rid 62:22 63:8
right 7:12,17 8:4 9:3,5,7,10 10:23 19:12 28:2 29:12 36:21 37:3 39:16 40:22 41:20 43:24 44:5 45:10,24 46:23 47:5,16,18 47:21 52:22 59:9 60:22 63:11 64:2 68:12,18 69:13 70:11,12 72:20 73:4 74:8 75:4,6 75:23 78:24 79:17 81:21 82:8,18,19 92:12 94:16,21 102:5 104:22 106:1 108:17 109:13,18,23 110:15 113:10 114:14 115:1,4 116:9 119:8,19 122:14 123:20 129:12,24 130:2,8 130:12,17 131:2 132:17 133:1,17 135:16 136:4,11 136:13 138:20 139:12 140:5,13 141:4,14,24 143:1 143:6 144:4 145:13,16 146:9 146:14,15,18 148:21,22 149:15 149:19 151:4,8 152:4 153:9 154:10,11 155:6 155:17,23 156:6 156:13 157:4,15 158:12 159:12,16 160:12 161:24 162:8,23 163:10 163:12,19 164:19 165:5,8 166:3,10 166:13,15 167:6 167:12 168:3,23 169:12 171:18 172:20,22 173:20 174:9,19 175:15 176:7,12,17,20 177:2,16 178:7 180:3,10,16 183:10,19 185:19 185:20 186:24 188:3,5,7,20 189:16,23 193:11 193:23 194:3,6,9 198:2 200:5 204:20 214:24 219:13 220:7 222:21 225:6,21 227:5 231:12 235:15 238:24 239:14 240:19,21 241:2 244:20 246:15 248:23 249:17 250:21 252:15 254:12 255:3,5,6 259:8 260:16,18 262:23 266:22 268:14 270:7,15 273:7,24 274:15,22 275:8 275:20 278:3 279:5,11,16 280:6 282:15,18,21,22 283:2,5,10,13,16 283:19 284:1,4 285:1,4 286:2,4,23 287:7,10,16,23 288:6,19,22,24 289:4,9,17,22 290:9,18 291:4,21 292:9,10,14,20,24 293:7,12 294:1,10 294:15,17,22 295:6,8,11,17,22 296:2,4,13,15,24 297:4,9,12,16,22

298:3,6,10,24 299:4,5,9,15 300:7 301:5,18 302:1,4,9 302:15,20 303:2 303:14 304:2,11 304:19 305:3,24 306:19 307:1,22 308:2,4,6,9,13,16 308:18 309:9,13 309:20 310:14 311:10 312:1,9 313:12,15,18,22 314:2,16,19,24 315:2,11 316:22 318:5,19 319:1
rights 179:16,24
rise 7:3 108:23 183:15,18 281:24
risk 242:5 279:7
road 120:19 121:1
roadmap 252:7 253:20
roadmaps 254:10
robust 211:2,6
role 17:1,2 19:1 99:7,9 114:8 163:14,19 165:12 165:16,18 166:2,9 166:11,14 167:11 168:3 171:17,21 172:10,22 174:21 211:24 311:2,5
roles 87:24 217:24
room 36:5
rose 1:20
rough 200:9 202:18
roughly 195:21 199:8 200:17 204:9 205:18 210:4 211:12 219:15 220:19 227:6 233:11 246:22 248:1,11 248:12 278:24
route 44:24
routed 108:2
routing 44:23 48:13 63:7
rovner 3:3
royalty 280:24
rpr 1:20
rule 132:2
rules 32:4 42:18 71:10,12 298:7,9
rumored 187:19
rumors 84:23
run 98:1 195:10 273:2 277:3 314:9 314:12,19
running 139:24 200:17 248:1
runs 297:9
russell 2:3 317:13

s

s 2:1 3:1 5:1 6:1 194:13
safe 33:23 316:10
safekeeping 317:6
safety 13:4
sal 291:4,12
sale 121:12 199:9
sales 98:9,12,14,15 98:18,19,21,22 99:3 125:19 175:8 201:21 214:3 246:21 247:6 250:15 262:11,11 262:18,18 263:15 264:10 283:9 291:17
salesman 231:23
salesmen 268:3
salespeople 231:24 267:13
sampled 247:5
sampling 98:2 126:14
san 3:10
sandia 27:8 28:4 34:21 35:13 36:1 87:8 93:21 96:6 97:7,11,14 99:7,24 101:5,13,20 102:4 102:10,15 104:4 104:19 105:3 106:4,6,10,11 107:3,6,6,8 111:18 111:20 112:3 114:9,15,24 115:14 116:3,19 119:4 120:20 126:11,14,18 196:18 213:15 236:7 244:15 245:22 246:4,6,24 247:4,5,7,23 248:4 248:8,9,15 249:5 249:14,22 252:8 252:16,18,21 253:4 256:6 276:18 284:1,8,13 292:20 299:17
sat 146:24 153:14 157:17 158:14
satellites 16:3
satisfy 50:24
saulsbury 3:9 4:6 7:8 9:12,13 28:1 36:20 39:15 79:16 93:24 94:8,17 115:3 119:7 122:13 128:22 129:20,22 131:17 131:24 132:7 133:20 134:1,8,9 134:10,17,22 137:3,4 139:22 140:2,9,11 143:23 146:16,19 147:20 148:1,2 150:8,14 150:18,23 151:5 151:10,12 154:16 154:19 156:14,19 156:20 158:24 159:2,22 160:3 163:3,5 164:6 165:3 170:4,9,21 171:2,11,15,23 172:4,7 175:19,24 176:4,8,10 177:23 178:4,9,21 180:8 180:24 181:5,11 182:15 185:23 186:2,7,11,19,21 189:10,12,15,20 190:3 193:9
save 62:23
savings 62:16
saw 29:22 142:17 156:13 157:14 168:22 172:23 229:23 244:6 247:9 276:18
saying 9:22 44:13 166:20 179:22,24 290:2 300:12 305:21
says 59:21 71:19 72:24 111:6 142:17 148:17 151:16,20 152:17 152:20 160:4,16

164:12 176:15 178:24 179:5,14 180:7 267:20 274:24 279:18,19 291:21 293:2,14 299:10 300:16,24 301:2 302:10,14 303:6,10 305:10 306:7 307:1 309:22 313:7 314:6,7
scenario 88:19
scenarios 84:13
schedules 24:1
schematic 187:12
scheme 108:1
schemes 155:14
school 17:12
schooling 17:16
science 17:21
scope 95:2,3
screen 24:11 30:5 39:18 40:17 41:10 67:23 79:20 82:4 95:18 115:7 119:11 185:4 188:24 191:18 265:4
sd 276:23 277:1
seal 320:11
seamlessly 77:4
searches 168:15
seat 7:11 12:13 108:24 118:11 120:10 183:20
seated 282:3,6
second 10:5 46:19 47:5 50:7 68:12 88:8 92:2,15 94:20 97:5 124:16 130:16,16 141:8,9 142:4,19 143:12 144:1,20 145:6,8 148:19 167:14 178:23 212:16 267:15,15 269:16 274:24 291:4,7 300:18 304:21 308:20 312:24 313:1,3,4,6 315:17
secondly 91:20 94:14
section 37:9 42:1 44:9,9 46:4,5 54:14,18 55:11,13 57:23 58:7,8,12,20 63:14 64:2,23 65:16,22 92:1 152:17 153:1 161:19,21,22 164:10
see 16:16 25:7 26:2,22 28:14 29:20 42:7 51:6 51:19,20,22 54:13 56:21 63:18 73:9 73:21,22 76:3 77:21 94:21,24 97:2 106:6 110:8 125:17 134:15 139:23 140:20,23 141:10 142:21 143:4,6,13 144:2,9 144:18,22 145:10 151:11,15,19 152:16 153:4 160:4,8,23 168:5 170:24 172:14,16 176:9,14 178:10 178:23 179:12,18 187:20 188:2,24 189:3 205:7 209:6 232:3,6,15 233:1 260:4 267:16,18 269:14,19 275:4 278:8,15 286:20 291:10 292:3 303:9 307:17 308:24 311:5,6 318:21
seeing 40:12 47:10 66:2 79:6 80:22 82:2 105:20 112:2 139:9 149:5 166:5 173:23 174:12
seen 24:16 46:18 52:24 168:20 181:9 196:7 203:23 279:24 292:13 302:22
sees 60:2 71:24
segments 34:12
sell 23:11 26:11 98:20 202:13 207:17 208:15 213:10 214:13,20 217:3 219:19 225:8 246:14,17 246:24 249:10 250:18 254:13 255:3 269:4,7,8 270:3 273:7 284:24 285:7 296:10 297:22 313:20 314:17
seller 217:8
selling 106:2 210:2 211:23 214:11,16 216:1,4 220:20 221:10 223:4 233:10,11 247:4 249:24 252:20 254:19,19,22 256:7 278:24 313:17
sells 211:10 214:3 221:7 250:24
semiconductor 15:22 18:13 26:5 26:8 28:10 212:15
semiconductors 198:8
send 123:17,22 318:2
senior 16:22 77:17 96:3 195:5,17 287:15 305:2
seniority 38:2
sense 77:23 200:19 215:3 221:20 305:11
sent 94:14 123:2 125:9 174:1,20 175:4 177:14 178:3,16 179:23 267:10 274:9,21 285:23 286:14 288:1,18 289:4 304:1
sentence 42:9 43:5 44:21 55:22 56:1 56:16 61:2 65:21 71:1 124:16 127:12 154:7 160:2 176:15 232:3 233:1,13 267:16 268:8,17 269:11 272:24 278:10 279:17 299:22
sentences 58:14 64:6,13 65:3
separate 66:8,10 67:2,9 69:4,20,24

70:3 71:23 79:3 98:14 101:8 105:10 111:14,17 212:17
separately 51:1 71:3,20 73:1 220:3
sequence 218:11
serial 20:7 293:17
series 42:23 43:2 310:11
serious 240:7
service 201:18
services 1:8
session 10:11 103:20
set 14:19 46:2 58:24 59:17 66:4 71:13 77:3 202:9 222:15,21 237:20 254:15 299:23 300:4,13
setting 169:9
seven 259:4
sgbfirm.com 2:13 2:13
share 62:2,9 63:9 66:7 129:5,24 130:2,3 139:16 155:21 156:4,22 187:24 254:9,16 283:21
shared 59:1 77:5 122:4
sharing 164:18 254:6
shaw 2:2,3
shawkeller.com 2:6,7
sheet 114:23 115:21 119:3 125:19,20 175:8
shifting 217:22
ship 213:4
short 18:16
shorten 21:24
shorthand 31:2 88:9 112:19 320:7
shortly 84:9
show 28:7 171:24 242:22 265:18 268:22,22,23 269:2
showcase 65:10
showed 87:8 117:18 130:4 131:19 158:2 234:7 268:24
showing 28:12 47:12 48:1 112:4 112:5 119:23 160:11 291:24
shown 26:6 41:15 47:14 49:14 50:22 70:7 107:23 111:15 116:20 117:24 122:9 131:5 133:16 134:7 142:7 146:7
shows 24:14 160:17 262:10 263:14 270:16
sic 144:7 302:15 305:20 311:3,7,21 313:10
side 28:13 33:19 47:4,5 68:1,11,12 68:22 69:13 70:11 70:12 92:23 93:6 102:5 114:3 140:10,10 190:17 190:17 225:16 259:11,11 261:22 317:12
sidebar 170:8,11 171:9
sided 240:22
sidelined 83:12
sign 81:3,5 96:3
signaling 20:18
signature 81:8 305:6 320:13
signed 81:12,19 286:4,23 288:14
significant 21:6
silicon 233:3
similar 18:12 23:8 24:16 26:2 38:14 55:3 56:3 87:10 92:7 100:19 104:8 120:1 121:12,14 126:24 250:22 264:7 275:3,7
similarly 90:13
simple 40:15 46:21 59:16 66:6 236:18
simpler 110:19
simplest 72:6
simplified 114:10 116:16 120:2
simplify 69:15 107:10 113:24 136:9
simply 88:5 114:3
simulation 33:6
simultaneous 35:23 57:11 121:16 148:9
simultaneously 41:6 44:19 45:1 59:6 88:22 101:17 116:7 144:6,14 148:20 247:22
single 35:4,8 43:11 44:22 48:23,24 56:7,13 57:5,13 59:1 62:8 68:2,3 88:4,19 101:5,16 102:17 121:18 123:4 139:16 187:18 189:5 209:21 216:16 224:1 247:17,21 275:2 278:14 279:3 284:6,11 293:16,24 294:20 295:2,8,9,14,16 297:16 314:20
sir 39:2 140:8 265:15 272:2
sit 255:14,17
sitting 10:18 81:16 148:10 158:16
situations 68:16
six 261:6
size 29:6 99:17,19 172:24 198:23 199:19 219:10,16
skilled 64:19 137:20
slayden 2:9,9 4:11 7:9,18 184:13 193:24 194:1,2,5 194:21 205:1,3 228:17 231:4,9,14 244:16,18 262:6 262:20 263:1,7,17 263:21 264:3,12 264:16,22 265:2,5 265:14,19,20 266:15,19,24 267:2 269:20,22 271:16,20,24

272:3 274:7,12,17 274:19 277:18,24 278:5 281:2 286:17 290:21 294:3 301:15 304:14 307:20
slide 24:11,24 25:7 25:10 302:14,18
slides 303:23
slightly 32:10 33:13 169:6 220:13 272:13
slip 106:13
slots 279:14
slow 89:22
slowly 13:13
small 13:11 14:3 26:24 77:20 151:16 183:13 198:22 199:18 214:1,15,21 227:14 301:4,9
smaller 29:2,4 227:11
smith 153:16,17 153:19 161:8 162:12
smith's 154:12
smsc 18:16,17,20 19:2,16,18 21:12 22:23 26:2,4 31:7 31:10,12,21 39:9 39:11 77:13,20,22 82:24 83:3,17 154:24 155:4 161:8,15 205:14 205:15,21,23 206:1,10,16,19,23 207:6,16,17,20 210:2
smsc's 78:11 154:3 162:8
snapshot 123:20
software 155:20 218:20 224:7 239:3 243:12,22 250:11
sold 34:13 78:9 200:4 201:7 214:19 220:14 221:5 242:18,19 251:7 261:3 275:11
soldered 117:22
solid 34:6
solution 38:20 44:22 48:11 49:18 86:11 87:16 88:1 88:8 89:21,24 90:2,12,15 91:19 91:22 92:7,11 106:5,5 107:3,5,8 107:12 124:21 152:18 153:5 160:20 179:10 180:2 216:17,20 229:9 230:5 232:13,22 233:3 234:1,5,6,9,11,21 234:22 235:4,19 237:24 239:1,4 240:3 243:10,17 243:19,20,21 247:17,21 249:20 250:5,9 255:18 256:3 257:24 259:19 260:17 268:6 269:2 270:1 273:20 275:3,7,11 275:15 276:9,13 276:17 279:15 288:4 293:8,22 294:10,19,21 295:3,13 296:11 296:19,22 297:4 297:15,16 298:2 299:3,7,12 300:2 300:15 302:20 303:1 305:24 306:19 311:23 312:2,8 313:8,9 314:1
solutions 1:22 57:10 88:14 216:16 229:7,8 230:8 235:18 247:8,10,15 248:21 267:21 275:9,9 280:1 295:4
solve 49:4 164:13 164:18 202:1
solving 13:9 128:16
somebody 103:11 254:11
someone's 10:21
somewhat 139:7
son 13:3
soon 10:22
sophisticated 33:5
sorry 21:20 28:23 30:19 38:9 39:1 65:24 69:22 73:12 75:10,14,15 90:21 94:5,10 103:4 106:9 111:2,12 117:14 121:10 129:10 134:5 136:8 142:8 144:7 147:19 151:1 156:16 161:21 163:16 166:17,24 168:9 173:24 179:22 182:20 191:3 192:7,8 196:17 211:5 214:8 216:3 231:19,20 238:1 238:13,15 264:22 270:11 275:17 282:3 284:9 289:14,24 291:7 291:13 309:2 313:4
sort 8:20 16:10 91:9 117:4 118:15 151:16 155:13,19 202:11 255:18 277:8 314:14
sought 34:17
sound 109:17 126:23
sounding 92:7 121:12
sounds 33:2 154:11
south 12:20
space 179:17
spare 13:8
speak 85:3 109:9 109:19
speaker 196:12
speakers 311:13 311:15
speaking 94:13
spec 21:8,17,19 22:1,1,2,4,4,9,11 22:11,12 26:14 31:14,16,16 32:2 33:13 34:9,16 43:2 50:20 71:9 71:10 73:3 90:7

113:22 136:5,14 136:15 209:12 276:2 309:7
special 30:21 89:12 198:8 243:16
specially 30:7
specific 55:14 67:19 72:21 73:16 73:17 87:14 119:18 138:3,22 139:18 240:1 243:15 275:20 278:23
specifically 84:2 130:1 169:7 179:8 193:18 236:4 238:1 254:12 255:8
specification 21:24 22:2,8,20 23:8,10,15,19 32:8 35:3,11 42:16 45:9 52:6,22 56:6 56:9 100:12 113:5 135:15,18,20 136:12 292:18,18
specifications 22:17 25:11 60:2 131:21
specifics 53:5
specified 71:4
specify 138:10
specs 22:11 91:11
speculation 175:17
speed 22:12 31:17 115:23 178:22
spell 11:6 21:22 194:10
spelling 21:23
spend 61:15 298:8
spent 60:15
splitting 293:16
spoke 129:1
spun 220:3
square 51:13
sroka 122:24 123:14,17,23 124:17 125:1,10 176:2 188:22 189:3,21 245:10 245:11,12,18,21 290:17 292:8 302:1 303:18,21 303:21 304:1 314:8 315:1
sroka's 123:6 124:8 292:13
stacked 48:18
staff 16:23 17:2 96:3
stance 291:22
stand 7:17 57:7,20 63:5 112:18 183:24 194:9 206:17 318:20
standard 18:15 20:14,20,22 23:6 25:12 34:22 35:2 35:14 40:18 61:16 68:5 69:14,17 106:22 116:22 118:7,17 120:9 127:4 169:14 205:11 211:6 217:12,13,15 226:8 235:18,20 237:19 241:6,14 241:17,17,23 242:5,8,12,21,22 242:24 243:4 270:4 271:4,8 273:14 280:4 293:12,15 294:1 299:13,24 300:5 300:13 303:7
standards 22:14 31:13 61:16 84:20 91:10 100:15 101:4 217:20 241:23 269:12 270:22
standing 183:4 320:3
standpoint 51:19 67:10 78:4 126:22 158:16,18
stands 20:6
stare 46:8
start 9:22 20:5 21:2 55:21 74:15 92:14 102:11 122:18 181:14 220:24 226:11 239:12 241:12 247:3 251:20 252:1 298:14 316:1,7
started 10:5 14:12 17:14,17,18 21:10 21:15 22:23,24 33:1 65:16 97:7,8 113:17 210:2 236:6 240:7,12 256:17
starting 31:21 56:16,20 60:11 61:2 67:4 127:8 127:10 154:18 181:20 259:15
starts 42:4 44:13 63:14 64:9 122:19 253:24 267:17 268:9
state 11:5 17:16 18:7 41:20 52:17 57:16 60:4 194:9 194:22 232:12
stated 274:20
statement 81:4 176:22 266:9
statements 81:13 81:17 95:1,4 173:20 217:2
states 1:1 17:12 232:4 276:7
status 50:14,19 52:3,16 53:3 66:18 67:7 126:11
stay 237:3 238:5 242:7 270:14
staying 13:16
stays 293:6
steam 124:20
steele 303:19,21 303:23 307:13 308:1 309:12,20
stefan 305:10
step 24:3 140:18 140:18 182:21 183:10 193:12 212:12,16 281:5 299:17 316:9,15 316:23
stepped 147:19 299:12
stepping 269:17
steps 42:23 43:2
stop 64:24 142:5 258:4 281:6

stopped 201:10
storage 196:14
store 210:16
story 120:20
straight 23:10 53:11 106:22
straightforward 77:1
street 1:16,23 2:4 3:3,10 72:14
strike 136:16 149:8 177:12
strive 34:5
strong 201:17 250:18 260:10 291:21
stronger 297:20
structured 56:6
struggle 83:6
studied 140:16 185:13 197:5
study 197:4
studying 146:24
stuff 31:15 93:3 99:14 100:3 167:17
sub 257:14,19
subject 90:20 93:24 302:8
submission 78:22 80:17 81:2
submissions 161:17
submit 77:16 78:17 297:8 317:24 318:1
submitted 78:20 80:2 81:6 162:8 162:10
subset 263:12 278:23
subsidiaries 179:1
subsidiary 220:1
substance 310:13
substantial 80:16
substantially 198:20
successful 313:24
sudden 234:6 242:23 255:6 259:20
sued 286:1
suggesting 300:3
suitable 89:2
suite 1:23
summary 58:13 82:6 150:3
super 113:7
supervision 320:7
supplier 211:24 287:5
supplies 220:22
supply 220:11,17 256:6 260:23
supplying 314:20
support 45:4 86:7 86:9 90:14 91:19 108:5 113:21 116:6 121:16,17 201:18,20 223:21 223:22 247:8 278:14 311:17
supported 102:22 104:15
supporting 100:14 223:5
supports 101:8
suppose 22:6 177:18
supposed 244:23
sure 22:19 23:23 33:18 64:14 65:1 68:18 72:20 78:12 90:14 94:12,15 98:4 100:14 101:3 108:2,16 109:16 110:14 111:10 113:2 116:24 132:18 135:22 136:24 137:23 139:20 169:22 170:22 184:20 189:18 199:12 242:6 265:1 280:23 284:10,17 284:18,21 285:16 294:24 295:23 298:2 300:9,11 302:7,22 309:24 310:17,21 317:5 317:10
surprise 241:5 243:1,2
surprised 241:9 242:12,13,14,16 243:8,13
surprising 241:15
survive 76:19
suspected 289:10
sustained 131:16 175:18
suv 118:11
switch 38:16 40:15 40:19,19 41:2,14 41:22 45:3 48:22 49:5,8,9 57:12 60:6 62:2,4,17,18 62:22 63:1,2,3,5,9 77:3 108:4 127:20 155:10,17,20 156:3,5,23 270:9
switched 57:3,15
switches 42:10 48:20,21 49:19 57:7,20 58:5,19 104:18 106:18 107:9,13,14,24 108:6 111:7,14 112:9 165:5,7,17 166:2,2,8,15
switching 35:21 38:14 39:9 48:2 55:16 57:1,8 60:5 86:20 153:20,23 154:23 155:8,13 165:18 221:22 224:11
sworn 11:12 194:16 320:5
system 18:20,23 19:1 24:8 56:10 72:18 85:11 86:4 89:13 155:5 180:3 218:23 237:7 239:13 271:9 273:11 310:5
systems 237:21

t

t 5:1 6:1 194:12 320:1,1
tab 79:6
table 243:10,18
tablet 30:6
taiwan 212:14
take 9:9 10:6,9 11:1 14:8 18:19 24:3 46:6 85:11 85:13 89:6 90:4,9 95:5,6 102:21 108:15,17,19 139:20 140:17 147:4 150:5,9 153:1 156:15

159:21,23,24 161:18 164:22 177:18 180:22 181:12 182:8 187:10 188:16 192:1 193:20 207:21 209:21 212:10 215:8 224:2 230:1 237:17 246:15,20 247:18 269:11 281:8,10,12,15 291:21 292:5,12 301:11 303:4 304:21 305:8 310:18 312:21 313:2 314:4 317:8 318:7,22
taken 108:22 181:16 183:17 217:18 281:22 287:4 288:23 320:4
takes 46:7 53:23
talk 8:8 17:4 31:6 35:10,15 49:11 51:3 58:17 92:18 94:24 96:13,13 102:9 159:4 169:22 237:2,3,6 237:10,15 243:7 255:22 281:16 311:8
talked 8:3,5 40:2 50:3 55:17 60:12 104:13,15 105:8 106:1 140:6 153:24 192:14 199:12 213:18 221:3 222:16 241:19 244:15 250:10 255:24 258:19,20 264:8 272:6
talking 16:7 21:19 35:7 44:14 49:9 56:1 59:20 66:17 68:14 69:3 85:6 85:15,16 89:3 91:20 110:10,24 116:4 117:12 120:22 124:18 125:21 132:9 146:13 148:8 169:13 180:20 181:21 196:5 201:13 235:1 276:8 304:18 308:5 315:16
talks 96:12 148:7
tamburri 1:20
tangri 3:8
target 230:14
team 23:23 83:12 91:2,3,3,5 96:1 97:6,10 98:2,6,8,9 98:11,13,18,19,22 98:23 99:1,8 100:18 125:4,6 126:2,7 176:23 240:10 244:8 246:5
team's 83:18 99:7
teams 97:13,17,23 97:24 98:1,13 223:17
tech 15:23
technical 12:9 16:23 17:1 39:11 126:7 201:20,21 223:21 273:21 275:2 287:22 314:13
technically 273:19
technologies 24:5
technology 1:4 12:9 83:24 86:19 92:11 125:12 153:13 206:5,9 217:1 224:20,22 240:5 253:12 254:2
tecvox 187:23 188:3 275:21,21 284:22 313:14,17 313:20
telecom 196:15
tell 8:4 12:18 15:19 17:6 22:22 24:13 45:14 47:9 54:17 80:21 110:11 119:14 120:4,20 174:16 198:5 212:11 315:18 320:5
telling 186:23 261:13 286:1 306:18 312:5
temperature 210:17,22
template 151:24
temporarily 238:7
tempting 315:17
ten 276:10
tend 10:6
tender 317:5
tends 201:9
term 17:13,20 21:17,24 29:21 30:3,17 42:15 52:6,19,20 103:15 112:23 113:1 117:8,16 202:11 203:5 211:15 224:23 227:8,16 236:10,12 257:10 258:19,21 259:22 273:24,24
terminology 225:20
terms 7:15 117:11 126:19 168:7 203:5 317:23
terrible 238:14
terribly 171:1
tesla 16:11 211:21 215:9
test 97:24 126:16 132:12 133:2 213:2,3
tested 132:6
testified 11:12 149:9 194:17
testimony 1:12 15:15 131:23 139:6 173:13 181:20 183:1,24 184:23 192:15 281:17 314:12 315:15 316:18 320:4,6,9
testing 201:24
tests 297:9,11
texas 2:12 12:21 13:4 18:10
text 287:1 303:5
thailand 213:3
thank 31:4 45:10 51:24 57:18 81:21 95:12,18 97:1 105:14 110:1 111:4,21 120:16 147:8 148:15 158:24 163:4

185:23 190:2,11 272:2 281:2,3 282:8 318:18,24
thankfully 14:7
thanks 115:7
theirs 127:2
thereof 320:10
thing 7:22 27:20 41:3 65:12 76:20 85:18 114:5 123:20 144:5 151:14 169:20 170:16 173:8 184:19 243:7 305:16 312:6
things 8:18 13:15 13:24 14:15 16:1 20:18 26:23 43:16 67:15 71:15 72:11 91:18 92:13 93:9 95:4 99:19 100:15 106:24 113:22 144:2 168:18 180:18 181:22 182:6 252:24 280:20 316:1
think 8:2,12 12:23 20:7,11,12 21:9 26:5,17 29:22 31:11 34:4 36:6 40:16 44:1,15 52:7,23 53:18 56:4 60:22,23 62:14,15 64:1 74:23 76:7 77:2 82:18 96:21 109:7 110:5 114:14 120:16 124:1,10 124:21 125:19 126:13 127:16 137:11,19 142:10 142:16 143:22 148:22 149:3 150:16 152:1,8 162:17,19 169:4 170:10 171:2 172:18,20 173:7 174:23 175:7 177:2,9 183:9 184:8 185:14 188:4,11 198:2 200:14 204:16,22 209:3,16 216:24 217:13 225:16,24 227:5,23 231:19 235:20 260:21 261:6 265:21 272:10,13 274:20 276:6 282:19,24 283:8 292:23 306:15 310:5 312:16 314:15
thinking 8:19 31:21 51:12 239:16
third 88:18 101:19 104:23,24 217:18 222:14 259:18 260:5 291:8 315:24
thorough 148:14
thought 8:2,5 45:21 65:10 78:11 92:9 94:14 113:18 154:2 165:15 166:17,19 168:18 177:6 229:12 234:5 240:16 255:17 280:2 295:14,20 296:1,3 298:1 299:11 301:8 303:12,16 303:18,19 317:22
thoughts 315:21
thousand 222:3
thousands 225:9
thread 122:9 124:2
threat 299:3 300:22 301:1
threatening 177:15 178:16
threats 298:20
three 25:2,3,21,22 37:5 101:8,9,12 102:3 197:17 211:20 212:1,5,22 228:20 229:19 234:17 247:10,15 251:20 264:10 287:7
throat 56:23
throw 155:10
thumb 311:13,15
thursday 1:14
ticket 253:1
tied 309:5
time 1:15 7:14 10:1 13:8 14:3,8,9 14:9,13 19:20,21 21:7,13,22 35:13 35:16 38:2,4 41:10,22 43:7,10 47:16 52:14 55:15 57:6,14 58:1,2 59:4 60:2,15 61:15 71:12,14 72:13,16 74:4 77:9 81:18 84:18 85:7 86:2,7 87:4 88:2,14 90:9 95:8 105:12 107:19 110:15 112:3 123:2 125:22 126:12,13 145:7 147:7 155:2,23,24 161:9 162:4 164:21,22 165:10 167:2,4 169:1,18 174:18 176:24 180:19 197:9 203:10 215:6,9 216:9 227:10 230:6,12 232:19 233:6,8 234:14,20 236:5 237:16,23 238:8,11,13,20,24 240:10 243:18 246:15 251:19 252:3,4,7 255:14 268:5 273:20 276:23 277:11,23 279:4 280:8 287:17 289:7 290:2 294:8,18 295:1,12,14,21 301:10 306:17 307:13 308:13 309:17 312:4 313:14 314:24 315:9 320:4
timeframe 21:5 24:17 84:8 88:16 126:9 166:4,16 167:8 174:2,11 226:12 230:17 290:18 307:15
timeline 315:3
times 16:17 41:7 100:5 180:18 198:22 215:15,22 219:15 256:1 279:24

timing 8:11
timothy 3:9
tiny 117:19
title 45:15 76:3 115:21,23 116:2 195:3,5
titled 39:9 40:15
today 8:13 9:2 10:14 16:8 81:16 139:6 146:13 147:3 171:1 172:20 195:21 199:2,4,6,9 200:11 200:12 204:9 208:23 212:13 217:4,7 218:4 219:13,20 220:11 220:12,15,17,19 220:23 221:8 222:4,13,20 223:8 247:1 248:1,13,23 252:23 260:24 261:3 280:16 281:6 287:17,20 294:16
told 109:2 153:19 214:17 258:2 305:10
tolerate 90:12
tomorrow 8:17 10:16 222:20 251:4 291:23 316:6,8,9 318:8,17 318:20
tonight 318:12
top 15:21 40:22 47:20 48:18 50:6 50:8,22 51:4 54:13 55:17 56:20 67:4 68:2,21 93:5 99:10 101:24 104:24 106:7,15 111:1 112:1 115:9 119:14 143:4,6 151:19 152:16 189:16,17 260:16 292:9 304:18 308:9 313:1,7 314:5
topple 183:8
total 261:7
totally 174:13
touch 258:11
touched 34:4 52:7
touchscreen 30:11
tough 9:24 211:2
tougher 210:23
tower 2:10 24:15 47:17
town 12:21
toyota 215:14
track 248:11 258:10
trade 85:23
trademarked 85:22
transaction 293:16
transactions 293:17
transcribed 320:7
transcript 1:11 170:24 172:1 185:12,13
transcription 320:8
transition 209:13
transitioned 18:12 19:8,19
transitions 113:20
treated 223:14
trial 10:15 14:18 14:20 16:7 27:1 36:12 39:4 79:12 93:14 114:19 118:23 121:23 133:23 139:24 150:20,21 175:21 175:22 177:20,21 181:3 186:5 231:2 262:4 263:5 264:1 265:9 266:13 271:14 274:5 277:16 286:9 290:13 301:13 304:6 307:7
tried 238:10 273:11,12
trip 298:22
trivial 317:1
trouble 109:4,17 273:18
true 81:14,18 95:6 215:17 257:23 285:11 298:11 302:21,23 315:4 320:8
trust 305:7
truth 320:5,5,6
try 8:20 10:22 21:22 60:1 83:9 100:22 109:7 125:10,17 169:6 169:16 300:4,13
trying 49:2 61:15 90:8 91:10 120:22 174:2,10 226:19 234:23 277:8 296:10 302:24 313:20
ts1c 212:15
tsaulsbury 3:12
turn 36:2 38:23 41:24 93:11 101:21 110:5 114:16 116:11 118:20 121:20 162:18 163:1 188:13,17 204:23 230:23,23 262:2 263:2,22 264:17 266:10 271:11 274:3 277:13 309:11
turned 162:16,21 236:21
turns 53:23
tweaks 33:17
two 12:24 19:7 21:10 24:19 25:21 35:15,20 37:15,24 39:22 41:15,18 44:18 47:13 48:9 50:22 51:3 52:1 53:10,11 58:14 64:6 68:8 70:21 73:20,21,22 77:7 86:8 87:2,3 88:11 88:22 89:14 91:17 92:13 98:12 101:2 101:14,17 104:10 105:10 107:7,22 110:18,20,23,24 112:7 113:20 114:6 115:13,13 115:18 116:7 117:4 118:5 121:16 129:5,23 131:2 133:12,13 134:2,12 143:6 156:22 179:3 191:23 199:2

211:13 213:10 216:15,19,21 218:5 222:20 223:10 224:2 225:12 227:6 229:7 230:7,8 235:17 237:3,21 239:13 247:11,19 247:21 248:24 252:23 253:17 259:6,10 264:10 275:9 276:19 280:1 293:15,17 293:23 295:4,7
type 16:20 30:11 62:13 137:7,8,9 179:7 195:22 223:24 274:1
types 55:14 58:4 136:18
typically 10:14 22:3 25:14 29:19 30:9 57:13 61:18 63:4 99:1 221:13 223:16 251:18
typos 75:20

u

u 62:19
u.s. 211:20 215:9 256:10
ultimately 91:17 97:24 162:13,14 162:20 206:7 246:2
um 23:2 131:6 283:11
underlying 24:5
understand 20:3 34:8 68:19 79:24 81:11 90:11 98:4 126:23 145:15 149:10 157:7,9,13 157:21,23 159:5 183:2 185:5 191:7 218:3 224:10 236:10 239:9 277:12 285:2,3 294:16 299:8 310:6
understanding 59:13,15 82:11 86:2 88:24 126:17 146:15 184:23 185:5 224:15 234:2 256:12 287:23,24 306:8
understands 310:22
understood 232:20 234:23,24 300:9
unfair 254:1 280:13
ung 245:13
unhappy 261:13
unique 67:13 72:1 72:19 106:23
unit 16:15 29:18 29:22,24 30:2,23 49:1 78:8 85:11 85:14 86:24 88:7 88:12 89:7 90:4 103:23 104:12 105:10 106:8 121:19 127:3 195:7 196:9,12,13 203:3 207:1,14 208:8 218:5,12 225:11 237:1,5,14 237:18 238:5 243:24 244:5,9 245:13 246:1 251:13,15 253:2 262:10 268:11,24 270:10,16 278:14 292:1 293:3,6 306:11 311:2,4,19
united 1:1 17:12
units 195:11 196:6 199:2,3 200:17 206:23 211:13 214:4 220:16,19 243:21 246:17 248:20 250:13 259:5,6 263:14 264:9 269:5
universal 20:6
university 18:7 197:3
unwire 233:2
unwired 121:10 121:11 124:20 125:11 126:2,5,18 176:16,24 187:3 187:14,17 211:23 212:2,3 224:12,15 224:17,19 225:22 225:23 226:3,16 227:2,4,8,10,17,19 227:24 228:2,6,10 228:18,22 229:18 229:19 230:18,20 231:16 234:7,11 234:15,17 235:8 236:21 240:18 243:20 253:11 259:11 266:2 272:7 275:3,7,16 275:18 278:10,17 278:20 279:3 292:2 295:13,21 296:1 299:2,7,12 300:1,6,14,21,24 301:4,8 302:9,19 303:1,13 308:16 313:8
unwired's 233:5 235:4 240:2 257:4
update 257:21 277:4
updated 31:13
updates 100:13
upgrade 85:21
upgraded 48:3
upper 37:3 45:16
upset 253:12,16
upstate 197:2
upstream 51:5 57:9 59:4 66:9,11 69:21 70:1 88:4,9 88:10,19 101:16 101:18 102:17 104:6,11 110:17 112:6 121:18 141:8,12 142:5,20 143:12 144:13 216:17,18,20 247:17,19 270:4 278:14 295:4
usable 41:19
usb 16:23 19:8,9 19:22 20:2,3,6,12 20:13 21:3,8,12,17 21:19 22:1,1,4,4,8 22:9,11,11,12,23 23:5,7,14 24:7,8 24:19,21 25:11,12 26:1,16 29:13 31:10,13,16,16,18 31:19,24 34:9,15 35:3,5,11,14,15 40:15,17,18 41:19 42:4,15,19 43:6 45:1,8,17 46:22

50:10,13,20 52:3,5 52:22,23 53:1,12 56:5,9,10 57:3,7,9 57:11,12,14 59:1,2 59:5 60:1,20 66:5 67:6 68:6 69:14 71:4,9,10 72:7,10 72:18 73:3 86:3,6 87:1 89:8 101:5 106:22 115:23 118:8,19 127:21 127:23 128:13 129:8,8,11,11,13 129:14 130:2 131:2,21 132:11 132:24 133:2,13 134:2,12,23 135:4 135:6,8,11,12,15 135:17,19 136:4,5 136:7,11,12 139:16 140:20,24 141:18 142:6,18 143:11,11 144:6,7 144:14,20 145:4,6 145:8 148:7,9,21 155:22 164:18 165:5,7,15 179:2,7 179:9 187:13 188:3 196:7,8 199:14 207:1,2 209:14,15,18,20 210:2,12 211:9 212:8 213:7,11 215:18,21,22 216:2,5,11 217:4 217:12,13,15,17 217:24 221:3,4 225:6,8 227:3,18 228:7,11,19 229:14,22 233:7 235:10,17 236:10 241:6,17 242:18 243:23 244:2 248:21 249:5,13 250:5,6,20 251:11 251:17 252:5 259:12,23 262:13 269:12 270:11,12 270:22 272:22 273:1,19 287:6,23 293:4,5,9,12,15,15 293:19 294:1,14 294:21 295:3,17 297:2,3,8,12,17 299:3,13 301:1 303:14 305:24 310:5,6,19 311:13 312:6 314:8,21

usb3740 106:17 107:13 111:6,8

usb3740s 107:7

usb4715 119:4,14

usb4914 115:10,13

usb4916 115:10,12 116:19 117:5

usb8460x 111:3

use 20:11 22:5 25:18 30:8 31:2 43:1 47:12 48:8 60:21 62:2 65:11 67:18 72:2 73:17 77:1 83:23 85:4 89:18 104:18 108:5 117:19 119:17 127:4 130:8 144:21 145:9 166:8 202:10 203:2,4,11 204:14,19 210:13 212:22 215:11 225:19 226:6 230:10 234:23 235:2 236:12 239:19 273:15 280:2 288:11 300:4,5 314:1 317:19

useful 84:13 103:22

user's 51:19

uses 106:22 221:12 269:1 280:23

usual 257:16

usually 27:14 31:2 32:12 96:11 201:15 210:16 212:10 227:11 251:20

utilize 62:6

utilizing 92:10

v

vague 136:20 180:4

valid 76:11,15 82:17

validate 91:18,21

value 208:23 209:6

valued 287:2

variant 28:11 101:19 110:17

variation 65:6

variations 64:18 64:22

varies 201:1

variety 276:18

various 304:10

vary 54:2 200:23

vegas 268:23

vehicle 118:15

vendors 310:2

veritext 1:22

version 21:8 61:22 61:23 103:11 104:4,6,8,14 105:3 105:5 117:24 119:4 161:10

versions 64:17 115:14 117:6

versus 157:18

viable 279:15

vice 195:5,17 287:15

video 48:21 171:13

view 236:20 273:7 279:5 301:5

viewed 235:17 280:4

village 12:21 14:4

violate 23:18

violated 33:13

violation 293:24

visit 298:23

visited 268:3

visiting 214:10

visits 100:4

volume 210:13 217:9 227:20 248:12 258:14

volumes 258:22

volunteer 14:7

volunteered 14:5

vp 246:1

vs 1:7

vw 215:10

w

w 2:3

wafer 212:13

wafers 212:13

wait 245:1

walked 146:10
wall 273:2 314:10 314:12,13,14,17 314:19
want 24:3 25:3,23 31:5,6 44:12 61:10 64:12,24 89:5 92:18 94:15 102:9 109:15 116:13 118:12 122:18 133:21 147:4 159:3 171:8 184:10 196:2 211:21 214:12 222:2,2 224:24 233:24 237:17,17 237:18 241:11 243:15 246:9 254:16 256:22 257:1 265:18 270:21 271:2 276:19,20,20 281:8 284:19 291:5,21 297:24 298:8 303:24 305:23 306:10,10 306:16 309:4 311:6 317:5,22 318:1,15
wanted 18:18 23:15,18 29:8 38:19 49:20 77:6 78:12 85:10 89:7 89:8 90:4,14 112:12 113:7 124:4 127:15 147:23 185:5 216:19 229:9,10 237:22 239:4 268:21,23 278:21 278:23 288:10 295:5
wanting 139:19 305:16
wants 181:23 224:3 281:10
warning 315:8
washington 17:16
way 8:21 15:15 17:11 32:9,23 35:24 40:6 41:12 43:9,17 45:1 51:11 53:18 56:12 65:7 67:6 68:23 72:6 78:13 92:9 128:7 129:23 130:15 133:4 136:24 137:1 139:15 143:3 151:14 169:16 177:1 189:17 204:19 212:19 237:8,9,14 240:14 240:15,18,19 251:19 259:7 276:22 281:1 283:19 291:8 292:13 293:21 297:7 303:22
ways 39:22 86:9 239:3 246:20 254:9
we've 12:23 13:11 13:13 48:20 68:8 103:16 105:9 196:7 214:17 244:15 250:21 251:7 279:24
weather 316:11
website 222:1
week 12:11 177:15 178:14 179:21,22 224:2 291:23
weekend 8:18
weeks 223:10
weigh 315:22
weighty 80:7
welcome 9:21 109:14 185:21
went 19:16 23:14 76:9 83:9 114:13 120:19 127:15 146:8 153:14 188:15 197:3 235:13 242:12 246:19,20 268:3 291:22
wide 210:22
wiener 3:9
wife 12:23
wifi 61:22
wildlife 13:14
willing 14:18
wilmington 1:17 2:5 3:5
win 34:12 63:10 63:10 229:4,12 230:2 232:21 234:5 236:4 238:10,12,19 255:3,5,5,6 257:17 261:17,24 268:6
winning 267:22
wire 195:12 196:2 218:7 230:8 247:21
wired 61:23
wireless 61:22
wires 28:18 117:20,20 216:19 247:20
wise 99:13 100:12
witness 4:2 10:6 11:4,22 12:13,16 25:1 26:22 36:3,4 44:4 64:9 82:22 109:21 118:20 128:18 132:5 136:22 143:22 147:9,16,18,21 148:12 156:16 164:4,23 165:1 178:19 180:6 183:2 185:1 193:13 194:11 294:5 307:9 316:20 320:9,11
witnessed 160:6
witnesses 182:2
wolson 1:19 7:4
won 229:14 235:9 253:19,19 257:3
wonder 261:9
wondering 306:22
word 42:14 59:12 75:20 135:1 154:9 154:12,12 161:4 177:18 187:10
words 46:7 52:3 53:24 55:21 59:10 59:11 191:8,13,18 191:20,22 192:3,4 192:5,6 297:5
work 10:22 15:2 16:20 17:7 19:9 20:3 21:2 23:4,22 26:14 31:7 32:13 32:16,22 33:7,15 33:17 34:1 47:14 56:11 89:24 90:9 90:19,23 93:4 97:11 99:23 103:8 113:18 121:13

125:1 160:7 198:13 201:23 210:17 218:22,24 219:2,4,5 233:24 241:22 242:3,6 244:8 251:5,24,24 255:17 261:23 306:19 310:13 312:6
worked 16:23 18:1 18:11 34:7 125:3 175:15 176:20 177:5,14 178:15 179:23 216:21 276:14 288:18 289:9 303:2
workers 38:5
working 14:21 15:10 16:21 19:3 19:8,21 34:17 38:12 39:24 91:12 93:7 155:2 232:19 255:15 275:1 279:12,13 287:12
workings 125:17 173:10,14,16,17
works 32:20 41:13 189:18 196:13,15 236:17 251:18 276:9,10 289:12 289:15,18,21
world 15:22 52:24 60:20 106:24 198:10 199:14 214:17 243:7 250:16 283:13
worldwide 204:8 204:9
worried 297:14
worries 177:9
worry 77:8 184:9
worth 50:5 213:19 259:12
wrap 10:12
wrapper 79:10,23 80:6 167:15
write 162:22 190:23 191:1 245:6,7 246:10
writes 308:22
written 35:4 39:9 150:15 153:10 160:21 164:21 169:21 231:22 245:9
wrong 150:15
wrote 43:22 78:5 191:2,4 245:8 292:17,21 303:16 303:23

x

x 4:1 5:1 6:1

y

y 194:13
yeah 11:3 21:20 60:22 61:3 75:3 75:15 86:16 117:10 124:10 130:23 133:18 134:7 136:2 137:3 140:5 145:14 148:1 157:20 167:1 174:3 184:2 196:1 198:19 199:7 200:3,9 204:9 205:14 207:10 210:5,13 211:12 213:9 215:6 216:8 218:2 220:18,24 224:17 226:1,1 227:19 229:16 232:18 238:23 239:12,13 239:22 240:6 241:9,19 242:18 243:5 248:5,23 250:1,1 252:18 255:13 259:3 260:19 261:1,12 267:19 268:2 270:1 273:5 275:5 276:15 279:21 280:7,17 283:3 284:6,19 287:24 288:16 289:1 296:3,22 297:5 298:4 301:6 304:3 305:7 307:3 308:17
year 13:22 14:6 17:13 19:6 21:9 107:20 160:22 197:6 200:13,17 201:2,9 202:14,14 203:6,7,11,14,16 209:23 211:11,12 211:14 213:15 217:10 220:11 222:24 223:2 227:4,7 229:17,17 247:24 248:2 251:21,21 259:9 259:13,16 296:24
year's 213:19
yearly 213:6 214:2
years 12:24 18:12 19:7,12 101:2 165:11 195:16 197:8,15 198:3,4,6 198:15,18 202:17 203:13,22 204:11 210:4,5 220:7,8 250:23 264:9 287:13
yellow 69:12
yep 180:6 187:15 216:6 245:1 306:6 309:21
yesterday 8:19 20:8 24:6 26:6 29:23 181:19 184:7 216:24 219:6
york 197:3

z

zero 72:8,10,12
zoom 101:23 113:13 159:3