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UNITED STATES DISTRICT COURT  
SOUTHERN DISTRICT OF FLORIDA

Case No. 18-80176-CIV-BB

IRA KLEIMAN, ET AL.,	)	
	)	
PLAINTIFFS,	)	
	)	
-v-	)	
	)	
CRAIG WRIGHT,	)	
	)	
DEFENDANT.	)	West Palm Beach, Florida
	)	August 5, 2019
_____	)	

TRANSCRIPT OF EVIDENTIARY HEARING PROCEEDINGS  
BEFORE THE HONORABLE BRUCE E. REINHART  
UNITED STATES MAGISTRATE JUDGE

Appearances:  
(On Page 2.)

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25

\* \* \* \* \*

1 (Call to the order of the Court.)

2 THE COURT: Good morning, everyone. Have a seat,  
3 please.

4 VOICES: Good morning, Your Honor.

5 THE COURT: So we're here on case number 18-80176,  
6 Ira Kleiman versus Dr. Craig Wright, et al. I'm sorry, Ira  
7 Kleiman and W&K versus Dr. Craig Wright.

8 Can I have counsel's appearances starting with  
9 counsel for the Plaintiffs, please.

10 MR. FREEDMAN: Good morning, Your Honor, Vel  
11 Freedman for the plaintiffs.

12 THE COURT: Mr. Freedman, good morning.

13 MR. ROCHE: Kyle Roche for the plaintiffs.

14 THE COURT: Mr. Roche, good morning.

15 MR. BRENNER: Good morning. Andrew Brenner for the  
16 plaintiffs.

17 THE COURT: Mr. Brenner, good morning.

18 MR. KEEFE: Good morning, Your Honor. Robert Keefe  
19 for the plaintiffs.

20 THE COURT: And Mr. Keefe, good morning.

21 Okay. And for the defense?

22 MS. MARKOE: Good morning, Your Honor. Zaharah  
23 Markoe for Dr. Wright.

24 THE COURT: Ms. Markoe, good morning.

25 MS. MCGOVERN: Your Honor, Amanda McGovern for

1 Dr. Wright.

2 THE COURT: Ms. McGovern, good morning.

3 MR. RIVERO: Good morning, Judge. Andres Rivero for  
4 Dr. Wright.

5 THE COURT: Good morning, Mr. Rivero.

6 MR. KASS: Good morning, Your Honor. Zalman Kass  
7 for Dr. Wright.

8 THE COURT: And Mr. Kass, good morning.

9 So first of all, I apologize to the parties for  
10 being a few minute late getting started. Judge Rosenberg  
11 needed to talk to me about another case, and she outranks you  
12 all, so . . .

13 All right. So we are here today for the  
14 continuation of the hearing on the plaintiffs' motion to  
15 compel and the Court's order to show cause. When we let out  
16 the last time we had completed Dr. Wright's testimony, so I  
17 will turn back to the plaintiffs and they can call -- I'm  
18 sorry, to the defendants, and they can call their next  
19 witness.

20 MR. FREEDMAN: Your Honor, if I may, just two  
21 housekeeping matters.

22 THE COURT: Yes, of course.

23 MR. FREEDMAN: So the first is personal. My wife is  
24 expecting in about two days, and I don't expect this to  
25 happen, but with your permission, I'm leaving my phone on in

1 the event I have to make a very quick exit.

2 THE COURT: Absolutely. And if you need to go, go.

3 MR. FREEDMAN: Thank you.

4 THE COURT: So much more important than anything  
5 we're doing here this morning.

6 MR. FREEDMAN: The second, Your Honor, is that the  
7 rule's been invoked.

8 THE COURT: Okay.

9 MR. FREEDMAN: However, Dr. Edman, our expert  
10 witness, who is an expert in applied cryptography and digital  
11 forensics, we'd like him to stay in for the testimony of Steve  
12 Shadders. Mr. Shadders, as we understand it, is coming as a  
13 fact witness, but in truth, his testimony is going to entail  
14 how the methodologies he used that were given to him by  
15 Dr. Wright to try and identify which Bitcoin addresses were  
16 Dr. Wright's as of 2013, and that will be a matter of applied  
17 cryptography.

18 Beyond that general description of what Steve  
19 Shadders is going to say, we've received a list of I think  
20 almost 1.4 million Bitcoin, and we have otherwise no idea what  
21 his testimony will be. And so it is the plaintiffs' position  
22 that Dr. Edman must listen to this testimony so that he can  
23 then tell us whether he has anything to add or rebut or -- we  
24 just don't have any information, and we would argue that  
25 Dr. Edman is therefore essential to the plaintiffs' case, just

1 like the Government is allowed to have an investigator at its  
2 table and experts are allowed to attend when essential to a  
3 party's case.

4 THE COURT: All right. Thank you.

5 Ms. McGovern?

6 MS. McGOVERN: Yes, Your Honor. Thank you.

7 We object, Your Honor. And the reason for that is  
8 because Steve Shadders, who will be presented by my colleague,  
9 Zaharah Markoe, is purely a fact witness, and the testimony  
10 that is being presented is not in the form of expert testimony  
11 and doesn't purport to be.

12 Dr. Edman, on the other hand, is an expert witness  
13 that is being offered to this Court on the very limited issue  
14 of the authenticity of certain documents that are presented to  
15 this Court. We have had -- we have provided the list of  
16 potential Bitcoin addresses and explained to the plaintiffs  
17 the purpose -- sort of the scope of the testimony of Steve  
18 Shadders since June 28th, Your Honor, and this is the first  
19 time we've heard that Dr. Edman is now going to potentially be  
20 a rebuttal expert on that topic.

21 And sort of separate and apart from the fact that  
22 the scope of the testimony was not part of the expert report,  
23 sort of the high-level analysis of the expert report that  
24 we've received from Dr. Edman, we've had absolutely no  
25 discussion about rebuttal experts. In fact, when we went over

1 the lineup for this hearing, Your Honor, we specifically said  
2 a while ago that we wanted to inform the plaintiffs' counsel  
3 that we would not be calling one of our expert witnesses with  
4 respect to the expert mechanism through which public addresses  
5 are derived and the importance of them, what can be learned  
6 from them specifically because we didn't think it was  
7 necessary, and we didn't want the plaintiffs to be preparing  
8 all weekend for somebody we weren't going to call. So we gave  
9 them a heads up on that.

10 At that time we never heard, well, we're going to be  
11 presenting expert testimony and in the rebuttal form to a fact  
12 witness on what really is simply factual testimony as to what  
13 our client has asked his colleague to do in an attempt to  
14 ameliorate his inability to provide the public addresses in  
15 accordance with this Court's order. We don't think it's  
16 appropriate, we think it's last minute, and we also don't  
17 think that it fits within the scope of his expert testimony,  
18 Your Honor.

19 So we object to that.

20 THE COURT: All right. What's the appropriate rule?  
21 I'm quickly looking at the rules of evidence. I wasn't  
22 expecting this issue. Can someone point me to the right rule?  
23 Is it in the 600s?

24 MS. MARKOE: Your Honor, the disclosure rules are --

25 THE COURT: No, I'm sorry, Ms. Markoe. It's the

1 rule that says a party can ask --

2 MR. FREEDMAN: 615, I believe, Your Honor.

3 THE COURT: 615, excluding witnesses. Thank you. I  
4 just want to take a quick look, please, and then Mr. Freedman  
5 I'll let you respond, but let me just look at the rule for a  
6 second.

7 MR. FREEDMAN: Your Honor, 615(c) I believe is the  
8 relevant . . .

9 THE COURT: Right. I'm looking at that right now.  
10 So Mr. Freedman, I'll hear from you.

11 MR. FREEDMAN: Your Honor, I think Ms. McGovern hit  
12 the nail on the head, which is I don't know if Dr. Edman is  
13 going to say anything in response to Steve Shadders'  
14 testimony, because I don't know what Steve Shadders is going  
15 to say. If he -- as I understand it, he will talk about the  
16 criteria that Dr. Wright gave him in order to derive the  
17 Bitcoin. That is applied cryptography. I don't understand it  
18 as well as Dr. Edman or as well as Mr. Shadders. My  
19 colleagues don't understand it as well as Mr. Shadders, who is  
20 the chief technological officer of nChain. And so it would be  
21 unfair to the plaintiffs if we don't have somebody in the room  
22 who could understand what Mr. Shadders is saying.

23 THE COURT: Okay. Thank you.

24 I'll allow the witness to say. I think under Rule  
25 615(c) says that: Although the Court must otherwise exclude



1 witnesses upon a request of a party, the Court does not have  
2 to exclude someone whom the Court finds to be essential to  
3 presenting the party's claim or defense.

4           And also given that this is a -- I'm the finder of  
5 fact and I'm the decision-maker here, if -- I can take into  
6 account the fact that the witness was present in the courtroom  
7 and may have heard Mr. Shadders's testimony, and I'll also  
8 entertain motions to strike if, Ms. McGovern, if you believe  
9 there's portions of the witness' testimony that are  
10 inappropriate given what he heard from Mr. Shadders.

11           So I'll allow the witness to stay.

12           So actually before we call the first witness, let me  
13 deal with one other housekeeping matter, and then I'll --  
14 well, first of all, either of the parties have any other  
15 preliminary matters that they want to cover?

16           From Mr. Freedman, no?

17           MR. FREEDMAN: No, Your Honor.

18           THE COURT: Ms. McGovern?

19           MS. MARKOE: No, Your Honor.

20           THE COURT: Okay. I just want to remind the folks  
21 in the audience here that there are to be no electronics.  
22 Unless you have prior clearance from the marshals as a member  
23 of the media, there are to be no electronics in the courtroom  
24 being used. You're not to have any telephones in the  
25 building, and no one is to be broadcasting in any way from the

1 courtrrooms during the proceedings. If you want to go outside,  
2 feel free, but nothing from the courtroom, and no phones in  
3 the building unless you have clearance from the marshals.

4 All right. With that, Ms. McGovern, I'll let you  
5 call your witness. Or, I'm sorry, Ms. Markoe.

6 MS. MARKOE: Thank you, Your Honor. I call Steve  
7 Shadders.

8 THE COURT: Okay. Mr. Shadders.

9 Mr. Shadders, raise your right hand, please.

10 Steve Shadders, a/k/a Steven Coughlan,  
11 Defendants' witness, sworn.

12 THE WITNESS: I do swear. I just want to make the  
13 note that my legal name is Steven Coughlan.

14 THE COURT: I'm sorry, can you spell your last name  
15 for the court reporter, please?

16 THE WITNESS: C-o-u-g-h-l-a-n.

17 THE COURT: All right. Mr. Coughlan, excuse me.  
18 Have a seat, please.

19 MR. BRENNER: Your Honor, I'm sorry, I just couldn't  
20 hear anything the witness said.

21 THE COURT: Oh, he just said that his correct legal  
22 name is Steven Coughlan, C-o-u-g-h-l-a-n. That's all he said  
23 so far, and he swore the oath.

24 MR. BRENNER: Thank you.

25 THE COURT: So Mr. Coughlan, if you can just make

1 sure you lean forward enough to pull that microphone close  
2 enough so that everyone may hear you. You can sit back in the  
3 chair, but just make sure you're close enough to the  
4 microphone when you speak.

5 Ms. Markoe.

6 Direct Examination

7 BY MS. MARKOE:

8 Q You go by the name Steve Shadders professionally; is that  
9 correct?

10 A Yes, I do.

11 Q And which name do you prefer being referred to here  
12 today?

13 A Steve Shadders is my preferred --

14 THE COURT REPORTER: I'm sorry?

15 THE COURT: Mr. Shadders, I'll also remind you that  
16 you have a different dialect than the rest of us here, so make  
17 sure you speak slowly enough so we can all follow along. Even  
18 though it's the same language, it's a different dialect.

19 THE WITNESS: Indeed.

20 BY MS. MARKOE:

21 Q Mr. Shadders, where do you live?

22 A I live in London, UK.

23 Q And where do you work, sir?

24 A I work for nChain, Limited, in London, also.

25 Q What is nChain, Limited?

1 A NChain is a technology company that's specifically  
2 focused on Bitcoin, or the version of Bitcoin that was  
3 described in Mr. Satoshi Nakamoto's white paper of 2008. We  
4 engage in research activities, as well as software engineering  
5 to build infrastructure components to support the Bitcoin  
6 ecosystem.

7 Q How long have you been involved in developing Bitcoin  
8 software and Bitcoin research?

9 A I became involved in Bitcoin in 2011, about mid 2011, and  
10 started writing softback then.

11 Q How long have you been working with nChain?

12 A Um, I began formally as a full-time employee in May of  
13 last year after moving to London, but prior to that I did  
14 contract work for them going back to mid 2017.

15 Q What is your title at nChain?

16 A I'm the chief technology officer.

17 Q What does that position entail?

18 A Broadly speaking, my remit is to oversee the technical  
19 implementation of nChain's kind of longterm vision. The  
20 longterm, I guess the 10, 20-year view comes from Craig  
21 Wright, our chief scientist, and my job is, well, not only  
22 interpreting Craig's vision, but also implementing that,  
23 taking probably the two- to five-year view.

24 Q And what do you mean by interpreting Dr. Wright's vision?

25 A I mean, Craig's well-known to not be the world's best

1 communicator. We have an entire team at nChain that's devoted  
2 to the task of trying to parse some of the more cryptic  
3 expressions of Craig so that we can understand what he's  
4 trying to describe to us.

5 Q How long have you known Dr. Wright?

6 A I first came across Dr. Wright in early 2017 through  
7 online, you know, messaging platforms, a Slack telegram, for  
8 example. I first met him in about October of 2017.

9 Q Do you stand to gain or lose financially or  
10 professionally based on the outcome of this case?

11 A I don't believe I do, no.

12 Q You've been asked to testify in this proceeding. Do you  
13 understand the purpose why you were asked to testify in this  
14 proceeding?

15 A Yes.

16 Q What do you understand that to be?

17 A I understand that Craig has been asked by the Court to  
18 produce a list of Bitcoin addresses that he mined during a  
19 certain period, and due to the fact that he used a software  
20 algorithm to generate these addresses, he didn't actually  
21 store a copy of them, and the requisite software and secrets  
22 that he needs in order to make use of this software are locked  
23 up in an encrypted file that he doesn't have access to. So  
24 Dr. Wright asked if -- if I could attempt to produce a close  
25 as possible list of those addresses by applying certain

1 criteria to public information.

2 Q And did you understand that the purpose of your task was  
3 to be more inclusive or less inclusive in terms of your  
4 analysis, i.e. were -- was the purpose to, you know, risk  
5 eliminating potential addresses, or was the purpose to ensure  
6 that you may have extra, but you made sure you didn't  
7 potentially exclude potential addresses belonging to  
8 Dr. Wright?

9 A Yeah, the intention was to avoid the possibility of  
10 excluding addresses that might belong to Dr. Wright, even if  
11 it meant that there were a larger number of addresses in that  
12 list that didn't belong to him.

13 MS. MARKOE: Okay. Your Honor, may I approach the  
14 witness?

15 THE COURT: You may.

16 MS. MARKOE: I have premarked this as exhibit D-2.  
17 The court reporter has a copy, the plaintiffs have a copy, and  
18 I believe Your Honor has a copy.

19 THE COURT: I do have a copy.

20 Are you going to offer this into evidence?

21 MS. MARKOE: I will.

22 THE COURT: Okay. Let me just preempt.

23 Mr. Freedman, any objection to D-2?

24 MR. BRENNER: No objection.

25 THE COURT: No objection okay.

1 MS. MARKOE: All right. Then I can --

2 THE COURT: D-2 will be admitted into evidence  
3 without objection.

4 (Defendant's Exhibit No. D-2 entered into evidence.)

5 MS. MARKOE: Then I can dispense with the typical  
6 foundational questions.

7 THE COURT: Yes. Well, I mean, to the extent you  
8 want to. If you want to -- you can do whatever you want, but  
9 it's in evidence.

10 BY MS. MARKOE:

11 Q Mr. Shadders, do you recognize this document?

12 A Yes, I do.

13 Q Okay. What do you recognize it to be?

14 A This is a printout of the list that I generated based on  
15 a quick look at the number of entries in it and a number of  
16 addresses that I know should not be on this list, which  
17 aren't.

18 Q Okay. Give me one second.

19 MS. MARKOE: Your Honor, I'm just displaying what  
20 has been marked as exhibit -- defense exhibit 2.

21 THE COURT: Thank you. I see that.

22 BY MS. MARKOE:

23 Q How many criteria did you use to conduct your analysis  
24 that generated this list of Bitcoin addresses?

25 MR. FREEDMAN: Ms. Markoe, I apologize, this is not

1 on our screen.

2 BY MS. MARKOE:

3 Q Mr. Shadders, how many criteria did you use to conduct  
4 your analysis?

5 A There were six criteria in total.

6 Q What was the first criteria that you used to winnow down  
7 the universe of Bitcoin addresses to a more narrow universe of  
8 Bitcoin addresses?

9 A Well, the first was a date range. Dr. Wright asserts  
10 that he was mining between a pair of dates beginning from the  
11 first block of Bitcoin block 1, I believe 3rd of January 2009,  
12 through to the 21st of August, 2010. So I excluded any  
13 addresses outside of that date range.

14 Q How many addresses were left once you applied that  
15 exclusion?

16 A It was between 75 and 76,000.

17 Q What was the next criteria that you utilized?

18 A The second criteria was that Dr. Wright did not spend any  
19 of those -- those Bitcoins that he'd mined using this  
20 algorithm, so they -- they had to be unspent. So I was able  
21 to exclude any Bitcoin addresses that had moved.

22 Q And were you able to further winnow down the list of  
23 potential Bitcoin addresses using that criteria?

24 A Yes, that dropped the list from the 75,000 mark down to  
25 about the 30,000 mark.



1 Q What was the third criteria that you used?

2 A The third criteria was the -- a lack of address reuse.  
3 I'll explain what I mean.

4 So Satoshi Nakamoto was very -- very much advocated  
5 that Bitcoin addresses should only ever be used once. This is  
6 both a privacy and a security best practice matter. So  
7 Dr. Wright's software did not -- the address generation  
8 algorithm, rather, and -- sorry, was designed and implemented  
9 in such a way that a Bitcoin address was only ever used a  
10 single time. So I was able to exclude further addresses by  
11 checking for any addresses that had been used more than once  
12 in the block chain history.

13 Q And were you able to further reduce the list based on  
14 that criteria?

15 A Yes, I believe I knocked another 128 out of the list on  
16 that criteria.

17 Q And what was the fourth criteria that you used?

18 A The fourth criteria was -- I can't remember if it was the  
19 fourth or the fifth, but there was a particular scripts  
20 template called -- commonly known as pay to public key.  
21 Dr. Wright's mining software only used this particular type of  
22 script template. It was also in common, common public use.  
23 So I searched for any --

24 THE COURT: Mr. Shadders, I'm sorry, what was the  
25 name of that template?

1 THE WITNESS: Pay to public key.

2 THE COURT: Pay to public key. Thank you very much.  
3 Sorry to interrupt you.

4 THE WITNESS: That's all right.

5 So, yeah, I searched for any Bitcoin addresses in  
6 the remaining list that used different types of scripts. That  
7 particular one didn't actually yield any results, though, but,  
8 so it was still important to check, because any that didn't  
9 follow that rule clearly couldn't have been Dr. Wright's.

10 BY MS. MARKOE:

11 Q And what was the fifth criteria that you used?

12 A The fifth criteria was a characteristic of the way that  
13 the Bitcoin Coinbase transactions were constructed.  
14 Dr. Wright's transactions only ever paid out to a single  
15 Bitcoin output, which is probably more easy to think of as a  
16 single Bitcoin address. So any Coinbase transactions that  
17 paid out to more than one were also excluded.

18 Q And with --

19 MR. BRENNER: Your Honor, I just -- if the witness  
20 could repeat the very end. I'm having a hard time following.

21 THE COURT: You said -- I'm sorry, Mr. Shadders.  
22 You said you were looking for transactions that only paid to a  
23 single, you used the word, Bitcoin "address"?

24 THE WITNESS: That's correct.

25 THE COURT: Is that what we might -- otherwise known

1 as a wallet, or is that something different from a wallet?

2 THE WITNESS: No, a wallet is typically a collection  
3 of addresses.

4 THE COURT: Okay.

5 THE WITNESS: Yeah.

6 THE COURT: And so tell me again what it is you  
7 looked for to try to identify Dr. Wright's -- what  
8 characteristic of the addresses were you looking for to try to  
9 identify Dr. Wright's Bitcoin?

10 THE WITNESS: It wasn't so much a characteristic of  
11 the addresses, it was a characteristic of the way the  
12 transactions are constructed. So a Bitcoin transaction can  
13 pay to many addresses by paying with multiple outputs. These  
14 particular transactions only paid to a single one. So any --  
15 any that I -- that I examined as candidates that paid to more  
16 than one I was able to exclude on that basis.

17 THE COURT: All right. Thank you.

18 MR. BRENNER: Thank you, Judge.

19 BY MS. MARKOE:

20 Q And was this criteria able to further narrow the  
21 potential list of Bitcoin addresses?

22 A Yeah, it knocked a further 68 off the list.

23 Q What was the final criteria that you used?

24 A The final criteria was what I refer to as a Nonce marker  
25 byte. The Nonce field in the Bitcoin header was used in an

1 unusual way. So it was characteristic of Dr. Wright's mining  
2 software.

3 Q Okay. Let's break that down and explain a couple of  
4 those terms.

5 First, what is a Bitcoin block header?

6 A Okay. So a Bitcoin block is essentially made up of a  
7 header which contains a number of information fields followed  
8 by a long list of transactions that are contained in the  
9 block. There's, if I recall correctly, seven or eight  
10 different data fields in the block header, and it's about 80  
11 bytes long, and it's this header that is actually used in the  
12 Bitcoin mining proof of work process. The header is  
13 constantly modified by a tiny little bit, and then the Bitcoin  
14 miners run it through what's called a hash function and check  
15 the results, check to see if the result meets the proof of  
16 work criteria.

17 Q And what is a Nonce field?

18 A The Nonce field is a four-byte field in the header which  
19 is specifically there for miners to make use of. It can hold  
20 any value at all. There's no rules around what value is put  
21 into this Nonce field, so it's typically used as an  
22 incremental counter so that the miners can attempt to hash and  
23 find a proof of work solution. And if they don't, they can  
24 change this Nonce field and hash again, which will give them a  
25 completely different result, and they repeat this process over

1 and over again.

2 THE COURT: And I'm sorry, Ms. Markoe, when you're  
3 using the phrases "knots," is that with or without the "K"?

4 MS. MARKOE: It's Nonce, N-o-n-c-e.

5 THE COURT: Thank you.

6 BY MS. MARKOE:

7 Q A -- one byte of the Nonce field, how many numbers can be  
8 represented in that single byte?

9 A One byte allows 256 unique combination, representations.

10 Q Ranging from what number to what number?

11 A Typically zero to 255, but it depends on the number and  
12 coding scheme that you're using. In some cases you can use  
13 sign numbers, so you allow negative numbers. So the range in  
14 that case would probably be negative 127 through to positive  
15 127.

16 Q And you mentioned that miners use the Nonce field as part  
17 of their proof of work, and the numbers increase  
18 incrementally. What happens when they've successfully proven  
19 their work and have therefore mined a block? What happens to  
20 the Nonce field number?

21 A Well, the Nonce -- the value that's in the Nonce field  
22 actually is part of the header that solved the proof of work.  
23 So it's -- effectively it's locked into that Bitcoin block  
24 header, and it's recorded and stays immutable forever.

25 Q What happens when a miner tries to mine the next block

1 and provide proof of work for the next block? What happens to  
2 the Nonce field then?

3 A Well, anything the miner wants can happen, because  
4 there's actually no rules around the use of it, but the  
5 default software and most mining software that I've come  
6 across will just reset the Nonce field back to zero and then  
7 start counting up again.

8 Q Until they've successfully proven their work, and then it  
9 gets set in stone again?

10 A Yeah, correct.

11 Q How did Dr. Wright use this one byte of the Nonce field  
12 differently? I think you said he used it in a more unique  
13 manner.

14 A Yeah. Well, so a four-byte field is commonly  
15 represent -- used to represent a 32-bit number, and it allows  
16 a total of 4.3 billion combinations. Dr. Wright separated off  
17 one of those bytes and used it for a different purpose. He  
18 actually used it as a marker for individual machines. So  
19 numbers 1 through 60. I think more accurately, it was zero  
20 through 58. Each machine had a particular value, and the  
21 Nonce field would be set to that value as that miner attempted  
22 to mine their version of a block.

23 Q So would you therefore expect Bitcoin addresses  
24 associated with Bitcoin mined by Dr. Wright to have, in that  
25 one byte marker, any number above I believe you said 58 or 60?

1 A No, I wouldn't expect them to have other values outside  
2 of the range of zero to 58, because the software explicitly  
3 was designed to set that byte to those values.

4 Q And applying that criteria with regard to this unique  
5 Nonce marker that was included in Dr. Wright's proprietary  
6 software, how many public addresses were you able to eliminate  
7 using that criteria?

8 A In the list that I've provided, I was able to exclude a  
9 further two and a half thousand. However, I would like to  
10 note that I was doing some further -- further investigation  
11 yesterday, just yesterday morning, and I noted that, um, what  
12 I think was a mistake in the way that I implemented that. The  
13 effect of that mistake is not at all to say that those two and  
14 a half thousand were incorrect; they were definitely correctly  
15 excluded. But there are a further 2700 or so that I may have  
16 been able to exclude but did not because of the error that I  
17 made.

18 Q Can you describe the error that you believe you made?

19 A The error that I made was in a quirk of the particular  
20 programming language that I used was interpreting a byte as a  
21 signed number, so it was able to have negative and positive  
22 values. I had assumed that it was an unsigned number, so it  
23 would only have positive values, and because of that I didn't  
24 actually do a check for negative numbers when I was  
25 excluding -- or testing for whether a transaction should be

1 excluded.

2 Q And when you convert a negative signed number into a  
3 positive unsigned number, what is the result of that?

4 A The result is the value would fall in the range of 128  
5 through 255.

6 Q And that would have been a range that would have  
7 otherwise been excluded by this criteria; is that correct?

8 A Yeah, that's correct.

9 Q And you just discovered this potential error yesterday;  
10 is that correct?

11 A Yeah, it was only yesterday morning, which is why I have  
12 not yet gone ahead and modified the list, because I really  
13 haven't had time to kinda consider carefully and make sure  
14 that there hasn't been a mistake in my interpretation. I  
15 don't want to go excluding things from the list without being  
16 certain that I'm not doing so correctly.

17 Q Should you be asked to provide a list of those 27-odd  
18 addresses, would you be able to do so?

19 A Yes, certainly I could.

20 THE COURT: I'm sorry, was it 27 or 2700?

21 MS. MARKOE: 2700, sorry.

22 BY MS. MARKOE:

23 Q How did you accomplish this analysis?

24 A Well, I began by taking the publicly available data,  
25 which is the Bitcoin block chain, and then I write some code



1 that cycled through all of the potential candidate Bitcoin  
2 Coinbase transactions, or Bitcoin addresses, rather. It then  
3 progressively applied these various criteria to determine  
4 whether each of those addresses should be excluded from the  
5 list or not.

6 Q And as a result of that code that you prepared applying  
7 these criteria and analyzing the public block chain, how many  
8 addresses were you left with?

9 A In the initial iteration, not accounting for my error, I  
10 was able to reduce it from 75,000 down to about 27,000 plus a  
11 few hundred.

12 Q And what percent reduction is that?

13 A It's rough math, but it would be around 60 percent, I  
14 would say.

15 Q So the list that you have provided and has been admitted  
16 into evidence as exhibit D-2, are you confident that that is  
17 inclusive of Dr. Wright's public Bitcoin addresses based on  
18 the criteria utilized?

19 A Yeah, the criteria that's -- that I've given, that I've  
20 applied. And, yeah, I don't believe there are any that have  
21 been excluded from that list that do -- don't fit the  
22 criteria.

23 Q From information derived from the public Bitcoin address,  
24 are you able to discern when a block was mined?

25 A Not from the Bitcoin address, no, no. The block that

1 it's -- it's mined into contains a time stamp in the block  
2 header, but the Bitcoin address contains no information about  
3 that.

4 Q From the public addresses themselves, are you able to  
5 determine whether or not Bitcoin was transacted from that  
6 address?

7 A From a public address you can see -- yeah, it gives you  
8 the information that you need to go and look at the  
9 transaction and see whether it has been spent at a later time.  
10 Although in this particular case, the list that we have here,  
11 one of the criteria applied was specifically that it was not  
12 spent. So I don't think that what's in this list will provide  
13 any useful information in that respect.

14 Q From the public Bitcoin address, are you able to  
15 determine the identity of the individual, individuals, or  
16 entity or entities that mined the Bitcoin?

17 A No, the Bitcoin address itself provides no information  
18 about the identity. Bitcoin is a pseudonymous system, which  
19 is different to anonymous in that you can see the activity  
20 related to a Bitcoin on the public block chain, but identity  
21 information needs to be separately attached to a Bitcoin  
22 public address, so usually by the owner themselves.

23 Q So I -- so then the answer is the same, that you cannot  
24 provide -- that the Bitcoin public address does not provide  
25 you with the identity of the owner of the Bitcoin in the

1 address; is that correct?

2 A That's correct, it doesn't.

3 Q You testified that you were asked by Dr. Wright to try to  
4 winnow down the available public addresses to create a list  
5 that likely contains his addresses from the time that he  
6 mined, from 2009 through 2000' -- August 21st, 2010. Do you  
7 believe that this list that you have provided and prepared and  
8 has been admitted into evidence as defendant's 2 accomplishes  
9 that goal?

10 A Well, according to the criteria that Dr. Wright asked me  
11 to apply, it -- it doesn't -- this list doesn't likely contain  
12 those addresses, it definitely contains those addresses. It  
13 contains additional addresses, and we don't know which are the  
14 additional ones and which are Dr. Wright's, but by those  
15 criteria, it definitely contains all of them.

16 MS. MARKOE: Your Honor, may I have a moment?

17 THE COURT: Yes.

18 MS. MARKOE: Mr. Shadders, I just have one or two  
19 more questions.

20 THE COURT: Hold on, Ms. Markoe, just one second.

21 I'm sorry, Ms. Markoe, thank you very much.

22 MS. MARKOE: No problem, Your Honor.

23 BY MS. MARKOE:

24 Q Mr. Shadders, I believe you just testified that this list  
25 contains all of Dr. Wright's public Bitcoin addresses that he

1 mined during the relevant time period that were not spent. Do  
2 you -- are you able to specifically identify which addresses  
3 within this list definitively belong to Dr. Wright or  
4 definitively were mined by Dr. Wright?

5 A Uh, no, no, I'm not, with a possible exception of some of  
6 the very first, the 1 through 10, because, I mean, block 9,  
7 for example, although that one is actually spent, was well  
8 known as the first one that was transact -- the first Bitcoin  
9 transaction when Satoshi Nakamoto sent Bitcoins to Hal Finney,  
10 so . . .

11 MS. MARKOE: I have no further questions for this  
12 witness.

13 THE COURT: Thank you.

14 Cross-examination?

15 MR. BRENNER: May it please the Court?

16 THE COURT: Yes.

17 Cross-Examination

18 BY MR. BRENNER:

19 Q Good morning, Mr. Shadders.

20 A Good morning.

21 Q How are you today?

22 A Very well.

23 Q My name is Andrew Brenner. I'm from the law firm of  
24 Boies, Schiller & Flexner, and I represent the plaintiffs in  
25 this case. Okay?

1 A Uh-huh.

2 Q You and I have not had the chance to meet before today;  
3 is that correct?

4 A That's correct.

5 Q You told the Court you're from London. That's -- you  
6 live in London; is that correct?

7 A Yes, I live in London.

8 Q Where were you born?

9 A In Australia.

10 Q Okay. Have you ever testified in a court in the United  
11 States?

12 A No, I've not.

13 Q Never been in a federal courthouse of the United States  
14 for -- to testify?

15 A Aside from when I was here on June 28th, I believe, but I  
16 didn't get to testify on that day.

17 Q Do you -- do you feel comfortable that you understood the  
18 oath that you took before you testified today?

19 A Yeah, I believe I undertook to tell the truth.

20 Q Are you represented here by counsel today?

21 A No, I'm not.

22 Q Okay. Has anyone explained to you the import of an oath  
23 in the United States courtroom?

24 A I understand that the penalty of perjury is pretty  
25 severe, yeah.

1 Q Very well.

2 You're not represented by counsel, but you've spoken  
3 to the lawyers from the Rivero Mestre firm, have you not?

4 A Yeah, that's correct.

5 Q And were they involved in asking you to testify today?

6 A Yes, that's correct.

7 Q In fact, who was the first person, or importance, that  
8 asked you to testify in connection with these proceedings?

9 A It was either Zaharah Markoe or Amanda McGovern. In  
10 fact, I don't recall if I was asked or if it came up in a  
11 conversation and I offered. It was quite a while now, so I  
12 can't recall.

13 Q Okay. So let's see if we can unpack that just a little  
14 bit. There was a time where -- there was a time where you  
15 were having a conversation with either Ms. Markoe or  
16 Ms. McGovern, correct?

17 A Yeah, that's correct.

18 Q And you don't recall in that conversation whether they  
19 first broached the subject with you to testify or you offered  
20 on your own?

21 A Um, no, I don't recall.

22 Q Okay. It's one of those two things that brought you here  
23 today, right?

24 A Yeah.

25 Q Do you recall about when that conversation happened?

1 A Um, I don't know. I think it was maybe a week or two  
2 before June the 28th.

3 Q So there was a hearing at the end of June that you've  
4 referenced a couple times, correct?

5 A Yeah.

6 Q And you were at that hearing? You were at least here  
7 present in the courthouse?

8 A I was present in the courthouse but not in the courtroom.

9 Q Right. You were excluded from the courtroom per a court  
10 rule, correct?

11 A I believe so, yeah.

12 Q Okay. How did you get to the -- when did you come into  
13 town for that hearing; do you recall?

14 A Um, I think I flew in maybe two days prior.

15 Q Okay. Did you fly in with Mr. Wright?

16 A Um, no. No, I didn't. I flew in from -- from Bogotá, in  
17 Colombia, where I had been for a conference, I believe.  
18 Dr. Wright must have come from London.

19 Q And I apologize. Dr. Wright, I meant to say.

20 You met him here, is that fair to say?

21 A Yes.

22 Q And you met with the lawyers?

23 A Yes.

24 Q And is it that time -- is that the first time that you  
25 went over with the lawyers what your testimony would be?

1 A Yes, I believe so.

2 Q And is that when you first tendered to them the list  
3 which has now been marked as D-2 for this proceeding?

4 A Um . . .

5 Q Or had you done that before?

6 A I think I was possibly still working on the list at that  
7 time. I don't recall the sort of specifics of the dates, but  
8 I may have sent sort of some preliminary results, not the  
9 actual list, but the numbers that I had been able to whittle  
10 it down to.

11 Q Okay. And I think my questions were unclear, so let me  
12 try to break it down to two different periods.

13 The first conversation you had with the lawyers  
14 about testifying, was that a couple weeks before you came --  
15 before the June 28th hearing?

16 A No, I think it was in Bogotá, so it actually would have  
17 been in the upcoming week. So perhaps a week before that  
18 hearing.

19 Q Was that a meeting in person or by telephone?

20 A It was in person.

21 Q In Bogotá?

22 A Yeah.

23 Q Who was at that meeting?

24 A Myself, Dr. Wright, Jimmy Nguyen, Amanda McGovern and  
25 Zaharah Markoe and Dr. Wright's wife.



1 Q Dr. Wright's wife, that's Ramona?

2 A Ramona, yeah.

3 Q Okay. And Jimmy, can you say that name again for me?

4 A Jimmy Nguyen.

5 Q How do you spell that?

6 A N-g-u-y-e-n.

7 Q And what is Jimmy's job?

8 A Jimmy's the president of the Bitcoin association. He was  
9 in Bogotá for a presentation at a Bitcoin conference, as I  
10 was.

11 Q So Jimmy was at a meeting with you and Dr. Wright and  
12 Dr. Wright's wife and Dr. Wright's lawyers?

13 A That's correct.

14 Q And at that meeting, you all discussed, amongst other  
15 things, your potential testimony in this case?

16 A That's correct.

17 Q Or in this -- for this proceeding?

18 A Uh-huh.

19 Q Yes?

20 A Yes.

21 Q And is it at that time that you -- on direct examination,  
22 you testified that you understood that you were going to try  
23 to identify for the Court a potential list or an  
24 over-inclusive list of Dr. Wright's public Bitcoin addresses,  
25 did I get that right?

1 A Yeah, yeah. The purpose of the testimony was to explain  
2 how this -- this list had come about.

3 Q And was it at that meeting that you were given the  
4 criteria that you talked to the Court about about 20 minutes  
5 ago?

6 A No; I had spoken with Dr. Wright about the criteria a  
7 couple of weeks earlier in the nChain office in London.

8 Q Okay. So a couple weeks before -- so let me do the  
9 timeline, if I could. We're going to work off the hearing  
10 date. The hearing was about June -- it was June 28th.

11 A Uh-huh.

12 Q Correct?

13 A Yes.

14 Q You said about a week or so before that you were in  
15 Bogotá, and you had this meeting you just talked about  
16 briefly?

17 A Yes.

18 Q And that's when you met with the lawyers?

19 A Yes.

20 Q Now, now you're -- what I thought I heard you say is that  
21 two or three weeks prior to that, which will take us back into  
22 May, you actually had a discussion with Dr. Wright about the  
23 Bitcoin addresses, correct?

24 A No, no. It wouldn't have gone back into May, because in  
25 May I was in Toronto. So it would have been in perhaps first

1 or second week of June.

2 Q Okay. And that meeting was with Dr. Wright and anyone  
3 else?

4 A No, just Dr. Wright.

5 Q Okay. And what did you two discuss then?

6 A Well, he explained to me that he needed to come up with  
7 this list of Bitcoin addresses, and he said that he was using  
8 proprietary software at the time that had certain  
9 characteristics, and that I might be able to filter out  
10 significant addresses by applying those characteristics as  
11 filters.

12 Q Okay. And without holding you to a certain date, I'm  
13 just going to use the first week of June as the best estimate.

14 A Uh-huh.

15 Q Prior to the first week of June, had Dr. Wright asked for  
16 your assistance in any way to help ascertain his public  
17 Bitcoin addresses?

18 A No.

19 Q So the first you heard about this whole thing and what  
20 you're here testifying about was in June of 2019, is that  
21 fair?

22 A Yeah.

23 Q Okay. Now, when you traveled from Bogotá, how long was  
24 the meeting with Craig, the one in about the first week of  
25 June?

1 A It wasn't a very long meeting, maybe half an hour. I  
2 mean, I probably had follow-up conversations with him about  
3 it, but describing those criteria didn't take very long.

4 Q Other than discussing the criteria that -- well, let me  
5 back up a second.

6 It was Craig that was giving you criteria to use for  
7 your work, correct?

8 A Yes.

9 Q And you were relying on his direction to do the work that  
10 you were going to do; that's fair?

11 A In terms of what those criteria were, yeah, yeah.

12 Q Sure. You were going to take criteria he gave you and  
13 then do your own analysis, as you described to Ms. Markoe,  
14 correct?

15 A Yeah.

16 Q Okay. Now, there were a few meetings with Craig where  
17 you discussed criteria?

18 A I wouldn't call them meetings. Probably, you know,  
19 tacked onto another meeting, an in-passing question, things  
20 like that.

21 Q And by the time you meet with the lawyers in Bogotá, have  
22 you -- has the criteria that you're going to use already been  
23 set?

24 A Yes, yes. I mean, Craig knew what those criteria were  
25 upfront. The additional conversations were me seeking

1 clarification.

2 Q Okay. Well, I can only ask you about what you know, so  
3 what Craig knew and when he knew it I'm not asking you.

4 When did you have -- prior to the meetings with the  
5 lawyers, did you have those six criteria that you described to  
6 the Court today?

7 A Yes.

8 Q Okay. So what -- tell me what the purpose of the meeting  
9 was with the lawyers. Were you seeking the lawyers' help for  
10 your technical work?

11 A No, I didn't need their technical help.

12 Q Okay. Were you seeking input from the lawyers on the  
13 criteria you were going to use?

14 A No, no. I was -- I was just present at a meeting that a  
15 number of people were having. I wasn't actually particularly  
16 involved in a lot of the content, but part of it was me  
17 explaining to them the criteria that were involved.

18 Q And at that point -- I think you said this, but I don't  
19 want to put words in your mouth. At that point, about a week  
20 before the June 28th hearing, you were able to give the  
21 lawyers a preliminary sort of a preview of what your results  
22 were going to be, correct?

23 A Yeah, yeah. I mean, the preview was just a member, not  
24 the actual list, but . . .

25 Q You were able to give them a number of what the list

1 would be?

2 A The number that I managed to whittle down the list to.  
3 At that point, it was actually at that point slightly more  
4 than this number, I believe.

5 Q So by the time you gave the lawyers the list, my count  
6 was it was somewhere in the high 27,000s. Your recollection  
7 is it's 27,000 and a couple hundred?

8 A It's somewhere between 27 and 28.

9 Q Fair enough.

10 When you talked to the lawyers about a week before  
11 the hearing in Bogotá, how much larger was the list?

12 A I think it was around 28 and a half or 29.

13 Q So largely the same?

14 A Yeah.

15 Q Okay. And then sometime after that meeting, did you have  
16 further meetings with or discussions with the lawyers for  
17 Dr. Wright prior to the June 28th hearing?

18 A After that meeting? Yeah, I met with the lawyers I  
19 believe the day before that hearing.

20 Q Okay. And is that when you gave them the list, or had  
21 you already given them the list?

22 A Um --

23 Q When I say the list, I mean the D-2 that you have in  
24 front of you, I think.

25 A I actually don't recall exactly when I did. I mean, I

1 would be able to check by looking back in my e-mail, but I  
2 couldn't tell you the precise date, unfortunately.

3 Q Now, you are employed by nChain, correct?

4 A That's correct.

5 Q NChain is a company that was founded by Dr. Wright,  
6 correct?

7 A Uh, I'm not sure if he's the founder. He was involved  
8 from the beginning as the chief scientist, but, yeah, I don't  
9 know if he founded it.

10 Q If he testified under oath in this case that he was the  
11 founder, or a founder of nChain, you would have no reason to  
12 dispute that, correct?

13 A No, I wouldn't.

14 Q And your title is chief technology officer?

15 A Yes.

16 Q Has that been -- and you've only been with the company  
17 formally about a year, did you say?

18 A I've been with the company in London since May of last  
19 year, but I was working with them as a contractor for about a  
20 year prior.

21 Q Okay. So there was -- there was a period of about a year  
22 where you were doing contract work, but you were not a formal  
23 employee of the company, correct?

24 A Yeah.

25 Q And then you became formally employed by about 15 months

1 ago?

2 A Yeah.

3 Q Who -- when you came in for the June 28th hearing, who  
4 paid for you to come in?

5 A Dr. Wright paid for my airfares, I believe. Or,  
6 actually, I believe it was put onto the nChain travel account  
7 which Dr. Wright was later asked to pay back to nChain.

8 Q Okay. Let me get that straight so I understand.

9 Obviously, you have expenses associated with travel  
10 to be in South Florida, correct?

11 A Yeah.

12 Q You didn't have -- you weren't otherwise planning to be  
13 here, correct?

14 A No.

15 Q And you -- when you came in for the June hearing, you  
16 came in a couple days before the hearing, right?

17 A Yeah.

18 Q And so you had to fly from Bogotá to South Florida,  
19 correct?

20 A Uh-huh.

21 Q Did you fly commercial or private?

22 A Commercial.

23 Q Okay. And then you stayed in a hotel when you got here?

24 A Yeah.

25 Q Okay. The cost of the airfare and the cost of your hotel



1 and the cost of your dining while you were here, that was all  
2 put on the nChain credit card, is that what you said?

3 A No, I don't think it's a credit card. We use a travel  
4 company who, I'm not sure how they do the invoicing in the  
5 back end.

6 Q It's like magic, you call the travel company and it's  
7 just done, right?

8 A Something like that.

9 Q Doesn't come from your pocket, right?

10 A I mean, some incidentals I pay for out of my pocket and  
11 then claim back later, but . . .

12 Q You say your what, sub-incidentals?

13 A Oh, some incidentals I pay for and claim back out of  
14 my -- claim back as an expense later.

15 Q So the big stuff goes -- is paid without you even being  
16 involved, other than making the arrangements, correct?

17 A Yeah.

18 Q And then some little stuff, you'll pay for it, and then  
19 you'll seek reimbursement later?

20 A Yeah.

21 Q Now, when you traveled to Bogotá, was that for nChain  
22 business?

23 A Yes.

24 Q Okay. And that you did the same sort of reimbursement  
25 scheme that you just told me, right? I don't mean scheme in a

1 bad way. Reimbursement policy that you just told us, right?

2 A Yeah, yeah. I mean, the -- a travel company arranges all  
3 the travel and books the hotels, et cetera, so . . .

4 Q Now, you said when it came -- when it had to do with this  
5 hearing in particular, is it your understanding that  
6 Dr. Wright personally reimbursed nChain for your expenses?

7 A I believe so, yeah.

8 Q So -- and that would not be true for your trip to Bogotá,  
9 correct?

10 A No, no. The trip to Bogotá was nChain business  
11 specifically, not Dr. Wright business.

12 Q Right. So for cost purposes, at least in your mind, you  
13 consider this Dr. Wright business not nChain business?

14 A Uh, yeah.

15 MS. MARKOE: Objection.

16 THE COURT: Legal basis?

17 MS. MARKOE: Foundation.

18 THE COURT: Overruled. You can answer it if you can  
19 answer it.

20 THE WITNESS: Sorry, can you repeat the question?

21 BY MR. BRENNER:

22 Q Sure.

23 For the purposes of the reimbursements, you  
24 considered your travel here for the June 28th hearing and the  
25 related expenses to be for Dr. Wright and for his business,

1 correct?

2 A I think that's how it's going to get organized in the  
3 back end. I mean, I don't really get too involved in the  
4 details, nor did I actually specifically ask --

5 Q Right.

6 A -- whether it was Craig or nChain paying for it.

7 Q Sure.

8 By the way, you fly first class or coach when you're  
9 coming from Bogotá?

10 A From Bogotá I flew economy, which I believe is coach in  
11 your dialect.

12 Q Yes. I think your, actually, dialect economy's right. I  
13 think that's the proper term now.

14 After the -- so did you leave shortly after the  
15 June 28th hearing? Leave Florida?

16 A Yeah, I actually left that evening, late that evening.

17 Q And where did you go?

18 A Back to London.

19 Q Did you fly back with Dr. Wright?

20 A I don't think Dr. Wright was on the same plane as me, no.

21 Q Again, you flew commercial?

22 A Yes.

23 Q Economy, or . . .

24 A Business class that time.

25 Q Back to London?

1 A Yeah.

2 Q And, again, that's expenses that you understood were  
3 coming from Dr. Wright, correct?

4 A I think in that case it was probably the difference  
5 between the cost of a premium and economy flight, which nChain  
6 would have covered anyway, because they had to get me back  
7 from Bogotá.

8 Q The difference between the Bogotá flight versus the  
9 Florida flight?

10 A Yeah.

11 MS. MARKOE: Objection; it mischaracterized his  
12 testimony.

13 THE COURT: Overruled.

14 BY MR. BRENNER:

15 Q Now, do you need some water? Not that I have it to offer  
16 you.

17 A I have water, yeah. I'm okay.

18 Q After the -- so you were, as you told us, you were -- you  
19 sat out in the hallway or in a witness room during the  
20 June 28th hearing?

21 A Yeah; it was one of the most boring days of my life.

22 Q Fair enough.

23 Did you have any discussions with Dr. Wright about  
24 what took place at the hearing?

25 A No, I specifically avoided discussing that topic with

1 him. I made the assumption, given that I wasn't supposed to  
2 be in the courtroom before testifying, that I probably wasn't  
3 supposed to seek out information about what I was otherwise  
4 asked not to see.

5 Q Okay. Now, what's Dr. Wright's -- first of all, does  
6 Dr. Wright, is he an employee of nChain, as far as you know?

7 A Yeah, he is the chief scientific officer.

8 Q And in the -- who do you report to directly at nChain?

9 A I report directly to the CEO, although I have a dotted  
10 line to Dr. Wright --

11 Q It's fair to -- I'm sorry, I didn't mean to cut you off.

12 It's fair to say that Dr. Wright is your superior at  
13 nChain, correct?

14 A Yeah, I think that's fair.

15 Q Yeah. He's your boss, right?

16 A No, the CEO, Dave Washburn, is my boss.

17 Q So Dr. Wright's a superior to you, but you don't consider  
18 him your boss, because he's not -- your line goes to the CEO,  
19 correct?

20 A Yeah, that's correct.

21 Q Now, you also consider Dr. Wright -- you've written that  
22 you consider Dr. Wright to be a friend of yours, correct?

23 A Yeah.

24 Q Now, you mentioned earlier Satoshi Nakamoto, correct?

25 A Yeah.

1 Q And you know that over the last 10 years or so, it's been  
2 an issue of considerable public interest who, in fact, was  
3 Satoshi Nakamoto, correct?

4 A Yes.

5 Q And there was a point in time where lots of different  
6 people have lots of different theories about who -- who, or  
7 even more than one person or an organization was Satoshi  
8 Nakamoto, correct?

9 A Yeah; I think that's still the case.

10 Q In fact, it's still the case, right?

11 A Yeah.

12 Q You know that the answer to that question was of great  
13 public interest, correct?

14 A Yeah.

15 Q And you know that there came a time where Dr. Wright  
16 claimed that he, in fact, was Satoshi Nakamoto, correct?

17 A Yes.

18 Q And you believed him, right?

19 A Um, at that time I didn't have enough evidence to sort of  
20 weigh it up one way or the other.

21 Q Well, there was a time where Dr. Wright offered to  
22 provide you proof that he said would show that he was Satoshi  
23 Nakamoto, correct?

24 A I don't know that I would characterize it that way. It  
25 was a very quick conversation next to the barbecue, and I

1 think I was joking to him, how come you've never offered me a  
2 proof. I think I might have called him a name which is common  
3 among friends in Australia. He then shot back at me, oh, do  
4 you want to see one. And I just said, actually, no, I -- I  
5 think I'd prefer not to see it. I'm not sure why, I just feel  
6 like it would change something that I can't undo once it's  
7 done. And then I think we changed the subject and moved on.

8 Q It's fair to say that you were willing to take  
9 Dr. Wright's word for it, correct?

10 A Uh, no, I don't think it was -- it's a case of taking his  
11 word for it. I think I've seen Dr. Wright over the time that  
12 I've known him express a knowledge and understanding of  
13 Bitcoin that I think is unparalleled from anyone that I've  
14 ever seen in the world, and it just appears to be enough  
15 circumstantial around this to lay the matter to rest, in my  
16 mind anyway.

17 Q Okay. Now, the work you did that you described to the  
18 Court, did you do that on your own, or did you have the help  
19 of others?

20 A No, I did that on my own.

21 Q Well, that's -- my question's a bad one, so let me unpack  
22 it a little bit. When it came to do the actual work of  
23 applying the criteria, that you did on your own, correct?

24 A Yeah, that's correct. I wrote the code myself.

25 Q You wrote the code yourself.

1           And, again, trying to use rough dates, it seems like  
2 it took you, from soup to nuts -- meaning from when you had  
3 your first conversation to when you had basically the complete  
4 list -- it took you about two weeks?

5     A     It wasn't two weeks of continuous work, but it was  
6 probably about rough -- roughly that kind of timeframe from  
7 when I had the first conversation to when I had some kind of  
8 useful results.

9     Q     If it wasn't two weeks of constant work, can you give the  
10 Court an estimate of how much time you spent from the time you  
11 first -- well, can you tell the Court when you settled into,  
12 these are the six criteria I'm going to use? It wasn't the  
13 first conversation with Craig, right?

14     A     I had a understanding of what are the criteria after that  
15 first conversation, but I think I reported back to him to get  
16 some clarification.

17     Q     Right. You went back, and you told us that, to get  
18 clarification, and you had a couple follow-up. You didn't  
19 call them meetings, you said they would be tack-ons to  
20 meetings or conversations, right?

21     A     Yes, just a question here or there.

22     Q     So when did you start the actual works?

23     A     I think the bulk of it I actually had to begin while I  
24 was away traveling. I recall that, because I have a Linux  
25 machine at home, which is usually connected to the Internet,



1 that I do most of my -- my coding on, and I believe it had  
2 crashed, or been switched off by someone, or something. I  
3 didn't have access to it, so I was in the loathsome position  
4 of having to use my Windows laptop for coding this off, which  
5 is not the best environment. So, yeah, I quite specifically  
6 recall that. I actually had to spend about a day messing  
7 about with the laptop to get it set up with the development  
8 environment and drag some libraries that I was able to get  
9 access to onto that laptop and get them set up before I even  
10 was able to start doing the coding.

11 Q So you had some computer issues you need to work out,  
12 correct?

13 A Yeah, that's a shorter way of putting it.

14 Q And then you -- how long did it take you to write the  
15 code?

16 A Probably about 12 to 16 hours in total.

17 Q And then once you had the code, does the criteria sort of  
18 run itself?

19 A Well, the code implements the criteria, yeah.

20 Q Correct.

21 A Yeah.

22 Q So basically the work was done once the code was  
23 finished, correct?

24 A Yes, yes.

25 Q Then you just had to run it and compile the results,

1 correct?

2 A Run it, compile the results. But after that there was a  
3 process of actually, like, looking at the results,  
4 crosschecking it with what I thought the code did to make sure  
5 that it was actually all working correctly, and that's an  
6 iterative process that I probably carried on. You know, even  
7 after the June 28th hearing, I still went back a few times and  
8 doublechecked some things.

9 Q Right. By hand and by eye?

10 A Yeah, by reading the code and, yeah, validating it in  
11 different ways.

12 Q Now, you would agree with me that the results you  
13 obtained were dependent upon the appropriateness of the  
14 criteria you used, correct?

15 A Yes.

16 Q Okay. And the criteria you used was -- and we'll go  
17 through each of them individually, or at least some of them  
18 but those were given to you by Mr. Wright, Dr. Wright,  
19 correct?

20 A That's correct.

21 Q So if Dr. Wright gave you criteria that was either  
22 incomplete or inaccurate, that would obviously skew the  
23 results accordingly, right?

24 A Yes.

25 Q You did not take any independent efforts to confirm the

1 accuracy of the criteria you were given, correct?

2 A Well, the criteria were dictated by a piece of software  
3 that's apparently locked up in an encrypted file that no one  
4 can access, so I have no mechanism of being able to  
5 independently confirm that.

6 Q Right; and that's my point. You were wholly dependent  
7 upon Dr. Wright to give you complete and accurate criteria?

8 A Yes, that's right.

9 Q Okay. So let's talk a little bit about the criteria,  
10 then I want to ask you some more general questions. Okay?

11 A Sure.

12 Q So the first criteria you used was that -- well, let's  
13 start from the beginning. You started with a date range.  
14 That's the first criteria, right?

15 A Yeah.

16 Q And the date range you used was approximately  
17 January 3rd, 2009, which was -- is that the first --

18 A I think that's the date the first Bitcoin block was  
19 mined, block 1, yeah.

20 Q And Bitcoin continues to be mined today?

21 A Yes.

22 Q Now, you -- so you had a -- Dr. Wright gave you a date to  
23 cut off the search at, right?

24 A Yeah, the 21st of August, 2010.

25 Q Right. So Dr. Wright said, I don't want you to look at

1 anything beyond August 21, 2010, correct?

2 A Well, he didn't say he didn't want me to look. He said  
3 that he was mining up until that date. That's when he stopped  
4 mining.

5 Q Right. So if he mined something after August 2010, it  
6 would not come up on your list, correct?

7 A Uh, no.

8 Q I'm sorry?

9 A No, it wouldn't.

10 Q It would not, right?

11 A No.

12 Q So that's one place where you're dependent upon the  
13 veracity of Dr. Wright to set the date range, correct?

14 A Yeah, that's correct.

15 Q If the date range is wrong and Dr. Wright in fact was  
16 mining Bitcoin after August 2010, you wouldn't -- it wouldn't  
17 come up in your search, right?

18 A Yeah; I think you can say the same for each one of these  
19 criteria.

20 Q Right. They're dependent on Dr. Wright, correct?

21 A Yes, yes.

22 Q Okay. So --

23 A I mean, if Dr. Wright provided you with -- actually had  
24 access to the list of Bitcoin addresses, the definitive list,  
25 the one that he's unable to access, you would still be

1 dependent upon Dr. Wright's assertion that they're his.

2 Q Right. We're all dependent on Dr. Wright's assertion in  
3 this respect, right?

4 A Yes.

5 Q You could have done the exact work you did and ignored  
6 the date range, correct?

7 Let me ask you the question again, because I want to  
8 make sure the court reporter got it.

9 A Uh-huh.

10 Q You had six criteria, correct?

11 A Uh-huh.

12 Q First one's the date range.

13 A Uh-huh.

14 Q You could have run the other five criteria on any date  
15 range you wanted to, correct?

16 A Yes, yes, I could.

17 Q Okay. Let's go to the second criteria. The second  
18 criteria was that -- and if I got these wrong it's because I'm  
19 not understanding, you'll correct me. Okay?

20 A Sure.

21 Q The second criteria is you looked at only unspent  
22 Bitcoin, correct?

23 A Yep, that's correct.

24 Q So what that means is that you -- you -- well, let's back  
25 up.

1           When you did the date range, you came up with a  
2 gross number of a total set of about 75,000 addresses,  
3 correct?

4   A    Yeah.

5   Q    Okay. So of those 75,000, you looked at which ones had  
6 never been spent, right?

7   A    Yeah, that's right.

8   Q    So that means that the Bitcoin was mined into a public  
9 address and never moved from there, correct?

10   A    Yeah.

11   Q    All right. So if Dr. Wright had Bitcoin that he spent,  
12 it wouldn't show up on your list, right?

13   A    Yeah, that's right.

14   Q    Right. And you know that Dr. Wright had Bitcoin that he  
15 spent, right?

16   A    Dr. Wright was -- had a laptop which I believe is what he  
17 used to mine the first 10 or 15, something in that order,  
18 blocks. So I believe he had access to -- to other Bitcoin  
19 that probably was spent, but the software that was mined using  
20 this algorithm, which is the software that was put into the  
21 addresses that he's unable to access was -- was never spent.

22   Q    I'm just going to try to unpack it a little bit. Part  
23 it's because I think we both talk fast, and I'm having trouble  
24 following some of it, so I want to take it in small pieces.  
25 Okay?

1 A Uh-huh.

2 Q My first question to you was: You know that Dr. Wright  
3 had Bitcoin that he, in fact, spent?

4 A Yes.

5 Q Okay. Those Bitcoin that he spent are not on your list  
6 because it would violate one of your criteria, correct?

7 A They actually -- no, sorry. Yes. No, you're correct,  
8 they would not be on the list.

9 Q Now, are you able to tell the Court the amount of Bitcoin  
10 that Dr. Wright had at one time and that he spent?

11 A No, I have no idea how much he had and spent.

12 Q Okay. So we don't know -- we do know that there's spent  
13 Bitcoin that are not on the list, we just don't know the  
14 number of that, correct?

15 A Uh, yeah. And we also don't know whether those spent  
16 Bitcoin were bought or mined.

17 Q Right. It's just another unknown about the list,  
18 correct?

19 A Correct.

20 Q Okay. Did you ask Dr. Wright whether he had spent  
21 Bitcoin?

22 A Um, I think it's common knowledge that Dr. Wright had  
23 spent Bitcoin, so . . .

24 Q What is the common knowledge of how much Bitcoin  
25 Dr. Wright had spent?

1 A I don't know if anyone knows how much he spent, but --

2 Q Right. It's unknown, right?

3 A I mean, it's -- well, if you accept the assertion that  
4 Craig Wright is Satoshi Nakamoto, then he spent Bitcoin in  
5 block 9 to Hal Finney, so that's common knowledge.

6 Q Well, let's back up a second.

7 It's not what I accept. Do you accept the assertion  
8 that Dr. Wright was Satoshi Nakamoto?

9 A Yes, I do.

10 Q Okay. In fact, it's integral. It's -- it is a necessary  
11 part of the analysis you did, correct?

12 A Yes.

13 Q Okay. Now, you had criteria three and four. I'm going  
14 to skip them only because one of them resulted in no cuts, and  
15 that was the pay to public key script, right?

16 A Yep.

17 Q And the other one I had written down as no address reuse,  
18 and that cut about 128 Bitcoin, right?

19 A Yes.

20 Q By the way, when you have that list, those are -- are  
21 those addresses of Bitcoin wallets?

22 A No. Bitcoin wallets are typically a collection of --  
23 well, the way they're implemented is a collection of Bitcoin  
24 addresses. Arguable whether that's the right way to do it,  
25 but . . .



1 Q Those are lists of Bitcoin addresses, correct? Public  
2 addresses?

3 A Yeah, yeah.

4 Q Do each of those represent -- do each of those addresses  
5 represent 50 Bitcoin?

6 A At the time, the Bitcoin block reward was 50 Bitcoin  
7 potentially, plus some transaction fee. So the majority of  
8 them would be exactly 50 Bitcoin; some of them would also be,  
9 you know, 50.001, or . . .

10 Q For all intents and purposes, it's 50?

11 A Yeah.

12 Q For each one of those addresses, correct?

13 A Yes.

14 Q And as I was saying, the no address reused got rid of  
15 about 128, a pretty insignificant, statistically insignificant  
16 cut, right?

17 A Correct.

18 Q Okay. So I'm going to go to the -- and then the fifth  
19 one, I should say, was pay to single address, and that only  
20 cut out about 68, right?

21 A Pay to a single output, yes. Sorry, it's an output  
22 address that sort of two things that mean very similar things.

23 Q Okay. And then the -- well, let's just walk it through,  
24 because we'll sorta step it down to how we got -- the biggest  
25 cut of all was --

1 A Sorry.

2 Q You okay? Good?

3 A Yeah.

4 Q Okay. The biggest cut of all was the unspent criteria,  
5 correct, that brought us from 75,000 to about 30,000?

6 A Yeah, that's right.

7 Q Okay. And then the next biggest cut, although far less,  
8 was your sixth criteria, which was the Nonce characteristic,  
9 correct?

10 A Yeah, that's right.

11 Q Now, the Nonce characteristic has to do with certain --  
12 certain values that were assigned by the miner, correct?

13 A Yeah.

14 Q And you found that there was a -- sort of a signature  
15 pattern to some of these addresses, correct?

16 A Uh, yeah. This has actually been known, actually, in the  
17 Bitcoin world for quite a few years. But, yeah, applying  
18 those criteria narrowed down to Bitcoin addresses that fit  
19 that pattern.

20 Q Right. That part of the analysis is actually, that you  
21 did, the sixth one is actually an analysis that's been done by  
22 others, correct?

23 A Yeah, that's correct.

24 Q It wasn't new to this hearing, right?

25 A No.

1 Q Okay. And, again, this one is -- as far as linking to  
2 Dr. Wright, is totally dependent on Dr. Wright telling you  
3 what he used, correct?

4 A Yes, it is.

5 Q And, again, if that information is incorrect, then your  
6 code would end up generating incorrect result, correct?

7 A Yeah, the code does what it's told, and that's what it  
8 was told.

9 Q Now --

10 THE COURT: I'm sorry, before you move to a  
11 different topic, I had one follow-up question, if I could,  
12 sir. Just so I can understand the Nonce filt -- I'll call it  
13 the filter --

14 THE WITNESS: Sure.

15 THE COURT: Using the Nonce characteristic.

16 After running that filter, you still had  
17 approximately 27,000 or so addresses that were left?

18 THE WITNESS: Yeah, it would have been under 25 if  
19 you correct for the error.

20 THE COURT: So that either 25, 27, whatever, every  
21 one of those addresses reflects the Nonce characteristic that  
22 Dr. Wright says he utilized, is that -- am I understanding  
23 your testimony correctly?

24 THE WITNESS: Yeah, that's right.

25 Due to the nature of the way that the Nonce field is

1 used, though, other people who weren't using Dr. Wright's  
2 software could have still used those characteristic values,  
3 which is why it doesn't narrow it down perfectly.

4 THE COURT: Okay. Thank you.

5 So it was not a characteristic that Dr. Wright  
6 himself uniquely used, other people could have used the same  
7 technique?

8 THE WITNESS: It's not so much other people used the  
9 same technique, it's just other people would have used the  
10 Nonce field in a way that could have used -- pseudorandomly  
11 arrived at any value between zero and 256. So some of those  
12 are always going to be in the zero to 60 range.

13 THE COURT: I see.

14 So the fact that when you had the software check the  
15 Nonce field in those 25 or 27,000 addresses, it came back with  
16 a value between zero and 58 --

17 THE WITNESS: Uh-huh.

18 THE COURT: It doesn't necessarily mean that  
19 Dr. Wright mined all of those. Other people could have had  
20 Nonce values between zero and 58, as well, is that my  
21 understanding of your testimony?

22 THE WITNESS: That's correct, yeah.

23 THE COURT: Sorry to interrupt. Thank you.

24 MR. BRENNER: Thank you.

25 BY MR. BRENNER:

1 Q In fact, other people have used that Nonce field,  
2 correct?

3 A Uh, yeah, but the Nonce field's available for any Bitcoin  
4 miner to use.

5 Q Right, of course.

6 A Yeah.

7 Q And other people have done the same analysis on that  
8 criteria and come up with a list of potential Satoshi  
9 addresses, right?

10 A Yes.

11 Q And, now, if -- let's use 25,000, because my -- it'll be  
12 easier for the math, because I think you said when you do the  
13 last cut, which is an additional cut since the June 28th list  
14 that I understood you just worked on the last day or so, you  
15 get to around 25,000 --

16 A Uh-huh.

17 Q -- Bitcoin.

18 And if you assume, which you told me we should, that  
19 it's essentially 50 per, right?

20 A The --

21 Q Fifty Bitcoin per address?

22 A Yeah.

23 Q Okay. So by my math, I think that is 1,250,000 Bitcoin,  
24 correct?

25 A Uh, you took my phone off me on the way in the building,

1 so I can't calculate it.

2 MR. BRENNER: Well, let's.

3 THE WITNESS: It's in the ballpark, yeah, I'd say.

4 MR. BRENNER: May I use the calculator on my phone,  
5 Judge?

6 THE COURT: Yeah, I'll take judicial notice it's  
7 1,250,000.

8 BY MR. BRENNER:

9 Q Okay. So let's assume it's 1,250,000.

10 Now, so you do the -- you do the list, right? And  
11 surely when you get done with the list --

12 THE COURT: Just to be clear, I'm using 25,000 times  
13 50 is 1,250,000.

14 MR. BRENNER: Yeah, that's what I'm trying to do.

15 BY MR. BRENNER:

16 Q When you got the list done -- and this is the 27,000  
17 list -- you gave it to the lawyers, right? You told me that,  
18 correct?

19 A Yeah.

20 Q Did you give it directly, or did Dr. Wright give it?

21 A I think I e-mailed it directly.

22 Q Okay. You also gave it to Dr. Wright, correct?

23 A Um, I gave it to Dr. Wright a few weeks -- it wasn't -- I  
24 think I sent it to him a few days later, but I actually don't  
25 recall if I copied him in on the e-mail when I first sent it

1 to the lawyers.

2 Q Okay. He knew the results of your search, correct?

3 A Yeah.

4 Q Okay. And he would have known, because he could -- he's  
5 a smart man. He could have -- at that point if he would have  
6 done the math, it would have been 1,350,000 Bitcoin if we use  
7 27,000, right?

8 MS. MARKOE: Objection; speculation.

9 MR. BRENNER: No.

10 THE COURT: The math is what it is.

11 MS. MARKOE: Well . . .

12 THE COURT: But, yes, as to Dr. Wright's state of  
13 mind, I'll sustain.

14 BY MR. BRENNER:

15 Q Okay. Well, did you tell Dr. Wright that you had --  
16 well, let me ask you this: Is it well known -- what do -- do  
17 you have an understanding whether Dr. Wright would have  
18 understood that each of those address contained 50 Bitcoin?

19 MS. MARKOE: Objection as to testifying to what is  
20 in Dr. Wright's head.

21 THE COURT: Sustained.

22 BY MR. BRENNER:

23 Q Is it well known that the early Bitcoin addresses up to  
24 2010 contained 50 Bitcoin, or within a couple decimal points?

25 MS. MARKOE: Objection as to what is well known.

1 THE COURT: I'll allow it if you know based on your  
2 personal experience in dealing with Bitcoin.

3 THE WITNESS: I mean, you have to distinguish  
4 between Bitcoin addresses that were used to receive freshly  
5 mined coins and other Bitcoin addresses, but if you are  
6 talking about freshly minted coins, yes, the Bitcoin block  
7 reward was 50 Bitcoin at the time.

8 BY MR. BRENNER:

9 Q Your list was freshly minted Bitcoin, right?

10 A Yes.

11 Q Okay. Everyone that knows about Bitcoin would have known  
12 those were 50 Bitcoin per address, correct?

13 A Yes.

14 MS. MARKOE: Objection as to what everyone would  
15 know.

16 THE COURT: Sustained.

17 BY MR. BRENNER:

18 Q You knew that, correct?

19 THE COURT: I think he's testified that the block  
20 reward at the relevant time was 50 Bitcoin for mining a new  
21 Bitcoin. A new block, excuse me.

22 BY MR. BRENNER:

23 Q Now, when you reported to Dr. Wright the results of  
24 your -- the initial, the D-2 exhibit list, did you discuss  
25 with him whether that amount of Bitcoin was an accurate



1 representation of the amount of Bitcoin he had mined?

2 A No, no. I had a target number of 16,500, or something  
3 along those lines, which was -- I'm not sure where that number  
4 has come from, but I believe that's what's supposed to be his  
5 holding. So, yeah.

6 Q All right. So when you go into the search, your  
7 understanding is that the correct number of Bitcoin that  
8 Dr. Wright mined is 16,500 addresses, correct?

9 A Uh, yeah. I'm not sure where I know that from, but it's  
10 a number that -- that I associate with that, yeah.

11 Q And that translates to just north of 800,000 Bitcoin,  
12 correct?

13 A Yeah, that would be correct.

14 Q Am I right?

15 A Yes.

16 Q Okay. And then you came up with a list that contained  
17 about 1,350,000 Bitcoin?

18 A Yes.

19 THE COURT: I'm sorry, can we go back one second? I  
20 want to make sure I'm following the terminology correctly  
21 here, Mr. Brenner. You said it's -- I thought you said  
22 Dr. Wright mined 16,500 Bitcoin, which corresponds to 800,000  
23 Bitcoin.

24 MR. BRENNER: Yeah, let me -- let me -- let me do  
25 better.

1 THE COURT: You mean he mined 16,500 blocks?

2 MR. BRENNER: Yes, let me do better.

3 THE COURT: Okay.

4 BY MR. BRENNER:

5 Q He mined -- your understanding when you began your search  
6 was that Dr. Wright had mined 16,500 blocks or addresses,  
7 correct?

8 A Uh, yeah.

9 Q Okay. And that translated to about 820,000 or so  
10 Bitcoin?

11 A Yes.

12 Q Yet when you came up with your list, your over-inclusive  
13 list, you came up with about 70 or 80 percent more than that,  
14 right?

15 A I did the math in my head and came --

16 THE COURT: Instead of a percentage --

17 THE WITNESS: -- to about 40 percent additional.

18 THE COURT: I'm sorry. Instead of a percentage, can  
19 we use a raw number?

20 MR. BRENNER: Sure.

21 THE COURT: Are you saying about 500,000 was the  
22 differential?

23 BY MR. BRENNER:

24 Q Yeah, about 500,000 more than the 800,000 or so that he  
25 was supposed to have.

1 A Yeah, that's easier math.

2 Q Okay. Fair enough.

3 In fact, if I were to point -- if I were to take  
4 this list, D-2, and randomly go to an address and ask you if  
5 it's Dr. Wright's, your answer would be "I don't know,"  
6 correct?

7 A I'd say there probably is a 65 percent chance that it is.

8 Q Right. For every one of them, there's about a 60 --  
9 there's about two-thirds chance it is and a one-third chance  
10 it's not.

11 A Uh-huh.

12 Q Okay. Now, you referenced -- and you did some additional  
13 work, you said, right? Since the D-2 list, right?

14 A Yeah; I was rechecking my work and my assumption, which  
15 is when I came across the error.

16 Q Right. And now maybe you've got it to like a 63 percent  
17 chance that you could get it right, correct? You haven't  
18 really materially changed the fact that you don't know which  
19 are Dr. Wright's and which are not, correct?

20 A Yeah, that's correct.

21 Q Okay. Now, did Dr. Wright explain to you -- you  
22 testified on direct, and I think you mentioned on  
23 cross-examination also that these addresses, or Dr. Wright's  
24 Bitcoin addresses, were all put into an encrypted file; is  
25 that what you said?

1 A That's my understanding, yeah.

2 Q Okay. So let's -- let's --

3 A I'm sorry, no. Sorry, let me clarify.

4 Q Sure.

5 A The addresses themselves were not put into an encrypted  
6 file as far as I know. The means of generating the addresses,  
7 which is a -- an algorithm which is embodied by a software  
8 implementation and a certain set of secrets that are required  
9 to operate that algorithm. That's what I understand is in an  
10 encrypted file.

11 Q Okay. So I'm going to try to get into language I can  
12 understand and try to figure out what happened, or your  
13 understanding of what happened. Okay?

14 THE COURT: Mr. Brenner, if you're going to change,  
15 are you at a logical breaking point? I want to take our  
16 morning recess.

17 MR. BRENNER: Sure, sure.

18 THE COURT: It's 11:00 a.m. Let's take a 15-minute  
19 recess, and then we'll come back and we'll resume this  
20 witness' testimony.

21 MR. BRENNER: Thank you.

22 THE COURT: So we'll be in recess for 15 minutes.

23 (A recess was taken from 11:03 a.m. to 11:16 a.m., after  
24 which the following proceedings were had:)

25 THE COURT: Be seated, please.

1 All right. The witness is back. Mr. Brenner's  
2 back.

3 Counsel, whenever you're ready you may proceed.  
4 Thank you.

5 MR. BRENNER: Thank you, Your Honor.

6 BY MR. BRENNER:

7 Q Mr. Shadders, you ready to go?

8 A Yeah, sure.

9 Q Okay, great.

10 So I want to get into a little more detail about  
11 the -- what's encrypted and what's not encrypted, because you  
12 had corrected me. I had asked you if the addresses were  
13 encrypted, and you said, no, the addresses are not encrypted,  
14 but the algorithm is encrypted. Is that what you said?

15 A The addresses could be part of that file, I don't know.  
16 But what I'm saying is they don't need to be. You don't  
17 actually need to keep the addresses if you have the algorithm  
18 to generate them. There's -- many wallets these days work  
19 exactly that way.

20 Q In connection with your work, did you discuss at all with  
21 Dr. Wright -- well, strike that.

22 You did discuss with Dr. Wright, you told us, when  
23 he mined Bitcoin, correct?

24 A Yeah.

25 Q He gave you those dates.

1           Did you have any other discussions with Dr. Wright  
2 about how he mined Bitcoin?

3 A     Yes, yes, I did.

4 Q     One of the things you discussed was the Nonce values,  
5 correct?

6 A     Yeah.

7 Q     Okay. What else did you discuss with Dr. Wright about  
8 how he mined Bitcoin?

9 A     The fact that he used approximately 60 individual  
10 machines.

11 Q     Sixty? Six-zero?

12 A     Yeah.

13 Q     Okay. Anything else?

14 A     The fact that he used a key generation algorithm.

15 Q     The pay to public key, is that -- or something else?

16 A     No, no, no, that's a different thing.

17           The algorithm that actually generates the chain of  
18 private and public keys which can be converted into Bitcoin  
19 addresses. It was notable to me, because it was actually a  
20 slightly more primitive version of something that's in very  
21 wide use today known as BIP32.

22 Q     Okay. So let's talk about what he was doing and this  
23 idea of encryption. Okay?

24 A     Sure.

25 Q     So sometime between January 3rd and August 21, 2010,

1 Dr. Wright has 60 machines trying to mine Bitcoin, correct?

2 A Approximately 60, yeah.

3 Q Okay. And your understanding is in that 20-month period  
4 or so, he successfully mines about 16,500 Bitcoin blocks,  
5 correct?

6 A I think so, yes.

7 Q Okay. So let's just pick one of those blocks.

8 A Uh-huh.

9 Q Let's just say, let's just pick the 50th one, okay?

10 A Yeah.

11 Q Tell the Court what happens when he successfully mines  
12 the 50th block. What does he -- how does he know he  
13 successfully mind it?

14 A Well, I don't understand the precise details of the  
15 entire setup, but presumably the 60 machines would have to  
16 have some mechanism of communication with each other so that  
17 they can coordinate their actions. Each machine has to obtain  
18 a public key for the next block and needs to know when someone  
19 else -- when one of the other miners has mined a block.

20 Q Okay. So let me stop you.

21 So machine number 37, let's say, gets bingo, right?

22 A Yeah.

23 Q Gets a block.

24 Tells the other machines, okay, we got 37, all  
25 right?

1 A Yeah.

2 Q Okay. What happens to that public address?

3 A Nothing happens to it. It forms part of the Coinbase  
4 transaction, which is now part of that block, but nothing  
5 actually happens to it.

6 Q Right. It gets assigned -- it gets assigned --

7 THE COURT: Well, Mr. Brenner, I'm sorry. Can I  
8 interrupt?

9 And I may have missed a step. How does the public  
10 address get generated? So the machine runs the hash values,  
11 and it, as Mr. Brenner says, it hits bingo. Now, we've got a  
12 block that's been -- the work has been confirmed. How does  
13 the public key get generated?

14 THE WITNESS: The public key isn't really a part of  
15 the mining process, except for the fact that it's used in one  
16 of the transactions in the candidate block that you're  
17 attempting to mine. But the public key itself is generated  
18 using -- there's a little bit of cryptomath involved, but it  
19 uses the previous public key, plus some additional  
20 information, and it's manipulated and mutated to produce the  
21 next public key in the chain.

22 THE COURT: Okay. And I apologize. Sorry, I should  
23 ask my question more precisely and break it down. The block  
24 is mined, the work is confirmed. That's done. Okay?

25 THE WITNESS: Yeah.



1 THE COURT: Then there's a black reward, a new  
2 Bitcoin, or 50 new Bitcoin are now generated, correct?

3 THE WITNESS: Uh-huh.

4 THE COURT: They have to be assigned an address --

5 THE WITNESS: Yeah.

6 THE COURT: -- for future transactions, correct?

7 THE WITNESS: Yeah.

8 THE COURT: Who assigns that value to them? You  
9 just told me how that value is assigned, which was the  
10 question I asked.

11 THE WITNESS: Yep.

12 THE COURT: The question I want to start with is:  
13 Who assigns that number? Is that generated by the miner, or  
14 is that assigned by someone else?

15 THE WITNESS: I understand now.

16 The -- every miner actually creates a candidate  
17 block before a block is mined. It's basically a block that  
18 has everything except for the correct Nonce that results in  
19 the proof of work. So each miner actually generates a public  
20 key and a Coinbase transaction that will pay to that public  
21 key beforehand, not necessarily knowing that that Coinbase  
22 transaction and that public key will actually make it into the  
23 next block. It only does if they actually win the proof of  
24 work race.

25 So the address is sort of created and used before

1 the block's actually mined.

2 THE COURT: So the miner, in this case Dr. Wright,  
3 generates the public key before he undertakes the effort to  
4 try to mine. And if, as you say, he wins the race, the block  
5 reward, which is new Bitcoin, gets assigned to that public  
6 address; is that correct?

7 THE WITNESS: Yeah, that's correct. He could have  
8 generated it immediately before. He could have generated  
9 it -- well, maybe not 10 years before. I don't know if the  
10 math was well known then. But, yeah. It just has to be  
11 before.

12 THE COURT: I'm sorry, Mr. Brenner.

13 BY MR. BRENNER:

14 Q I'm going to pick up right where the Judge was.

15 So Dr. Wright generates a public key candidate for  
16 potential Bitcoin reward, correct?

17 A Um, I wouldn't call the public key itself a candidate.  
18 He creates a block candidate which includes a Coinbase  
19 transaction, which includes that public key, but the public  
20 key could be -- if they fail to find a block, you could use  
21 the public key in the next attempt.

22 Q Right. But once the -- once Dr. Wright generates it and  
23 wins, he gets reward, he now has Bitcoin in that place that he  
24 generated, correct?

25 A Yeah, that's correct.

1 Q Okay. And he knows that, right?

2 A Yeah.

3 Q Okay. At that point, did you discuss with Dr. Wright if  
4 he was able to spend that Bitcoin?

5 A Sorry, at which point?

6 Q When he gets it.

7 A Oh. Well, he would be able to spend the Bitcoin if he  
8 had access to the corresponding private key, which isn't  
9 necessarily the case. He can generate public keys without  
10 having the requisite knowledge to generate the corresponding  
11 private keys.

12 Q Okay. I don't want to talk hypothetically. I don't want  
13 to talk about what other people did. I want to talk about  
14 what Dr. -- your understanding of what Dr. Wright did. Do you  
15 have an understanding as to when Dr. Wright got -- and we use  
16 number 50 -- when he got that Bitcoin, whether he had the  
17 ability to spend it?

18 A No, I don't know whether he had the private keys or not.

19 Q Right. You have no -- as far as you know, Dr. Wright had  
20 the private keys to each and every Bitcoin he mined at the  
21 time he mined it, correct?

22 MS. MARKOE: Objection.

23 THE WITNESS: No, I don't know that. I don't know.

24 BY MR. BRENNER:

25 Q You don't know one way or the other?

1 A No.

2 Q Right.

3 A I know it's possible for it to have been done either way,  
4 but I don't actually know if he had the private keys at that  
5 time or not.

6 Q Right.

7 And you're not here testifying that the private keys  
8 for any of Dr. Wright's Bitcoin were not known to him,  
9 correct?

10 MS. MARKOE: Objection; mischaracterizes testimony.

11 THE COURT: It's confusing. I'll let you rephrase  
12 the question. But before you do, again, you've jumped over  
13 something that I need clarification on.

14 THE WITNESS: Yep.

15 THE COURT: So back to the prior hypothetical.

16 When Dr. Wright wins the race -- I'm using your  
17 phrase -- now, he's awarded the block reward, so he gets new  
18 Bitcoin that's created from the ether, and he assigns a public  
19 key to that. Am I with you so far?

20 THE WITNESS: Yes, yeah.

21 THE COURT: In order to spend that or transact any  
22 transaction with that newly created Bitcoin, there needs to be  
23 a private key?

24 THE WITNESS: Yes.

25 THE COURT: Okay. Does he generate that private key

1 at that time, does he generate that private key at some later  
2 time, or does somebody else generate that private key?

3 THE WITNESS: There's always a private key  
4 associated with a public key. The question is whether he  
5 knows it at that time or not. Because as long as you begin  
6 from the same common root of the chain, there's a separate  
7 algorithm for deriving a chain of public keys that there is to  
8 deriving the chain of private keys.

9 THE COURT: Okay.

10 THE WITNESS: So you could run those two algorithms  
11 separately and in different places or at different times if  
12 you want to, or you could run them together. But if I  
13 generate the public key, I could come back, you know, years  
14 later and generate my private keys when I want to -- when I  
15 want to spend them.

16 THE COURT: So as long as I know the starting point  
17 and I know the public key, I can work my way backwards into a  
18 private key?

19 THE WITNESS: Yeah.

20 THE COURT: Okay. And do you know whether  
21 Dr. Wright -- this algorithm that he says is now encrypted,  
22 whether that was generating both public and private keys or  
23 just public keys?

24 THE WITNESS: I don't know. I would imagine that  
25 they would actually be two separated algorithms. Whether he's

1 kept them together or not I'm unable to tell you.

2 THE COURT: All right. Thank you.

3 Mr. Brenner.

4 BY MR. BRENNER:

5 Q And what we do know is that -- which we talked about  
6 earlier, we know that of the 16,000 -- well, strike that.

7 We do know of the Bitcoin that Dr. Wright mined,  
8 that he did spend some of it, correct?

9 A Yes.

10 Q So we know that he had the private keys to spend that  
11 Bitcoin, correct?

12 A Yes, but they're not necessarily private keys that were  
13 generated using this mechanism, this algorithm.

14 Q You have no idea one way or the other, right?

15 A Well, I know about one in particular, and he's already  
16 said that he used his laptop to mine some coins for testing,  
17 et cetera. Those would have been using the public Bitcoin  
18 software, so they would have had private keys in a file called  
19 wallet.dat sitting on his laptop.

20 Q You have no knowledge whatsoever, one, the amount of  
21 Bitcoin Dr. Wright spent, correct?

22 A That's correct.

23 Q You have no idea whatsoever if that Bitcoin was mined in  
24 his 60-computer setup or on a private laptop, correct?

25 A I couldn't tell you on a coin by coin basis, no.

1 Q What you do know is for any Bitcoin that he did spend, he  
2 was able to access both the public and private keys, correct?

3 A Yes.

4 Q Okay. There's nothing inherent that you know of about  
5 the way Dr. Wright mined Bitcoin which made it impossible for  
6 him to know the public or private keys, correct?

7 A Yes, that's correct.

8 Q Okay. Now, the work you did, was there any reason it  
9 couldn't have been done two months ago, six months ago, a year  
10 ago?

11 A Um --

12 MS. MARKOE: Objection; calls for speculation. He  
13 was asked to do it when he was asked to do it.

14 THE COURT: Well, no, I'll allow him to answer the  
15 question.

16 BY MR. BRENNER:

17 Q Do you -- I'm sorry.

18 A From my point of view the reason was that I didn't know  
19 that this set of criteria existed until Dr. Wright told me.  
20 Dr. Wright -- well, Dr. Wright's an extraordinarily busy man  
21 and thinks about a lot of things. I would imagine it took him  
22 some time to recall some of these details.

23 Q Okay. As far as you're concerned, have you'd been asked  
24 to do this six months ago, you could have done it, correct?

25 A Yes.

1 Q As long as Dr. Wright gave you the information he gave  
2 you in June, correct?

3 A Yeah.

4 Q Now, if you look at your list, you'll see block 9 is not  
5 on that list, correct?

6 A That's correct.

7 Q Okay. And that is -- that is a block you know that --  
8 did you know that Dr. Wright has sworn that that's a --  
9 something that he mined?

10 A I wasn't aware that he had sworn to it, but . . .

11 Q Okay. And is the reason that's not on your list because  
12 it was -- you understand it was spent?

13 A Yeah, yeah. It's actually -- it's widely known that the  
14 first Bitcoin transaction was actually in that block that  
15 paid -- sorry, I'm not sure which block it was in precisely,  
16 but it was paid to Hal Finney, I believe.

17 Q Block 12, are you under -- do you understand that that is  
18 another block that Dr. Wright says that he mined?

19 A Um, block 12 I'm not sure is one I'm familiar with the  
20 history of.

21 Q Okay. It's not on your list, right?

22 A No.

23 Q What about 64? Another one that Dr. Wright said he mined  
24 that's not on your list?

25 A Sixty-four, if I recall correctly, was the one that



1 Satoshi Nakamoto paid to Mike Hearn.

2 Q So you think that's a spent one?

3 A I think so, yeah.

4 Q Mined by Dr. Wright if you're -- under your assertion or  
5 assumption that he's Satoshi Nakamoto?

6 A Yes, probably.

7 Q Okay. Under today's valuations, do you have an  
8 understanding of the market value of the 800,000-plus Bitcoin  
9 Dr. Wright claims to have mined?

10 A Um, I can probably calculate a market capitalization for  
11 them. Whether the market value is equivalent to that is  
12 probably a different story, because if you tried to sell that  
13 many Bitcoins, you'd tank the market.

14 Q It's about \$8 billion, right?

15 A About that, yeah.

16 Q Prior to the exercise that you went through, are you  
17 aware of Dr. Wright taking any efforts to try to identify for  
18 himself the public addresses of the \$8 billion in Bitcoin he  
19 claims to own?

20 A Uh, no, I'm not aware. I was actually very much  
21 distracted and not at all involved in this court case until  
22 recently, so I didn't follow any of the detail of it.

23 Q Unrelated to the Court case.

24 A No, no. I don't think he had any reason to try and get  
25 the addresses. The addresses on their own are not a lot of

1 use to you.

2 THE COURT: Well, wait a minute. Explain that to  
3 me. You said the addresses are not a lot of use to you. You  
4 just told me you can use the address to get the public~-- the  
5 private key and then make transactions, and you can't make  
6 transactions without the public key, can you?

7 THE WITNESS: No, no, you can't use the address to  
8 derive the private key. You can derive a corresponding  
9 private key, but it will require access to a different secret  
10 to the one that's required to generate the public key. So  
11 when I say that the address is not -- of no use to you --

12 THE COURT: And can you do a Bitcoin transaction  
13 without the public key?

14 THE WITNESS: The public key itself --

15 THE COURT: No, not public key, I apologize; public  
16 address.

17 THE WITNESS: Without a public address. Um, you  
18 could form a Bitcoin and transaction without the public  
19 address. Actually, yes, you can.

20 THE COURT: How do you identify which Bitcoin you're  
21 transacting if you don't use the public address?

22 THE WITNESS: A Bitcoin transaction contains a set  
23 of inputs which are actually references to prior transactions,  
24 and the reference is actually the transaction I.D. and the  
25 index of the output of the last one that you're spending. The

1 reference doesn't actually contain the Bitcoin address or the  
2 public key at all.

3 THE COURT: What if it's the first transaction with  
4 a brand new, newly mined Bitcoin?

5 THE WITNESS: Um --

6 THE COURT: What do you need to transact with that?

7 THE WITNESS: They -- that's called a Coinbase  
8 transaction, and they actually follow special rules in that  
9 they don't actually need inputs, because you're making new  
10 Bitcoins out of thin air.

11 In order to spend those --

12 THE COURT: No, no. You've made the Bitcoin out of  
13 thin air. Now, I have it.

14 THE WITNESS: Yeah.

15 THE COURT: Now, I want to transact with it. So I  
16 have a public key -- I have a public address for it.

17 THE WITNESS: Yep.

18 THE COURT: It was generated when I got it.

19 THE WITNESS: Yep.

20 THE COURT: Don't I need that address to transact  
21 with it the first time?

22 THE WITNESS: No, you need to -- you need to create  
23 a new Bitcoin -- sorry, a new transaction. Every spend in  
24 Bitcoin involves two transactions, the old one that you're  
25 spending out of and the new one that you're paying into. That

1 new transaction will contain a reference back to the  
2 transaction, the Coinbase transaction, and the index of the  
3 output, in which case -- in all these cases it'll just be  
4 zero. And the Bitcoin miners themselves, when they go to  
5 validate the transaction, they will pull up the script which  
6 contains the public key, but the person who creates the  
7 transaction doesn't actually need the public key. All they  
8 need to know is what that transaction I.D. was.

9 THE COURT: Okay. And just so we're clear, you --  
10 we've used the term "public key" and "public address". Are  
11 those the same, or are those different things?

12 THE WITNESS: They're very similar. A public  
13 address is derived from a public key, and it's just a more  
14 user-friendly form. So a public key is much longer on paper.  
15 It's very -- about twice as long and quite a lot more  
16 confusing to read. A Bitcoin address is just a shorter  
17 compressed version of that.

18 THE COURT: Okay. And you testified earlier that a  
19 wallet holds addresses. It's just a collection of addresses.  
20 Which addresses, public or private?

21 THE WITNESS: Um, there's not an easy answer to that  
22 question, because different wallets, the answers' different.

23 Going back to like the original Bitcoin wallet, it  
24 held a list of private keys, and if you hold the private key,  
25 you can derive the public key and the Bitcoin address easily.

1 If you have the public key, you can't go backwards and get  
2 the -- get the private key. So there are things called watch  
3 wallets which allow you to monitor Bitcoin on the public block  
4 chain but don't contain private keys, so you can't spend out  
5 of them.

6 So, I'm sorry, that was a little bit of a sidetrack.  
7 I'm not sure if I answered your question properly.

8 THE COURT: Well, here's what I'm confused about,  
9 and I want to give you a chance to explain to me.

10 You've testified that basically these public  
11 addresses don't -- aren't worth anything, correct?

12 THE WITNESS: They're useful in the sense that --  
13 only really in the sense that, yeah, you can use them to check  
14 if a Bitcoin has been spent without requiring, you know,  
15 private keys or anything, anything else. But if you're  
16 already making the assertion that the Bitcoins haven't been  
17 spent, I'm not really sure of any other use for them.

18 THE COURT: Okay. Then what is it that Dr. Wright  
19 is losing by the fact that his are allegedly encrypted in a  
20 way that he can't get to? What can't he do based on the fact  
21 that these public addresses aren't available to him?

22 THE WITNESS: The only thing that he really can't do  
23 is check if any of them have been spent or not, but presumably  
24 if he has -- he's confident no one else has access to the  
25 private keys, then he doesn't need to go and check that.

1 THE COURT: Okay. Mr. Brenner.

2 BY MR. BRENNER:

3 Q Could Dr. Wright spend any of his Bitcoin today?

4 A Sorry, I didn't hear part of that question.

5 Q Could Dr. Wright spend any of his Bitcoin today?

6 A Could he spend any of his Bitcoin today? I'm not aware  
7 of what Bitcoin Dr. Wright holds, so . . .

8 Q No?

9 A No.

10 I mean, I would presume maybe he holds Bitcoin that  
11 is outside of this -- this encrypted file and list of  
12 addresses. I don't know. He could have bought some on  
13 exchange. It's not a question I've ever asked him directly.

14 Q But he can't spend any that's in the encrypted addresses?

15 A To my knowledge, he doesn't have access to the private  
16 keys, so, no, he couldn't.

17 Q But that's the only thing he lacks access to is private  
18 keys?

19 MS. MARKOE: Objection; speculation and foundation.

20 THE COURT: Overruled.

21 THE WITNESS: So the only thing he lacks in order to  
22 be able to spend those Bitcoins is access to the private keys.  
23 Yes, if he had access to the private keys, he would be able to  
24 spend them.

25 BY MR. BRENNER:

1 Q My question's a little different. For the Bitcoin he  
2 owns, what else other than access to the private keys does Dr.  
3 -- is Dr. Wright lacking, if anything?

4 MS. MARKOE: Objection; foundation. He -- if --

5 THE WITNESS: Lacking for what?

6 THE COURT: Hold on. Let her state her legal  
7 objection.

8 Go ahead, Ms. Markoe.

9 MS. MARKOE: Objection; foundation. There lacks a  
10 predicate whether or not he even has knowledge of that  
11 information.

12 THE COURT: Well, ask a more general question,  
13 Mr. Brenner.

14 BY MR. BRENNER:

15 Q Do you have knowledge of what information Dr. Wright has  
16 available to him regarding the Bitcoin that he mined?

17 A That's a very broad question.

18 THE COURT: I think it's a yes or no question for  
19 now. Do you have other knowledge about that?

20 THE WITNESS: I have a knowledge about what  
21 information that he has. I'm aware of the fact that there's  
22 this Shamir sharing scheme with, you know, shares distributed  
23 in various places, but I'm not really privy to any of the  
24 details of that.

25 BY MR. BRENNER:

1 Q Anything else?

2 A Um, oh, as I think I've already said, that there's an  
3 encrypted file that contains algorithms that can be used --  
4 I'm sorry, implementations of algorithms that can be used for  
5 the generation of keys.

6 Q If I asked, would Dr. Wright have any better luck  
7 narrowing down D-2 for which are his Bitcoin than you have?

8 MS. MARKOE: Objection; again, foundation and asking  
9 what Dr. Wright might be able to do.

10 THE COURT: Sustained.

11 BY MR. BRENNER:

12 Q What program language did you use for the software that  
13 you used to generate your list?

14 A Primarily Java. I used a component of Java Script, as  
15 well as a little bit of batch script to access a Bitcoin CLI.

16 Q And is the source code that you used available -- would  
17 it be -- could you make that available for inspection if  
18 required to?

19 A Yeah, I could. I'd probably like some time to remove a  
20 couple of things, like part of my own personal passwords,  
21 et cetera. But, yeah, I could make that available.

22 Q Other than your personal information, you could make that  
23 available?

24 A Sure.

25 MR. BRENNER: May I have a moment, Your Honor?



1 THE COURT: Thank you.

2 Ms. Markoe.

3 MR. BRENNER: No, if I may just confer with counsel?

4 THE COURT: Oh, yes, of course.

5 BY MR. BRENNER:

6 Q Just to follow up on one thing that the Court asked you.  
7 You don't need a public address to transact in Bitcoin because  
8 you can generate it if you have the private key, correct?

9 A Um, no, that's not quite what I said.

10 You don't need the public address in order to be  
11 able to spend Bitcoin. You need the private key associated  
12 with it, and you need a reference to the transaction that you  
13 are spending out of.

14 Q I'm sorry, were you done?

15 A Yeah.

16 Q Oh, I'm sorry.

17 Can you generate a public address if you have the  
18 private key?

19 A Yes, you can.

20 MR. BRENNER: Thank you, Mr. Shadders.

21 Thank you, Your Honor.

22 THE COURT: All right. Mr. Shadders, one follow-up  
23 to that.

24 You said you need the public -- in order to spend  
25 the Bitcoin, you would need the private key and a reference to

1 the prior transaction.

2 THE WITNESS: Yeah.

3 THE COURT: And if I understood your prior  
4 testimony, in one of these situations that Dr. Wright has  
5 described where none of this Bitcoin has ever been spent  
6 before, there's only one index zero transaction.

7 THE WITNESS: Yeah.

8 THE COURT: Would you need the public key to  
9 identify that transaction if you hadn't written down the  
10 transaction, or is there a separate transaction number that  
11 you need?

12 THE WITNESS: There's a separate transaction number,  
13 which is referred to as a transaction I.D.

14 THE COURT: Okay. So if you have the transaction  
15 I.D. and the private key, then you can spend the Bitcoin?

16 THE WITNESS: The transaction I.D., the index of the  
17 output and the private key, yeah.

18 THE COURT: Okay. But here, the index would always  
19 be, I guess, one? Could it be the first transaction --

20 THE WITNESS: Zero, actually, yeah. But, yeah, it  
21 would always be zero.

22 THE COURT: Okay. Mr. Brenner, any further  
23 questions based on the Court's questions?

24 MR. BRENNER: No, Your Honor.

25 THE COURT: All right. Ms. Markoe, redirect.

1 MS. MARKOE: I promise I'll be very brief.

2 THE COURT: Take as much time as you need.

3 Redirect Examination

4 BY MS. MARKOE:

5 Q I don't mean to characterize your testimony, but I  
6 believe on cross there was a question that I found a little  
7 confusing, and I think that things got a little muddled. I  
8 just want to clear that up.

9 Is there anything -- and this was talking about  
10 access to the public and private keys, and I believe your  
11 answer was something to the effect of there was nothing  
12 inherent in the way that Dr. Wright mined where he couldn't  
13 access the public or private key, something to that general  
14 effect. When you testified about that, did you mean at the  
15 time that those -- that he was mining, or did you mean at a  
16 later date?

17 MR. BRENNER: Objection; leading.

18 THE COURT: I'll allow it.

19 THE WITNESS: Sorry, I'm not quite sure I'm  
20 understanding the question.

21 BY MS. MARKOE:

22 Q I will rephrase and try to make it a little clearer.

23 From your understanding, for the public -- for the  
24 Bitcoin that Dr. Wright mined through this algorithm and  
25 proprietary software, do you have an understanding as to

1 whether or not Dr. Wright had at the time he mined, first,  
2 access to the public and private keys?

3 A Um, I don't know one way or the other, but I know that it  
4 is entirely possible that he could have mined without needing  
5 access to the private keys, and, in fact, the software itself  
6 wouldn't even have needed to store the public keys or the  
7 addresses.

8 THE COURT: Ms. Markoe, if I can just clarify the  
9 question you're asking. Are you asking whether Dr. Wright --  
10 essentially you're asking whether the -- whether this witness  
11 knows if the algorithm automatically generated that  
12 information and Dr. Wright never subjectively knew it, or are  
13 you asking whether he never had access to it?

14 MS. MARKOE: I'm asking the former.

15 THE COURT: Okay. Okay.

16 THE WITNESS: The algorithm wouldn't have actually  
17 even needed to generate the private keys at all. That could  
18 be done at a later time. It needed to generate the public  
19 keys --

20 THE COURT: Okay.

21 THE WITNESS: -- in order -- because they were used  
22 to construct the Coinbase transaction.

23 THE COURT: Essentially, I think the question -- and  
24 Ms. Markoe, correct me if I'm getting you question wrong -- is  
25 this was -- to your understanding, Dr. Wright had set this up

1 as a fully automated process, where the mining went on through  
2 these 50 or 60 machines. If they hit, they assign whatever  
3 numbers needed to be assigned, they stored it, and then they  
4 went back to mining, and Dr. Wright himself didn't go in and  
5 do anything?

6 THE WITNESS: Yeah, I believe it was automated,  
7 yeah.

8 THE COURT: All right. Ms. Markoe, if I messed up  
9 your question feel free to clean it up.

10 MS. MARKOE: No, I think that you helped that one  
11 along, so I appreciate it.

12 BY MS. MARKOE:

13 Q With regard to the automated process, is it your  
14 understanding that that automated process would allow  
15 Dr. Wright, should he want to, or when he was able to, go back  
16 and recreate or regenerate the information necessary to  
17 actually transact in the coins that he mined?

18 A So long as he had access to the secrets that were  
19 required to generate private keys, yeah.

20 Q Okay. And that those secrets relate to the encryption of  
21 that algorithm and those files?

22 A Not just the encryption of the algorithm, but the -- I  
23 guess I've described the keys as a chain of keys, where each  
24 child is derived from its parent. So at the top of that chain  
25 is I guess what you would call a root private key, which would

1 need to be, you know -- you'd need access to that to be able  
2 to generate the -- the chain of children, yeah.

3 Q And it's your understanding that Dr. Wright does not have  
4 access to that root private key at this point in time either;  
5 is that correct?

6 MR. BRENNER: Objection; leading, foundation, beyond  
7 the scope of cross.

8 THE COURT: I'll allow it.

9 THE WITNESS: That is my understanding, he doesn't  
10 have access to it, yeah.

11 BY MS. MARKOE:

12 Q Do you have -- you know Dr. Wright. You've known him for  
13 about two years, and I think that, you know, established that  
14 you guys are colleagues and friends. Based on your knowledge  
15 of Dr. Wright, is there any reason that you have to believe  
16 that Dr. Wright would not provide the list required of him by  
17 this Court if he could?

18 MR. BRENNER: Objection; speculation, beyond the --

19 THE COURT: Sustained.

20 MS. MARKOE: One second.

21 BY MS. MARKOE:

22 Q Mr. Shadders, in your conversations with Dr. Wright  
23 around generating this list, was there anything in those  
24 conversations whereby Dr. Wright indicated to you in any way,  
25 shape or form that he had the ability to actually provide the

1 list required of him by this Court?

2 MR. BRENNER: Objection; calls for hearsay.

3 THE COURT: I'll allow the answer.

4 THE WITNESS: Um, no, no, there was not. And it  
5 makes no sense to me that we would go through this process  
6 if -- if he -- he were able to do that.

7 I mean, I look at this question, and I have to  
8 consider the fact that, like, Dr. Wright, you look at his  
9 writing for the last two years. This is a man who has a  
10 profound respect for the sovereignty of the legal system and  
11 courts. It's mentioned in almost everything he's written for  
12 the last two years. So it beggars belief to me that I would  
13 waste an enormous amount of time generating this list if he  
14 could simply produce one. I'm sure if he could, he would.

15 MS. MARKOE: I have nothing further, Your Honor.

16 THE COURT: All right. Thank you.

17 MR. BRENNER: Your Honor, can I have just two brief  
18 follow-ups?

19 THE COURT: Sure.

20 Recross-examination

21 BY MR. BRENNER:

22 Q You referenced the -- the parent key/root key situation,  
23 right? When did that start?

24 A When . . .

25 Q When did that come to be? This scheme that you referred

1 to, when did that happen?

2 A Well, it would have had to have been before he started  
3 using the algorithm. I don't know the precise date or time.

4 Q You think that he set that up before he mined his first  
5 Bitcoin?

6 A I don't know if it was before that or not.

7 Well, the first Bitcoin he might used the public --  
8 publicly available Bitcoin software, so . . .

9 Q You have no idea whatsoever at what point Dr. Wright  
10 supposedly took the private keys that he had to have and put  
11 them into this secret sharing system, right? You have no idea  
12 when that happened?

13 A No, I don't know when that happened.

14 Q It could have happened in 2012, 2013, 2014?

15 MS. MARKOE: Objection; calls for speculation.

16 THE COURT: I'll allow it. It just goes to this  
17 witness' knowledge. If you know.

18 THE WITNESS: No, I don't know. I mean, I just said  
19 I don't know. So it could have been any of those dates.

20 BY MR. BRENNER:

21 Q And in order to set it up, he needed to have the -- he  
22 needed to know the private keys, correct?

23 A He needed to know the root secret, which means that he  
24 would have been in possession of the means for generating the  
25 private keys.



1 Q Right. He had --

2 A Not all of them. He didn't need to actually generate  
3 them.

4 Q He had to have access to the private keys to set up the  
5 sharing system, correct?

6 A At some point he would have, yeah.

7 Q Okay. Now, you said it would be unfathomable to you that  
8 Dr. Wright would have you spend all this time generating a  
9 list. You spent about a day and a half?

10 A Probably two or three once you factor in all of the  
11 double-checking, yeah.

12 Q Oh, by the way, have you -- did Dr. Wright give you  
13 access to the file that supposedly contains this Shamir Secret  
14 Sharing Scheme?

15 A No, I've never seen that file.

16 Q You've never seen it?

17 A No.

18 MR. BRENNER: Okay. That's all I have, Your Honor.

19 THE COURT: Ms. Markoe, any redirect off of the  
20 recross?

21 MS. MARKOE: No, Your Honor.

22 THE COURT: The witness may step down. Thank you,  
23 sir.

24 Ms. Markoe, how long do you think the next -- are  
25 you done? I'm sorry, I should -- are you going to call your

1 next witness? I apologize.

2 Or Ms. McGovern?

3 MS. McGOVERN: Yeah, the defense rests, Your Honor.

4 THE COURT: All right. Mr. Brenner or Mr. Freedman,  
5 it's 10 minutes of 12:00. I don't know if you want to get  
6 started now with this witness, and we can go 'til about 12:30  
7 and take a break for lunch or if folks -- I know y'all came up  
8 from Miami. Maybe you're hungry, you want to get an early  
9 lunch and then we can come back.

10 What's your pleasure?

11 MR. FREEDMAN: Your Honor, actually, so this could  
12 help inform the decision.

13 There are -- there's one witness that -- well, two  
14 that we intend to call by deposition, Jonathan Warren, the  
15 creator of Bitmessage.

16 THE COURT: Okay.

17 MR. FREEDMAN: I don't know if the Court wants us to  
18 read that into the record or just submit the designations.

19 THE COURT: I'm happy to have you submit the  
20 designations, as long as both sides have reviewed them and  
21 there's no objection to them.

22 MS. McGOVERN: We agree with that with respect to  
23 this witness, Your Honor.

24 THE COURT: Yeah, I don't know that the parties need  
25 to play act for me. I can read it just as easily as I can

1 hear you read it to me. Unless it's 4000 pages, in which case  
2 I'm going to make you sit here and read it to me.

3 MR. FREEDMAN: No, Your Honor, we will submit that.

4 THE COURT: Great. Just mark it as, you know, an  
5 agreed exhibit and then submit it.

6 MR. FREEDMAN: Yes.

7 And then, Your Honor, we -- and this is a mea culpa  
8 on my part. We designated portions of Dr. Wright's previous  
9 depositions for the Court to review. Obviously, the defendant  
10 has not had much time to review them, and so we had agreed  
11 amongst each other that we would give the defense until Monday  
12 of next week to submit counter designations.

13 THE COURT: That's fine. I'm not going to rule from  
14 the bench today.

15 MS. McGOVERN: Yeah. And just for the record, Your  
16 Honor, we received them this morning.

17 THE COURT: That's fine.

18 How much time do you need, Ms. McGovern? If  
19 Monday's not enough time to you, I'll give you more time.

20 MS. McGOVERN: I think we agreed on Monday morning.

21 THE COURT: Okay. That's fine.

22 MS. McGOVERN: Thank you.

23 THE COURT: Sure, no issues.

24 MR. FREEDMAN: Then, Your Honor, we're at your  
25 pleasure if you'd like to take lunch. Our only live witness

1 is Dr. Edman.

2 THE COURT: How long do you think he will be on  
3 direct?

4 MR. FREEDMAN: About two hours.

5 THE COURT: Oh, then, again, I'll --

6 Ms. McGovern, what's your pleasure?

7 MS. McGOVERN: Your Honor, with respect to  
8 Dr. Edman, we would like to make a Daubert challenge with  
9 respect to the expert testimony that is being offered.

10 THE COURT: Okay.

11 MS. McGOVERN: And we -- and we're certainly  
12 prepared to do that now. I think it would take us 'til about  
13 12:30, but we need to connect the iPad to the podium with a  
14 different piece.

15 THE COURT: Okay. Then why don't we deal with that.  
16 If we're going to have a Daubert issue, let's deal with that  
17 now.

18 MR. FREEDMAN: Your Honor, can I? Just for the  
19 record, Dr. Edman's expert opinions has been disclosed to the  
20 defendant for -- since Monday?

21 MR. ROCHE: Yes.

22 MR. FREEDMAN: Since last Monday, and this is the  
23 first we're hearing that they intend to mount a Daubert  
24 challenge.

25 THE COURT: Okay. Well, let me -- I'll deal with

1 all of that as part of that proceeding. So let me just -- we  
2 will not take fact testimony or testimony from Dr. -- Edmans?

3 MR. ROCHE: Edman.

4 MR. FREEDMAN: Edman, E-d-m-a-n.

5 THE COURT: Edman, I'm sorry.

6 -- at this time, but let's go ahead, if there is a  
7 Daubert challenge, I'll hear it. If I determine that it's  
8 untimely, I'll deal with that. But let's at least help me  
9 frame the issue. I have not idea what -- I've not seen  
10 anything. I know nothing about what this witness is going to  
11 testify to. So y'all are going to have to help me at least  
12 frame the issues a little bit.

13 So maybe, Mr. Freedman, let me turn to you first. I  
14 mean, if you want to give me the expert disclosures that were  
15 given to the other side, I will be happy to look at them if  
16 that will educate me.

17 MR. FREEDMAN: Certainly, Your Honor.

18 I'm going to hand this over to Mr. Roche, who is  
19 taking Dr. Edman's testimony.

20 THE COURT: Mr. Roche, if you could hand that up,  
21 that will at least . . .

22 Ms. McGovern, do you need our technology people to  
23 help you connect what needs to be connected?

24 MS. McGOVERN: I believe Zalman Kass can do that.  
25 I'm going to give him the podium.

1           Your Honor, with respect to this challenge, you  
2 know, I think it's important for us, given the severity of the  
3 nature of this hearing, this is a hearing for both civil as  
4 well as criminal contempt against our client, and we believe  
5 it's very important to make a full record --

6           THE COURT: Uh-huh.

7           MS. McGOVERN: -- before Your Honor with respect to  
8 what is being done with Dr. Edman's testimony vis-a-vis the  
9 accusations that are being made against our client.

10          THE COURT: Okay. Just give me --

11          MS. McGOVERN: In that regard, Your Honor, I'd also  
12 request, again, not to be pushy, but I'd like to have the  
13 opportunity for the defense to make a full record and voir  
14 dire the witness before he offers his expert testimony. I  
15 think in doing so, Your Honor, it will be clear that the  
16 expert testimony, the actual expert testimony that this  
17 witness is offering in this proceeding, is inappropriate and  
18 does not satisfy Rule 702 or the Daubert standard.

19          THE COURT: Okay. Give me a second.

20          So Mr. Roche, am I correct that at least from a  
21 quick glance at what you've handed me, that Dr. Edman is  
22 essentially going to be testifying to the authenti -- to his  
23 analysis of metadata and other things as to the authenticity  
24 of certain documents?

25          MR. ROCHE: Yes. He analyzed two categories of

1 documents, documents that were submitted pursuant to  
2 Dr. Wright's sworn declaration, and other documents that were  
3 produced in this litigation related to the trust. He analyzed  
4 those documents using two methods. The first is he analyzed  
5 metadata and object code contained within those documents.  
6 The second methodology he used is certain of those documents  
7 had a cryptographic signature, and he analyzed the  
8 cryptographic signature related to certain documents. So two  
9 methodologies.

10 THE COURT: Okay. All right. The reason I ask is  
11 I -- and maybe it wasn't Dr. Edman, but I recall that in  
12 someone's submission earlier on for this hearing, someone had  
13 at least indicated there might be a witness on the Shamir  
14 sharing scheme. Is Dr. Edman going to testify about that, as  
15 well?

16 MR. ROCHE: Dr. Edman will not be testifying about  
17 the Shamir Secret Sharing Scheme.

18 THE COURT: Okay. Okay. And is Dr. Edman the only  
19 witness that you're planning to call at this point?

20 MR. ROCHE: Yes, he's the only witness we were  
21 planning to call.

22 THE COURT: Okay. So Ms. McGovern, you're asking to  
23 be able to voir dire him on his qualifications and his  
24 opinions and then make your Daubert motion, is that the way  
25 you'd like to proceed?

1 MS. McGOVERN: Yes, we are, Your Honor.

2 THE COURT: Okay. All right. I'll allow him to be  
3 voir dired, and then I'll rule on the Daubert issue.

4 So Dr. Edman, if you can come forward.

5 Matthew John Edman, Plaintiffs' witness, sworn.

6 THE COURT: All right. Please be seated. Pull that  
7 microphone up, and if you could state your full name and spell  
8 your last name for the court reporter, please.

9 THE WITNESS: Full name is Matthew John Edman, last  
10 name spelled E-d-m-a-n.

11 THE COURT: Ms. McGovern, whenever you're ready.

12 MS. MARKOE: Thank you, Your Honor.

13 Voir Dire Examination

14 BY MS. McGOVERN:

15 Q Good afternoon, Dr. Edman. My name is Amanda McGovern,  
16 and I represent Dr. Craig Wright.

17 Dr. Edman, this is the first time that you've met me  
18 today, correct?

19 A Yes, though I've seen you at previous hearings, but we  
20 haven't interacted before.

21 Q You've never spoken to me before now; is that correct?

22 A That is correct.

23 Q Dr. Edman, you've been paid to give your opinion  
24 testimony on the question of whether certain documents are  
25 authentic; isn't that right?



1 A That is correct.

2 Q And the sole basis for the opinion that you are offering  
3 on that limited subject is the metadata of certain documents;  
4 isn't that right?

5 A That is not correct.

6 Q What else are you relying upon, Dr. Edman, other than the  
7 metadata, the documents, to render a conclusion that the  
8 document isn't authentic?

9 A I also analyzed the internal contents and structure of  
10 the documents themselves, as well as cryptographic signatures  
11 that were contained within some of those documents.

12 Q Okay. So you're relying upon the document itself, the  
13 metadata and the information that you've just explained to us,  
14 to render an opinion to this Court that the document is  
15 inauthentic; is that right?

16 A I compared artifacts identified within those documents to  
17 other information that is, you know, publicly available on the  
18 Internet in some instances.

19 Q Okay. But in deciding whether a document is not -- is  
20 inauthentic, that's the information that you've relied upon,  
21 correct?

22 A The documents themselves, their internal structure,  
23 cryptographic signatures when applicable and additional  
24 information based on~--

25 Q On the Internet; is that right?

1 A On the Internet, as well as my, you know, education,  
2 training and experience.

3 Q Okay. So you say that you've reviewed certain metadata  
4 of certain documents, and you've determined that the metadata  
5 of the document appears to have been modified or, in fact, was  
6 modified; is that right?

7 A In some instances, yes, it appeared that the metadata on  
8 some of the documents was modified.

9 Q Metadata can be changed in different ways, correct?

10 THE COURT: Ms. McGovern, what does this have to do  
11 with his qualifications to render an opinion? Can we get to  
12 that, please? If he's allowed to testify, you can  
13 cross-examine him on the merits later.

14 MS. MCGOVERN: Yes, I will, Your Honor.

15 For example, one of the challenges, Your Honor, that  
16 we're making is that the information that Dr. Edman is relied  
17 upon is, in fact, user-generated information of the metadata.  
18 In other words, as opposed to computer generated, user  
19 generated. And I'd like to inquire with respect to that,  
20 because we'd like to make a hearsay objection to the  
21 introduction of that -- of that evidence on a hearsay basis,  
22 Your Honor.

23 MR. ROCHE: Your Honor, if I may?

24 THE COURT: Yeah.

25 MR. ROCHE: I think this type of line of questioning

1 is more appropriate for cross-examination and is not relevant  
2 to whether or not the type of testimony and the opinions he's  
3 going to be rendering are permissible under Rule 702.

4 THE COURT: I agree. Let's get to his  
5 qualifications and the methodology and the factors that I have  
6 to consider under Daubert.

7 BY MS. McGOVERN:

8 Q Dr. Edman, you never spoke with Craig Wright; isn't that  
9 right?

10 A That is correct.

11 Q And you've never spoken with Dave Kleiman; is that right?

12 MR. ROCHE: Again, this is -- objection. This is  
13 cross material, not Daubert related.

14 MS. McGOVERN: Your Honor, if I could get a little  
15 leeway, what I'm going to here -- and I can tell you right now  
16 exactly where I'm going, because it's not a surprise, and that  
17 is that the methodology that is being used for Dr. Edman to  
18 render an expert opinion on whether a document has been  
19 authenticated actually is rely -- he is relying exclusively on  
20 information that has nothing to do with who made the changes  
21 to the document, when the documents were -- when those changes  
22 were made, how they were made, where they're made, the factual  
23 circumstances surrounding when those changes were made, but  
24 the conclusion that he is actually rendering before this  
25 Court, Your Honor, is that the document is inauthentic based

1 solely on the information that he's described to us today,  
2 which is the metadata and other things.

3           So in order for this expert opinions -- expert  
4 opinion, there should be no mistake about it, the expert  
5 opinion that is being introduced to this Court is that -- goes  
6 directly to at least with respect to one document, which is  
7 the document that was authenticated under oath by Dr. Wright  
8 is a fraud. That's the expert testimony that's being  
9 provided. The methodology to reach that conclusion --

10           THE COURT: Well --

11           MS. McGOVERN: -- has not been generally accepted  
12 and has not been subject to peer review.

13           THE COURT: Well, first of all, I'm not sure the  
14 witness can opine that something is fraudulent. He can -- a  
15 witness can opine that a document is inauthentic or has been  
16 tampered with or has been modified. Those are all facts, but  
17 a witness can testify --

18           MS. McGOVERN: Your Honor, if I can use an example?

19           THE COURT: No, let me just finish for a second.

20           Okay. So the Daubert analysis requires the Court to  
21 answer three questions:

22           First, is the proposed expert qualified to testify  
23 competently regarding the subject matter in question? I've  
24 heard no testimony about that, or no testimony suggesting he's  
25 not qualified.

1           Second, is the methodology sufficiently reliable?  
2 I've heard no testimony from you about what the methodology is  
3 and why it's not reliable.

4           And, third, will his testimony assist the trier of  
5 fact through the application of scientific, technical or  
6 otherwise specialized expertise to understand the witness --  
7 understand the evidence or determine a fact at issue?

8           I am not at this stage to assess credibility or  
9 weight. That's what cross-examination is for. So if you'd  
10 like to address the three factors I am supposed to consider,  
11 which is: What are his qualifications, what is the  
12 methodology he used, and will his methodo -- is it reliable,  
13 and will it assist me, that's what you can explore at this  
14 time.

15 BY MS. McGOVERN:

16 Q     Dr. Edman, your expert opinion testimony is that the  
17 document which Dr. Wright authenticated under oath is a fraud;  
18 isn't that right?

19           MR. ROCHE: Objection; mischaracter --

20           THE COURT: Sustained. That is not one of the three  
21 questions I consider at this phase. Please ask him about his  
22 qualifications, his methodology, and whether it will be  
23 helpful to me or not. That's what this part of the hearing is  
24 limited to.

25 BY MS. McGOVERN:

1 Q Dr. Edman, with respect to your expert testimony  
2 concerning tab 31, which is an e-mail from Dave Kleiman to  
3 Dr. Wright, what methodology did you use to determine that, in  
4 fact, that e-mail from Dave Kleiman to Dr. Wright is a fraud?

5 MR. ROCHE: Objection; the witness doesn't have the  
6 exhibit in front of him, and, again, this is asking about  
7 specific documents. This does not go to the overall  
8 methodology and is more appropriate for cross-examination.

9 THE COURT: Sustained.

10 MS. McGOVERN: Your Honor, with respect to the  
11 methodology --

12 THE COURT: If you want to ask him about his general  
13 methodology not tied to any particular piece of evidence, that  
14 is what this stage of the proceeding is for. If I determine  
15 that he gets over the gatekeeping requirements of Daubert, you  
16 can ask him all the questions you want about specific  
17 documents. But at this point, I need to hear general  
18 methodology questions, not specific fact or evidence  
19 questions.

20 BY MS. McGOVERN:

21 Q Dr. Edman, what is the general methodology that you  
22 employed in determining whether a document in this case was  
23 fraudulent?

24 MR. ROCHE: Objection to the characterization.

25 THE COURT: I'll allow the question. I understand,

1 I understand. Go ahead.

2 THE WITNESS: In general, for the documents that I  
3 reviewed, I reviewed metadata associated with those documents,  
4 the internal structure or contents of those documents, and  
5 when applicable, the cryptographic signatures that were  
6 contained within those documents.

7 BY MS. McGOVERN:

8 Q And is that all that you relied upon in determining  
9 whether a document in this case was a forgery or a fraud?

10 MR. ROCHE: Again, objection to the characterization  
11 of the expert's opinion.

12 THE COURT: I'm the finder of fact. I understand.  
13 Go ahead. You can answer.

14 THE WITNESS: As I mentioned earlier, when  
15 applicable, I also evaluated the documents in the context of  
16 other information available publicly on the Internet.

17 BY MS. McGOVERN:

18 Q Okay. Is there anything else you relied upon in  
19 determining whether a document that has been submitted as  
20 authentic under oath is, in fact, a forgery or a fraud? Is  
21 there anything else that you relied upon other than the  
22 metadata, the Internet and the internal structure of the  
23 document itself?

24 A My own education, training and experience.

25 Q And, in fact, is the methodology that you have just

1 described to us generally accepted in the community for  
2 purposes of determining whether, in fact, a document has been  
3 fraudulently altered?

4 MR. ROCHE: Again, objection to the characterization  
5 "fraudulent".

6 THE COURT: Sustained.

7 Fraud implies that this witness is going to give an  
8 opinion about the state of mind of the person who handled the  
9 document. That's improper expert testimony. He can testify  
10 it's been altered, modified, changed, but he's not going to be  
11 allowed to testify whether it's fraudulent or not, so your  
12 question should not incorporate that fact.

13 MS. McGOVERN: Your Honor, if, in fact, Dr. Edman is  
14 not going to be testifying that any of the documents attached  
15 to his expert report are, in fact, fraudulent or a forgery,  
16 then this Daubert challenge is unnecessary. It is going only  
17 and exclusively to his opinion in his expert report that  
18 tab 31, document number 2413, which was submitted to this  
19 Court under oath by Dr. Wright, is a fraud or a forgery. If  
20 that is not his testimony, Your Honor, then the Daubert  
21 challenge is unnecessary.

22 THE COURT: Okay. I -- then I'll be clear. I think  
23 there's a difference between a forgery and a fraud. A forgery  
24 simply means the document is not what it purports to be. So  
25 it is -- that, to me, is a fact. That doesn't go to



1 Dr. Wright's state of mind or anybody else's state of mind. I  
2 would allow him to testify that he believes the document is a  
3 forgery. I will not allow him to testify to whether he  
4 believes it was fraudulently prepared.

5 So I don't know how that --

6 MS. McGOVERN: Or fraudulently altered, Your Honor.

7 THE COURT: Correct.

8 MS. McGOVERN: Okay.

9 THE COURT: He can't testify to that. He doesn't  
10 know the state of mind of the individual who may or may not  
11 have modified the document, so I would not allow testimony as  
12 to that person's state of mind, which is what is necessary for  
13 testimony that it was fraudulent. But he will be permitted to  
14 testify, if it is his opinion, the documents have been  
15 altered, modified or forged.

16 MS. McGOVERN: Thank you, Your Honor.

17 With respect to the fraud component of Dr. Edman's  
18 testimony, we're comfortable with that conclusion.

19 THE COURT: All right.

20 MS. McGOVERN: Let me simply, though, pursue briefly  
21 the issue with respect to forgery, if I might.

22 THE COURT: Sure, sure. And maybe we can start with  
23 defining how we're all using that term or how Dr. Edman has  
24 used that term in his report, if he has used that term.

25 MS. McGOVERN: I'm sorry, Your Honor?

1           THE COURT: Yeah, if we're going to -- does Dr. -- I  
2 haven't read the report carefully. Does Dr. Edman actually  
3 use the word "forgery" in his report?

4           MS. McGOVERN: Yes, he uses the word "forgery" and  
5 "fraud", Your Honor.

6           THE COURT: Okay. So I've already dealt with  
7 fraudulent.

8           MS. McGOVERN: Yes.

9           THE COURT: But if we're going to talk about  
10 forgery, I think that's proper -- well, let me just find out.

11           Dr. Edman, when you have used the term "forgery" in  
12 your report, what is your understanding of what that means?  
13 So if I hear you testify that something is, in your view, a  
14 forgery, what is it you're telling me about that document?

15           THE WITNESS: That it is a document that has been  
16 manipulated or altered to appear to be something -- or than it  
17 actually is.

18           THE COURT: Okay. Ms. McGovern, back to you.

19           It would seem to me that's proper testimony. That's  
20 factual testimony.

21           MS. McGOVERN: I agree with you, Your Honor.

22           Our concern with respect to this testimony with this  
23 witness was that there are statements in the report that a  
24 particular document submitted to Your Honor by our client  
25 under a declaration of authenticity was a fraud. So -- and

1 that the forgery actually goes to a state of intent with  
2 respect to our client to purposefully manipulate the  
3 appearance of the document, and if that, in fact, is not going  
4 to be permitted and it's simply limited to an authenticity  
5 based upon the information he's been provided, then we believe  
6 the qualifications would not be subject to a Daubert  
7 challenge.

8 THE COURT: Look, I think -- okay. I appreciate  
9 that.

10 MR. ROCHE: Your Honor, if I may?

11 THE COURT: Yeah.

12 MR. ROCHE: Just a point for clarification.

13 If counsel could point out where the word "fraud" or  
14 "fraudulent" is used in the expert's disclosures, my  
15 understanding is that it is not used in the expert's  
16 disclosures.

17 THE COURT: Okay. Again, we don't need to go there,  
18 because I've already ruled that he's not going to be allowed  
19 to testify to that anyway.

20 Look, I think as I recall Dr. Wright's testimony  
21 when he was confronted about some of these documents, he  
22 testified that other people had access to these documents,  
23 other people may have had a motive to manipulate the  
24 documents, and clearly his position as I heard it was even if  
25 these documents have somehow been manipulated, I didn't do it.

1 MS. McGOVERN: Correct, Your Honor.

2 THE COURT: That was his position, and I don't  
3 believe that this witness or any other witness can testify  
4 directly to what was in Dr. Wright's mind and whether he did  
5 it -- these were documents that he personally manipulated on  
6 purpose or didn't manipulate on purpose, and I would not allow  
7 that.

8 I think it is fair argument from other evidence in  
9 the record for either side to argue that either Dr. Wright did  
10 or did not do it, but that's argument, not fact.

11 MS. McGOVERN: Thank you, Your Honor.

12 THE COURT: Okay. With that understanding, you're  
13 no longer pursuing your Daubert challenge?

14 MS. McGOVERN: Yes, we are.

15 THE COURT: Okay, great.

16 All right. Then with that, Mr. Roche, it's now  
17 12:10. Does it make sense to start with Dr. Edman now?

18 MR. ROCHE: I think it probably makes sense, you  
19 know, given the nature of the documents, to do lunch and then  
20 come back after lunch.

21 THE COURT: Okay, great. I just want to make sure  
22 we finish today. So you think two hours on Dr. Edman roughly  
23 on direct.

24 Ms. McGovern, I know this is always a hard question,  
25 because you haven't heard his testimony yet, but what's your

1 sense about cross on Dr. Edman?

2 MS. McGOVERN: I think the same, Your Honor.

3 THE COURT: Okay.

4 MR. ROCHE: If it would help, we would be willing to  
5 do a shorter lunch.

6 THE COURT: Then how about if we come back at  
7 1:00 o'clock. That gives everybody just under an hour to grab  
8 lunch. Is that enough time?

9 MR. ROCHE: That's more than enough time.

10 THE COURT: All right. How about we'll reconvene at  
11 1:00 o'clock, we'll start Dr. Edman's testimony at that time,  
12 and we'll stay however long we need to stay to complete his  
13 testimony today.

14 All right. Thank y'all very much. We'll be in  
15 recess 'til 1:00 o'clock. And Mr. Freedman, if your phone  
16 beeps, go. Somebody else can tell me why you're not here at  
17 1:00 o'clock.

18 MR. FREEDMAN: Thank you.

19 THE COURT: All right. We'll be in recess.

20 (A recess was taken from 12:14 p.m. to 1:06 p.m., after  
21 which the following proceedings were had:)

22 THE COURT: Good afternoon, everyone. Please have a  
23 seat.

24 Dr. Edman's back on the stand; great.

25 All right. All counsel are present. The witness is

1 present.

2 Mr. Roche, whenever you're ready, you may proceed.

3 Direct Examination

4 BY MR. ROCHE:

5 Q All right. Good afternoon, Dr. Edman. Before we begin,  
6 can you please state your name and where you live.

7 A My name is Matthew John Edman, and I live in New York,  
8 New York.

9 Q And Dr. Edman, have you been retained by the plaintiffs  
10 in this case?

11 A Yes.

12 Q And what is your field of expertise?

13 A My field of expertise includes digital forensic  
14 investigations and applied cryptography.

15 Q And before we get into your findings related to this  
16 litigation, can you please tell the Court where you're  
17 presently employed?

18 A I currently work as a director of cyber security  
19 investigations for a consulting firm called Berkeley Research  
20 Group, in New York.

21 Q And what is your educational background?

22 A I have a bachelor of science in computer science from  
23 Baylor University, a master of science in computer science  
24 from Rensselaer Polytechnic Institute and a Ph.d. also in  
25 computer science from Rensselaer Polytechnic Institute.

1 Q And what was the focus of your research during your  
2 graduate studies?

3 A My master's research was focused on the design and  
4 analysis of anonymous communication systems on the Internet,  
5 and my doctoral work was focused on cryptographic security in  
6 wireless networks.

7 Q Did you ever work for an organization called The MITRE  
8 Corporation?

9 A Yes.

10 Q What was your role there?

11 A I was a lead cyber security engineer in the domestic  
12 security division.

13 Q And while you were at The MITRE Corporation, did there  
14 ever come a time where you worked supporting the FBI?

15 A Yes. Primarily when I was at MITRE, I primarily  
16 supported the FBI's remote operations unit in Quantico,  
17 Virginia.

18 Q And did -- can you please describe your work that you  
19 performed with the FBI under MITRE in a little bit more  
20 detail?

21 A Sure. My work was primarily related to research and  
22 developments related to computer security and support of  
23 criminal and national security investigations.

24 Q Okay. And did any of these investigations involve Silk  
25 Road?

1 A Yes.

2 Q Can you please describe to the Court the nature of your  
3 role in those investigations related to Silk Road?

4 A Yes. So my support to the FBI in that investigation  
5 primarily related to the identification of the servers hosting  
6 the Silk Road website.

7 Q And can you describe any -- in any more detail the work,  
8 if any, you did related to the Silk Road investigation?

9 A Well, subsequent to my time at MITRE, I was a senior  
10 director at a consulting firm called FTI Consulting, in New  
11 York, in the global risk investigations practice. While  
12 there, I supported the U.S. Attorney's Office for the Southern  
13 District of New York in reviewing various forensic images  
14 collected during the course of that investigation belonging to  
15 Silk Road and the defendant, Ross Ulbricht, identifying  
16 Bitcoin-related wallets and other artifacts on those forensic  
17 images, extracting them, analyzing them to establish  
18 relationships between the website and the defendant, Ross  
19 Ulbricht.

20 MR. ROCHE: Your Honor, may I approach the witness?

21 THE COURT: You may.

22 BY MR. ROCHE:

23 Q I'm now handing you what's been marked as plaintiffs'  
24 exhibit 24. Dr. Edman, what is plaintiffs' exhibit 24?

25 A This is a copy of my CV.



1           MR. ROCHE: Okay. I move to enter plaintiffs'  
2 exhibit 24 into the record as evidence.

3           THE COURT: Any objection?

4           MS. McGOVERN: No objection.

5           THE COURT: Entered without objection. Exhibit 24  
6 without objection.

7           (Plaintiffs' Exhibit No. 24 entered into evidence.)

8 BY MR. ROCHE:

9 Q All right. Now, what were you asked to do in preparation  
10 for this hearing as part of rendering an expert opinion?

11 A I was asked to review certain documents produced by the  
12 defendant in this litigation and evaluate, to the extent  
13 possible, whether or not they are authentic.

14 Q Okay. And you can briefly describe your findings based  
15 on this analysis?

16 A My findings generally were that a number of the documents  
17 that I reviewed appeared to have been manipulated and  
18 therefore are not authentic.

19 Q Okay. And before we get into the substance of your  
20 analysis, can you please inform the Court on the methods you  
21 used to analyze the documents at issue.

22 A Sure. The methods that I used generally involved  
23 reviewing metadata or information about the files that I was  
24 reviewing, reviewing the internal structure and contents of  
25 the files themselves, and when applicable, also reviewing

1 cryptographic signatures embedded in those documents.

2 Q Okay. So let's break that down.

3 Can you describe to the Court what metadata is?

4 A Sure. Metadata is information about a file or a piece of  
5 data, such as who created it, when, using what program, and  
6 when it was last modified.

7 Q Okay. Now can you describe to the Court what a  
8 cryptographic signature is?

9 A Sure. A cryptographic signature is a means of verifying  
10 the origin and the authenticity of a piece of data, such as an  
11 e-mail or a file.

12 MR. ROCHE: Your Honor, may I approach?

13 THE COURT: You may.

14 BY MR. ROCHE:

15 Q I'm now handing you what's been previously admitted in  
16 these proceedings as plaintiffs' exhibit 1. Do you recognize  
17 this document?

18 A Yes.

19 Q What is it?

20 A It is an e-mail purportedly from Dave Kleiman to Craig  
21 Wright in June of 2011 regarding the Tulip Trust.

22 Q And are you aware that the defendant has sworn to the  
23 authenticity of this document?

24 A Yes.

25 Q Dr. Edman, do you know how exhibit 1, bearing Bates label

1 ending in 2413, was collected and produced to the plaintiffs  
2 in this litigation?

3 A I understand it was collected as a scan of a paper  
4 document, and the scan was provided to the plaintiffs.

5 Q Dr. Edman, can you turn to the last page of plaintiffs'  
6 exhibit 1. And there's a string of a bunch of characters.  
7 What -- can you describe to the Court what this is on Bates  
8 ending 2416?

9 A This is a PGP.

10 MS. McGOVERN: I believe it's 2413. Oh, you're  
11 talking about the Bates number? Okay.

12 THE COURT: It's page 4 of 4 of document 237-1,  
13 Mr. Roche; is that correct?

14 MR. ROCHE: Correct.

15 THE COURT: Thanks.

16 MR. ROCHE: At the bottom, the Bates label is 2416.

17 THE COURT: All right. I'm with you.

18 MS. McGOVERN: Thank you.

19 THE WITNESS: Yeah, Bates label 2416 is a PGP  
20 signature, or a printout of a PGP signature, which is a type  
21 of cryptographic signature.

22 BY MR. ROCHE:

23 Q And can you describe how an individual would go about  
24 creating a cryptographic signature?

25 A Sure. To create a cryptographic signature, you generally

1 need two keys, a private key, which is secret and known only  
2 to you, and a corresponding public key, which is -- can be  
3 made public and shared with anyone with whom you want to  
4 exchange information. The private key and the public key are  
5 related such that information encrypted with the private key  
6 can only be decrypted using the corresponding public key, and  
7 vice versa.

8           So in order to create a cryptographic signature of,  
9 say, a document, or an e-mail, or some other piece of data,  
10 you first create sort of a digital fingerprint called a hash  
11 of that data, which is unique to that particular piece of  
12 data. You then encrypt this digital fingerprint, or the hash,  
13 using your private key, and then include that signature or  
14 that encrypted hash with the data that you're sending to a  
15 recipient.

16           When the recipient receives that data, they can  
17 compute the same digital fingerprint, or hash, of what they  
18 received, decrypt the signature using the corresponding public  
19 key, and then compare the two fingerprints and make sure  
20 they're the same. If they're the same, then they know that  
21 that piece of data hasn't been modified and originated from  
22 the person who holds the corresponding private key.

23 Q    Okay. And if we go back to exhibit 1, the last page,  
24 2416, what is this a cryptographic signature of?

25 A    This is a cryptographic signature of a Tulip Trust PDF.

1 Q And can you direct the Court where the Tulip Trust PDF is  
2 contained within this document?

3 A Yes, Bates 2414 and 2415.

4 Q Okay. We'll come back in a little bit to discuss the  
5 cryptographic signature in this document.

6 THE COURT: Wait, I'm sorry. Just before you leave  
7 that, I'm sorry, you lost me for a second.

8 So what is reflected on 2416, the PGP signature,  
9 is -- I'm sorry, Dr. Edman, can you tell me again what you say  
10 that is?

11 THE WITNESS: That is a PGP signature, which is a  
12 type of cryptographic signature --

13 THE COURT: Right.

14 THE WITNESS: -- of the Tulip Trust PDF file.

15 THE COURT: Okay. Thank you.

16 Thank you, Mr. Roche. Go ahead.

17 And I'm sorry, where was that? You said that is on  
18 2414 and 2415, as well?

19 THE WITNESS: The Tulip Trust PDF is on 2414 and  
20 2415.

21 THE COURT: Oh, that is what your -- those two pages  
22 are what you're calling the Tulip Trust PDF?

23 THE WITNESS: Correct.

24 THE COURT: I understand that, thank you.

25 BY MR. ROCHE:

1 Q And 2416 is the cryptographic signature of 2414 and 2415?

2 A Correct.

3 MR. ROCHE: Okay. Your Honor, may I approach?

4 THE COURT: Yes.

5 BY MR. ROCHE:

6 Q Dr. Edman, I'm handing you what's been previously  
7 admitted as exhibit 2 and exhibit 6. Do you recognize these  
8 documents?

9 A Yes.

10 Q What are they?

11 THE COURT: I'm sorry, Mr. Roche, can you just  
12 differentiate for me which one is 2 and which one is 6?

13 MR. ROCHE: Yes, the -- at the top, the document  
14 number is --

15 THE COURT: Oh, 2 and 6, I see them there. Okay.  
16 Thank you.

17 MR. ROCHE: No problem.

18 BY MR. ROCHE:

19 Q And Dr. Edman, what are these documents?

20 A These are printouts of a PDF of an e-mail.

21 Q And how do these exhibits 2 and 6 relate to exhibit 1?

22 A Exhibit 2 here relates to exhibit 1 in that it is  
23 identical in terms of content to exhibit 1. Exhibit 6 is  
24 almost identical, except the date appears to have been  
25 changed.

1 Q Okay. And what type of files were Bates number 13189 and  
2 13459 produced as?

3 A PDF files.

4 Q Okay. And for ease of reference, I'm going to call  
5 exhibit 6 the October 2014 e-mail and exhibit 2 the June 2011  
6 e-mail. Is that okay with you?

7 A Yes.

8 Q All right. Let's focus on the October 2014 e-mail, and  
9 we can put exhibit 2 aside for a second. What, if anything,  
10 did you do to analyze the authenticity of this e-mail?

11 A I analyzed metadata associated with this file, as well as  
12 the internal structure and contents of the file, the PDF file  
13 itself.

14 MR. ROCHE: Your Honor, may I approach?

15 THE COURT: You may.

16 BY MR. ROCHE:

17 Q I'm handing you what's been previously marked as  
18 exhibit 7 that has been conditionally admitted into evidence.

19 Okay. What is this document?

20 THE COURT: Which one, 7?

21 MR. ROCHE: We're on exhibit 7, yes.

22 THE WITNESS: Exhibit 7 is a printout of a metadata  
23 object that I extracted from the 2014 e-mail PDF.

24 BY MR. ROCHE:

25 Q And how did you create -- how did you extract this

1 exhibit?

2 A I extracted it using a tool called 010 Editor, which is a  
3 hex editor.

4 Q And is tool 010 Editor, is that a tool that is commonly  
5 used in your profession for analyzing metadata?

6 A It -- yes, it's a tool that's commonly used for analyzing  
7 a variety of files.

8 MR. ROCHE: Okay. I now move to have exhibit 7  
9 moved into evidence.

10 THE COURT: Any objection?

11 MS. McGOVERN: Yes, hearsay.

12 THE COURT: No, the witness testified that he  
13 personally extracted it. I'll allow it. It's admitted over  
14 objection.

15 (Plaintiffs' Exhibit No. 7 entered into evidence.)

16 BY MR. ROCHE:

17 Q Okay. Dr. Edman, I'd like to focus -- I'd like to ask  
18 you a few questions to see if we can walk through the  
19 information contained within this document, so I'd like to  
20 start at line number 4.

21 What does the XMP meta field show?

22 A The XMP meta field is used to provide information about  
23 the software that created this particular metadata object.

24 Q And is there a date associated with the XMP meta field?

25 A Yes, that field contains the date August 23rd, 2012.



1 Q And what does that date mean?

2 A That date indicates the date that the software that was  
3 used to create this metadata object was compiled.

4 Q Okay. Does any of the metadata indicate what program was  
5 used to create the PDF?

6 A Yes, the creator tool field on line 15 indicates that the  
7 PDF was created using Acrobat PDF Maker 11 for Microsoft  
8 Outlook.

9 Q Okay. And what does that tell us?

10 A It tells us that this PDF was created from an e-mail that  
11 was opened in Microsoft Outlook and then saved as a PDF.

12 Q Is there any metadata in this document that indicates  
13 when the e-mail was received in Microsoft Outlook?

14 A Yes. The mail date field on line 23 indicates that the  
15 e-mail was received October 17, 2014, at 12:04:57 p.m., in the  
16 time zone UTC plus 10.

17 Q Okay. And do you know what time zone UTC plus 10 is  
18 associated with?

19 A It's associated with eastern Australia.

20 Q Is there any metadata in this document that indicates who  
21 sent the e-mail?

22 A Yes. The mailed from field on line 20 indicates that  
23 this e-mail was sent from the address craig@panoptcrypt.com.

24 Q Okay. And are there any other indicators in this  
25 document that show who sent this e-mail?

1 A Yes. The mail transport header includes a number of  
2 references to the address that was -- from which this e-mail  
3 was sent.

4 Q Okay. We'll get to the mail transport header in a  
5 second, but is there any metadata -- so we discussed who sent  
6 the e-mail. Is there any metadata that indicates who the  
7 e-mail was sent to?

8 A Yes. The mailed to field on line 21 indicates that the  
9 e-mail was sent to craig@panopticopt.com.

10 Q Okay. And so what does that tell us about how this PDF  
11 was created?

12 A It tells us that this PDF was created from an e-mail that  
13 was sent from craig@panopticopt.com to craig@panopticopt.com  
14 and then saved as a PDF from Microsoft Outlook.

15 Q And Dr. Edman, what is -- I believe you briefly mentioned  
16 this before, but what is an e-mail header?

17 A An e-mail header provides information about an e-mail,  
18 such as who it's from, who it's to, and the various e-mail  
19 servers through which an e-mail is routed from the sender to  
20 the recipient.

21 Q Is the e-mail header contained within the metadata for  
22 this document?

23 A Yes.

24 Q Which metadata field contains the e-mail header?

25 A The mail transport header field, which starts on line 25,

1 contains the e-mail header.

2 Q Okay. And does the e-mail header contain information  
3 provided by the server the e-mail is being routed through or  
4 the infor -- or information from the computer the e-mail is  
5 being sent from?

6 A It includes both types of information.

7 Q Okay. Let's start with the information provided by the  
8 e-mail server. Is there a particular set of fields associated  
9 with the information provided by the e-mail server?

10 A Yes. In particular, the received fields, which are  
11 included from lines 25, up to and including the DKIM, or  
12 D-KIM, signature, which ends on line 59.

13 Q Okay. That's a lot of lines, so let's walk through that.

14 Let's start with DKIM signature, which is on page 2  
15 of this document at line 53. What does the attribute DKIM  
16 mean?

17 A The DKIM signature is a field that cryptographically  
18 shows the domain from which a particular e-mail originated.

19 Q And is there a time stamp associated with the DKIM  
20 signature?

21 A Yes. On line 54, there's a time stamp that starts with  
22 "T" equals, and then a series of numbers. That time stamp is  
23 given in what's sometimes called a UNIX time or an Epoch time,  
24 which is expressed as the number of seconds that have elapsed  
25 since midnight, January 1, 1970. So if you convert this to a

1 more human readable name, you find that this time stamp  
2 corresponds to October 2014 and shows that this e-mail  
3 originated from the domain panopticopt.com, as shown in  
4 line 53.

5 Q And that's "D" equals panopticopt.com?

6 A Correct; the end of line 53.

7 Q Okay. And if we look at lines 25 through 52, which are  
8 also in the e-mail header, I see there are five fields labeled  
9 received. What does that indicate?

10 A The received headers are added by each e-mail server that  
11 routes a particular e-mail, one on top of the other. So to  
12 follow the flow of a particular e-mail message, you start from  
13 the bottom and then read to the top.

14 So, for example, the first one would be on line 49  
15 chronologically.

16 Q Okay. So let's start with just that first one starting  
17 at line 49 with received. Can you walk the Court through the  
18 information contained in that header?

19 A Sure. The received header, which starts on line 49,  
20 indicates that this e-mail originated from a computer with the  
21 name PCCSW01 using an account craig@panopticopt.com.

22 Authenticated sender indicates that the sender of the e-mail  
23 was logged into that particular account at the time on Friday,  
24 October 17th, 2014, at 1:04:44 a.m. in time zone UTC plus 0.

25 Q Okay. And so you said -- I see the words "authenticated

1 sender". What does that mean about the domain craig@ -- or  
2 the e-mail craig@panopticopt.com?

3 MS. McGOVERN: Object to foundation.

4 THE COURT: Overruled.

5 THE WITNESS: It indicates that the individual who  
6 sent this e-mail at craig@panopticopt.com provided the user  
7 name or e-mail address and password for that particular  
8 account in order to send this e-mail.

9 BY MR. ROCHE:

10 Q Dr. Edman, I see right after the received line, there is  
11 a from PCCSW01. What does that mean?

12 A That is the name of the computer device from which this  
13 e-mail originated.

14 MR. ROCHE: Your Honor, may I approach?

15 THE COURT: Yes.

16 BY MR. ROCHE:

17 Q I'm handing you what's been marked as plaintiffs'  
18 exhibit 25.

19 THE COURT: Actually, Mr. Roche, we don't have a  
20 jury here. You can just approach without asking each time.

21 MR. ROCHE: Perfect.

22 THE COURT: That will speed things along.

23 If you've got a packet of exhibits you're going to  
24 use and you want to hand those over at one big packet at some  
25 point, that will speed things along. I'm happy to do it that

1 way, as well.

2 MR. ROCHE: Okay.

3 THE COURT: So this is marked as what? I'm sorry.

4 MR. ROCHE: This is plaintiffs' exhibit 25.

5 THE COURT: Thank you.

6 BY MR. ROCHE:

7 Q Dr. Edman, if we looked at the received header field,  
8 again, at line 49, there is -- it says: Unknown 14.1.18.30.  
9 What is that?

10 A That is the IP address associated with the computer  
11 PCCSW01 at that particular time.

12 Q And what is an IP address?

13 A An IP address is sort of like a phone number for a  
14 computer or other device on a network like the Internet.

15 Q Okay. And if you can look at exhibit 25. What is this?

16 A Exhibit 25 is a printout from a MaxMind, M-a-x-M-i-n-d,  
17 GeoIP2, G-e-o-I-P, the number 2, Precision Lookup, which is a  
18 publicly available utility for mapping an IP address to an  
19 approximate geographic location. In this exhibit, the lookup  
20 is for the IP address 14.1.18.30.

21 Q And that's the same as the IP address in line 48 of  
22 exhibit 7?

23 A It is the same as the IP address in line 49 --

24 Q Oh, thank you.

25 A -- of my exhibit, from exhibit 7.

1           MR. ROCHE: The plaintiffs now move to enter  
2 exhibit 25 into evidence.

3           THE COURT: Any objection?

4           MS. McGOVERN: Yes, Your Honor, hearsay.

5           MR. ROCHE: Your Honor, this --

6           MS. McGOVERN: This is a printout which has not been  
7 authenticated in any other way other than the witness stating  
8 that he printed it out, and it's a statement which is being  
9 introduced for the truth of the matter asserted, and we  
10 object. It's classic hearsay.

11          MR. ROCHE: Your Honor, if I may?

12          THE COURT: Yeah.

13          MR. ROCHE: Dr. Edman is a expert in the field of  
14 applied cryptography and digital forensics and used this to  
15 look -- created this document himself. If you want me to, I  
16 can ask him further background about the particular website  
17 and tool he used to pull this information, but I think this is  
18 classic information that an expert is allowed to rely on in  
19 rendering an opinion.

20          THE COURT: Well, I think you need to develop -- I'm  
21 looking again at the rules of evidence. I think under the  
22 hearsay rule there is an exception for treatises and other  
23 sorts of --

24          MR. ROCHE: I believe as an expert witness, he is  
25 allowed to rely on hearsay that is used in his field of

1 expertise.

2 THE COURT: I understand.

3 MS. McGOVERN: Your Honor, may I respond?

4 THE COURT: Hold on one second.

5 Mr. Roche, I think you need to develop a slightly  
6 more developed foundation.

7 MR. ROCHE: Okay.

8 THE COURT: Because Rule of Evidence 803(18) says  
9 that: A statement contained in a treatise, periodical,  
10 pamphlet or other learned publication is admissible if relied  
11 on by an expert on direct examination and the publication is  
12 established as a reliable authority by the expert's admission  
13 or testimony, by another expert's testimony, or by judicial  
14 notice.

15 So if you can just have the witness more fully  
16 explain what this tool was that he used and why that might  
17 meet the qualifications of the rule.

18 MR. ROCHE: Absolutely.

19 BY MR. ROCHE:

20 Q Dr. Edman, what is GeoIP2 Precision Lookup?

21 A GeoIP2 Precision Lookup is a service offered by a company  
22 called MaxMind that lets you map an IP address to an  
23 approximate geographic location.

24 Q Have you relied on GeoIP2 Precision Lookup to inquiry a  
25 particular IP address during your professional experience?



1 A Yes.

2 Q And is GeoIP Precision Lookup a tool that is commonly  
3 used in the field of digital forensics to look up information  
4 related to a particular IP address?

5 A Yes.

6 MR. ROCHE: Your Honor, I now move to --

7 BY MR. ROCHE:

8 Q And is GeoIP2 Precision Lookup a reliable authority?

9 A Yes.

10 MR. ROCHE: Your Honor, I now move to admit  
11 plaintiffs' exhibit 25 into the record as evidence.

12 THE COURT: Any objection?

13 MS. McGOVERN: We restate our objection, Your Honor.  
14 It may be a reliable tool, but they've printed this out  
15 without any indication on this document as to the date or  
16 otherwise, and it's the printout that we object to, Your  
17 Honor. It's -- there hasn't been a foundation laid which  
18 provides for sufficient reliability that, in fact, this  
19 printout was done either at or the time the e-mail is being  
20 examined.

21 THE COURT: All right. I think that all goes to  
22 weight, and you can certainly cross-examine about that, but  
23 I'll admit it over the objection of defense. So it's admitted  
24 over objection.

25 (Plaintiffs' Exhibit No. 25 entered into evidence.)

1 BY MR. ROCHE:

2 Q Dr. Edman, if we look at exhibit 10, what geographic  
3 location is the IP address of line 49 of exhibit 7 associated  
4 with?

5 A The IP address in exhibit 7, line 49, according to  
6 exhibit 5 is associated with eastern Australia.

7 Q Okay. And could you walk -- and if we go back to -- we  
8 can put exhibit 25 to the side for now.

9 If we can go back to exhibit 7. Could you walk --  
10 we went through one of the received fields in the mail  
11 transport header. Can you walk through the other four  
12 received fields starting with the one prior to the one we just  
13 looked at?

14 A Sure.

15 The e-mail was received by the next e-mail server in  
16 the path for the address craig@panopticopt.com on Friday,  
17 October 17, 2014, at 1:04:53 a.m. UTC plus 0.; it was then  
18 received by the next e-mail server Friday, October 17, 2014,  
19 also at 1:04:53 a.m. UTC plus 0; and then relayed to the next  
20 e-mail server, where it was received on Thursday, October 16,  
21 2014, at 9:04:54 p.m., the time zone UTC minus 4; and then on  
22 the previous page, finally it's received by the last server in  
23 the path on Thursday, October 16, 2014, at 8:04:55 p.m., at  
24 UTC minus 5.

25 Q And if we could look at -- I just want to focus real

1 quick on something that -- if we could look at line 41, the  
2 envelope from craig@panopticopt.com. What does that mean?

3 A That indicates, again, the e-mail address from which this  
4 e-mail came.

5 Q Okay. And if we look at line 28 within this -- if we  
6 look at line 28, I see a field called return path. What does  
7 that mean?

8 A The return path is sort of like a -- it's like a bounce  
9 back address where, if there are any delivery errors  
10 associated with this e-mail, those errors will be sent to this  
11 particular address. It's usually set to the same address as  
12 the person who sent the e-mail, and in this case it shows the  
13 address craig@panopticopt.com.

14 Q Okay. And if we could go back through the e-mail header  
15 one more time. Line 45, what does the e-mail -- what does it  
16 mean when it says for craig@hotwirepe.com?

17 A It indicates that this e-mail may have -- or  
18 craig@panopticopt.com may have also been associated with  
19 craig.wright@hotwirepe.com.

20 Q Okay. And if we -- we've looked at line 23 before, which  
21 was the mailed date from the Microsoft Outlook program. Does  
22 the date in line 23, is it consistent with the received header  
23 fields in the e-mail header?

24 A Yes.

25 Q Okay. So we reviewed -- does the e-mail header say

1 anything about who sent the e-mail?

2 A Yes, and there are a number of indications that the  
3 e-mail came from the address craig@panopticopt.com, including  
4 the fields that we just discussed, as well as the from field  
5 on line 60.

6 Q Okay. And does that information match lines 21 and 20  
7 that were the fields created by Microsoft Outlook?

8 A Yes.

9 Q Okay. Now, you mentioned earlier that there's also  
10 information in the e-mail header added by the computer the  
11 e-mail is sent from. What are some of those fields?

12 A Some of those fields include the from, to, the subject,  
13 date field, for example.

14 Q Okay. And can -- where is the date information located  
15 from the -- from the information added by the computer itself?

16 A The date header field provided by the client at the  
17 client's computer is in line 63.

18 Q And what does that date field indicate?

19 A It contains the date June 24th, 2011, which was a Friday,  
20 at 12:04:38 p.m., time zone UTC plus 10.

21 Q Okay. Now, how could the originating computer and the  
22 e-mail server assign such drastically different time stamps?

23 A The date on the computer that was used to send this  
24 message could have been manually changed, which would result  
25 in one date showing up in the date field and then a very

1 different series of dates showing up in the received headers,  
2 which are added by the e-mail servers that handled this  
3 e-mail.

4 Q So someone could change the date on their computer, and  
5 that would be reflected in the metadata for this document?

6 A Correct.

7 Q Okay. I'd like to look at line 71. It says X-mailer.  
8 What does that field indicate?

9 A The X-mailer header field is a field that is used to  
10 indicate the type of software and version of that software  
11 that was used to send this particular e-mail.

12 Q And what version of software was used to send this  
13 particular e-mail?

14 A Microsoft Outlook 15.

15 Q I'll now hand you what's been marked as plaintiffs'  
16 exhibit 26. Dr. Edman, what is this document?

17 A This document is a printout from Microsoft's website that  
18 indicates the various Outlook product names associated with  
19 Outlook version numbers.

20 Q And is this a reliable -- is -- how did you access this  
21 information?

22 A I accessed it by going to Microsoft's website.

23 Q And is going to Microsoft's website a reliable source for  
24 finding version information out about its particular products?

25 A Yes.

1 Q And is it -- would this website be used by individuals in  
2 your field of expertise to look up version information about a  
3 particular Microsoft software?

4 A Yes.

5 MR. ROCHE: I now move to have plaintiffs'  
6 exhibit 26 entered into the record as evidence.

7 THE COURT: Any objection?

8 MS. McGOVERN: Yes, Your Honor, hearsay.

9 THE COURT: I'll overrule that objection and admit  
10 26 over objection.

11 (Plaintiffs' Exhibit No. 26 entered into evidence.)

12 BY MR. ROCHE:

13 Q Okay. And we -- going back to exhibit 7, it says:  
14 Microsoft Outlook 15.0. When was Microsoft Outlook 15.0  
15 released to the general public?

16 A Microsoft Outlook 15.0 was associated with Outlook 2013,  
17 which was released in early 2013.

18 Q So this version of Microsoft Outlook did not exist as of  
19 June 24th, 2011?

20 MS. McGOVERN: Objection; foundation.

21 THE COURT: Overruled.

22 THE WITNESS: Correct.

23 BY MR. ROCHE:

24 Q Dr. Edman, can a user manipulate -- you testified earlier  
25 that a user can manipulate the date on their particular

1 computer. Can a user manipulate the date on the server that a  
2 particular e-mail is being routed through?

3 A Not generally. Only if they had access to that  
4 particular server.

5 Q Okay. Let's go back to page 1 of exhibit 7, and if we  
6 can look at line 24. It says PDFX colon mail attachments.  
7 What is the mail attachments field?

8 A The mail attachments field indicates the names of files  
9 that were attached to the e-mail when it was sent.

10 Q Okay. Were you able to extract the three attachments  
11 listed from the mail attachment field, or from -- strike that  
12 question.

13 Were you able to extract the three attachments  
14 identified on line 24 in exhibit 7 from the October 2014  
15 e-mail?

16 A Yes.

17 Q And did you analyze the Tulip Trust PDF?

18 A Yes.

19 THE COURT: I'm sorry, Mr. Roche. I'm sorry, I'm  
20 catching up to you here.

21 So the witness was able to go into plaintiffs'  
22 exhibit 6?

23 MR. ROCHE: Six.

24 THE COURT: And that was produced in some sort of a  
25 native format, where the --

1 MR. ROCHE: It was produced as a PDF.

2 MS. McGOVERN: PDF, Your Honor.

3 THE COURT: A PDF, okay. With PDF attachments. Got  
4 it, thank you.

5 BY MR. ROCHE:

6 Q And did you analyze the Tulip Trust PDF?

7 A Yes.

8 Q And was the Tulip Trust PDF embedded in the October 2014  
9 e-mail the same as the Tulip Trust document from exhibit 1  
10 that Dr. Wright swore was authentic?

11 MS. McGOVERN: Objection, Your Honor, foundation.  
12 There's nothing in the record that suggests that anything can  
13 be derived from exhibit 1, and if that's the testimony he'd  
14 like to elicit before rendering that conclusion, that's fine,  
15 but it's not in the record now.

16 THE COURT: I think that's right. I think  
17 there's -- you haven't laid an adequate foundation to compare  
18 this document to 1, because there's no testimony that the  
19 witness even extracted anything from exhibit 1. So I'll  
20 sustain the objection.

21 BY MR. ROCHE:

22 Q Okay. Let's unpack that.

23 You were able to extract the Tulip Trust PDF from  
24 exhibit 6?

25 A Yes, that is correct.



1 Q Okay. And if we go -- if you can put exhibit 1. And for  
2 the record, is the document that you were able to extract from  
3 exhibit 6 identical to the text in plaintiffs' exhibit 1 at  
4 2414 and 2415?

5 MS. McGOVERN: Objection, Your Honor, foundation.  
6 The document, is he still referring to the Tulip Trust or to  
7 the face of the e-mail?

8 THE COURT: Oh, I think he just referenced the  
9 specific page number.

10 So I think the question, Dr. Edman, is: Whatever  
11 you extracted from plaintiffs' exhibit 6, was it the same or  
12 different from these two pages, page 2414 and 2415?

13 THE WITNESS: It was the same.

14 MS. McGOVERN: I'd like to just state the objection  
15 for the record for foundation.

16 THE COURT: Okay. Overruled.

17 I'm sorry, Dr. Edman, did you answer the question?

18 THE WITNESS: Yes, sir. It was the same.

19 THE COURT: Same, okay.

20 BY MR. ROCHE:

21 Q Okay. We can put the October 2014 e-mail to the side,  
22 and let's pull up exhibit 2, which is the June 2011 version of  
23 that e-mail. And, again, for the record, so we know what  
24 we're looking at, what type of document was exhibit 2 produced  
25 as?

1 A It was produced as a PDF.

2 Q Handing you what's been previously conditionally admitted  
3 as plaintiffs' exhibit 3. Dr. Edman, what is this document?

4 A This document is a printout of a metadata object that I  
5 extracted from the 2011 e-mail PDF.

6 Q Okay. And if we can -- strike that.

7 MR. ROCHE: I now move to have plaintiffs' exhibit 3  
8 admitted into evidence.

9 THE COURT: Any objection?

10 MS. McGOVERN: Hearsay, Your Honor.

11 THE COURT: Okay. Overruled on that grounds.

12 Exhibit 3 will be admitted over objection.

13 (Plaintiffs' Exhibit No. 3 entered into evidence.)

14 BY MR. ROCHE:

15 Q If we could put exhibit 3 and exhibit 7, which is the  
16 metadata from the 2011 e-mail and the metadata from the 2014  
17 e-mail, side by side.

18 A Okay.

19 Q I'd like to look at line 16 in both exhibits. They both  
20 have an attribute called document I.D. What is that?

21 A The document I.D. is a common identifier used to  
22 associate multiple versions or revisions of a particular  
23 document.

24 Q Okay. And what can you tell the Court about the document  
25 IDs for the June 2011 e-mail and the October 2014 e-mail?

1 A They're the same.

2 Q And if you go to the next line, line 17, I see another  
3 attribute called instance I.D. Dr. Edman, what is an instance  
4 I.D.?

5 A An instance I.D. is a unique identifier that is used to  
6 identify a specific version or revision of a document.

7 Q So what do these two attributes, the document I.D. and  
8 the instance I.D., tell us about the metadata in exhibit 3 and  
9 exhibit 7?

10 A It tells us that they are two different revisions of the  
11 same document.

12 Q Okay. I'd like to -- now, we can put exhibit 7 aside and  
13 focus again on just exhibit 3. Let's look at line 21. What  
14 does the mail date field indicate?

15 A The mail date field indicates June 24th, 2011, at  
16 12:04:57 p.m., in the time zone UTC plus 10.

17 Q And does that match the text of exhibit 2, that date?

18 A Yes.

19 Q Okay. What does the mail from field indicate at line 23?

20 A The mail from field on line 23 indicates the address  
21 dave@davekleiman.com.

22 Q And what does the mail to field indicate?

23 A The mail to field includes the address  
24 craig@panopticopt.com.

25 Q And Dr. Edman, you testified earlier that this is a

1 revision of the October 2014 e-mail. Is there any metadata in  
2 the June 2011 e-mail that suggests it was modified in 2014?

3 A Yes. The modified date and metadata dates on lines 12  
4 and 14 indicate that the document was modified October 22nd,  
5 2014.

6 Q Okay. And let's look at the XMP meta field in line 4 in  
7 this document. What does that field show?

8 A Again, the XMP meta field indicates the version of the  
9 software that was used to create this particular metadata  
10 object. In this case, it contains the compilation timer build  
11 time of August 23rd, 2012.

12 Q So this version of software that was used to create it  
13 didn't even exist in June 2011?

14 A Correct.

15 Q Was that the same software that was used to create the  
16 October 2014 e-mail?

17 A Yes.

18 Q And did you analyze the mail transport header in the  
19 June 2011 e-mail?

20 A Yes.

21 Q What did it show?

22 A It showed that a significant portion of the mail  
23 transport header had been truncated or removed.

24 Q Okay. And is there any other information in this  
25 document that conflicts with the document's purported creation

1 date of June 2011?

2 A Uh, yes. The mail transport header on line 27 contains a  
3 version of the Microsoft SMTP server, or Microsoft Exchange  
4 software, that handled this e-mail, and that version is  
5 14.3.169.1, which, at -- as of June 2011 did not exist.

6 Q Is there a date in the mail transport header?

7 A Yes.

8 Q What is that date?

9 A It contains the date Thursday, June 24th, 2011.

10 Q Is there anything noteworthy about that date?

11 A June 24th, 2011, was a Friday.

12 Q And if we could go back to the SMT server. When did that  
13 version of the Microsoft SMT server come out?

14 A November 2013.

15 Q All right, Doctor. If we can look at line 28, and I see  
16 there's two line 28s. Why is there two line 28s there?

17 A In -- when this was printed out, the repeated line number  
18 indicates that it's a continuation of the same line.

19 Q Okay. So when you converted this to a PDF, it wrapped  
20 the line because it was too long?

21 A Yes, that is correct.

22 Q Okay. And in line 28, I see a field called return path.  
23 What does that field show?

24 A That field contains the e-mail address  
25 craig@panopticopt.com, which indicates that any mail delivery

1 errors associated with this message would have been sent to  
2 craig@panopticopt.com.

3 Q Okay. Dr. Edman, besides examining the metadata, did you  
4 do anything else to analyze the October 2014 and June 2011  
5 e-mails?

6 A Yes, I also examined the internal structure and content  
7 of the files themselves.

8 Q Did this analysis reveal any further modifications to the  
9 PDF file?

10 A Yes.

11 Q Okay. And before we get into that analysis, can you  
12 briefly describe to the Court what a PDF file is comprised of?

13 THE COURT: Well, before you get to that, sorry,  
14 Mr. Roche, plaintiffs' 2, 6 and I guess 1 --

15 MR. ROCHE: Yes.

16 THE COURT: -- were those produced by the defense in  
17 this case?

18 MR. ROCHE: Yes.

19 THE COURT: And were they produced from -- at least  
20 was it represented they came from the files of Dr. Wright?

21 MR. ROCHE: That, as best as I understand, yes.

22 THE COURT: Okay.

23 MS. McGOVERN: Your Honor, if I could just correct  
24 the record.

25 THE COURT: Yeah, please.

1 MS. McGOVERN: The documents were produced from the  
2 computer files which contained all of the ESI for all of the  
3 companies, including Dr. Wright, and for purposes of being  
4 overly inclusive, everything was produced. So there is not  
5 actually a file path in this case, like many other cases,  
6 where you would simply have one defendant producing all of the  
7 ESI he had in his computer, for example, in a folder or a  
8 laptop. This is a mammoth computer which contained all of the  
9 ESI for over 10 companies, and there is not a file path in  
10 which all of these documents can be tied back to production by  
11 Dr. Craig Wright.

12 THE COURT: Okay. But these are all business  
13 records of one of those companies?

14 MS. McGOVERN: Correct, Your Honor.

15 THE COURT: Okay. Then I'll adopt that as part of  
16 my ruling as to overruling your hearsay objection. If they're  
17 business records produced by the defendant, then that supports  
18 my prior ruling.

19 Mr. Roche, you may continue.

20 MR. ROCHE: Yes.

21 BY MR. ROCHE:

22 Q All right. Dr. Edman, if you'd bear with me, I'm going  
23 to hand you five exhibits. So two of these have been  
24 previously conditionally admitted at the June 28th hearing.  
25 They are marked plaintiffs' exhibit 8 and plaintiffs'

1 exhibit 4. And before I ask you any questions, we'll just get  
2 them all in front of you.

3 THE COURT: I apologize, Mr. Roche. I think when I  
4 interrupted, you had a question pending about explain to the  
5 Court what a PDF is or something like that.

6 MR. ROCHE: Oh, yes.

7 THE COURT: I don't know if you want to continue  
8 with that question or move to a different question.

9 MR. ROCHE: Yep.

10 BY MR. ROCHE:

11 Q Dr. Edman, can you describe to the Court what a PDF file  
12 is comprised of?

13 A Yes. So a PDF is a common document format that comprises  
14 a number of what are called objects, where an object is, for  
15 example, text, or images, or other embedded files, as well as  
16 instructions to the PDF reader software regarding how to  
17 render all of those objects on the screen.

18 Q And I'm now also handing you what has been marked as --

19 THE COURT: Mr. Roche, we were just noticing that  
20 you've not been publishing these for the public, so I didn't  
21 know whether that's technologically infeasible or there is a  
22 reason why, but if we are showing exhibits to the witness, it  
23 would be preferable, if we can, to show them on the ELMO or on  
24 the screen or something.

25 Ms. Fagan is helping us out.



1 BY MR. ROCHE:

2 Q Okay. You should have in front of you exhibit what has  
3 been previously a conditionally exhibit admitted as  
4 plaintiffs' exhibit 4?

5 THE COURT: Don't publish it yet, Mr. Freedman,  
6 because it's not been fully admitted.

7 BY MR. ROCHE:

8 Q Plaintiffs' exhibit 8, plaintiffs' exhibit 27, and  
9 plaintiffs' exhibit 28.

10 A Yes, I do.

11 Q What are these documents?

12 A These documents are printouts of object code contained  
13 within the PDF files. Exhibit 4 is from the 2011 e-mail PDF,  
14 and 8, 27 and 28 are from the 2014 e-mail PDF.

15 Q And did you extract these -- this object code from the  
16 PDF files for the October 2014 and the June 2011 e-mails?

17 A Yes.

18 MS. McGOVERN: Objection, Your Honor. There's a  
19 reference to e-mails, plural, for 2011. There are two 2011  
20 e-mails that have been referred to as exhibit 1 and I believe  
21 exhibit --

22 THE COURT: Four, I think.

23 MS. McGOVERN: -- 2.

24 THE COURT: Let's use the exhibit numbers, if we  
25 can, Mr. Roche. I think that will simplify the record.

1 MR. ROCHE: Sure.

2 BY MR. ROCHE:

3 Q So we can correct the record, Dr. Edman, these are  
4 extracts from exhibit 2 and exhibit 6, the PDF files; is that  
5 correct?

6 A Yes, that is correct.

7 MR. ROCHE: Okay. I'd like to move plaintiffs'  
8 exhibit 4, plaintiffs' exhibit 8, plaintiffs' exhibit 27 and  
9 plaintiffs' exhibit 28 into evidence.

10 THE COURT: Any objection?

11 MS. McGOVERN: Yes. Objection; hearsay, Your Honor.  
12 If I could just make the objection for the record --

13 THE COURT: Sure.

14 MS. McGOVERN: I understand that it's --

15 THE COURT: Go ahead.

16 MS. McGOVERN: -- I'm testing patience, but --

17 THE COURT: It is not. Make your record.

18 MS. McGOVERN: Thank you very much, Your Honor.

19 To the extent that these extracted metadata excerpts  
20 are being introduced for the proposition that they are not  
21 automatically computer generated, but rather manually  
22 generated by an individual, they are, regardless of having  
23 been printed out from the -- from the PDF by this expert, they  
24 nevertheless are considered statements by a third party that  
25 are made out of court and being introduced for the proof --

1 for the truth of the matter asserted. So I object on that  
2 grounds, Your Honor, under the authority which holds that to  
3 be hearsay.

4 THE COURT: Okay. I understand.

5 And my ruling is based on the fact, first of all,  
6 that these are documents that were business records that were  
7 produced. So they're not hearsay in that regard, and the  
8 underlying documents, which are already in evidence,  
9 exhibits 2 and 6. And also, to the extent the witness has  
10 testified that he has extracted these using a reliable tool  
11 that is used in his industry to do this, and I suppose has  
12 testified or can testify that these are (sic) accurately  
13 reflect the underlying metadata because of the use of a  
14 reliable tool, then I would allow it. So I would overrule the  
15 objection.

16 But Mr. Roche, you may need to ask that one  
17 additional question to lay the predicate, that this is a  
18 reliable -- are these, in fact, reliable reflections of the  
19 underlying metadata based on the tool that the witness used.

20 BY MR. ROCHE:

21 Q Dr. Edman, are plaintiffs' exhibit 4, 8, 27 and 28  
22 accurate representations of the metadata contained -- excuse  
23 me, the object code that you extracted from plaintiffs'  
24 exhibit 2 and plaintiffs' exhibit 6?

25 A Yes.

1 MR. ROCHE: I now move to have them admitted into  
2 evidence.

3 THE COURT: I will admit over objection 4, 8, 27 and  
4 28.

5 (Plaintiffs' Exhibit Nos. 4, 8, 27 and 28 entered into  
6 evidence.)

7 THE COURT: Mr. Roche, I don't think I have 27 and  
8 28. I think I just have 4 and 8.

9 MR. ROCHE: Exhibit 27 and 28.

10 THE COURT: Thank you, Mr. Roche.

11 MR. ROCHE: Your Honor, it appears there's one  
12 straggler, so . . .

13 BY MR. ROCHE:

14 Q Dr. Edman, I'm handing you now what's been marked as  
15 plaintiffs' exhibit 29. What is plaintiffs' exhibit 29?

16 A Twenty-nine is a PDF object that I extracted from the  
17 2014 e-mail PDF.

18 MR. ROCHE: And I'd like to move plaintiffs'  
19 exhibit 29 into the record as evidence.

20 THE COURT: I think you need to lay the same  
21 foundation.

22 MR. ROCHE: Yep.

23 THE COURT: I'll anticipate Ms. McGovern's  
24 objection. Sustained based upon the objection she didn't make  
25 yet.

1 BY MR. ROCHE:

2 Q What -- and how did you -- what is plaintiffs' exhibit 29  
3 associated with?

4 A It's exhibit -- associated with the 2014 e-mail, which I  
5 believe is exhibit 6.

6 Q And did you extract and verify that that's an accurate  
7 representation of the source code contained within plaintiffs'  
8 exhibit 6?

9 A Yes.

10 MR. ROCHE: I now move to have plaintiffs'  
11 exhibit 29 admitted into evidence.

12 THE COURT: Any objection?

13 MS. McGOVERN: Same objection, Your Honor, hearsay.

14 THE COURT: All right. Thank you. That objection  
15 will be preserved but overruled.

16 MS. McGOVERN: Thank you.

17 (Plaintiffs' Exhibit No. 29 entered into evidence.)

18 BY MR. ROCHE:

19 Q Now, we have a lot of source code in front of us right  
20 now. Did you prepare a demonstrative to help walk the Court  
21 through a comparison of this source code?

22 A Yes.

23 Q Dr. Edman, is this the demonstrative you prepared?

24 THE COURT: And first of all, Mr. Roche, how do we  
25 mark this?

1 MR. ROCHE: It's a demonstrative.

2 THE COURT: Even if it's a demonstrative, I want the  
3 record to reflect a number to it.

4 MR. ROCHE: Demonstrative 1.

5 THE COURT: Okay. Demonstrative 1. Thank you.

6 THE WITNESS: Yes, this is my demonstrative.

7 BY MR. ROCHE:

8 Q Let's turn to page 2 of your demonstrative.

9 THE COURT: Hold on before we use it.

10 Ms. McGovern, did you have a chance to review this?  
11 Any objection to the Court using this as a demonstrative only,  
12 not as separate evidence?

13 MS. McGOVERN: No objection to that use.

14 THE COURT: All right. Mr. Freedman, you may also  
15 publish it, then, for the public. Thank you.

16 BY MR. ROCHE:

17 Q Okay. All right. If we're looking at page 2 of  
18 demonstrative 1, what exhibit is this data associated with?

19 A This is the 2014 e-mail, which I believe is exhibit 6.

20 Q Okay. And what does the first box in this demonstrative  
21 show?

22 A This first box shows a text object that I extracted from  
23 the 2014 e-mail PDF.

24 Q And what does the second box in this demonstrative show?

25 A The second box shows a -- the corresponding modified text

1 object also from the same exhibit.

2 Q And can you walk the Court through the modifications that  
3 were made?

4 A Sure.

5 So it appeared that the text in the from field was  
6 changed from Craig S. Wright to instead read Dave Kleiman.  
7 When you modify text in a PDF, the software often adds what's  
8 called a marked content point labeled TouchUp\_TextEdit,  
9 indicating that the following text object was modified, and  
10 the modified text appears as a series of letters and numbers  
11 where every four letters or numbers maps to a particular  
12 character to display on the screen.

13 So, for example, in line 52 on the box on the top  
14 right, the code 0027 maps via another object in the PDF to the  
15 letter capital "D"; 0044 maps to a lower case "a"; and so on,  
16 and the box in the lower left shows that particular mapping.

17 Q Okay. So it displays in the PDF as Dave Kleiman?

18 A That is correct. That's what the box in the bottom right  
19 shows.

20 Q Okay. Let's go to page 3 of your demonstrative.

21 Were there any other edits to the exhibit 6, the  
22 October 2014 e-mail?

23 A Yes. The from and the to fields in the PDF, the blue  
24 underlined text is actually a clickable link, where, if you  
25 hover over that text with your mouse cursor, it shows the

1 e-mail address associated with that particular name. And from  
2 the contents of the PDF identified that the link in the from  
3 field was changed from craig@panopticopt.com to instead  
4 dave@davekleiman.com. Similarly, the link in the to field was  
5 changed from craig@panopticopt.com to the e-mail address  
6 overlyqualified@gmail.com.

7 Q And so these links that we're seeing, this is what you  
8 see when you hover over, like, an e-mail address in Microsoft  
9 Word or in a PDF?

10 A Correct.

11 Q Now, let's go to page 4 of your demonstrative. What does  
12 the first box in the demonstrative in this page show?

13 A The first box in this demonstrative in the top left shows  
14 a text object from the 2014 e-mail.

15 Q And what does the second box show?

16 A The second box shows a corresponding text object from the  
17 2011 e-mail in which the date field has been modified.

18 Q And I see there's red highlights in the first and second  
19 box. Can you walk the Court through those red highlights?

20 A Sure.

21 Again, the TouchUp\_TextEdit marker was added to  
22 indicate that the following text object was modified. In  
23 particular, within the date field, the date 17 was changed to  
24 24, the month October was changed to June, and the 4 in 2014  
25 was changed to a 1 to instead read 2011.



1 Q Okay. And how can we be sure that these text edits are  
2 revisions to the same document?

3 A Again, the two documents have the identical document I.D.

4 Q Okay. Dr. Edman, are you aware of whether Dr. Wright has  
5 produced any original e-mail -- so strike that.

6 Exhibit 2 and exhibit 6 are PDF files, correct?

7 A Yes.

8 Q Are you aware of whether Dr. Wright has produced any  
9 original e-mail files related to exhibit 1?

10 A Yes, he has produced a MSG file.

11 Q And so that would be different than a PDF file?

12 A Correct.

13 Q Dr. Edman, I'm now handing you what has been marked as  
14 plaintiffs' exhibit 30 with Bates stamp ending in 79344. Do  
15 you recognize this document?

16 A Yes.

17 Q What is this document?

18 A This is a printout of the MSG that the defendant  
19 produced.

20 Q Do you know when the defendant produced this document?

21 A I understand it was a couple days before the June 28th  
22 hearing.

23 MR. ROCHE: Okay. I'd like to enter -- move to  
24 enter exhibit 30, plaintiffs' exhibit 30, into evidence.

25 THE COURT: Any objection?

1 MS. McGOVERN: None.

2 THE COURT: Without objection, 30 will be admitted.

3 (Plaintiffs' Exhibit No. 30 entered into evidence.)

4 BY MR. ROCHE:

5 Q Did you review the metadata associated with this  
6 document?

7 A Yes.

8 Q Dr. Edman, I'm now handing you what's been marked as  
9 plaintiffs' exhibit 31. What is this document?

10 A This document is a printout of the e-mail header that I  
11 extracted from the MSG file.

12 Q And did you extract this using the same methodology as  
13 the metadata you extracted from exhibit 2 and exhibit 6?

14 A Yes.

15 MR. ROCHE: Okay. I move to enter plaintiffs'  
16 exhibit 31 into evidence.

17 THE COURT: Any objection?

18 MS. McGOVERN: One second, Your Honor.

19 THE COURT: Yes.

20 MS. McGOVERN: Same objection, Your Honor, hearsay.

21 THE COURT: I'll overrule that objection.

22 (Plaintiffs' Exhibit No. 31 entered into evidence.)

23 BY MR. ROCHE:

24 Q All right. Dr. Edman, is there anything in the e-mail  
25 header, which is being published to the Court as exhibit 31,

1 that suggests that the e-mail was not sent in June 2011?

2 A Yes.

3 Q What is that?

4 A The received header on line 3 contains a time stamp added  
5 by an e-mail server that's processed this particular message.  
6 That time stamp, again, is -- it's at the end of line 3  
7 starting with 135. Again, that time stamp is in UNIX time or  
8 Epoch time, expressed as, in this case, the number of  
9 milliseconds that have elapsed since midnight, January 1,  
10 1970. And when you convert this time stamp to a human  
11 readable form, you can see that this time stamp actually  
12 corresponds to an e-mail processed October 2012.

13 Q And is there a particular -- is that server associated  
14 with any particular company?

15 A It's operated by Google.

16 Q Okay. And did you find anything else in your analysis of  
17 exhibit 30 and 31 that is inconsistent with exhibit 30 being  
18 sent in June 2011?

19 A Yes. The MSG file contained within it a reference to the  
20 e-mail address craig.wright@hotwirepe.com.

21 Q Okay. And why is that noteworthy?

22 A At the time this e-mail was purportedly sent, that domain  
23 did not exist.

24 Q Dr. Edman, in your opinion, is this e-mail file an  
25 authentic e-mail from Dave Kleiman in June 2011?

1 A No.

2 MS. McGOVERN: Objection, Your Honor, foundation.  
3 Move to strike.

4 THE COURT: And what's the --

5 MS. McGOVERN: The testimony, the specific question  
6 was: Is this an authentic e-mail from Dave Kleiman to Craig  
7 Wright. We presented our position earlier before this expert  
8 presented his testimony that to the extent that he is  
9 testifying as to the authenticity of the document, whether the  
10 document is authentic, that is going to be his expert  
11 testimony. But to the extent that he is taking a step farther  
12 to determine whether, in fact, this document was sent, in  
13 fact, from Dave Kleiman to Craig Wright, the expert testimony  
14 that's been provided thus far based upon the metadata of a  
15 Google time stamp and an MSG file reference, without  
16 supporting information, doesn't substantiate an expert opinion  
17 that, in fact, this e-mail is -- was not sent by Dave Kleiman.

18 MR. ROCHE: Your Honor, may I respond?

19 THE COURT: You may.

20 MR. ROCHE: The question I asked was: Sent by Dave  
21 Kleiman to Craig Wright in June 2011.

22 THE COURT: Right. I took the question to be asking  
23 the witness is this what it purports to be. Is this, in his  
24 opinion -- by the way, I don't know if he's actually been  
25 formally qualified as an expert, but we're all treating him as

1 an expert, so I'm going to assume there's been no objection to  
2 him testifying within the limited expertise that we talked  
3 about that.

4 MS. McGOVERN: Your Honor, if I could quickly  
5 respond to that. That's precisely the reason I wanted to make  
6 the objection now. To the extent that we stand on the ruling  
7 that was made earlier today, which is this expert has -- and  
8 we do not object to this expert's qualifications with respect  
9 to authenticity of a document, but to the extent that there is  
10 any inference in the record that the expert is qualified to  
11 testify beyond that, beyond simply the authenticity based  
12 upon, and in this instance, exclusively the metadata and  
13 apparently some reference to a Google domain site -- which,  
14 again, there's no evidence in front of you other than his  
15 testimony -- we object, and we --

16 THE COURT: And I appreciate that. And, yes, I've  
17 already ruled the scope of what he can offer an opinion on.

18 As I heard the question, I heard the question to be  
19 within the scope of that, because what I heard the question to  
20 be is, you know, document 30 purports to be an e-mail from  
21 Dave Kleiman to Craig Wright on June 24th, 2011, at 12:03:48  
22 p.m. In your expert opinion, is, in fact, that what number 30  
23 is? Is it an e-mail from Dave Kleiman to Craig Wright on that  
24 date? If that's the question, I will allow that answer.

25 MS. McGOVERN: And I don't want to be splitting

1 hairs on this, but I heard the testimony to be: Was this  
2 e-mail in fact sent from Dave Kleiman to Craig Wright, which I  
3 understood to be different than simply does this -- does this  
4 document -- is this document what it appears to be on the face  
5 of the document based upon the metadata. I understood the  
6 questions to be different.

7 THE COURT: Right. No, no, I understand. And I'm  
8 the finder of facts, so I understand the limitations I'm going  
9 to put on the answer, but I will allow the answer to the  
10 question.

11 So Mr. Roche, if you want to restate your question.  
12 I'll overrule the objection with the limitations I've already  
13 explained.

14 BY MR. ROCHE:

15 Q Just so that -- Dr. Edman, in your opinion, is this  
16 e-mail file, exhibit 30, an authentic e-mail from Dave Kleiman  
17 to Craig Wright sent on June 24th, 2011?

18 A No.

19 Q Dr. Edman, were you able to locate any other documents  
20 that contained the same document I.D. as previously identified  
21 in exhibit 2 and exhibit 6, the June 2011 e-mail and the  
22 October 2014 e-mail?

23 A Yes.

24 Q Dr. Edman, I'm handing you what's been marked as  
25 plaintiffs' exhibit 32. What is this document?

1 A This document is a e-mail purportedly from Dave Kleiman  
2 to Craig Wright in April 2013 regarding Dave accepting a role  
3 as director of CoinExchange.

4 MR. ROCHE: Now move to admit plaintiffs' exhibit 32  
5 bearing Bates stamp ending in 13188 into evidence.

6 THE COURT: Any objection?

7 MS. McGOVERN: No objection, Your Honor.

8 THE COURT: Okay. Thirty-two will be admitted  
9 without objection.

10 (Plaintiffs' Exhibit No. 32 entered into evidence.)

11 BY MR. ROCHE:

12 Q Dr. Edman, did you review the metadata associated with  
13 exhibit 32?

14 A Yes.

15 THE COURT: Dr. Edman, while he's looking for the  
16 document, I know you testified to this, I'm just having  
17 trouble finding it. Where would I find -- you said this --  
18 you have found multiple documents with the same document I.D.  
19 Is that what's on line 16 of exhibit 7?

20 MR. ROCHE: That is on line 16 of exhibit 7 and 16  
21 of exhibit 3, associated with exhibit 2 and with exhibit 6.

22 THE COURT: Thank you.

23 BY MR. ROCHE:

24 Q Dr. Edman, I'm now handing you what's been marked as  
25 plaintiffs' exhibit 33. What is this document?

1 A This document is a printout of a metadata object that I  
2 extracted from exhibit 32.

3 Q Okay. And did you extract this using the same  
4 methodologies as the other metadata documents we've looked at  
5 today?

6 A Yes.

7 MR. ROCHE: I now move to admit plaintiffs'  
8 exhibit 33 into evidence.

9 THE COURT: Any objection?

10 MS. McGOVERN: Same objection, Your Honor.

11 THE COURT: All right. Overruled for the same  
12 reasons. So 33 will be admitted over objection.

13 (Plaintiffs' Exhibit No. 33 entered into evidence.)

14 BY MR. ROCHE:

15 Q All right. I'd like to focus again on line 16. Is there  
16 anything noteworthy about the document I.D. contained within  
17 exhibit (sic) 16?

18 A Yes, it is the same as in the 2011 and 2014 e-mails.

19 Q And what does that mean?

20 A It means that this is another revision of the same  
21 document.

22 Q Okay. Let's look at line 12 and 13. What does this  
23 metadata show?

24 A It shows that this particular revision was created  
25 October 23rd, 2014.



1 Q And does that match the date of exhibit 32?

2 A No.

3 Q Okay. And if you can look at line 30, jumping down to  
4 the bottom of the page, again, I see there's two line 30s.  
5 Can you refresh the Court on what that represents?

6 A Yeah. That, again, indicates a particularly long line  
7 that, when printed to a PDF, had to be wrapped.

8 Q Okay. And I see a number of attachments listed in  
9 line 30, again, like we looked at in the previous documents.  
10 Were you able to extract the attachments listed here from  
11 exhibit 32?

12 A No.

13 Q Why would the mail attachments field shown on line 30  
14 indicate there are attachments if none exist?

15 A The attachments could have been removed from the PDF  
16 manually, but the corresponding metadata field was not updated  
17 accordingly.

18 Q Okay. And if we can go back to 32, exhibit 32 for a  
19 second. Is there anything noteworthy about the e-mail header  
20 at the top of the e-mail as it relates to the attachments?

21 A Yeah, it includes an attachments header field, even  
22 though there are no attachments.

23 Q And is that a normal display for an e-mail that contains  
24 no attachments?

25 A No. An e-mail with no attachments, when printed like

1 this, generally does not include the attachments header.

2 Q And was that attachment header present in exhibit 2 and  
3 exhibit 6?

4 A Yes.

5 Q Okay. Let's switch gears here. I see -- no, let's say  
6 on exhibit 32. Not switching that many gears.

7 If we can go down to the bottom, I see there's a  
8 crypto -- there's a long string of text. What is that?

9 A That is a cryptographic PGP signature.

10 Q And did you do anything to analyze this cryptographic PGP  
11 signature?

12 A Yes.

13 Q What did you do?

14 A I extracted the text and the signature from this PDF and  
15 used a program called GnuPG, sometimes called GPG, in order to  
16 verify that the signature matches the text shown and that it  
17 is a valid signature.

18 Q Okay. I'm now handing you what has been marked as  
19 plaintiffs' exhibit 34. What is this document?

20 A This document is a printout from the output from GPG when  
21 I verified the signature in exhibit 32.

22 Q And is the tool that you used to extract this information  
23 a tool that is relied upon in analyzing cryptographic  
24 signatures, such as the PGP signature contained in exhibit 32?

25 A Yes, GPG is a very commonly used tool.

1 Q And it's commonly used in your field of expertise?

2 A That's correct.

3 Q I now move to have exhibit 34 admitted into evidence.

4 THE COURT: Any objection?

5 MS. McGOVERN: No, Your Honor.

6 THE COURT: No objection? Without objection, it's  
7 admitted.

8 (Plaintiffs' Exhibit No. 34 entered into evidence.)

9 BY MR. ROCHE:

10 Q Is there anything in exhibit 34 that indicates when the  
11 signature was created?

12 A Yes, line 32 indicates that the signature was created on  
13 or about October 23rd, 2014, according to the computer on  
14 which this particular signature was created.

15 Q Okay. And you understand Dave Kleiman died in  
16 April 2013?

17 A I do.

18 MS. McGOVERN: Objection, Your Honor, relevance.  
19 This witness is not here to testify as to anything beyond  
20 whether a document is authentic. There's no intent for this  
21 testimony, and those questions are irrelevant.

22 THE COURT: I'll overrule that objection. It's  
23 foundational. I don't think the parties dispute when  
24 Mr. Kleiman died.

25 BY MR. ROCHE:

1 Q This cryptographic signature which is purportedly signed  
2 by Dave Kleiman appears to have been signed more than a year  
3 after his death, according to the information contained within  
4 exhibit 34.

5 A Correct.

6 Q Does GPG output indicate anything about the key that  
7 signed the document?

8 A Yes. Line 33 indicates that the signature was created  
9 using the key with the identifier that starts with A0DA.

10 Q Okay. And that's at the end of line 33, correct?

11 A Yes.

12 Q Okay. Have you reviewed any other cryptographic  
13 signatures associated with the A0DA key?

14 A Yes.

15 Q Where have you reviewed other signatures?

16 A The signature of the Tulip Trust PDF was created using  
17 the same key.

18 Q Okay. And let's go back and look at that signature. I  
19 believe it's in exhibit 1. So I know you have a lot of paper  
20 in front of you. If you can pull that up. Let me know when  
21 you're there.

22 A Yes, sir.

23 Q And if you can first point the Court to where the A0DA  
24 key is identified in exhibit 1.

25 A The A0DA key appears at the bottom of Bates 2414, the

1 first bullet.

2 THE COURT: Okay. Hold on. Mr. Roche, you lost me,  
3 because I'm looking at exhibit 1. Okay. That's exhibit 1.  
4 And where is this?

5 MR. ROCHE: So we're looking at the bottom of 2414.  
6 I've got it on the screen now.

7 THE COURT: Right.

8 BY MR. ROCHE:

9 Q And Dr. Edman, if you can direct the Court to where that  
10 is?

11 A The bottom of 24 --

12 THE COURT: Oh, right there. Okay.

13 THE WITNESS: The bottom of 2414 there are two  
14 bullets. That key is referenced in the first of those two  
15 bullets.

16 THE COURT: Thank you.

17 BY MR. ROCHE:

18 Q Understood.

19 And -- okay. Let's go back to the last page of  
20 exhibit 1, Bates ending 2416. And Dr. Edman, we briefly  
21 reviewed this part of exhibit 1, but can you remind the Court  
22 what this -- what this page of the document shows.

23 A This document shows a printout of a PGP or cryptographic  
24 signature of the Tulip Trust PDF.

25 Q And what key was used to create the signature?

1 A The AODA key.

2 Q And this was the same key that was used to sign the  
3 CoinExchange e-mail that we just saw was created in  
4 October 2014?

5 A Correct.

6 Q Okay. So what does this mean about the private key used  
7 to sign the Tulip Trust document?

8 A It means that the individual who signed the Tulip Trust  
9 document had access to the same private key that was used to  
10 sign the e-mail in exhibit 32.

11 Q Okay. And, now, lastly, let's -- focusing again on  
12 exhibit 1 ending in 2416. You see the string of text that  
13 says "version"? What does that text describe?

14 A That text is used to describe the software and the  
15 version of that software that was used to create this  
16 particular PGP signature.

17 Q Is there anything noteworthy about the manner in which  
18 the version number is displayed?

19 A Yes. The version number only includes one number, which  
20 is called the major version number. For example, it just says  
21 GnuPG v2. At the time the signature was purportedly created,  
22 the default behavior for GnuPG would have been to include the  
23 full version number, which would have been something like  
24 v2.0.1, or something like that.

25 Q Dr. Edman, is it possible to backdate a cryptographic

1 signature with GnuPG such that the signature displays a date  
2 earlier than when the signature was actually created?

3 A Yes.

4 Q And Dr. Edman, how do you know that the A0DA key was used  
5 to sign this cryptographic signature in 2416?

6 A Because I verified it using GnuPG.

7 Q Dr. Edman, in your opinion, is exhibit 1 an authentic  
8 e-mail sent by Dave Kleiman on June 24th, 2011?

9 A No.

10 Q Did you examine any other documents Craig submitted to  
11 this Court and related to the trust?

12 A Yes.

13 Q I'm handing you what's been previously marked as  
14 exhibit 9 at the June 28th hearing.

15 THE COURT: And this is in evidence already?

16 MR. ROCHE: This is already admitted into evidence  
17 on the June 28th hearing.

18 THE COURT: Very good.

19 BY MR. ROCHE:

20 Q What is exhibit 9?

21 A Exhibit 9 is a Deed of Trust dated October 23rd, 2012.

22 Q And do you understand that Dr. Wright swore to the  
23 authenticity of this document?

24 A Yes.

25 Q And can you turn to the signature page of this document

1 located at Bates ending at 50988?

2 A Okay.

3 Q What does the signature page purportedly show concerning  
4 the date the document was signed?

5 A It purports to show that the document was signed  
6 October 23rd, 2012.

7 Q And did you review the metadata associated with the Deed  
8 of Trust?

9 A Yes.

10 Q Okay. I'm now handing you what's been marked as  
11 plaintiffs' exhibit 35.

12 THE COURT: Counsel, can I just get clarification?  
13 When was this document produced to -- when was this document  
14 produced by the defense to the plaintiff? Was this in  
15 response to my order? Was that --

16 MS. McGOVERN: Yes, it was, Your Honor.

17 THE COURT: Okay. Thank you.

18 MS. McGOVERN: That's not to say it wasn't produced  
19 earlier, Your Honor, but it was also produced in response to  
20 your order.

21 THE COURT: Very well.

22 BY MR. ROCHE:

23 Q Dr. Edman, what is plaintiffs' exhibit 35?

24 A Exhibit 35 is a printout of a metadata object that I  
25 extracted from the Deed of Trust.



1 Q Okay. And did you extract that metadata object in the  
2 same manner in which you extracted the other metadata objects  
3 we've reviewed today?

4 A Yes.

5 MR. ROCHE: I move to have plaintiffs' exhibit 35  
6 admitted into evidence.

7 THE COURT: Any objection?

8 MS. McGOVERN: Yes, Your Honor, hearsay.

9 THE COURT: For the reasons I've previously stated,  
10 I'll overrule this objection.

11 (Plaintiffs' Exhibit No. 35 entered into evidence.)

12 MS. McGOVERN: Your Honor, if you could indulge me  
13 for one second.

14 THE COURT: Yeah, of course.

15 MS. McGOVERN: I believe that there was a metadata  
16 that was also introduced, and it might have been without  
17 objection on our part, because I was distracted.

18 THE COURT: No problem.

19 MS. McGOVERN: I'd like to make sure that that  
20 document, as well, which is I believe the metadata that was  
21 associated with number 40 is also -- or, I'm sorry,  
22 plaintiffs' 30 is also -- reflects our objection based on  
23 hearsay.

24 THE COURT: Yeah, the metadata at plaintiffs'  
25 exhibit 31?

1 MS. McGOVERN: It would be 31, correct.

2 THE COURT: You did lodge an objection.

3 MS. McGOVERN: Okay. Thank you.

4 THE COURT: No problem. I want to make sure you get  
5 your record.

6 And as to 35, I'll overrule the objection for the  
7 same reasons I've previously stated.

8 BY MR. ROCHE:

9 Q Okay. What -- and looking at exhibit 35, what does the  
10 metadata indicate concerning the creation date of --

11 THE COURT: Hold on. I'm sorry, I'm sorry,  
12 Mr. Roche.

13 And as well, as I recall, Dr. Wright during his  
14 testimony authenticated this document, testified that it was  
15 an authentic copy of a document.

16 MS. McGOVERN: There are two trusts, Your Honor.  
17 I'm not trying to go back on what's been produced or  
18 authenticated, but I think there are two documents, there are  
19 two trust documents that Dr. Wright authenticated in response  
20 to your order, Your Honor. It's this trust document dated  
21 October 23rd, and there's another trust document dated  
22 October 24th. And I believe his testimony, for purposes of  
23 clarification, was the October 24th trust is, in fact, the  
24 trust document, and he had explanation for October 23rd,  
25 but --

1 THE COURT: No, but my point was just this is  
2 exhibit 9. It was previously admitted, and I believe it was  
3 admitted when Dr. Wright testified.

4 MS. McGOVERN: Yes, that's correct.

5 THE COURT: And when he was shown the document on  
6 cross-examination he authenticated the document.

7 MS. McGOVERN: Correct.

8 THE COURT: So if all the -- if exhibit 35 is simply  
9 the forensic extraction of information already contained in  
10 this PDF, and it's been testified to that it was done using  
11 reliable means, I will overrule your objection as to 35.

12 MS. McGOVERN: Okay.

13 THE COURT: I'm sorry, Mr. Roche.

14 MR. ROCHE: And just for the record, exhibit 30 --  
15 exhibit 9 is a document that is sworn in the defendant's  
16 May 13th declaration.

17 THE COURT: I understand.

18 Okay. But it's in evidence, and 35 is in over  
19 objection.

20 BY MR. ROCHE:

21 Q And what does the metadata shown in exhibit 35 indicate  
22 concerning the creation date of this document?

23 A It indicates the document was created October 22nd, 2012.

24 Q And did you perform any other analysis to determine when  
25 the Deed of Trust document was created?

1 A Yes.

2 Q What did you do?

3 A Again, I analyzed the internal contents and structure of  
4 this PDF, and then I identified a number of embedded font  
5 files contained within this PDF.

6 Q And how many embedded font files were located in the PDF?

7 A Five.

8 Q Okay. And was there anything interesting about those  
9 font files?

10 A Those font files contained data suggesting that they were  
11 created in 2015.

12 Q Now, handing you what has been marked as plaintiffs'  
13 exhibit 36. Dr. Edman, what is plaintiffs' exhibit 36?

14 A Thirty-six is a printout of information or metadata about  
15 the font files that I extracted from the Deed of Trust.

16 MR. ROCHE: Okay. And for the record, plaintiffs'  
17 exhibit 10 contained one of these pages, and it was  
18 conditionally admitted previously.

19 BY MR. ROCHE:

20 Q And Dr. Edman, how did you extract this information from  
21 exhibit 9?

22 A Again, I used the same tools as before in order to  
23 extract the embedded font files, and then this metadata shown  
24 in exhibit 36 is displayed by Microsoft Windows.

25 MR. ROCHE: I now move to enter what was previously

1 conditionally admitted as exhibit 10 and plaintiffs'  
2 exhibit 36 into evidence.

3 THE COURT: Any objection?

4 MS. McGOVERN: Objection; hearsay, Your Honor.

5 THE COURT: All right. I'll overrule those two  
6 objections based on the same reasoning I've already  
7 articulated.

8 (Plaintiffs' Exhibit Nos. 10 and 36 entered into  
9 evidence.)

10 BY MR. ROCHE:

11 Q All right. And can you walk the Court through what is  
12 contained within exhibit 36?

13 A Again, exhibit 36 is a series of printouts showing  
14 information or metadata about the font files that I extracted  
15 from the Deed of Trust.

16 Q Okay. And is there anything related to -- anything  
17 associated to a particular date related to those font files?

18 A Yes, the copyright markers in the font files indicate  
19 they were copyrighted in October 2015.

20 Q And so does this mean that the font files in exhibit 9,  
21 the fonts that were used in that file, were not copyrighted  
22 by -- until 2015?

23 A Correct.

24 Q And who were they copyrighted by?

25 A Generally, the Monotype Corporation. Some of them

1 copyrighted by the Microsoft Corporation.

2 Q Okay. And did you do -- were there any other files you  
3 extracted in your analysis of the font files contained in  
4 exhibit 9?

5 A There were aspects of the font files that I extracted and  
6 analyzed.

7 Q I'm handing you now what's been marked as plaintiffs'  
8 exhibit 37. What is this document?

9 A This document is a printout of the text representation of  
10 digital signatures that I extracted from each of the font  
11 files that I, in turn, extracted from the Deed of Trust.

12 Q Okay. And can you show the Court where the date field of  
13 the signature is indicated?

14 A On page 15, line 725 contains a signing time stamp, which  
15 indicates May 22nd, 2000' --

16 THE COURT: Hold on a second. This document's not  
17 in evidence yet.

18 BY MR. ROCHE:

19 Q And Dr. Edman, how did you extract the information  
20 contained within exhibit 37?

21 A I extracted the signature, again, using the same hex  
22 editor and then parsed it using a tool called OpenSSL, which  
23 is a common tool for creating and verifying and printing  
24 information about signatures and other cryptographic objects.

25 Q And are those tools used in your -- commonly used in your

1 profession in digital forensics?

2 A Yes.

3 MR. ROCHE: I now move to have plaintiffs'  
4 exhibit 37 entered into the record as evidence.

5 THE COURT: Any objection?

6 MS. McGOVERN: Yes, Your Honor, hearsay.

7 THE COURT: All right. I'll overrule that  
8 objection.

9 (Plaintiffs' Exhibit No. 27 entered into evidence.)

10 BY MR. ROCHE:

11 Q Okay. And if we can look at what you were -- go back to  
12 page 17, line 725. Lot of information there, but what is the  
13 date contained within line 725?

14 A That date is May 22nd, 2015.

15 Q And is that the -- where is that date? Is that here?

16 A That is -- I can't see where you're pointing, but that is  
17 on the right-hand side of page 15, line 725.

18 I can see it now, and you have correctly highlighted  
19 the time stamp.

20 BY MR. ROCHE:

21 Q Thank you.

22 And who provided the date in this cryptographic  
23 signature?

24 A That time stamp is provided by Microsoft.

25 Q Okay. And did you analyze the cryptographic signatures

1 for the other four font files contained in the Deed of Trust  
2 document?

3 A Yes.

4 Q What were the dates associated with those cryptographic  
5 signatures?

6 A Of the other four font files, two of the cryptographic  
7 signatures were from May 2015, and two were from June of 2015.

8 Q Dr. Edman, is it possible that a PDF created in 2012  
9 contained embedded font files from Microsoft that did not  
10 exist until 2015?

11 A No.

12 Q How could the metadata that we looked at earlier of the  
13 Deed of Trust document show a date of October 22nd, 2012, but  
14 the PDF itself contained font files from 2015?

15 A The metadata of the PDF could have been manipulated or  
16 modified, or the date of the computer could have been manually  
17 altered.

18 Q Dr. Edman, in your opinion, is exhibit 9 an authentic  
19 document?

20 A No.

21 Q Okay. Now, Dr. Edman, besides the documents that  
22 Dr. Wright submitted as part of his declaration to this Court,  
23 did you review any other documents produced by Dr. Wright and  
24 relating to the trust in this litigation?

25 A Yes.



1 MR. ROCHE: It's not on.

2 MS. McGOVERN: Objection; relevance, Your Honor.

3 THE COURT: Okay. What's the exhibit number? I'm  
4 sorry.

5 MR. ROCHE: I was about to hand the witness  
6 plaintiffs' exhibit 38, and I think there's an objection  
7 pending to my previous question.

8 THE COURT: Okay.

9 MR. ROCHE: And if I could maybe get into the  
10 exhibit, I can explain the relevance.

11 THE COURT: Well, hold on just one second.

12 So Ms. McGovern, were you objecting to 38 or to  
13 something that had already happened before we got to 38?

14 MS. McGOVERN: No, Your Honor, I'm actually  
15 objecting to the line of questioning.

16 Mr. Roche has just stated that the witness is about  
17 to testify about documents that have been produced in this  
18 case but do not have any relevance to the documents that have  
19 been submitted in response to the Court's order or the issue  
20 in front of this Court, frankly, which is the inability to  
21 access and decrypt a file and provide public addresses, which  
22 is why we're here.

23 So to the extent that the testimony is going to  
24 relate to simply documents that we've produced in this case --  
25 and there have been lots of them -- and this -- we object to

1 this line of questioning based on relevance.

2 THE COURT: Okay. Mr. Roche?

3 MR. ROCHE: Yes.

4 The subject matter of these proceedings is directly  
5 relating to the trust and whether or not the defendant has  
6 access to be able to move and provide the Bitcoins contained  
7 within that trust. So documents discussing the trust and  
8 discussing the nature of what Dave and Craig did with the  
9 trust and that the defendant has produced in this litigation  
10 are relevant to the Court's credibility determinations.

11 THE COURT: Okay. So just so I'm clear where you're  
12 going, is it your intention to offer evidence that there are a  
13 number of other documents that you'll have testimony, the  
14 witness will opine are not authentic documents, but that they  
15 relate tangentially to the trust but not directly to the  
16 trust?

17 MR. ROCHE: That is -- there's two e-mails that I  
18 would like to show the Court that are purportedly between Dave  
19 and Craig and relate directly to the trust.

20 THE COURT: Okay. And the purpose is that you're  
21 going to eventually -- the witness will offer an opinion that  
22 these also were altered documents of some kind?

23 MR. ROCHE: That they were manipulated, correct.

24 THE COURT: All right. I'll allow it. I think it  
25 goes to the topic Mr. Roche raised, as well as intent and

1 credibility relating to Dr. Wright. So I'll allow it.

2 BY MR. ROCHE:

3 Q Dr. Edman, do you recognize exhibit 38?

4 A Yes.

5 Q What is it?

6 A This is a e-mail exchange purportedly between Dave  
7 Kleiman and Craig Wright in September 2012.

8 MR. ROCHE: Okay. I now move to admit exhibit 38  
9 bearing Bates stamp 27291 into evidence.

10 THE COURT: Any objection?

11 MS. McGOVERN: No objection, Your Honor.

12 THE COURT: Without objection, exhibit 38 will be  
13 admitted.

14 (Plaintiffs' Exhibit No. 38 entered into evidence.)

15 BY MR. ROCHE:

16 Q Dr. Edman, are there any cryptographic or PGP signatures  
17 in this e-mail exchange?

18 A Yes, there are two.

19 Q All right. And let's start with the cryptographic  
20 signature on page 2 of this document. Did you analyze the  
21 cryptographic signature at the bottom of page 2, Bates 27292?

22 A Yes.

23 Q I'm now handing you what has been marked as plaintiffs'  
24 exhibit 39. Dr. Edman, what is plaintiffs' exhibit 39?

25 A Exhibit 39 is a printout of the GPG output from verifying

1 the signature at the bottom of Bates 27292.

2 Q And did you extract this information from GnuPG using the  
3 same methodology as you used to extract the cryptographic  
4 signature that we previously looked at today?

5 A Yes.

6 MR. ROCHE: I now move to admit plaintiffs'  
7 exhibit 39 into evidence.

8 THE COURT: Any objection?

9 MS. McGOVERN: Objection; hearsay, Your Honor.

10 THE COURT: Understood. Overruled for the same  
11 reasons previously stated. Thirty-nine will be admitted over  
12 objection.

13 (Plaintiffs' Exhibit No. 39 entered into evidence.)

14 BY MR. ROCHE:

15 Q Dr. Edman, is there a date associated with this GPG  
16 output?

17 A Yes. Line 32 indicates the signature was created  
18 February 28th, 2014, according to the date of the computer on  
19 which it was created.

20 Q And that's the text at the end of line 32?

21 A Correct.

22 Q Okay. And does that match the date the e-mail in  
23 exhibit 38 was purportedly sent?

24 A No.

25 Q And Dr. Edman, if we can go back to exhibit 38. For the

1 record, can you read the text of the e-mail that begins with  
2 "the trust"?

3 A Sure.

4 The trust is set up in the Seychelles. I will  
5 arrange a shelf company to manage it in the UK, as we discuss  
6 later. There is no rush there. I will leave you and myself  
7 off for now and leave it as non-trading. Just listen to some  
8 advice for once, Craig, and trust me to be your friend, Dave.

9 Q Okay. Are there any other cryptographic signatures in  
10 this e-mail exchange?

11 A Yes, there is also one at the bottom of Bates 27291.

12 Q Okay. And did you analyze that cryptographic signature?

13 A Yes.

14 Q Now, handing you what has been marked as plaintiffs'  
15 exhibit 40. Dr. Edman, what is plaintiffs' exhibit 40?

16 A Exhibit 40 is, again, output from GnuPG when I verified  
17 the signature at the bottom of Bates 27291.

18 Q And did you extract the information contained in  
19 exhibit 40 using the same methodology as the signature you  
20 extracted in exhibit 39?

21 A Yes.

22 MR. ROCHE: I now move to enter exhibit 40 into  
23 evidence.

24 THE COURT: Any objection?

25 MS. McGOVERN: Objection; hearsay, Your Honor.

1 THE COURT: All right. Same ruling, overruled.  
2 Forty will be admitted without -- over objection.

3 (Plaintiffs' Exhibit No. 40 entered into evidence.)

4 BY MR. ROCHE:

5 Q And is there a date associated with the GPG output in  
6 exhibit 40?

7 A Yes, line 32 at the end indicates the signature was  
8 created March 5th, 2014, according to the computer on which it  
9 was created.

10 Q And does that date match the date the e-mail was  
11 purportedly sent?

12 A No.

13 Q Okay. Dr. Edman, let's look back at exhibit 38 again.  
14 Let's look at the bottom. Let's look at the PGP signature  
15 contained within exhibit 38 on page 1. Is there anything else  
16 noteworthy about the signature itself, the text of the  
17 signature itself?

18 A Yes. The signature includes a version string that  
19 indicates it was created using the version GnuPG Version  
20 2.0.20, which, at the time of this alleged e-mail, had not  
21 been released.

22 Q I'm now handing you what has been marked as exhibit 41  
23 for the record. What is exhibit 41?

24 A Exhibit 41 is a printout from the GnuPG website which  
25 indicates the dates associated with various GnuPG software

1 releases.

2 Q And how did you obtain this information?

3 A I went to the public GnuPG website.

4 Q And is the public GnuPG website an accurate source of  
5 information for GnuPG release history?

6 A Yes.

7 Q And would it be relied commonly in your profession for  
8 version history related to GnuPG?

9 A Yes.

10 MR. ROCHE: I move to enter exhibit 41 into  
11 evidence.

12 THE COURT: Any objection?

13 MS. McGOVERN: Hearsay, Your Honor.

14 THE COURT: All right. I'll overrule it for the  
15 reasons previously stated.

16 (Plaintiffs' Exhibit No. 41 entered into evidence.)

17 BY MR. ROCHE:

18 Q Dr. Edman, can you identify for the Court what the  
19 release date is for GnuPG 2.0.20, the version identified in  
20 exhibit 38?

21 A It is at the top of page 9.

22 Q Okay. We can go to page 9.

23 And what is the release date for GnuPG 2.0.20?

24 A May 10, 2013.

25 Q Okay. And that date is roughly a month after Dave

1 Kleiman passed away?

2 A Correct.

3 Q And almost a year after the e-mail was purportedly sent?

4 A Correct.

5 Q Dr. Edman, does exhibit 38 appear to be manipulated?

6 A Yes.

7 Q Is there -- I think we've discussed there's another  
8 document you reviewed related to the trust that's been  
9 submitted in this litigation?

10 A Yes, there is.

11 Q Okay. Dr. Edman, I'm handing you what's been marked as  
12 plaintiffs' exhibit 42. Do you recognize this document?

13 A Yes.

14 Q What is this document?

15 A This is a printout of a purported e-mail from Dave  
16 Kleiman to Craig Wright in October of 2012.

17 MR. ROCHE: Okay. I move to enter plaintiffs'  
18 exhibit 42 bearing Bates stamp ending in 28008 into evidence.

19 THE COURT: Any objection?

20 MS. McGOVERN: No objection.

21 THE COURT: Exhibit 42 will be admitted without  
22 objection.

23 (Plaintiffs' Exhibit No. 42 entered into evidence.)

24 BY MR. ROCHE:

25 Q Okay. And I see a list of characters about -- throughout



1 the first page of the document. What are those?

2 A Those are Bitcoin addresses.

3 Q How do you know those are Bitcoin addresses?

4 A The format of them looks consistent with a Bitcoin  
5 address, and I also looked each one of them up on a website  
6 called blockchain.info.

7 Q Okay. And Dr. Edman, can you read the e-mail out loud  
8 purportedly sent by Dave beginning with "Craig", and you can  
9 skip over the Bitcoin addresses themselves.

10 A Craig, you need to use that FB picture of yours for a  
11 corporate profile. Then with a UK group, you can be Bond and  
12 the villain all at the same time. Right now the trust holds  
13 the following keys:

14           Skipping over the keys.

15           They are all in one wallet, so we need to be careful  
16 of backups and also loss. I have created a paper wallet for a  
17 couple of the holdings as an offline backup and in case.

18 These are:

19           Skipping over more keys.

20           Most of these go back to 2010 and 2011, when you  
21 first transferred them, but I have moved a few of the  
22 online ones. There are only single copies of the paper  
23 wallets, and there is no backup. The rest are with you.

24           The keys are set up in the TrueCrypt drive on the  
25 main server at <http://www.seyhost.com>. The backups are with

1 http://www.netcetera.co.uk in both the UK and as a third in  
2 the Isle of Man.

3           Respectfully, Dave Kleiman.

4 Q     Okay.

5 A     PS, as you will see on the SF list, there are ways to  
6 handle things without it being personal. Check my password  
7 response.

8 Q     Okay. And is there a cryptographic signature in this  
9 document?

10 A    Yes.

11 Q    Is that what's at the end of this e-mail exchange?

12 A    Yes.

13 Q    And did you analyze this cryptographic signature?

14 A    Yes.

15 Q    I'm now handing you what has been marked as plaintiffs'  
16 exhibit 43. What is this document?

17 A    This is a printout of the GnuPG output from verifying the  
18 signature at the -- in the middle of Bates 28009.

19 Q    And is there a date -- excuse me. And did you extract  
20 this GPG -- GnuPG signature -- strike that.

21           Did you extract this GPG signature using the same  
22 GnuPG software that you used to extract the previous  
23 cryptographic signatures we looked at?

24 A    I used the same GnuPG software to verify the signature,  
25 just as I did before.

1 MR. ROCHE: I now move to enter exhibit 43 into  
2 evidence.

3 THE COURT: Any objection?

4 MS. McGOVERN: Same objection, Your Honor, hearsay.

5 THE COURT: Okay. I'll overrule that objection.  
6 Forty-three will be admitted over objection.

7 (Plaintiffs' Exhibit No. 43 entered into evidence.)

8 BY MR. ROCHE:

9 Q Dr. Edman, is there a date associated with the  
10 cryptographic signature?

11 A Yes. Line 32 indicates the signature was created on or  
12 about March 2nd, 2014.

13 Q Does that match the date this e-mail was purportedly  
14 sent?

15 A No.

16 Q Dr. Edman, as -- is it your opinion that exhibit 42 is  
17 manipulated?

18 A Yes.

19 THE COURT: Mr. Roche, is this a logical stopping  
20 point?

21 MR. ROCHE: Yes.

22 THE COURT: Okay.

23 MR. ROCHE: I think we've probably got 20 more  
24 minutes.

25 THE COURT: No, no. You'll take as much time as you

1 need, but I think I need to take a break, give the court  
2 reporter a break, as well. So if it's a logical stopping  
3 point --

4 MR. ROCHE: It is.

5 THE COURT: -- I'll stop here.

6 Let's be in recess. It's 2:55. We'll be in recess  
7 until 3:10, and then we'll resume Dr. Edman's testimony. So  
8 we'll be in recess until 3:10.

9 (A recess was taken from 2:57 p.m. to 3:15 p.m., after  
10 which the following proceedings were had:)

11 THE COURT: Be seated, please.

12 No calls, Mr. Freedman?

13 MR. FREEDMAN: Not yet; I'm safe.

14 THE COURT: Okay. All right. The witness is still  
15 here. Mr. Roche is here. So Mr. Roche, whenever you're  
16 ready, you may proceed.

17 BY MR. ROCHE:

18 Q All right. Dr. Edman, are you familiar with a program  
19 called Bitmessage?

20 A Yes.

21 Q What is it?

22 A Bitmessage is a protocol, an application for peer-to-peer  
23 encrypted messaging.

24 Q And did you review any Bitmessages as part of your  
25 preparation for this hearing?

1 A Yes.

2 Q Dr. Edman, I'm handing you what's been marked as  
3 plaintiffs' exhibit 44. Can you turn to the page ending in  
4 Bates 056406.

5 A Okay.

6 Q Dr. Edman, what does this show?

7 A This shows a screen shot of the Bitmessage application  
8 showing a number of messages from Dave Kleiman to Craig  
9 Wright.

10 Q Okay. And if you could turn to the eighth page of this  
11 exhibit. What is this?

12 THE COURT: Well, hold on. I'm sorry, Mr. Roche.  
13 Is exhibit 44 in evidence already?

14 MR. ROCHE: Um, I -- it is not in evidence, no.

15 THE COURT: All right. Well, let's do that before  
16 we start reading from the document.

17 MR. ROCHE: I wasn't going to read, I was just  
18 matching up, because there is a black and white picture and a  
19 color version of it. So I just wanted to establish what that  
20 was before I moved it in.

21 THE COURT: Sure, no problem. I think Dr. Wright  
22 was questioned about this document when he testified, as well,  
23 and I think he authenticated it. But go ahead.

24 BY MR. ROCHE:

25 Q Okay. And if you turn to the eighth page of this

1 exhibit, what is it?

2 A This appears to be the same screen shot, except now it's  
3 in color.

4 MR. ROCHE: Okay. Now, I move to admit plaintiffs'  
5 exhibit 44 into evidence.

6 THE COURT: Any objection?

7 MS. McGOVERN: Your Honor, I have an exhibit that  
8 is -- I don't know if it's the whole exhibit that's being  
9 introduced, but it goes from Bates number 56403 to -- and some  
10 of the documents don't have Bates numbers on them. So I'm  
11 just not sure what the full extent of this exhibit is, but it  
12 seems to be a compilation of multiple documents stapled  
13 together.

14 THE COURT: Mr. Roche?

15 MR. ROCHE: Yes. And I -- I was -- need to correct  
16 the record. This was previously admitted as plaintiffs'  
17 exhibit 16. It was produced to us by the defendant with that  
18 Bates range. We're only -- I mean, it's already been  
19 admitted. I can correct the record and identify it as  
20 plaintiffs' exhibit 16.

21 THE COURT: Okay. If it's in evidence, it's in  
22 evidence.

23 My recollection is Dr. Wright did testify about it,  
24 and it was just one is the native document that's printed out  
25 in color because it's easier to read, and the other one is the

1 PDF format; is that right?

2 MR. ROCHE: That is correct.

3 MR. FREEDMAN: Your Honor, I believe you overruled  
4 that exact objection at Dr. Wright's cross-examination.

5 THE COURT: Okay. Well, if it's in evidence they've  
6 reserved their objection, and we'll go forward.

7 BY MR. ROCHE:

8 Q Okay. And so the record is clear, this is not  
9 plaintiffs' exhibit 44, this is plaintiffs' exhibit 16.

10 And so are you on the color page of the Bitmessage?

11 A Yes, sir.

12 Q What does the highlighted row in the Bitmessage window  
13 show?

14 A The highlighted row shows a Bitmessage from Dave Kleiman  
15 to Craig Wright with the subject "trust" purportedly received  
16 December 24th, 2012.

17 Q Dr. Edman, is there anything about this message that  
18 calls into question its authenticity?

19 A The -- there are other messages in the screen shot that  
20 call into question the overall screen shot's authenticity.

21 Q And what is -- about the other messages calls into  
22 question its authenticity?

23 A There are a number of messages that were received, or  
24 purportedly received, prior to the Bitmessage software even  
25 being made publicly available for the first time.

1 Q When was the Bitmessage software made publicly available?

2 A November 19, 2012.

3 Q And how do you know that?

4 A I reviewed the Bitmessage websites, I reviewed the  
5 Bitcoin message commit history on GitHub, which is a series of  
6 source code changes and releases, and I also interviewed the  
7 developer of Bitmessage, Jonathan Warren.

8 Q Okay. And do you understand that John Warren was also  
9 deposed in this case?

10 A Yes.

11 Q And did you review his deposition transcript?

12 A Yes.

13 Q When did you review his deposition transcript?

14 A Last week.

15 Q Was there anything said -- was there anything John Warren  
16 said in his deposition, the transcript that you reviewed, that  
17 indicates a version of Bitmessage could have been available to  
18 Dave Kleiman or Craig before November 19th, 2012?

19 A No.

20 Q Okay. I am now handing you what has been marked as  
21 plaintiffs' exhibit 44. Dr. Edman, what is this document?

22 A This document is a printout from a website called Virus  
23 Total, which provides information related to the file named  
24 bitmessagev0.1.0.exe.

25 Q And how did you come into -- how did you first review



1 this document?

2 A This was produced by the defendants as part of  
3 Mr. Warren's deposition?

4 Q Okay. What does this document relate to, again, for the  
5 record?

6 A This document relates to the release of the Bitmessage  
7 software.

8 MR. ROCHE: Okay. I'd now like to move plaintiffs'  
9 exhibit 44 into evidence, which was previously used at -- and  
10 we submitted the John Warren deposition, and this was an  
11 exhibit used by the defendants in that -- the Warren  
12 deposition.

13 THE COURT: All right. Is this exhibit -- just so I  
14 know, is this exhibit referenced in the excerpts that you have  
15 designated?

16 MR. ROCHE: It is, yes. I believe it was the  
17 defendant's counter designations that referenced this exhibit.

18 THE COURT: Okay. Any objection, Ms. McGovern?

19 MS. McGOVERN: Hearsay.

20 THE COURT: I'll overrule that objection for the  
21 reasons previously stated.

22 And to be clear, as well, I'm not sure this is  
23 offered for the truth of the gibberish contained therein, but  
24 we'll see. But in any event, I'll admit it.

25 (Plaintiffs' Exhibit No. 44 entered into evidence.)

1 BY MR. ROCHE:

2 Q And do you see that there is a May 25th, 2012, date  
3 associated with exhibit 44?

4 A Yes.

5 Q Where -- can you point the Court to where that date is  
6 identified?

7 A It is in the middle of the page, the first line below  
8 history says: Creation time 2012, 5/25.

9 Q What is this date associated with?

10 A So in order to determine what this date was associated  
11 with, I first downloaded the referenced file  
12 bitmessagev0.1.0.exe from the Bitmessage website, computed the  
13 MD5 SHA1 and SHA256 hashes --

14 THE COURT REPORTER: I'm sorry. I'm sorry. You're  
15 speaking Greek, and I don't know what you're saying.

16 THE WITNESS: Appologies.

17 In order to determine what this creation time stamp  
18 referenced, I first downloaded the file bitmessagev0.1.0.exe  
19 from the Bitmessage website. I then computed the MD5 S-H-A-1,  
20 or SHA1 hash and the S-H-A-2-5-6, or SHA256 hash of the file  
21 that I downloaded and compared those hashes to the hashes  
22 given in the defendant's exhibit 1 from the Warren  
23 declaration -- or Warren deposition. I confirmed -- so I  
24 confirmed that the file that I was reviewing was the same file  
25 referenced in this exhibit.

1 I determined that this file was produced using a  
2 tool called PyInstaller, which is a utility that is commonly  
3 used to package Python applications like Bitmessage and its  
4 assorted dependencies, like graphics libraries and various  
5 other dependencies into a single executable program.

6 From analyzing the PyInstaller source code and  
7 libraries compiled within PyInstaller, I determined that the  
8 creation time shown in this particular exhibit actually  
9 relates to the time that the PyInstaller software was compiled  
10 and is unconnected to the release date or time of the  
11 Bitmessage software.

12 BY MR. ROCHE:

13 Q Okay. And just to sum up, because I know there was a lot  
14 of digits, characters and words in the analysis that you just  
15 described, the May 25th, 2012, date identified in this exhibit  
16 is associated with a tool that was used to pack -- package the  
17 Bitmessage tool, not the time the Bitmessage client itself was  
18 released?

19 A That is correct.

20 Q I'm now handing you what has been marked as plaintiffs'  
21 exhibit 45. Dr. Edman, do you recognize this document?

22 A Yes.

23 Q What is this document?

24 A This document is a printout of an e-mail exchange between  
25 Craig Wright and Ira Kleiman.

1 Q Okay. And if you can look at the bottom, can you read  
2 the Bates label at the bottom of the first page?

3 A The Bates at the bottom of the first page is 465.

4 MR. ROCHE: Okay. I now move to admit plaintiffs'  
5 exhibit 45 into evidence.

6 THE COURT: And just so I'm clear, 45 is a 25-page  
7 exhibit?

8 MR. ROCHE: Yes.

9 THE COURT: Okay. Any objection?

10 MR. ROCHE: That was produced by the plaintiffs in  
11 this litigation.

12 MS. McGOVERN: Objection, Your Honor. This is  
13 outside the scope of the plaintiffs' expert's report that was  
14 provided to us. We're seeing it for the first time.

15 THE COURT: Okay. And Mr. --

16 MS. McGOVERN: We haven't had an opportunity to  
17 review it. So we would object as being beyond the -- untimely  
18 and beyond the scope of the expert disclosures that the Court  
19 suggested we follow, it then became a procedure in this  
20 hearing, the parties agreed to it, and we have seen this for  
21 the first time right now.

22 THE COURT: And Mr. Roche, where are you going with  
23 this exhibit, just so I can evaluate?

24 MR. ROCHE: Yes.

25 So this morning, Mr. Shadders gave testimony that we

1 were previously, you know, unprepared for what he was going to  
2 testify as far as the methodology used to extract the list of  
3 Bitcoins that he provided the -- provided plaintiffs after the  
4 June 28th hearing.

5 THE COURT: Uh-huh.

6 MR. ROCHE: After Dr. Edman heard that --

7 THE COURT: Just to cut you off -- I apologize,  
8 we're short on time today. Not that anybody should rush, I  
9 just want to make efficient use of our time. Is your proffer  
10 that this is being offered to impeach or contradict testimony  
11 that was given this morning?

12 MR. ROCHE: It is used to contradict the  
13 methodology -- the soundness of the methodology that  
14 Mr. Shadders testified he was instructed by Dr. Wright to  
15 create the list of Bitcoins that were belong -- that belong to  
16 him and the list of public addresses.

17 THE COURT: All right. Ms. McGovern, anything  
18 further on your objection?

19 MS. MCGOVERN: Same objection, Your Honor.

20 THE COURT: Okay. I'll overrule the objection on  
21 relevance. If, in fact, this is responsive to testimony that  
22 was heard for the first time this morning, I'll allow it,  
23 subject, Ms. McGovern, when we're done, if you think it should  
24 be stricken, you can make that motion once we hear what it is,  
25 or if you need additional time to respond to it, I'll

1 entertain that motion, as well.

2 MS. McGOVERN: Thank you.

3 THE COURT: But since I'm the finder of fact, I'm  
4 confident I can ignore it if I need to.

5 Mr. Roche, go ahead. I'll admit 45 over objection.

6 (Plaintiffs' Exhibit No. 45 entered into evidence.)

7 BY MR. ROCHE:

8 Q Dr. Edman, were you here for Mr. Steve Shadders'  
9 testimony this morning?

10 A Yes.

11 Q And did you hear him testify that the list of Bitcoins  
12 that he searched for and identified were all contained in  
13 50-Bitcoin-sized addresses?

14 A Yes.

15 Q Okay. Dr. Edman, I'd like to direct your attention to  
16 page -- I believe it's the seventh page of the document ending  
17 in Bates 470.

18 This is, if you can see the top, this is an e-mail  
19 from Craig Wright to -- addressed to Ira. And if you could go  
20 to the next page ending in Bates 471, and if you could read  
21 the bottom paragraph, and it continues -- it starts: "I have  
22 files of Dave's." And if you could read that paragraph, and  
23 it goes into the next page.

24 A I have files of Dave's that I cannot access now. These  
25 are TrueCrypt partitions. We held backups for the other, but

1 no passwords. I cannot access these. If I cannot find the  
2 key or password on these, I do not believe that I can on  
3 yours. Dave was smarter than I was in some ways. He broke  
4 his wallets into many 50-BTC-sized addresses. I left several  
5 large addresses that are not easy to move without making the  
6 word notice.

7 Q Dr. Edman, is the statement by the defendant that "I left  
8 several large addresses that are not easy to move" consistent  
9 with the identification of wallets Dr. Wright instructed  
10 Mr. Shadders to identify?

11 A No.

12 MS. McGOVERN: Objection, Your Honor. This is not  
13 expert testimony. He's asking a witness to simply read a  
14 document into evidence and do what any of us could do, which  
15 is decide whether, in fact, it's consistent or not, completely  
16 out of context.

17 THE COURT: Sustained. It's argumentative. I'll  
18 sustain that. If you want to argue that. The fact is there,  
19 Mr. Roche. If you want to argue the consequences of that  
20 fact, I'll be happy to allow you to do that, but I don't think  
21 this witness is competent to -- it's not proper to have this  
22 witness testify this is inconsistent with the testimony of a  
23 different witness. That's a fact you can argue.

24 BY MR. ROCHE:

25 Q Okay. Dr. Edman, is this statement consistent with

1 Dr. Wright only owning Bitcoin in 50-Bitcoin-sized public  
2 addresses?

3 MS. McGOVERN: Objection. Same objection, Your  
4 Honor.

5 THE COURT: Sustained.

6 BY MR. ROCHE:

7 Q Dr. Edman, as a matter of Bitcoin mechanics and  
8 cryptography, is the statement that: "I left several large  
9 addresses that are not easy to move" consistent with  
10 Dr. Wright never moving Bitcoin across the block chain?

11 MS. McGOVERN: Same objection, Your Honor.

12 THE COURT: Sustained.

13 MR. ROCHE: Okay.

14 THE COURT: This witness is not an expert on  
15 Bitcoin.

16 BY MR. ROCHE:

17 Q Dr. Edman, did you review any other documents Dr. Wright  
18 submitted as part of his sworn affidavit to this Court?

19 A Yes.

20 Q Okay. Dr. Edman, I'm handing you what has been marked as  
21 plaintiffs' exhibit 46. What is this document?

22 A This document is a purported invoice from a company  
23 called HIGHSECURED.com.

24 Q And if you could read the Bates label at the bottom of  
25 the document.



1 A The Bates number is defendant's 051013.

2 MR. ROCHE: I move to enter this exhibit 46 into  
3 evidence.

4 THE COURT: Any objection?

5 MS. McGOVERN: No objection.

6 THE COURT: Without objection, admitted.

7 (Plaintiffs' Exhibit No. 46 entered into evidence.)

8 BY MR. ROCHE:

9 Q Dr. Edman, are you aware that Dr. Wright swore this  
10 document was authentic?

11 A Yes.

12 Q Is this document authentic?

13 A No.

14 Q How did you determine that this document was not  
15 authentic?

16 A Again, I analyzed the internal contents and structure of  
17 the PDF file itself and identified a number of edits that were  
18 made to the PDF since it was created.

19 Q And did you prepare a demonstrative to walk the Court  
20 through the changes that were made to this document?

21 A Yes.

22 Q I'm now handing you what's been marked as plaintiffs'  
23 demonstrative number 2.

24 THE COURT: Ms. McGovern, did you have a chance to  
25 review this, and, if so, do you have any objection to the

1 demonstrative aid?

2 MS. McGOVERN: No objection to the demonstrative.

3 THE COURT: Thank you.

4 BY MR. ROCHE:

5 Q Dr. Edman, what does this demonstrative show?

6 A This demonstrative shows in the red bold letters and  
7 numbers the particular edits that appear to have been made to  
8 the PDF since it was created.

9 Q And so I understand, the red here shows what has been  
10 manipulated within the document?

11 A Correct.

12 Q And this was a document that was, you understand, sworn  
13 by the defendant as authentic?

14 A Correct.

15 MS. McGOVERN: Objection.

16 BY MR. ROCHE:

17 Q Dr. Edman --

18 THE COURT: Hold on.

19 Legal basis?

20 MS. McGOVERN: Objection, Your Honor. To the extent  
21 that Mr. Roche is asking this witness, now for the second time  
22 on this document, whether he's aware that Dr. Wright  
23 authenticated this document in its un-redlined form, it goes  
24 outside the scope of this expert testimony, which is purely  
25 whether or not the metadata reflects whether it's authentic or

1 not authentic in his opinion. It suggests intent. I realize  
2 there's not a jury here. I know you're the fact-finder, but I  
3 want to make that point on the record.

4 THE COURT: I understand. I'll overrule that  
5 objection. I just view that as a foundational question that  
6 goes to the authenticity of the document, so -- or puts the  
7 document in context; it makes it relevant. So I'll overrule  
8 that objection, but it's preserved.

9 BY MR. ROCHE:

10 Q Dr. Edman, as I'm sure everyone in this courtroom's  
11 aware, we looked at a lot of documents over the past couple  
12 hours. Could you briefly sum up your findings for the Court?

13 A Yes. My findings generally were that a number of the  
14 documents that I reviewed, including documents for which the  
15 defendant has sworn to their authenticity, appear to have been  
16 manipulated and were therefore not authentic.

17 MR. ROCHE: Thank you, Your Honor. No further  
18 questions at this time.

19 THE COURT: All right. Thank you.

20 Ms. McGovern.

21 MR. ROCHE: Your Honor, one more.

22 THE COURT: Oh, yes, sure.

23 BY MR. ROCHE:

24 Q Dr. Edman, one final question: Are all the opinions that  
25 you gave today, are those opinions given with a reasonable

1 degree of certainty based on somebody with expertise within  
2 your field?

3 A Yes.

4 MR. ROCHE: Okay. No further questions at this  
5 time.

6 THE COURT: Very well.

7 Ms. McGovern, whenever your ready. Take your time,  
8 and know you've got a lot of paper to shuffle. So whenever  
9 you're ready.

10 MS. McGOVERN: Your Honor, we're not going to be  
11 introducing new documents.

12 THE COURT: Okay.

13 MS. McGOVERN: So the documents, if it's okay with  
14 the Court, that I go through I'll be putting up, but they're  
15 going to have already been addressed.

16 THE COURT: No problem. As long as they're in  
17 evidence, you just identify for the record what it is you're  
18 publishing, you can go to town.

19 Cross-Examination

20 BY MS. McGOVERN:

21 Q Hello again, Dr. Edman.

22 A Hello.

23 Q A number of hours later.

24 Dr. Edman, you've made several opinions here today  
25 based upon conclusions regarding modifications to metadata,

1 correct?

2 A I've made a number of opinions regarding modifications  
3 made to metadata files and cryptographic signatures.

4 Q I want to go over exactly what metadata, to be clear and  
5 so that the record is clear, what metadata relates to what  
6 document and the conclusions that you've drawn from that  
7 metadata as to that document, but first I want to just ask you  
8 a couple questions about metadata.

9 Metadata in a PDF can be easily altered, correct?

10 A Correct.

11 Q And metadata in a PDF that's been altered doesn't tell  
12 you who did it, correct?

13 A The metadata itself does not necessarily tell you exactly  
14 who did it.

15 Q That's my question. The metadata itself doesn't tell you  
16 who did it, does it?

17 A No; but it's important to view it in the context of other  
18 information, such as other data contains within the file and  
19 information contained therein.

20 Q I understand, but the metadata itself in a document  
21 doesn't tell you who modified the information or the data on a  
22 PDF, correct?

23 A It may or may not. It depends on the particular  
24 modifications made.

25 Q So in this particular case, you reviewed the metadata for

1 the document. You did not speak with anybody related to any  
2 of the documents on which you have opined modifications have  
3 been made to them, correct?

4 Let me be clear. You didn't speak to the sender,  
5 correct?

6 A Can you be more specific?

7 Q You didn't speak to the person on the document, on the  
8 face of the document, who purported to have sent the document.  
9 Example Dave Kleiman, correct?

10 A I did not speak to Dave Kleiman, that is correct.

11 Q And you didn't speak to the recipient of any of these  
12 documents; is that right?

13 A Again, can you be specific? I didn't mean -- I didn't  
14 speak to Craig Wright, for example, if that's to whom you're  
15 referring.

16 Q Well, you've reviewed these documents, and you've opined.  
17 You've provided expert testimony on them. There are not a lot  
18 of recipients on these documents we're talking about, are  
19 they?

20 A Sure.

21 Q You didn't speak to any of them, did you?

22 A I didn't speak to anyone involved in any of the e-mails  
23 that I reviewed, correct.

24 Q And with respect to the factual circumstances surrounding  
25 these documents and surrounding the modifications to these

1 documents that you've testified to, you don't have personal  
2 knowledge as to any of the circumstances surrounding the  
3 creation of those documents; isn't that right?

4 A I don't have, you know, firsthand knowledge of the  
5 individuals who may have made these modifications, if that's  
6 what you're getting at.

7 Q No, it's actually more than that. I'm asking whether --  
8 or I'm actually -- isn't it true that you have no personal  
9 knowledge with respect to the factual circumstances  
10 surrounding the creation, the modification of any of the  
11 documents on which you've provided expert testimony, correct?

12 A There's a number of evidence contained within the  
13 documents that would be consistent with the defendant creating  
14 the modifications, such as the time zone, the IP address, the  
15 name of the computer bearing his initials, the user name  
16 contained within some of the metadata being consistent with  
17 his, but, you know, as far as statements from the defendant  
18 that he modified the documents, or, you know, video footage of  
19 him modifying them, I certainly don't have that.

20 Q That would be personal knowledge, correct?

21 A Correct.

22 Q And you don't have that.

23 A Correct. Again, my opinions are based on the evidence  
24 available to me.

25 Q I'm just simply trying to clarify and confirm and

1 understand the extent of the information that's been available  
2 to you in rendering these expert opinions.

3           So with respect to the documents that you reviewed,  
4 the metadata that you extracted, you have no personal  
5 knowledge as to the factual circumstances that gave rise to  
6 the creation or the modification of those documents. You  
7 don't know what was going on at the time in 2014 or 2011,  
8 correct?

9 A       Again, I can only opine on the evidence that's available  
10 within the documents themselves, but I wasn't present when  
11 they were created.

12 Q       So the answer is, no, you do not.

13 A       The answer is I wasn't present when they were created.

14 Q       So you do not have -- Dr. Edman, you know what personal  
15 knowledge is, correct?

16 A       I believe so.

17 Q       I don't mean to be argumentative, but I'd like you to  
18 just give me a yes or a no.

19           You do not have personal knowledge concerning any of  
20 the factual circumstances surrounding the creation or the  
21 modification or the documents you have given expert testimony  
22 on today? Yes or no.

23           MR. ROCHE: Objection; asked and answered.

24           THE COURT: No, he hasn't answered it.

25           It's a simple yes or no question. Were you around



1 in 2011, 2012, 2013, 2014, so that you actually have any  
2 personal knowledge about these events, or are you simply  
3 testifying based upon what you've observed in the documents  
4 themselves and any other evidence that you've looked at after  
5 the fact?

6 THE WITNESS: I'm testifying based on the evidence  
7 in the documents themselves. I was not present when they were  
8 created.

9 THE COURT: All right. Now, he's answered it.

10 MS. McGOVERN: Thank you, Your Honor.

11 BY MS. McGOVERN:

12 Q So metadata can be changed easily on a PDF, and your  
13 expert testimony focuses on two PDFs, correct?

14 A No.

15 Q You have provided expert testimony on two PDFs; isn't  
16 that right?

17 A We've discussed --

18 Q Let me be specific so you don't -- I don't mean to be  
19 putting you in a corner.

20 You've provided expert testimony about a PDF dated  
21 2014. And I can pull it up for you so that you can take a  
22 look at it. Let me know if this pops up on your screen so you  
23 can see it.

24 Is it there?

25 THE COURT: Is that plaintiffs' exhibit 6,

1 Ms. McGovern?

2 MS. McGOVERN: That is plaintiffs' exhibit 6, Your  
3 Honor.

4 THE COURT: Okay. Thank you.

5 BY MS. McGOVERN:

6 Q Dr. Edman, I have pulled up on the screen, which I  
7 believe you can see now in front of you, plaintiffs' exhibit  
8 number 6, which has a Bates stamp DEF00013459. Do you see the  
9 document?

10 A Yes, ma'am.

11 Q Okay. This is a PDF, correct?

12 A Yes.

13 Q And back to my original question about metadata. The  
14 metadata that you reviewed in connection with number 37,  
15 which, to be clear for the record, is plaintiffs' exhibit  
16 number 7 and plaintiffs' exhibit number 8, all of this  
17 metadata that we've reviewed over the last couple hours that  
18 pertains to this PDF could have been easily done by anybody;  
19 isn't that right?

20 A Yes, in general.

21 Q You also provided testimony with respect to another PDF,  
22 which is plaintiffs' exhibit number 2, DEF00013189. It should  
23 be in front of you right now. Is it?

24 A Yes.

25 Q Okay. This is a PDF, correct?

1 A Yes.

2 Q The metadata that we have gone over extensively with you  
3 today was introduced as plaintiffs' exhibit 3, plaintiffs'  
4 exhibit 8 -- plaintiffs' exhibit 7 and 8, actually. So there  
5 are a number of extracted printouts of metadata that pertain  
6 to plaintiffs' exhibit 6 -- I'm sorry, plaintiffs' exhibit 2,  
7 which all pertain and relate directly to this PDF, correct?

8 A I don't believe your statement is entirely accurate. The  
9 one in front of me is the 2011 PDF.

10 Q Correct. And that is -- I have that as plaintiffs'  
11 exhibit 6.

12 A I have the 2011 PDF as plaintiffs' exhibit 2.

13 Q Two. I'm sorry, plaintiffs' exhibit 2, yes.

14 And the metadata associated with plaintiffs'  
15 exhibit 2 is plaintiffs' exhibit 3, correct?

16 A Yes, that's accurate.

17 Q Okay. Okay. The metadata that is extracted and  
18 reflected on plaintiffs' exhibit 3 that relates to plaintiffs'  
19 exhibit 2 all could have been done by anybody; isn't that  
20 right?

21 A Anybody could manipulate the metadata, but, again, there  
22 are a number of indicators contained within the metadata that  
23 are consistent with the defendant.

24 Q That's not my question.

25 You don't know the defendant, do you?

1 A I've been told facts about the defendant, such as where  
2 he lived at the period of time, which would be consistent with  
3 a number of items within the metadata.

4 Q Okay. But my question is: The metadata that you  
5 testified about in plaintiffs' exhibit 3 relating to  
6 plaintiffs' exhibit 2 could have been done by anybody. That's  
7 my question.

8 A Sure.

9 Q And, again, the metadata doesn't tell you who did it,  
10 does it?

11 A Again, it doesn't necessarily state exactly who modified  
12 the documents. It may in some circumstances, but it's  
13 important to look at the evidence as a whole.

14 Q I understand, but it doesn't tell you definitively who  
15 did it, does it?

16 A Not in the metadata that we've discussed today.

17 Q And if we go to -- bear with me one second.

18 You also -- excuse me. You also provided testimony  
19 with respect to plaintiffs' exhibit number 1, which I'm going  
20 to pull up right now. Plaintiffs' exhibit number 1 is the  
21 document you testified you were aware that Dr. Wright  
22 authenticated; is that right?

23 A Correct.

24 Q There's no metadata that you provided with respect to  
25 this document; isn't that right?

1 A Correct.

2 Q So -- but you've concluded that this document, that  
3 doesn't provide you any metadata at all, is inauthentic,  
4 haven't you?

5 A I wouldn't --

6 Q It's just a yes or a no, Dr. Edman. Haven't you?

7 A Can you please restate the question?

8 Q Yes.

9           You have not -- we just went over all the metadata  
10 that you gave us and that you testified about for 2 and 6, and  
11 you explained all the changes, everything that happened in the  
12 PDF metadata.

13           With respect to number 1, which was the document  
14 that was authenticated by Dr. Wright, there was no metadata  
15 that you extracted and provided and analyzed in reaching your  
16 conclusion that this document was inauthentic. That's my  
17 question. There was no metadata that you extracted from this  
18 document for your expert opinion that this document is  
19 inauthentic. It's just a yes or a no.

20 A Well, then I would -- I don't believe your statement is  
21 accurate, because I did extract metadata from the signature  
22 shown on the fourth page of this document, which was part of  
23 my analysis.

24 Q How did you extract document -- metadata with respect to  
25 that document?

1 A For the cryptographic signature in the fourth page, that  
2 is just simply a matter of copy/pasting or reentering the  
3 text.

4 Q Okay. But you did not extract the metadata from this  
5 document. I want to be very clear about that. Correct me if  
6 I'm wrong.

7 A Can you be specific?

8 Q I understand that you say you cut and pasted or retyped  
9 it and analyzed the PGP signature, but my question is: This  
10 document, you did not extract any metadata from this document.

11 A This PDF shown on the first page, you are -- or printout  
12 of a PDF, you are correct. I did not extract any metadata  
13 from that specific page.

14 Q Okay. But you have concluded that this document is  
15 inauthentic, correct?

16 A Yes, that is my opinion.

17 Q So let's talk about how you got there.

18 We have two PDFs that you've analyzed. And I don't  
19 want to be oversimplistic about this, but, yeah, I think we're  
20 going to just show a picture to see if we can follow it  
21 through. Because I have a lot of papers over there, and I  
22 just want to be really clear about your conclusions.

23 By the way, with respect to the documents that  
24 you've analyzed, which appear to be similar, identical,  
25 et cetera, do you know how many copies of a document that

1 looks like this was produced in this case?

2 A Not precisely.

3 Q So you didn't look to see if there are other documents  
4 that have been produced, other PDFs, that don't have any  
5 modifications, or changes or anything that would, I guess the  
6 word you were asked is interesting. You didn't do that,  
7 correct?

8 A I did a search for other PDF files which contained the  
9 exact same document I.D., and we also identified a number of  
10 identical copies of the -- some of the PDFs that I did  
11 analyze.

12 Q Okay. Where is that analysis?

13 A Which analysis specifically?

14 Q On the other documents?

15 A We've talked about many of the documents today. The ones  
16 that have these exact same document I.D. we have discussed.

17 Q But where is the analysis on the other PDFs that you say  
18 that you searched for and reviewed and analyzed? Where is  
19 that analysis? Did you perform any kind of analysis, formal  
20 analysis? Did you extract the metadata from those documents,  
21 and did you use any of those documents in supporting your  
22 opinion here that exhibit number 1, plaintiffs' exhibit  
23 number 1, is inauthentic?

24 A To the best of my knowledge, the PDFs that I reviewed  
25 that were identical, they had identical hash values to the

1 PDFs that I reviewed, and so necessarily the metadata would  
2 have been identical and my analysis would be the same.

3 Q Necessarily it would have been? I'm not asking you what  
4 it might have been or what it would have been. I'm asking you  
5 whether you got all the copies of the PDFs that were produced  
6 in the hundreds of thousands of documents produced in this  
7 case and performed the same analysis that you did with respect  
8 to plaintiffs' exhibit 2 and 6 in reaching your conclusion  
9 about number 1.

10 A Again, if two documents, their cryptographic hash is  
11 identical, then the contents of those documents, including the  
12 metadata, is identical. And so analysis done on one is  
13 applicable to the others.

14 Q Dr. Edman, I didn't -- I'm not asking you a hypothetical.  
15 Please listen to my question so that we can get through this.

16 I'm asking you whether you did it. Yes or no.

17 A Can you --

18 MR. ROCHE: Objection; argumentative.

19 THE COURT: Well, you can rephrase the question. I  
20 don't think -- rephrase the question.

21 BY MS. McGOVERN:

22 Q Dr. Edman, how many documents were produced in this case  
23 that look like exhibit 1?

24 A I don't know off the top of my head.

25 Q Over 50?



1 THE COURT: Are you asking him how many were  
2 produced, or how many he analyzed, or he looked at, or he  
3 searched for? What is the right verb?

4 MS. McGOVERN: Well, that's a very good question.

5 BY MS. McGOVERN:

6 Q How many documents were produced to your knowledge that  
7 look like this document in this case?

8 A I don't recall exactly.

9 Q Okay. So you wouldn't know if it's over 50, would you?

10 A No, not off the top of my head.

11 Q Because you didn't perform any analysis on any of those  
12 documents.

13 A Again, if the documents have the exact same hash I.D.,  
14 then I wouldn't have needed to analyze those, because they  
15 were identical to the ones that I did.

16 Q But you don't know, sitting here today, how many  
17 documents were produced that looked like exhibit number 1 that  
18 you actually analyzed, do you?

19 A Sure; correct.

20 Q No, you don't?

21 A No, I don't as I sit here today.

22 Q Okay. So I have a very rudimentary graph on this easel  
23 which I hope is helpful, and I can certainly use the iPad if  
24 it's not, but --

25 MR. ROCHE: Your Honor, can we have the -- we can't

1 see the --

2 THE COURT: You can go sit in the jury box or come  
3 over here so you can see it, if you like. That's perfectly  
4 fine. I want to make sure the witness can see it.

5 And Ms. McGovern, you need to stay at the lecturn,  
6 though, because of the microphone.

7 MS. McGOVERN: Oh, sorry. Okay. All right.

8 THE COURT: If you want to bring that closer to you,  
9 you may, so you can point at it. If you want to put it closer  
10 to the witness.

11 Ms. McGovern, we have a handheld microphone if you  
12 want to put it up here next to the witness and you can stand  
13 there.

14 MS. McGOVERN: I'm not that comfortable.

15 BY MS. McGOVERN:

16 Q Okay. So Dr. Edman, we've talked about the -- we've  
17 talked about the different versions of the e-mail. This  
18 e-mail that I'm referring to, this box right here, this is the  
19 authenticated 2011 e-mail by Dr. Wright which has this Bates  
20 number, and it's plaintiffs' exhibit number 1. That's what  
21 that box is. And these two documents in front of that  
22 authenticated document are plaintiffs' exhibit number 6, which  
23 is 13459 Bates stamp, and plaintiffs' exhibit number 2, which  
24 is 13189 Bates stamp.

25 You see that?

1 A Yes.

2 Q Okay. You testified that these two documents have a  
3 document -- have -- are connected.

4 THE COURT: I'm sorry. Just for the record, when  
5 you say these two, you mean plaintiffs' exhibit 2 and  
6 plaintiffs' exhibit 6?

7 MS. McGOVERN: Correct.

8 THE COURT: Okay.

9 BY MS. McGOVERN:

10 Q Your testimony, Dr. Edman, if I'm not mistaken, is that  
11 plaintiffs' exhibit number 6, which is a PDF, has metadata  
12 that has been changed on it, and this particular change is --  
13 reflects in the metadata that it went from Craig to Craig and  
14 was changed to Dave to Craig. Do you recall that testimony?

15 A I apologize. Just so I'm understanding your diagram  
16 correctly, when you have the from and the to, you're  
17 suggesting the changes of the metadata, not the from and the  
18 to fields contained within those exhibits. Is that accurate?

19 Q That's exactly right.

20 A I apologize for asking you a question.

21 Q No, no, Dr. Edman, you're right. That is a good  
22 clarification. That is exactly what it means.

23 The change is that the -- this PDF, its metadata  
24 reflects that it's an e-mail that originally was from Craig to  
25 Craig, and it was changed to be from Dave to Craig. Do you

1 recall that?

2 A Yes.

3 Q Okay. And your testimony is that this PDF shows that  
4 metadata behind it, and that is part of the basis for your  
5 opinion, correct?

6 A To be clear, the metadata, combined with the internal  
7 structure and contents, the object code from the PDF led me to  
8 that conclusion.

9 Q I understand. I understand. I'm trying to keep it  
10 simple.

11 And then the next change with these two PDFs is that  
12 plaintiffs' exhibit number 2, which is Bates 00013189 has  
13 another change to it, which is it went from 2014 to 2011,  
14 correct?

15 A Yes.

16 Q And you then conclude because of these metadata changes  
17 on PDFs, that this document is inauthentic, which had no  
18 metadata that you extracted or analyzed; isn't that right?

19 A Yes. Again, the document on the far right I understand  
20 was produced as a scan of a printed paper document.

21 Q I'm just simply asking if that is, in fact, correct.

22 A Yes, it is correct.

23 MR. ROCHE: Objection; it misstates the witness'  
24 prior testimony.

25 THE COURT: I've heard the testimony, so I'll recall

1 the testimony.

2 And just so the record is clear, again, when  
3 Ms. McGovern said "this document," she was referencing  
4 plaintiffs' exhibit number 1.

5 MS. McGOVERN: That is correct.

6 MR. ROCHE: Your Honor, just so the record's clear,  
7 Dr. Edman previously testified about the cryptographic  
8 signature in plaintiffs' exhibit 1.

9 THE COURT: Okay. I heard the testimony. I'll  
10 recall the testimony. You'll have a chance to argue.

11 So just so I'm clear from the doctor's last answer,  
12 though, so plaintiffs' exhibit 1 was not produced in a format  
13 where you could extract metadata, is that what your testimony  
14 was? It was a scan, not a --

15 THE WITNESS: Any metadata extracted would not be  
16 relevant to the original document, since the original document  
17 appears to have been printed into a paper form and then  
18 rescanned into an electronic form.

19 THE COURT: Got it. All right. Thank you.

20 BY MS. McGOVERN:

21 Q So this connection between this, to this, to this, in  
22 this direction, ends here from a metadata perspective; isn't  
23 that right?

24 A Yes.

25 THE COURT: And, again, Ms. McGovern, just so you

1 get your record, just be sure when you say here, here and  
2 here, you identify what you're pointing to.

3 MS. McGOVERN: Thank you so much, Your Honor.

4 THE COURT: Uh-huh.

5 BY MS. McGOVERN:

6 Q Let me rephrase.

7 Your analysis from a metadata perspective, which  
8 relies upon changes to plaintiffs' exhibit 6, further changes  
9 reflected in plaintiffs' exhibit 2, ends before, from a  
10 metadata perspective, we arrive at plaintiffs' exhibit  
11 number 1; isn't that right?

12 A Yes.

13 Q Okay. There is nothing on the face of plaintiffs'  
14 exhibit number 1, on the face of this document, that is  
15 inauthentic, is there? On the face of the document; isn't  
16 that right?

17 A To be clear, just so I understand, does plaintiffs'  
18 exhibit 1 include all pages of the Bates 2413 through 2416?

19 Q Yes.

20 A Okay.

21 Q Let's start with the cover e-mail. Okay? And it's right  
22 in front of you, Dr. Edman. There is nothing on plaintiffs'  
23 exhibit number 1, the 2011 e-mail that Dr. Wright  
24 authenticated, that supports a conclusion that that e-mail is  
25 inauthentic, is there?

1 A On its face you are correct.

2 Q I'd like to ask you about -- I'd like to ask you about  
3 plaintiffs' exhibit number 30, which is the box at the bottom  
4 here. Plaintiffs' exhibit 30, Bates number 00079344. Do you  
5 see that? It should be on your screen.

6 A Yes, ma'am.

7 Q Okay. This is, in fact, a native file of an e-mail dated  
8 June 24th, 2011, correct?

9 A Yes, it is a native e-mail file.

10 Q I'd like to ask you to look at plaintiffs' exhibit -- I  
11 don't have it scanned, unfortunately -- 31. I can't put it on  
12 the iPad because it's introduced today.

13 Do you have plaintiffs' exhibit number 31 in front  
14 of you?

15 A Yes, ma'am.

16 Q Okay. This is the metadata that you extracted from  
17 plaintiffs' exhibit 30, which is the native 2011 e-mail,  
18 correct?

19 A Yes; it is an e-mail header which I would consider  
20 metadata.

21 Q Okay. It's data behind the document that you looked at  
22 in analyzing it, is that a fair statement?

23 A Yes.

24 Q Okay. I believe you testified on line 3 that this  
25 document must be inauthentic because there is a Google time

1 stamp which has a long sort of address to it which converts in  
2 milliseconds, and if you convert it, shows that the document  
3 was sent after the date of the document. Is that a fair  
4 statement?

5 A Yes.

6 Q On line 4 there's another date, which is June 23rd, 2011.  
7 That's also a time stamp, isn't it?

8 A Yes.

9 Q And it's consistent with the document, isn't it?

10 A Yes.

11 Q But you excluded that one in relying upon the embedded  
12 one in milliseconds that you converted to reach your  
13 conclusion; is that right?

14 A Yes.

15 Q Dr. Edman, you testified that you believe the order of  
16 inauthenticity, as it were, which is: Start with plaintiffs'  
17 exhibit 6, go to plaintiffs' exhibit number 2 and reach your  
18 conclusions, makes sense. But isn't it also possible that we  
19 have a native file that was copied and pasted from Craig to  
20 Craig, and this actually comes right here? In other words,  
21 plaintiffs' exhibit number 30 is the genesis for plaintiffs'  
22 exhibit number 1? Isn't that possible?

23 A Sure, it's possible.

24 Q Dr. Edman, you've testified about other documents, as  
25 well, in this case, and I'd like to ask you some questions



1 about them.

2           The first document that I'd like to ask you about  
3 that you testified to is an e-mail that was sent in 2013, and  
4 it is plaintiffs' exhibit -- when I pull it up, I'm going to  
5 find which exhibit it is. Yeah, so it's plaintiffs'  
6 exhibit 32. I'm going to pull it up.

7 A     My apologies. Did you say 32?

8 Q     Yes, I did.

9 A     Thank you.

10 Q     So this is an e-mail that you were also asked about with  
11 respect to authenticity, and I believe your testimony was this  
12 document is inauthentic because the PGP signature, according  
13 to the date from which the -- from which the PGP signature  
14 came -- in other words, according to the computer from which  
15 the PGP signature came, doesn't match the date on the face of  
16 the e-mail in which it was sent; is that right?

17 A     In addition to what you just stated, this document also  
18 had the same document I.D. as the 2011 and the 2014 e-mail  
19 PDFs and metadata that suggested that it was modified from  
20 those, which is an unrelated e-mail conversation.

21 Q     Okay. So let's focus on the PGP signature. Your  
22 testimony was this document is inauthentic because according  
23 to the computer on which the signature was created, it doesn't  
24 match the date that it was sent; is that right?

25 A     Yes.

1 Q Okay. "According to the computer on which the signature  
2 was created," what does that mean?

3 A It means that GnuPG, or whatever software is used to  
4 create the signature, it only knows the date and time of the  
5 computer on which that software is being run.

6 Q So if it was copied and pasted from a different computer,  
7 it's going to grab that date, correct?

8 A Yes.

9 Q Okay. And the computer clock may be off, correct?

10 A Yes.

11 Q You don't have any other basis other than the "according  
12 to the computer on which the signature was created" to  
13 determine that this PGP signature is false, do you?

14 A Correct.

15 Q So let me ask you about -- oh, actually, while we're  
16 talking about that, let me go to another document on which you  
17 rendered an opinion, which is plaintiffs' 42. This document  
18 should be in front of you, as well. And this is a document  
19 where you read the text. You didn't include the addresses,  
20 but you read the text in the e-mail, but your testimony wasn't  
21 about the text, it was about the PGP signature. So I want to  
22 focus on that.

23 I believe you said this document is also inauthentic  
24 because the PGP signature, according to the computer on which  
25 it was created, is March 2nd, 2014, and that's after the date

1 of this e-mail; is that correct?

2 A Correct.

3 Q Okay. But, again, the same question arises. The clock  
4 might've been off; isn't that right?

5 A That is right.

6 Q And you don't know whether it was, do you?

7 A Correct.

8 Q Okay. So if we could go to another document. If we go  
9 to plaintiffs' exhibit 38, which is in front of you. This is,  
10 I believe you also testified, an issue regarding a PGP  
11 signature. And if I wrote it down correctly you said:

12 According to the computer on which the PGP signature was  
13 created, this PGP signature doesn't match the date of the  
14 document; is that right?

15 A Correct.

16 Q And that's the basis for inauthenticity of this document,  
17 correct?

18 A That, in addition to the version of GnuPG that was used  
19 to purportedly create the signature also didn't exist at the  
20 time this e-mail was allegedly sent.

21 Q You've testified about versions of software. Let me ask  
22 you about that. What's an alpha as it relates to a version of  
23 software?

24 A It's like a testing version.

25 Q Now, what's a beta?

1 A Also perhaps a more mature, but still testing version.

2 Q Okay. So when versions are released, are they, poof,  
3 magically perfect and released by Microsoft, or have they gone  
4 through an alpha and a beta testing process, in your  
5 experience?

6 A In my experience, there is a testing process, yes. I  
7 can't speak, of course, to Microsoft's development and release  
8 practices.

9 Q All right. And you don't know whether they released an  
10 alpha or a beta and had a control group. You don't know  
11 whether there were versions -- betas, alphas -- available and  
12 in circulation online, do you?

13 A Correct.

14 Q You don't know.

15 A Correct.

16 Q And we're talking about people that were online, aren't  
17 we?

18 A I guess so.

19 Q Okay. This is an online kinda case, isn't it?

20 MR. ROCHE: Objection.

21 THE COURT: Sustained.

22 MS. McGOVERN: I'll withdraw.

23 THE COURT: Sustained.

24 MS. McGOVERN: I'll withdraw.

25 THE COURT: You don't get to withdraw. Sustained.

1 The record is what it is. You asked the question.

2 BY MS. MCGOVERN:

3 Q I'd like to ask you about another document that you  
4 provided expert testimony on, which is plaintiffs' exhibit  
5 number 9, which is the October 23rd, 2012, Deed of Trust. Do  
6 you have that in front of you? Is it on the screen, as well,  
7 just for your ease of reference?

8 A Yes, ma'am, it is on the screen, and I have it in front  
9 of me.

10 Q Okay. Could you go to the very back of this -- oh, let  
11 me just start with this: You opined that this document is  
12 inauthentic, didn't you?

13 A Yes.

14 Q Can we go to the very back of the document and look at  
15 Bates 00050988, which is the second to last page of it. You  
16 see that?

17 A Yes, ma'am.

18 Q That's the signature page, isn't it?

19 A Yes, ma'am.

20 Q Okay. Individuals signed this document, correct?

21 MR. ROCHE: Objection; calls for speculation.

22 BY MS. MCGOVERN:

23 Q Does it appear to you, in your expert experience in  
24 looking at documents, that there are signatures above these  
25 individual signature lines on this document?

1 A Yes.

2 Q Okay. Do you have any personal knowledge as to whether  
3 any of these people have withdrawn from their signature or  
4 stated that their signature is invalid?

5 A No.

6 Q You're not a forgery expert, are you?

7 A Not in terms of signature --

8 MR. ROCHE: Objection.

9 BY MS. McGOVERN:

10 Q You didn't provide any --

11 THE COURT: Whoa, whoa, whoa. Hold on. There's an  
12 objection. What's the legal objection?

13 MR. ROCHE: Objection; outside the scope of the  
14 direct examination. And this witness has not been admitted as  
15 a handwriting expert, and I don't know why this line of  
16 questioning is relevant.

17 THE COURT: All right. Well, the witness did answer  
18 that he's not an expert on hand -- on handwriting, so you can  
19 move on from that. So I'll sustain the objection.

20 BY MS. McGOVERN:

21 Q Did you consider the fact that this was a signed document  
22 without any objection by the signatories to this document when  
23 you rendered your opinion that it was inauthentic? Did you  
24 consider that?

25 MR. ROCHE: Objection; relevance.

1 THE COURT: No, he testified the document's  
2 inauthentic. She can probe. I'll overrule the objection.

3 MR. ROCHE: Objection, and it assumes facts that are  
4 not in evidence.

5 THE COURT: Well, no. He's testified that this  
6 document was not authentic. All she's asked him is in coming  
7 to that conclusion, did he consider that there were  
8 handwritten signatures on it. That's a fair question. Either  
9 he did or he didn't.

10 MS. McGOVERN: You've asked the question so much  
11 better than I just did. I wish I could just learn from you.

12 BY MS. McGOVERN:

13 Q That's the question. Did you consider it?

14 A No, ma'am. The presence or absence or nature of these  
15 signatures did not factor into my opinion.

16 Q It's my understanding that the basis of your conclusion  
17 that this document is inauthentic is based upon fonts that  
18 were not available at the time the document purports to have  
19 been created and executed, correct?

20 A Correct.

21 Q Okay. And I believe you testified that you were talking  
22 about embedded fonts?

23 A That is correct.

24 Q Is it possible that when this document was created, it  
25 didn't have any fonts?

1 A It's possible.

2 Q Okay. And if it didn't have any fonts, and then the  
3 document was OCR'd for, I don't know, let's say an ATO  
4 proceeding, or something else, and the document software that  
5 was OCR'ing this document tried to match fonts, is it possible  
6 that that could have happened to this document?

7 A To the extent I follow your hypothesis, if this OCR  
8 software embedded additional font files within this PDF to  
9 create a new PDF, in my experience, I would expect the  
10 metadata to also have been updated, such as the last  
11 modification date.

12 Q Okay. That's your experience, but it's possible, isn't  
13 it?

14 A Sure.

15 Q And the computer date can be wrong, correct?

16 A Yes.

17 Q Okay. If I could ask you to take a look at the next  
18 document that you testified about. Okay. So this is the  
19 invoice, and I believe this redline version that you're  
20 looking at right now is the demonstrative, but that's okay, we  
21 can talk about it in the form of a demonstrative. Do you have  
22 it in front of you?

23 A Yes, ma'am.

24 Q Okay. What's an invoice, to your knowledge?

25 MR. ROCHE: Objection; relevance.



1 THE COURT: Goes to the content of the document;  
2 it's okay.

3 THE WITNESS: An invoice generally would be a bill  
4 for goods or services.

5 BY MS. McGOVERN:

6 Q Okay. In your experience, do you generate a bill to a  
7 client from scratch every single time?

8 MR. ROCHE: Objection; relevance.

9 THE COURT: Sustained. You can ask it a different  
10 way.

11 BY MS. McGOVERN:

12 Q Isn't it possible, Dr. Edman, that this document was a  
13 template?

14 A Sure.

15 Q Templates are used to then modify the data of the  
16 document without having to recreate the whole thing, correct?

17 A Yes.

18 Q And it's possible that that's exactly what happened here,  
19 isn't it?

20 A That's possible, though the line of text on the bottom  
21 indicates that the PDF was automatically generated --

22 Q But it's possible.

23 A -- as opposed to manually modified from a template.

24 Q Correct? It's possible.

25 A Sure.

1 Q So I know I'm going to get an objection, but could this  
2 invoice have been modified by HIGHSECURED?

3 MR. ROCHE: Objection; outside of the witness'  
4 expertise, and it's a fact that --

5 THE COURT: Calls for speculation. Calls for  
6 speculation. I'll sustain it.

7 BY MS. MCGOVERN:

8 Q Dr. Edman, you also provided testimony -- let me go back  
9 to the demonstrative that's in front of you and just ask a  
10 final question. Perhaps this is the one I should have asked  
11 originally, which is: Based upon your review of this  
12 document, you don't know who modified it, do you?

13 A Correct.

14 Q I don't have this document to pull up on the screen  
15 because we received it today, but it's plaintiffs' exhibit 16.  
16 Yeah, that's it. I've pulled up what was marked previously as  
17 number 16, plaintiffs' exhibit number 16, and this refers to  
18 the Bitmessage messages that are reflected I think probably  
19 more clearly towards the end, which is now in front of you.  
20 It's colored so it's clearer.

21 And Dr. Edman, I believe you testified that these --  
22 all these Bitmessages could not possibly have occurred because  
23 Bitmessage was not available until November 19th; is that  
24 correct?

25 A No. To be clear, I believe I only testified that the

1 messages prior to November 19th did not occur.

2 Q Did not occur.

3 And you based your testimony in that regard on what  
4 you said was an interview with Jonathan Warren; is that right?

5 A An interview with John Warren in connection with a review  
6 of the Bitmessage website and the commit history associated  
7 with Bitmessage on GitHub.

8 Q Okay. And you said you read Dr. Warren's deposition also  
9 in formulating your opinion that prior to November 19th, these  
10 Bitmessages never happened, correct?

11 A Yes.

12 Q Okay. In connection with that, did you consider  
13 Mr. Warren's testimony where he affirmatively states that  
14 there could have been a version of Bitmessage that was  
15 released on the dark web prior to November 2012? Did you  
16 consider that?

17 A Yes.

18 Q Did you just ignore it?

19 A If I recall, he didn't seem to think that that was a  
20 likely possibility.

21 Q But he said it could have been released on the dark web,  
22 correct?

23 A Sure. If anything's possible, sure.

24 Q Okay. Which means it was released prior to  
25 November 2012, didn't it? That's what that means.

1 MR. ROCHE: Objection; mischaracterizes.

2 THE COURT: I think the evidence states what it  
3 states. If he testified that it could have happened before  
4 November 12th, then it could -- November 19th, then that's  
5 what he said. It's argumentative. I'll sustain the  
6 objection.

7 BY MS. MCGOVERN:

8 Q Okay. Did you also consider, Dr. Edman, that Jonathan  
9 Warren affirmatively stated that other people could have  
10 helped him testing his software before it was released?

11 MR. ROCHE: Objection. If we're going to ask  
12 questions about what Jonathan Warren did and didn't say, I  
13 think the witness should be allowed to see the transcript  
14 rather than rely on Ms. McGovern's characterizations of what  
15 John Warren said.

16 THE COURT: Well, if the witness doesn't understand  
17 the question and needs to see it, then he can ask.

18 BY MS. MCGOVERN:

19 Q I'm simply asking, Dr. Edman, whether, when you spoke  
20 with Jonathan Warren and read the deposition testimony, did  
21 you also consider that he said other people might have helped  
22 him test it?

23 A I vaguely remember a discussion of it, but as I sit here  
24 today, I don't recall exactly from Mr. Warren's testimony the  
25 time period during which he said other people may potentially

1 have tested the software.

2 Q And, finally, did you consider that Jonathan Warren  
3 communicated with Dr. Wright about Bitmessage?

4 A Yes.

5 Q Okay. And you still conclude that November 19th is the  
6 line in the sand with respect to any Bitm -- Bitmessages could  
7 happen before -- or after, but anything before, that's the  
8 line in the sand, and it unequivocally, no exceptions did not  
9 happen; is that correct?

10 A Again, I don't have the testimony in front of me, but as  
11 I recall, Jonathan Warren both didn't really recall his  
12 interactions with Craig Wright, and those interactions, I  
13 believe, if I'm recalling his testimony correctly, were  
14 significantly after the release of the Bitmessage software on  
15 November 19, 2012.

16 Q So you concluded that even if he spoke with Dr. Wright,  
17 even if it could have been released on the dark web, even if  
18 other people might have helped him test before he released,  
19 that none of that matters; it's November 19th, and that's it.  
20 Is that right?

21 A Yes.

22 MR. ROCHE: Objection; argumentative.

23 THE COURT: Well, if he can answer it, he can answer  
24 it.

25 THE WITNESS: Yes.

1 BY MS. MCGOVERN:

2 Q I just have a few other questions for you, Dr. Edman.

3 The modifications that we've been talking about to  
4 the PDFs, the modifications to the PDFs, I believe you would  
5 say they occurred generally in 2014; is that right?

6 A Yes, it appeared that way.

7 Q Okay. Do you know when this lawsuit was filed?

8 A Not specifically, no.

9 Q 2018. Did you know that?

10 MR. ROCHE: Objection; relevance.

11 THE COURT: Sustained. You can argue that if you  
12 want to, Ms. McGovern. It's not relevant to this witness'  
13 testimony.

14 BY MS. MCGOVERN:

15 Q But generally, these modifications that you're referring  
16 to generally did not occur after 2014, even the modifications,  
17 modifications, just standing alone as modifications without  
18 anything else, approximately the timeframe is 2014, correct?

19 A Generally, the bulk of them did appear around 2014-2015,  
20 within that time range.

21 MS. MCGOVERN: Your Honor, I have no further  
22 questions.

23 THE COURT: Great.

24 Redirect?

25 MR. ROCHE: Your Honor, may we have one minute to

1 confer?

2 THE COURT: Yeah, absolutely.

3 MR. ROCHE: Your Honor, no further questions.

4 THE COURT: All right. Thank you very much.

5 Doctor, you may step down.

6 Oh, wait, I'm sorry, Dr. Edman, I did have one  
7 question before you -- I apologize -- before you go.

8 Examination

9 BY THE COURT:

10 Q Do you have exhibit -- could you look up exhibits 30 and  
11 31. Do you have those?

12 A I'm finding them right now, sir.

13 Q Okay. No problem.

14 It's the document. Ms. McGovern was asking you  
15 about the native file for the 2011 e-mail and the  
16 corresponding metadata relating to the header text.

17 A Your Honor, I have those in front of me right now.

18 Q Okay. So here's my question: Looking at the metadata --  
19 or looking at the header, it does -- it has a from line, a  
20 sent line, a to line, a subject line and an attachments line.  
21 Where would I find each one of those in the metadata?

22 A So those fields are included within the -- well, the from  
23 field, for example, would be on line 34, the to field on  
24 line 35, the sent is pulled from one of the received fields,  
25 most likely, and the subject is --

1 Q I think that's line 46.

2 A Line 46, yes. Yes, Your Honor.

3 Q Where are the attachments?

4 A The attachments would have been included in the MSG file  
5 itself.

6 Q Okay. Because I know I saw other metadata today that had  
7 the attachment listed in it. That's what I was confused  
8 about.

9 A Yes, Your Honor. The metadata that's listed the names of  
10 the attachments that we looked at earlier was contained within  
11 a PDF. This particular file was an MSG, which is a different  
12 kind of file format, and the attachments are stored  
13 differently.

14 Q I understand.

15 Okay. So the fact that there's no attachments  
16 listed on exhibit 31 doesn't give you any pause?

17 A Correct.

18 THE COURT: Okay. Thank you. That's what I wanted  
19 to clarify.

20 Ms. McGovern, any questions based on the Court's  
21 questions?

22 MS. MCGOVERN: No.

23 THE COURT: Mr. Roche, any questions based on the  
24 Court's questions?

25 MR. ROCHE: No, Your Honor.



1 THE COURT: Thank you, Doctor. You may step down.

2 THE WITNESS: Thank you.

3 THE COURT: All right. It's 4:40. Let me -- let's  
4 circle up on loose ends.

5 So y'all are going to submit the deposition  
6 designations and cross-designations by Monday. Do the  
7 parties -- I mean, I don't know that we have enough time to do  
8 it today, but if you want to, we can do it today. Do the  
9 parties wanted to have argument, essentially closing argument,  
10 on the issues that have been raised, or do you want to wait  
11 until you've submitted the designations and had a chance to  
12 sort of digest the testimony? I see nodding heads up and  
13 down.

14 MS. McGOVERN: I'm nodding, because I -- and I think  
15 Vel and I talked about it. Maybe it would be better if we had  
16 everything in and then were able to do it.

17 THE COURT: Works for me.

18 MS. McGOVERN: Okay.

19 THE COURT: But that means you have to make another  
20 trip up from Miami, and Mr. Freedman's not going to be getting  
21 any sleep because he's going to have a new baby at home.

22 So works for me.

23 MR. FREEDMAN: I have a good team, Your Honor.

24 THE COURT: I hope so.

25 So what's your pleasure in terms of timing for that?

1 How much time would y'all like to submit the designations,  
2 give me time to read them and then come back and argue? Any  
3 thought? Any request? Look at your calendars. I know we're  
4 getting to the beginning of school, and I know y'all have  
5 children, you gotta deal with those issues.

6 MS. McGOVERN: I'm just going to throw this out  
7 there, Vel, but if you -- you know, you let us know. The week  
8 of the 26th?

9 MR. FREEDMAN: So that works for me, too, but the  
10 19th does, as well.

11 MS. McGOVERN: What does?

12 MR. FREEDMAN: The week of the 19th or 26th work for  
13 me.

14 MS. McGOVERN: So I'm available, but I'd like Andres  
15 to be here. So if we could do the week of the 26th, that  
16 would be great.

17 THE COURT: Okay.

18 MR. FREEDMAN: We could do the 26th or 27th.

19 THE COURT: So, counsel, I am the duty judge for  
20 that week, so my morning is tied up, but I'm usually done by  
21 lunchtime. So I could accommodate you 1:00, 1:30,  
22 2:00 o'clock, whatever accommodates the Brightline and your  
23 schedules.

24 MR. FREEDMAN: That's fine.

25 THE COURT: 1:30 on the 26th, does that work?

1 MS. McGOVERN: Yes.

2 MR. FREEDMAN: Yes.

3 THE COURT: All right. So we'll have argument on  
4 the 26th at 1:30.

5 And one of the things that I would like -- obviously  
6 I haven't decided the issue, but just to -- I think this is  
7 something that we should at least talk about at the time. I  
8 would like counsel to be prepared to discuss the appropriate  
9 remedy, if I determine there is to be a remedy in this case.  
10 And I certainly haven't decided anything of that nature, but I  
11 would like to hear from you about, if I end up there, what you  
12 believe the appropriate remedy is.

13 I know plaintiffs had asked for a default and some  
14 other remedies. Short of a default -- I know obviously the  
15 defense's position is is there should be no remedy, and I  
16 understand that but when we have argument, if you'd be  
17 prepared to at least discuss that topic, that would be helpful  
18 to me.

19 All right. Well, while we're here this afternoon,  
20 is there anything else the parties need to discuss or we need  
21 to discuss as long as we're all here?

22 MR. FREEDMAN: Your Honor, just one slight  
23 housekeeping matter.

24 THE COURT: Sure.

25 MR. FREEDMAN: Mr. Roche and myself are opening our

1 own firm. We will be continuing to handle the case. We hope,  
2 we expect to continue handling it together with Boies  
3 Schiller, and we will be noticing an appearance, but I just  
4 didn't want that to just hit the docket without having told  
5 you that.

6 THE COURT: Well, I appreciate that. Good luck to  
7 both of you. Having had my own solo practice at one point,  
8 it's an exciting venture. The good news is you get to keep  
9 all the money that you make. The bad news is you have to earn  
10 all the money that you get to keep.

11 So good luck. I'm sure Mr. Rivero will give you the  
12 benefit of his experience, having ventured out on its own, and  
13 I'm sure Boies Schiller is sad to see you go, but I'm happy to  
14 hear that it's a cordial parting and that you'll continue to  
15 work together.

16 Mr. Brenner, if you'll be on the case, welcome.  
17 It's an interesting venture. But I appreciate the heads up  
18 upon.

19 So big year for you, Mr. Freedman. A new baby, a  
20 new firm. You going to move, too, just in --

21 MR. FREEDMAN: We don't play over here, Your Honor.

22 THE COURT: I can tell.

23 All right. Ms. McGovern, anything else you think we  
24 should talk about today while we're all together?

25 MS. MCGOVERN: (Shakes head.)

1           THE COURT: All right. Well, thank you all very  
2 much. Excellent presentations of the issues, and I will wait  
3 to get the designations, and we'll hear argument at the end of  
4 the month.

5           So, thank you. We'll be in recess.

6           (Proceedings concluded.)

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## I N D E X

## Testimony of Steve Shadders

Direct by Ms. Markoe	11
Cross by Mr. Brenner	28
Redirect by Ms. Markoe	91
Recross by Mr. Brenner	95

## Testimony of Matthew John Edman

Voir Dire by Ms. McGovern	104
Direct by Mr. Roche	118
Cross by Ms. McGovern	212
Examination by the Court	247

\* \* \* \* \*

## E X H I B I T S

## Plaintiffs' Exhibits in Evidence:

Plaintiffs' 24	121
Plaintiffs' 7	128
Plaintiffs' 25	137
Plaintiffs' 26	142
Plaintiffs' 3	146
Plaintiffs' 4, 8, 27 and 28	156
Plaintiffs' 29	157
Plaintiffs' 30	162
Plaintiffs' 31	162
Plaintiffs' 32	167

\* \* \* \* \*

## E X H I B I T S

## Plaintiffs' Exhibits in Evidence:

4	Plaintiffs' 33	168
5	Plaintiffs' 34	171
6	Plaintiffs' 35	177
7	Plaintiffs' 10 and 36	181
8	Plaintiffs' 27	183
9	Plaintiffs' 38	187
10	Plaintiffs' 39	188
11	Plaintiffs' 40	190
12	Plaintiffs' 41	191
13	Plaintiffs' 42	192
14	Plaintiffs' 43	195
15	Plaintiffs' 44	201
16	Plaintiffs' 45	206
17	Plaintiffs' 46	209

\* \* \* \* \*

## CERTIFICATE

I, Stephen W. Franklin, Registered Merit Reporter, and Certified Realtime Reporter, certify that the foregoing is a correct transcript from the record of proceedings in the above-entitled matter.

Dated this 14th day of AUGUST, 2019.

/s/Stephen W. Franklin

\_\_\_\_\_  
Stephen W. Franklin, RMR, CRR

<p><b>BY MR. BRENNER:</b>  <b>[26]</b> 28/18 42/21 44/14  60/25 62/8 62/15 63/14  63/22 64/8 64/17 64/22  66/4 66/23 69/6 74/13  75/24 78/4 79/16 86/2  86/25 87/14 87/25 88/11  89/5 95/21 96/20  <b>BY MR. ROCHE: [74]</b>  118/4 120/22 121/8  122/14 123/22 125/25  126/5 126/18 127/16  127/24 128/16 133/9  133/16 134/6 136/19  137/7 138/1 142/12  142/23 144/5 144/21  145/20 146/14 151/21  152/10 153/1 153/7  154/2 155/20 156/13  157/1 157/18 158/7  158/16 162/4 162/23  166/14 167/11 167/23  168/14 171/9 171/25  173/8 173/17 175/19  176/22 178/8 179/20  180/19 181/10 182/18  183/10 183/20 187/2  187/15 188/14 190/4  191/17 192/24 195/8  196/17 197/24 199/7  202/1 203/12 206/7  207/24 208/6 208/16  209/8 210/4 210/16  211/9 211/23  <b>BY MS. MARKOE:</b>  <b>[15]</b> 11/7 11/20 15/10  15/22 16/2 18/10 19/19  21/6 24/22 27/23 91/4  91/21 93/12 94/11 94/21  <b>BY MS. McGOVERN:</b>  <b>[28]</b> 104/14 107/7  109/15 109/25 110/20  111/7 111/17 212/20  217/11 218/5 224/21  225/5 226/15 227/9  229/20 230/5 237/2  237/22 238/9 238/20  239/12 241/5 241/11  242/7 244/7 244/18  246/1 246/14  <b>BY THE COURT: [1]</b>  247/9  <b>MR. BRENNER: [28]</b>  3/15 10/19 10/24 14/24  18/19 19/18 28/15 60/24  62/2 62/4 62/14 63/9  65/24 66/2 66/20 68/17  68/21 69/5 88/25 89/3  89/20 90/24 91/17 94/6  94/18 95/2 95/17 97/18  <b>MR. FREEDMAN: [33]</b>  3/10 4/20 4/23 5/3 5/6  5/9 8/2 8/7 8/11 9/17  15/25 98/11 98/17 99/3  99/6 99/24 100/4 100/18</p>	<p>100/22 101/4 101/17  117/18 196/13 199/3  249/23 250/9 250/12  250/18 250/24 251/2  251/22 251/25 252/21  <b>MR. KASS: [1]</b> 4/6  <b>MR. KEEFE: [1]</b> 3/18  <b>MR. RIVERO: [1]</b> 4/3  <b>MR. ROCHE: [131]</b>  3/13 100/21 101/3  102/25 103/16 103/20  106/23 106/25 107/12  109/19 110/5 110/24  111/10 112/4 115/10  115/12 116/18 117/4  117/9 120/20 121/1  122/12 123/14 123/16  126/3 126/13 126/17  127/14 127/21 128/8  133/14 133/21 134/2  134/4 135/1 135/5  135/11 135/13 135/24  136/7 136/18 137/6  137/10 142/5 143/23  144/1 146/7 150/15  150/18 150/21 151/20  152/6 152/9 154/1 154/7  156/1 156/9 156/11  156/18 156/22 157/10  158/1 158/4 161/23  162/15 164/18 164/20  167/4 167/20 168/7  173/5 175/16 177/5  179/14 180/16 180/25  183/3 185/1 185/5 185/9  186/3 186/17 186/23  187/8 188/6 189/22  191/10 192/17 195/1  195/21 195/23 196/4  197/14 197/17 198/4  198/15 199/2 201/8  201/16 204/4 204/8  204/10 204/24 205/6  205/12 208/13 209/2  211/17 211/21 212/4  216/23 224/18 225/25  228/23 229/6 236/20  237/21 238/8 238/13  238/25 239/3 240/25  241/8 242/3 244/1  244/11 245/22 246/10  246/25 247/3 248/25  <b>MS. MARKOE: [39]</b>  3/22 7/24 9/19 10/6  14/13 14/16 14/21 15/1  15/5 15/19 21/4 24/21  27/16 27/18 27/22 28/11  42/15 42/17 44/11 63/8  63/11 63/19 63/25 64/14  75/22 76/10 79/12 86/19  87/4 87/9 88/8 91/1  92/14 93/10 94/20 95/15  96/15 97/21 104/12  <b>MS. McGOVERN:</b>  <b>[127]</b> 3/25 6/6 98/3  98/22 99/15 99/20 99/22</p>	<p>100/7 100/11 101/24  102/7 102/11 104/1  106/14 107/14 108/11  108/18 110/10 112/13  113/6 113/8 113/16  113/20 113/25 114/4  114/8 114/21 116/1  116/11 116/14 117/2  121/4 123/10 123/18  128/11 133/3 135/4  135/6 136/3 137/13  142/8 142/20 144/2  144/11 145/5 145/14  146/10 150/23 151/1  151/14 153/18 153/23  154/11 154/14 154/16  154/18 157/13 157/16  158/13 162/1 162/18  162/20 164/2 164/5  165/4 165/25 167/7  168/10 171/5 171/18  176/16 176/18 177/8  177/12 177/15 177/19  178/1 178/3 178/16  179/4 179/7 179/12  181/4 183/6 185/2  185/14 187/11 188/9  189/25 191/13 192/20  195/4 198/7 201/19  204/12 204/16 205/19  206/2 207/12 208/3  208/11 209/5 210/2  210/15 210/20 212/10  212/13 217/10 218/2  225/4 226/7 226/14  227/7 229/5 230/3  236/22 236/24 239/10  246/21 248/22 249/14  249/18 250/6 250/11  250/14 251/1 252/25  <b>THE COURT</b>  <b>REPORTER: [2]</b> 11/14  202/14  <b>THE COURT: [424]</b>  <b>THE WITNESS: [86]</b>  10/12 10/16 11/19 18/1  18/4 18/24 19/2 19/5  19/10 42/20 59/14 59/18  59/24 60/8 60/17 60/22  62/3 64/3 66/17 72/14  72/25 73/3 73/5 73/7  73/11 73/15 74/7 75/23  76/14 76/20 76/24 77/3  77/10 77/19 77/24 82/7  82/14 82/17 82/22 83/5  83/7 83/14 83/17 83/19  83/22 84/12 84/21 85/12  85/22 86/21 87/5 87/20  90/2 90/7 90/12 90/16  90/20 91/19 92/16 92/21  93/6 94/9 95/4 96/18  104/9 111/2 111/14  114/15 123/19 125/11  125/14 125/19 125/23  127/22 133/5 142/22  145/13 145/18 158/6</p>	<p>173/13 202/16 217/6  229/15 241/3 245/25  249/2  <b>VOICES: [1]</b> 3/4  <b>\$</b>  <b>\$8 [2]</b> 81/14 81/18  <b>\$8 billion [2]</b> 81/14  81/18  <b>'til [3]</b> 98/6 100/12  117/15  <b>-</b>  <b>-- 2 [1]</b> 153/23  <b>-and [6]</b> 2/4 2/7 2/10  2/16 2/19 2/22  <b>-v [1]</b> 1/5  <b>/</b>  <b>/s/Stephen [1]</b> 255/23  <b>0</b>  <b>00013189 [1]</b> 228/12  <b>00050988 [1]</b> 237/15  <b>00079344 [1]</b> 231/4  <b>0027 [1]</b> 159/14  <b>0044 [1]</b> 159/15  <b>010 [2]</b> 128/2 128/4  <b>051013 [1]</b> 209/1  <b>056406 [1]</b> 197/4  <b>1</b>  <b>1,250,000 [4]</b> 61/23 62/7  62/9 62/13  <b>1,350,000 [2]</b> 63/6 65/17  <b>1.4 million [1]</b> 5/20  <b>10 [17]</b> 12/20 28/6 46/1  54/17 74/9 98/5 129/16  129/17 138/2 140/20  147/16 151/9 180/17  181/1 181/8 191/24  255/7  <b>100 [3]</b> 2/3 2/6 2/11  <b>1000 [4]</b> 2/15 2/18 2/21  2/24  <b>104 [1]</b> 254/9  <b>10504 [1]</b> 2/9  <b>11 [2]</b> 129/7 254/4  <b>118 [1]</b> 254/10  <b>11:00 a.m [1]</b> 68/18  <b>11:03 [1]</b> 68/23  <b>11:16 [1]</b> 68/23  <b>12 [5]</b> 49/16 80/17 80/19  148/3 168/22  <b>121 [1]</b> 254/16  <b>127 [2]</b> 21/14 21/15  <b>128 [5]</b> 17/15 24/4 56/18  57/15 254/17  <b>12:00 [1]</b> 98/5  <b>12:03:48 [1]</b> 165/21  <b>12:04:38 [1]</b> 140/20  <b>12:04:57 [1]</b> 129/15  <b>12:04:57 p.m [1]</b> 147/16  <b>12:10 [1]</b> 116/17  <b>12:14 [1]</b> 117/20</p>	<p><b>12:30 [2]</b> 98/6 100/13  <b>12th [1]</b> 244/4  <b>13 [1]</b> 168/22  <b>13188 [1]</b> 167/5  <b>13189 [2]</b> 127/1 226/24  <b>13459 [2]</b> 127/2 226/23  <b>135 [1]</b> 163/7  <b>137 [1]</b> 254/18  <b>13th [1]</b> 179/16  <b>14 [1]</b> 148/4  <b>14.1.18.30 [2]</b> 134/8  134/20  <b>14.3.169.1 [1]</b> 149/5  <b>142 [1]</b> 254/19  <b>146 [1]</b> 254/20  <b>14th [1]</b> 255/22  <b>15 [7]</b> 39/25 54/17 68/22  129/6 141/14 182/14  183/17  <b>15-minute [1]</b> 68/18  <b>15.0 [3]</b> 142/14 142/14  142/16  <b>156 [1]</b> 254/21  <b>157 [1]</b> 254/22  <b>16 [15]</b> 49/16 138/20  138/23 146/19 167/19  167/20 167/20 168/15  168/17 198/17 198/20  199/9 242/15 242/17  242/17  <b>16,000 [1]</b> 78/6  <b>16,500 [6]</b> 65/2 65/8  65/22 66/1 66/6 71/4  <b>162 [2]</b> 254/23 254/24  <b>167 [1]</b> 254/25  <b>168 [1]</b> 255/4  <b>17 [6]</b> 129/15 138/17  138/18 147/2 160/23  183/12  <b>171 [1]</b> 255/5  <b>177 [1]</b> 255/6  <b>17th [1]</b> 132/24  <b>18 [1]</b> 136/8  <b>18-80176-CIV-BB [1]</b>  1/2  <b>181 [1]</b> 255/7  <b>183 [1]</b> 255/8  <b>187 [1]</b> 255/9  <b>188 [1]</b> 255/10  <b>19 [2]</b> 200/2 245/15  <b>190 [1]</b> 255/11  <b>191 [1]</b> 255/12  <b>192 [1]</b> 255/13  <b>195 [1]</b> 255/14  <b>1970 [2]</b> 131/25 163/10  <b>19th [9]</b> 200/18 242/23  243/1 243/9 244/4 245/5  245/19 250/10 250/12  <b>1:00 [1]</b> 250/21  <b>1:00 o'clock [4]</b> 117/7  117/11 117/15 117/17  <b>1:04:44 a.m [1]</b> 132/24  <b>1:04:53 a.m [2]</b> 138/17  138/19  <b>1:06 [1]</b> 117/20  <b>1:30 [3]</b> 250/21 250/25</p>
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<p><b>1</b></p> <p><b>1:30...</b> [1] 251/4</p> <hr/> <p><b>2</b></p> <p><b>2.0.20</b> [3] 190/20 191/19 191/23</p> <p><b>20</b> [4] 34/4 129/22 140/6 195/23</p> <p><b>20-month</b> [1] 71/3</p> <p><b>20-year</b> [1] 12/20</p> <p><b>2000'</b> [2] 27/6 182/15</p> <p><b>2008</b> [1] 12/3</p> <p><b>2009</b> [3] 16/11 27/6 51/17</p> <p><b>201</b> [1] 255/15</p> <p><b>2010</b> [9] 16/12 27/6 51/24 52/1 52/5 52/16 63/24 70/25 193/20</p> <p><b>2011</b> [47] 12/9 12/9 122/21 127/5 140/19 142/19 145/22 146/5 146/16 146/25 147/15 148/2 148/13 148/19 149/1 149/5 149/9 149/11 150/4 153/13 153/16 153/19 153/19 160/17 160/25 163/1 163/18 163/25 164/21 165/21 166/17 166/21 168/18 175/8 193/20 216/7 217/1 219/9 219/12 226/19 228/13 230/23 231/8 231/17 232/6 233/18 247/15</p> <p><b>2012</b> [22] 96/14 128/25 148/11 163/12 175/21 176/6 179/23 184/8 184/13 187/7 192/16 199/16 200/2 200/18 202/2 202/8 203/15 217/1 237/5 243/15 243/25 245/15</p> <p><b>2013</b> [10] 5/16 96/14 142/16 142/17 149/14 167/2 171/16 191/24 217/1 233/3</p> <p><b>2014</b> [47] 96/14 127/5 127/8 127/23 129/15 132/2 132/24 138/17 138/18 138/21 138/23 143/14 144/8 145/21 146/16 146/25 148/1 148/2 148/5 148/16 150/4 153/14 153/16 156/17 157/4 158/19 158/23 159/22 160/14 160/24 166/22 168/18 168/25 171/13 174/4 188/18 190/8 195/12 216/7 217/1 217/21 228/13 233/18 234/25 246/5 246/16 246/18</p> <p><b>2014-2015</b> [1] 246/19</p> <p><b>2015</b> [9] 180/11 181/19 181/22 183/14 184/7 184/7 184/10 184/14</p>	<p>246/19</p> <p><b>2017</b> [3] 12/14 13/6 13/8</p> <p><b>2018</b> [1] 246/9</p> <p><b>2019</b> [3] 1/8 35/20 255/22</p> <p><b>206</b> [1] 255/16</p> <p><b>209</b> [1] 255/17</p> <p><b>21</b> [5] 52/1 70/25 130/8 140/6 147/13</p> <p><b>212</b> [1] 254/11</p> <p><b>21st</b> [3] 16/12 27/6 51/24</p> <p><b>22nd</b> [5] 148/4 179/23 182/15 183/14 184/13</p> <p><b>23</b> [5] 129/14 139/20 139/22 147/19 147/20</p> <p><b>237-1</b> [1] 123/12</p> <p><b>23rd</b> [10] 128/25 148/11 168/25 171/13 175/21 176/6 178/21 178/24 232/6 237/5</p> <p><b>24</b> [10] 120/24 120/24 121/2 121/5 121/7 143/6 143/14 160/24 173/11 254/16</p> <p><b>2413</b> [4] 112/18 123/1 123/10 230/18</p> <p><b>2414</b> [9] 125/3 125/18 125/19 126/1 145/4 145/12 172/25 173/5 173/13</p> <p><b>2415</b> [6] 125/3 125/18 125/20 126/1 145/4 145/12</p> <p><b>2416</b> [10] 123/8 123/16 123/19 124/24 125/8 126/1 173/20 174/12 175/5 230/18</p> <p><b>247</b> [1] 254/12</p> <p><b>24th</b> [12] 140/19 142/19 147/15 149/9 149/11 165/21 166/17 175/8 178/22 178/23 199/16 231/8</p> <p><b>25</b> [16] 59/18 59/20 60/15 130/25 131/11 132/7 133/18 134/4 134/15 134/16 135/2 137/11 137/25 138/8 202/8 254/18</p> <p><b>25,000</b> [3] 61/11 61/15 62/12</p> <p><b>25-page</b> [1] 204/6</p> <p><b>2500</b> [1] 2/23</p> <p><b>2525</b> [3] 2/14 2/17 2/20</p> <p><b>255</b> [2] 21/11 24/5</p> <p><b>256</b> [2] 21/9 60/11</p> <p><b>25th</b> [2] 202/2 203/15</p> <p><b>26</b> [5] 141/16 142/6 142/10 142/11 254/19</p> <p><b>26th</b> [6] 250/8 250/12 250/15 250/18 250/25 251/4</p> <p><b>27</b> [15] 24/20 38/8 59/20 149/2 153/8 153/14 154/8 155/21 156/3</p>	<p>156/5 156/7 156/9 183/9 254/21 255/8</p> <p><b>27,000</b> [6] 25/10 38/7 59/17 60/15 62/16 63/7</p> <p><b>27,000s</b> [1] 38/6</p> <p><b>27-odd</b> [1] 24/17</p> <p><b>2700</b> [3] 23/15 24/20 24/21</p> <p><b>27291</b> [3] 187/9 189/11 189/17</p> <p><b>27292</b> [2] 187/21 188/1</p> <p><b>27th</b> [1] 250/18</p> <p><b>28</b> [16] 38/8 38/12 139/5 139/6 149/15 149/22 153/9 153/14 154/9 155/21 156/4 156/5 156/8 156/9 254/5 254/21</p> <p><b>2800</b> [3] 2/3 2/6 2/12</p> <p><b>28008</b> [1] 192/18</p> <p><b>28009</b> [1] 194/18</p> <p><b>28s</b> [2] 149/16 149/16</p> <p><b>28th</b> [19] 6/18 29/15 31/2 32/15 34/10 37/20 38/17 40/3 42/24 43/15 44/20 50/7 61/13 151/24 161/21 175/14 175/17 188/18 205/4</p> <p><b>29</b> [8] 38/12 156/15 156/15 156/19 157/2 157/11 157/17 254/22</p> <p><b>2:00 o'clock</b> [1] 250/22</p> <p><b>2:55</b> [1] 196/6</p> <p><b>2:57</b> [1] 196/9</p> <p><b>2nd</b> [5] 2/3 2/6 2/11 195/12 234/25</p> <hr/> <p><b>3</b></p> <p><b>30</b> [21] 161/14 161/24 161/24 162/2 162/3 163/17 163/17 165/20 165/22 166/16 169/3 169/9 169/13 177/22 179/14 231/3 231/4 231/17 232/21 247/10 254/23</p> <p><b>30,000</b> [2] 16/25 58/5</p> <p><b>30s</b> [1] 169/4</p> <p><b>31</b> [14] 110/2 112/18 162/9 162/16 162/22 162/25 163/17 177/25 178/1 231/11 231/13 247/11 248/16 254/24</p> <p><b>32</b> [21] 166/25 167/4 167/10 167/13 168/2 169/1 169/11 169/18 169/18 170/6 170/21 170/24 171/12 174/10 188/17 188/20 190/7 195/11 233/6 233/7 254/25</p> <p><b>32-bit</b> [1] 22/15</p> <p><b>33</b> [7] 167/25 168/8 168/12 168/13 172/8 172/10 255/4</p> <p><b>33131</b> [3] 2/4 2/7 2/12</p>	<p><b>33134</b> [4] 2/15 2/18 2/21 2/24</p> <p><b>333</b> [1] 2/9</p> <p><b>33401</b> [1] 1/18</p> <p><b>34</b> [7] 170/19 171/3 171/8 171/10 172/4 247/23 255/5</p> <p><b>35</b> [13] 176/11 176/23 176/24 177/5 177/11 178/6 178/9 179/8 179/11 179/18 179/21 247/24 255/6</p> <p><b>36</b> [8] 180/13 180/13 180/24 181/2 181/8 181/12 181/13 255/7</p> <p><b>37</b> [6] 71/21 71/24 182/8 182/20 183/4 218/14</p> <p><b>3768</b> [1] 1/17</p> <p><b>38</b> [15] 185/6 185/12 185/13 187/3 187/8 187/12 187/14 188/23 188/25 190/13 190/15 191/20 192/5 235/9 255/9</p> <p><b>39</b> [7] 187/24 187/24 187/25 188/7 188/13 189/20 255/10</p> <p><b>3:10</b> [2] 196/7 196/8</p> <p><b>3:15</b> [1] 196/9</p> <p><b>3rd</b> [3] 16/11 51/17 70/25</p> <hr/> <p><b>4</b></p> <p><b>4.3 billion</b> [1] 22/16</p> <p><b>40</b> [9] 177/21 189/15 189/15 189/16 189/19 189/22 190/3 190/6 255/11</p> <p><b>40 percent</b> [1] 66/17</p> <p><b>4000</b> [1] 99/1</p> <p><b>41</b> [7] 139/1 190/22 190/23 190/24 191/10 191/16 255/12</p> <p><b>42</b> [7] 192/12 192/18 192/21 192/23 195/16 234/17 255/13</p> <p><b>43</b> [4] 194/16 195/1 195/7 255/14</p> <p><b>44</b> [9] 197/3 197/13 198/5 199/9 200/21 201/9 201/25 202/3 255/15</p> <p><b>45</b> [7] 139/15 203/21 204/5 204/6 206/5 206/6 255/16</p> <p><b>46</b> [6] 208/21 209/2 209/7 248/1 248/2 255/17</p> <p><b>465</b> [1] 204/3</p> <p><b>470</b> [1] 206/17</p> <p><b>471</b> [1] 206/20</p> <p><b>48</b> [1] 134/21</p> <p><b>49</b> [7] 132/14 132/17 132/19 134/8 134/23 138/3 138/5</p> <p><b>4:40</b> [1] 249/3</p>	<p><b>5</b></p> <p><b>5/25</b> [1] 202/8</p> <p><b>50</b> [16] 57/5 57/6 57/8 57/10 61/19 62/13 63/18 63/24 64/7 64/12 64/20 73/2 75/16 93/2 224/25 225/9</p> <p><b>50-Bitcoin-sized</b> [2] 206/13 208/1</p> <p><b>50-BTC-sized</b> [1] 207/4</p> <p><b>50,001</b> [1] 57/9</p> <p><b>500,000</b> [2] 66/21 66/24</p> <p><b>50988</b> [1] 176/1</p> <p><b>50th</b> [2] 71/9 71/12</p> <p><b>514-3768</b> [1] 1/17</p> <p><b>52</b> [2] 132/7 159/13</p> <p><b>53</b> [3] 131/15 132/4 132/6</p> <p><b>54</b> [1] 131/21</p> <p><b>561</b> [1] 1/17</p> <p><b>56403</b> [1] 198/9</p> <p><b>58</b> [5] 22/20 22/25 23/2 60/16 60/20</p> <p><b>59</b> [1] 131/12</p> <p><b>5th</b> [1] 190/8</p> <hr/> <p><b>6</b></p> <p><b>60</b> [10] 22/19 22/25 60/12 67/8 70/9 71/1 71/2 71/15 93/2 140/5</p> <p><b>60 percent</b> [1] 25/13</p> <p><b>60-computer</b> [1] 78/24</p> <p><b>600s</b> [1] 7/23</p> <p><b>615</b> [4] 8/2 8/3 8/7 8/25</p> <p><b>63</b> [1] 140/17</p> <p><b>63 percent</b> [1] 67/16</p> <p><b>64</b> [1] 80/23</p> <p><b>65 percent</b> [1] 67/7</p> <p><b>68</b> [2] 19/22 57/20</p> <hr/> <p><b>7</b></p> <p><b>70</b> [1] 66/13</p> <p><b>701</b> [1] 1/18</p> <p><b>702</b> [2] 102/18 107/3</p> <p><b>71</b> [1] 141/7</p> <p><b>725</b> [4] 182/14 183/12 183/13 183/17</p> <p><b>75</b> [1] 16/16</p> <p><b>75,000</b> [5] 16/24 25/10 54/2 54/5 58/5</p> <p><b>76,000</b> [1] 16/16</p> <p><b>79344</b> [1] 161/14</p> <hr/> <p><b>8</b></p> <p><b>80</b> [1] 20/10</p> <p><b>80 percent</b> [1] 66/13</p> <p><b>800,000</b> [3] 65/11 65/22 66/24</p> <p><b>800,000-plus</b> [1] 81/8</p> <p><b>80176</b> [1] 3/5</p> <p><b>803</b> [1] 136/8</p> <p><b>820,000</b> [1] 66/9</p> <p><b>8:04:55</b> [1] 138/23</p> <hr/> <p><b>9</b></p> <p><b>91</b> [1] 254/6</p>
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<p><b>9</b></p> <p><b>95 [1]</b> 254/7</p> <p><b>9:04:54 [1]</b> 138/21</p> <hr/> <p><b>A</b></p> <p><b>a.m [6]</b> 68/18 68/23 68/23 132/24 138/17 138/19</p> <p><b>AODA [6]</b> 172/9 172/13 172/23 172/25 174/1 175/4</p> <p><b>ability [2]</b> 75/17 94/25</p> <p><b>able [45]</b> 16/20 16/22 17/10 17/13 19/16 19/20 23/6 23/8 23/16 23/21 24/18 25/10 25/24 26/4 26/14 28/2 32/9 35/9 37/20 37/25 39/1 49/8 49/10 51/4 55/9 75/4 75/7 79/2 86/22 86/23 88/9 89/11 93/15 94/1 95/6 103/23 143/10 143/13 143/21 144/23 145/2 166/19 169/10 186/6 249/16</p> <p><b>above [3]</b> 22/25 237/24 255/21</p> <p><b>above-entitled [1]</b> 255/21</p> <p><b>absence [1]</b> 239/14</p> <p><b>absolutely [4]</b> 5/2 6/24 136/18 247/2</p> <p><b>accept [3]</b> 56/3 56/7 56/7</p> <p><b>accepted [2]</b> 108/11 112/1</p> <p><b>accepting [1]</b> 167/2</p> <p><b>access [37]</b> 13/23 49/3 49/9 51/4 52/24 52/25 54/18 54/21 75/8 79/2 82/9 85/24 86/15 86/17 86/22 86/23 87/2 88/15 91/10 91/13 92/2 92/5 92/13 93/18 94/1 94/4 94/10 97/4 97/13 115/22 141/20 143/3 174/9 185/21 186/6 206/24 207/1</p> <p><b>accessed [1]</b> 141/22</p> <p><b>accommodate [1]</b> 250/21</p> <p><b>accommodates [1]</b> 250/22</p> <p><b>accomplish [1]</b> 24/23</p> <p><b>accomplishes [1]</b> 27/8</p> <p><b>accordance [1]</b> 7/15</p> <p><b>according [13]</b> 27/10 138/5 171/13 172/3 188/18 190/8 233/12 233/14 233/22 234/1 234/11 234/24 235/12</p> <p><b>accordingly [2]</b> 50/23 169/17</p> <p><b>account [5]</b> 9/6 40/6 132/21 132/23 133/8</p> <p><b>accounting [1]</b> 25/9</p>	<p><b>accuracy [1]</b> 51/1</p> <p><b>accurate [9]</b> 51/7 64/25 155/22 157/6 191/4 219/8 219/16 221/21 227/18</p> <p><b>accurately [2]</b> 22/19 155/12</p> <p><b>accusations [1]</b> 102/9</p> <p><b>Acrobat [1]</b> 129/7</p> <p><b>across [4]</b> 13/6 22/6 67/15 208/10</p> <p><b>act [1]</b> 98/25</p> <p><b>actions [1]</b> 71/17</p> <p><b>activities [1]</b> 12/4</p> <p><b>activity [1]</b> 26/19</p> <p><b>actual [5]</b> 32/9 37/24 47/22 48/22 102/16</p> <p><b>actually [77]</b> 9/12 13/20 18/7 20/11 21/22 22/4 22/18 23/24 28/7 32/16 34/22 37/15 38/3 38/25 40/6 43/4 43/12 43/16 47/4 48/23 49/6 50/3 50/5 52/23 55/7 58/16 58/16 58/20 58/21 62/24 69/17 70/17 70/19 72/5 73/16 73/19 73/22 73/23 74/1 76/4 77/25 80/13 80/14 81/20 82/19 82/23 82/24 83/1 83/8 83/9 84/7 90/20 92/16 93/17 94/25 97/2 98/11 107/19 107/24 114/2 114/17 115/1 133/19 151/5 159/24 163/11 164/24 175/2 185/14 203/8 215/7 215/8 217/1 219/4 225/18 232/20 234/15</p> <p><b>add [1]</b> 5/23</p> <p><b>added [6]</b> 132/10 140/10 140/15 141/2 160/21 163/4</p> <p><b>addition [2]</b> 233/17 235/18</p> <p><b>additional [11]</b> 27/13 27/14 36/25 61/13 66/17 67/12 72/19 105/23 155/17 205/25 240/8</p> <p><b>address [79]</b> 17/2 17/7 17/9 18/16 18/23 25/23 25/25 26/2 26/6 26/7 26/14 26/17 26/22 26/24 27/1 54/9 56/17 57/14 57/19 57/22 61/21 63/18 64/12 67/4 72/2 72/10 73/4 73/25 74/6 82/4 82/7 82/11 82/16 82/17 82/19 82/21 83/1 83/16 83/20 84/10 84/13 84/16 84/25 89/7 89/10 89/17 109/10 129/23 130/2 133/7 134/10 134/12 134/13 134/18 134/20 134/21 134/23 136/22 136/25 137/4 138/3 138/5 138/16 139/3</p>	<p>139/9 139/11 139/11 139/13 140/3 147/20 147/23 149/24 160/1 160/5 160/8 163/20 193/5 215/14 232/1</p> <p><b>addressed [2]</b> 206/19 212/15</p> <p><b>addresses [101]</b> 5/15 6/16 7/4 7/14 13/18 13/20 13/25 14/5 14/7 14/10 14/11 15/16 15/24 16/7 16/8 16/13 16/14 16/21 16/23 17/5 17/10 17/11 18/5 19/3 19/8 19/11 19/13 19/21 22/23 23/6 24/18 25/2 25/4 25/8 25/17 26/4 27/4 27/5 27/12 27/12 27/13 27/25 28/2 33/24 34/23 35/7 35/10 35/17 52/24 54/2 54/21 56/21 56/24 57/1 57/2 57/4 57/12 58/15 58/18 59/17 59/21 60/15 61/9 63/23 64/4 64/5 65/8 66/6 67/23 67/24 68/5 68/6 69/12 69/13 69/15 69/17 70/19 81/18 81/25 81/25 82/3 84/19 84/19 84/20 85/11 85/21 86/12 86/14 92/7 185/21 193/2 193/3 193/9 205/16 206/13 207/4 207/5 207/8 208/2 208/9 234/19</p> <p><b>adds [1]</b> 159/7</p> <p><b>adequate [1]</b> 144/17</p> <p><b>admissible [1]</b> 136/10</p> <p><b>admission [1]</b> 136/12</p> <p><b>admit [12]</b> 137/10 137/23 142/9 156/3 167/4 168/7 187/8 188/6 198/4 201/24 204/4 206/5</p> <p><b>admitted [36]</b> 15/2 25/15 27/8 122/15 126/7 127/18 128/13 137/23 146/2 146/8 146/12 151/24 153/3 153/6 156/1 157/11 162/2 167/8 168/12 171/3 171/7 175/16 177/6 179/2 179/3 180/18 181/1 187/13 188/11 190/2 192/21 195/6 198/16 198/19 209/6 238/14</p> <p><b>adopt [1]</b> 151/15</p> <p><b>advice [1]</b> 189/8</p> <p><b>advocated [1]</b> 17/4</p> <p><b>affidavit [1]</b> 208/18</p> <p><b>affirmatively [2]</b> 243/13 244/9</p> <p><b>after [28]</b> 12/13 38/15 38/18 43/14 43/14 44/18 48/14 50/2 50/7 52/5 52/16 59/16 68/23</p>	<p>116/20 117/20 133/10 172/3 191/25 192/3 196/9 205/3 205/6 217/4 232/3 234/25 245/7 245/14 246/16</p> <p><b>afternoon [4]</b> 104/15 117/22 118/5 251/19</p> <p><b>again [60]</b> 19/6 20/24 21/1 22/7 22/9 33/3 43/21 44/2 48/1 53/7 59/1 59/5 76/12 88/8 100/5 102/12 107/12 110/6 111/10 112/4 115/17 125/9 134/8 135/21 139/3 145/23 147/13 148/8 160/21 161/3 163/6 163/7 165/14 168/15 169/4 169/6 169/9 174/11 180/3 180/22 181/13 182/21 189/16 190/13 201/4 209/16 212/21 214/13 215/23 216/9 219/21 220/9 220/11 224/10 225/13 228/19 229/2 229/25 235/3 245/10</p> <p><b>against [2]</b> 102/4 102/9</p> <p><b>ago [7]</b> 7/2 34/5 40/1 79/9 79/9 79/10 79/24</p> <p><b>agree [4]</b> 50/12 98/22 107/4 114/21</p> <p><b>agreed [4]</b> 99/5 99/10 99/20 204/20</p> <p><b>ahead [9]</b> 24/12 87/8 101/6 111/1 111/13 125/16 154/15 197/23 206/5</p> <p><b>aid [1]</b> 210/1</p> <p><b>air [2]</b> 83/10 83/13</p> <p><b>airfare [1]</b> 40/25</p> <p><b>airfares [1]</b> 40/5</p> <p><b>al [2]</b> 1/3 3/6</p> <p><b>algorithm [19]</b> 13/20 16/20 17/8 54/20 68/7 68/9 69/14 69/17 70/14 70/17 77/7 77/21 78/13 91/24 92/11 92/16 93/21 93/22 96/3</p> <p><b>algorithms [4]</b> 77/10 77/25 88/3 88/4</p> <p><b>alleged [1]</b> 190/20</p> <p><b>allegedly [2]</b> 85/19 235/20</p> <p><b>allow [25]</b> 8/24 9/11 21/13 64/1 79/14 85/3 91/18 93/14 94/8 95/3 96/16 104/2 110/25 113/2 113/3 113/11 116/6 128/13 155/14 165/24 166/9 186/24 187/1 205/22 207/20</p> <p><b>allowed [8]</b> 6/1 6/2 106/12 112/11 115/18 135/18 135/25 244/13</p> <p><b>allows [2]</b> 21/9 22/15</p>	<p><b>almost [4]</b> 5/20 95/11 126/24 192/3</p> <p><b>alone [1]</b> 246/17</p> <p><b>along [5]</b> 11/17 65/3 93/11 133/22 133/25</p> <p><b>alpha [3]</b> 235/22 236/4 236/10</p> <p><b>alphas [1]</b> 236/11</p> <p><b>already [18]</b> 36/22 38/21 78/15 85/16 88/2 114/6 115/18 155/8 165/17 166/12 175/15 175/16 179/9 181/6 185/13 197/13 198/18 212/15</p> <p><b>also [54]</b> 7/16 9/4 9/7 11/15 11/24 12/22 17/22 18/17 45/21 55/15 57/8 62/22 67/23 102/11 105/9 111/15 118/24 121/25 132/8 138/19 139/18 140/9 150/6 152/18 155/9 158/14 159/1 176/19 177/16 177/21 177/22 186/22 189/11 193/5 193/16 200/6 200/8 218/21 220/18 220/18 223/9 232/7 232/18 233/10 233/17 234/23 235/10 235/19 236/1 240/10 242/8 243/8 244/8 244/21</p> <p><b>altered [9]</b> 112/3 112/10 113/6 113/15 114/16 184/17 186/22 213/9 213/11</p> <p><b>although [5]</b> 8/25 26/10 28/7 45/9 58/7</p> <p><b>always [5]</b> 60/12 77/3 90/18 90/21 116/24</p> <p><b>am [8]</b> 59/22 65/14 76/19 102/20 109/8 109/10 200/20 250/19</p> <p><b>Amanda [5]</b> 2/13 3/25 30/9 32/24 104/15</p> <p><b>ameliorate [1]</b> 7/14</p> <p><b>among [1]</b> 47/3</p> <p><b>amongst [2]</b> 33/14 99/11</p> <p><b>amount [5]</b> 55/9 64/25 65/1 78/20 95/13</p> <p><b>analysis [33]</b> 6/23 14/4 15/23 16/4 24/23 36/13 56/11 58/20 58/21 61/7 102/23 108/20 119/4 121/15 121/20 150/8 150/11 163/16 179/24 182/3 203/14 221/23 223/12 223/13 223/17 223/19 223/19 223/20 224/2 224/7 224/12 225/11 230/7</p> <p><b>analyze [13]</b> 121/21 127/10 143/17 144/6 148/18 150/4 170/10 183/25 187/20 189/12 194/13 223/11 225/14</p>
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<p><b>A</b>  <b>analyzed [17]</b> 102/25  103/3 103/4 103/7 105/9  127/11 180/3 182/6  209/16 221/15 222/9  222/18 222/24 223/18  225/2 225/18 228/18  <b>analyzing [7]</b> 25/7  120/17 128/5 128/6  170/23 203/6 231/22  <b>Andres [3]</b> 2/19 4/3  250/14  <b>Andrew [3]</b> 2/5 3/15  28/23  <b>anonymous [2]</b> 26/19  119/4  <b>another [19]</b> 4/11 17/15  36/19 55/17 80/18 80/23  136/13 147/2 159/14  168/20 178/21 192/7  218/21 228/13 232/6  234/16 235/8 237/3  249/19  <b>answer [21]</b> 26/23 42/18  42/19 46/12 67/5 79/14  84/21 91/11 95/3 108/21  111/13 145/17 165/24  166/9 166/9 216/12  216/13 229/11 238/17  245/23 245/23  <b>answered [4]</b> 85/7  216/23 216/24 217/9  <b>answers' [1]</b> 84/22  <b>anticipate [1]</b> 156/23  <b>any [146]</b> 5/24 9/14 9/24  9/25 14/23 16/12 16/18  16/21 17/11 17/23 18/5  18/7 18/8 18/16 19/14  19/15 20/20 22/25 25/20  26/13 35/16 44/23 50/25  53/14 60/11 61/3 70/1  76/8 76/21 79/1 79/8  81/17 81/22 81/24 85/17  85/23 86/3 86/5 86/6  86/14 87/23 88/6 90/22  94/15 94/24 96/19 97/19  110/13 112/14 116/3  119/24 120/7 120/7  120/8 121/3 128/10  129/4 129/12 129/20  129/24 130/5 130/6  135/3 135/7 137/12  137/15 139/9 142/7  146/9 148/1 148/24  149/25 150/8 152/1  154/10 157/12 158/11  159/21 161/5 161/8  161/25 162/17 163/14  165/10 166/19 167/6  168/9 171/4 172/12  175/10 177/7 179/24  181/3 182/2 183/5  184/23 185/18 187/10  187/16 188/8 189/9  189/24 191/12 192/19  195/3 196/24 198/6</p>	<p>201/18 201/24 204/9  207/14 208/17 209/4  209/25 214/1 214/11  214/21 214/22 215/2  215/10 216/19 217/1  217/4 221/3 222/10  222/12 223/4 223/19  223/21 225/11 225/11  229/15 234/11 238/2  238/3 238/10 238/22  239/25 240/2 245/6  248/16 248/20 248/23  249/21 250/2 250/3  <b>anybody [7]</b> 113/1 205/8  214/1 218/18 219/19  219/21 220/6  <b>anyone [6]</b> 29/22 35/2  47/13 56/1 124/3 214/22  <b>anything [47]</b> 5/4 5/23  8/13 10/20 22/3 52/1  70/13 85/11 85/15 85/15  87/3 88/1 91/9 93/5  94/23 101/10 111/18  111/21 127/9 140/1  144/12 144/19 149/10  150/4 162/24 163/16  168/16 169/19 170/10  171/10 171/19 172/6  174/17 180/8 181/16  181/16 190/15 199/17  200/15 200/15 205/17  223/5 245/7 246/18  251/10 251/20 252/23  <b>anything's [1]</b> 243/23  <b>anyway [3]</b> 44/6 47/16  115/19  <b>aol.com [1]</b> 1/19  <b>apart [1]</b> 6/21  <b>apologies [1]</b> 233/7  <b>apologize [11]</b> 4/9 15/25  31/19 72/22 82/15 98/1  152/3 205/7 227/15  227/20 247/7  <b>apparently [2]</b> 51/3  165/13  <b>appear [7]</b> 114/16 192/5  210/7 211/15 222/24  237/23 246/19  <b>appearance [2]</b> 115/3  252/3  <b>appearances [3]</b> 1/14  1/21 3/8  <b>appeared [4]</b> 106/7  121/17 159/5 246/6  <b>appears [10]</b> 47/14  106/5 126/24 156/11  159/10 166/4 172/2  172/25 198/2 229/17  <b>applicable [5]</b> 105/23  111/5 111/15 121/25  224/13  <b>application [3]</b> 109/5  196/22 197/7  <b>applications [1]</b> 203/3  <b>applied [9]</b> 5/10 5/16  8/17 16/14 25/3 25/20</p>	<p>26/11 118/14 135/14  <b>apply [1]</b> 27/11  <b>applying [6]</b> 13/25 23/4  25/6 35/10 47/23 58/17  <b>Appologies [1]</b> 202/16  <b>appreciate [5]</b> 93/11  115/8 165/16 252/6  252/17  <b>approach [7]</b> 14/13  120/20 122/12 126/3  127/14 133/14 133/20  <b>appropriate [6]</b> 7/16  7/20 107/1 110/8 251/8  251/12  <b>appropriateness [1]</b>  50/13  <b>approximate [2]</b> 134/19  136/23  <b>approximately [5]</b> 51/16  59/17 70/9 71/2 246/18  <b>April [2]</b> 167/2 171/16  <b>April 2013 [2]</b> 167/2  171/16  <b>aren't [4]</b> 15/17 85/11  85/21 236/16  <b>Arguable [1]</b> 56/24  <b>argue [8]</b> 5/24 116/9  207/18 207/19 207/23  229/10 246/11 250/2  <b>argument [7]</b> 116/8  116/10 249/9 249/9  251/3 251/16 253/3  <b>argumentative [5]</b>  207/17 216/17 224/18  244/5 245/22  <b>arises [1]</b> 235/3  <b>Armonk [1]</b> 2/9  <b>around [9]</b> 20/20 22/4  25/13 38/12 47/15 61/15  94/23 216/25 246/19  <b>arrange [1]</b> 189/5  <b>arrangements [1]</b> 41/16  <b>arranges [1]</b> 42/2  <b>arrive [1]</b> 230/10  <b>arrived [1]</b> 60/11  <b>articulated [1]</b> 181/7  <b>artifacts [2]</b> 105/16  120/16  <b>ascertain [1]</b> 35/16  <b>aside [3]</b> 29/15 127/9  147/12  <b>ask [32]</b> 8/1 37/2 43/4  51/10 53/7 55/20 63/16  67/4 72/23 87/12 103/10  109/21 110/12 110/16  128/17 135/16 152/1  155/16 213/7 231/2  231/2 231/10 232/25  233/2 234/15 235/21  237/3 240/17 241/9  242/9 244/11 244/17  <b>asked [32]</b> 7/13 13/12  13/13 13/17 13/24 24/17  27/3 27/10 30/8 30/10  35/15 40/7 45/4 69/12  73/10 79/13 79/13 79/23</p>	<p>86/13 88/6 89/6 121/9  121/11 164/20 216/23  223/6 233/10 237/1  239/6 239/10 242/10  251/13  <b>asking [24]</b> 30/5 37/3  88/8 92/9 92/9 92/10  92/13 92/14 103/22  110/6 133/20 164/22  207/13 210/21 215/7  224/3 224/4 224/14  224/16 225/1 227/20  228/21 244/19 247/14  <b>aspects [1]</b> 182/5  <b>asserted [2]</b> 135/9 155/1  <b>assertion [6]</b> 53/1 53/2  56/3 56/7 81/4 85/16  <b>asserts [1]</b> 16/9  <b>assess [1]</b> 109/8  <b>assign [2]</b> 93/2 140/22  <b>assigned [8]</b> 58/12 72/6  72/6 73/4 73/9 73/14  74/5 93/3  <b>assigns [3]</b> 73/8 73/13  76/18  <b>assist [2]</b> 109/4 109/13  <b>assistance [1]</b> 35/16  <b>associate [2]</b> 65/10  146/22  <b>associated [42]</b> 22/24  40/9 77/4 89/11 111/3  127/11 128/24 129/18  129/19 131/8 131/19  134/10 138/3 138/6  139/10 139/18 141/18  142/16 150/1 157/3  157/4 158/18 160/1  162/5 163/13 167/12  167/21 172/13 176/7  177/21 181/17 184/4  188/15 190/5 190/25  195/9 202/3 202/9  202/10 203/16 219/14  243/6  <b>association [1]</b> 33/8  <b>assorted [1]</b> 203/4  <b>assume [3]</b> 61/18 62/9  165/1  <b>assumed [1]</b> 23/22  <b>assumes [1]</b> 239/3  <b>assumption [3]</b> 45/1  67/14 81/5  <b>ATO [1]</b> 240/3  <b>attached [3]</b> 26/21  112/14 143/9  <b>attachment [3]</b> 143/11  170/2 248/7  <b>attachments [23]</b> 143/6  143/7 143/8 143/10  143/13 144/3 169/8  169/10 169/13 169/14  169/15 169/20 169/21  169/22 169/24 169/25  170/1 247/20 248/3  248/4 248/10 248/12  248/15</p>	<p><b>attempt [4]</b> 7/13 13/24  20/22 74/21  <b>attempted [1]</b> 22/21  <b>attempting [1]</b> 72/17  <b>attend [1]</b> 6/2  <b>attention [1]</b> 206/15  <b>Attorney's [1]</b> 120/12  <b>attribute [3]</b> 131/15  146/20 147/3  <b>attributes [1]</b> 147/7  <b>audience [1]</b> 9/21  <b>August [11]</b> 1/8 16/12  27/6 51/24 52/1 52/5  52/16 70/25 128/25  148/11 255/22  <b>August 2010 [2]</b> 52/5  52/16  <b>August 21 [2]</b> 52/1  70/25  <b>August 21st [1]</b> 27/6  <b>August 23rd [2]</b> 128/25  148/11  <b>Australia [4]</b> 29/9 47/3  129/19 138/6  <b>authentic [1]</b> 102/22  <b>authentic [23]</b> 104/25  105/8 111/20 121/13  121/18 144/10 163/25  164/6 164/10 166/16  171/20 175/7 178/15  184/18 186/14 209/10  209/12 209/15 210/13  210/25 211/1 211/16  239/6  <b>authenticated [17]</b>  107/19 108/7 109/17  132/22 132/25 135/7  178/14 178/18 178/19  179/6 197/23 210/23  220/22 221/14 226/19  226/22 230/24  <b>authenticity [17]</b> 6/14  102/23 114/25 115/4  122/10 122/23 127/10  164/9 165/9 165/11  175/23 199/18 199/20  199/22 211/6 211/15  233/11  <b>authority [3]</b> 136/12  137/8 155/2  <b>automated [4]</b> 93/1 93/6  93/13 93/14  <b>automatically [3]</b> 92/11  154/21 241/21  <b>available [23]</b> 24/24  27/4 61/3 85/21 87/16  88/16 88/17 88/21 88/23  96/8 105/17 111/16  134/18 199/25 200/1  200/17 215/24 216/1  216/9 236/11 239/18  242/23 250/14  <b>avoid [1]</b> 14/9  <b>avoided [1]</b> 44/25  <b>awarded [1]</b> 76/17  <b>aware [12]</b> 80/10 81/17</p>
---	---	---	---	--

<p><b>A</b></p> <p><b>aware...</b> [10] 81/20 86/6 87/21 122/22 161/4 161/8 209/9 210/22 211/11 220/21</p> <p><b>away</b> [2] 48/24 192/1</p> <hr/> <p><b>B</b></p> <p><b>baby</b> [2] 249/21 252/19</p> <p><b>bachelor</b> [1] 118/22</p> <p><b>back</b> [63] 4/17 11/2 12/14 22/6 34/21 34/24 36/5 39/1 40/7 41/5 41/11 41/13 41/14 43/3 43/18 43/19 43/25 44/6 47/3 48/15 48/17 50/7 53/24 56/6 60/15 65/19 68/19 69/1 69/2 76/15 77/13 84/1 84/23 93/4 93/15 98/9 114/18 116/20 117/6 117/24 124/23 125/4 138/7 138/9 139/9 139/14 142/13 143/5 149/12 151/10 169/18 172/18 173/19 178/17 183/11 188/25 190/13 193/20 218/13 237/10 237/14 242/8 250/2</p> <p><b>backdate</b> [1] 174/25</p> <p><b>background</b> [2] 118/21 135/16</p> <p><b>backup</b> [2] 193/17 193/23</p> <p><b>backups</b> [3] 193/16 193/25 206/25</p> <p><b>backwards</b> [2] 77/17 85/1</p> <p><b>bad</b> [3] 42/1 47/21 252/9</p> <p><b>ballpark</b> [1] 62/3</p> <p><b>barbecue</b> [1] 46/25</p> <p><b>based</b> [31] 13/10 15/14 17/13 25/17 64/1 85/20 90/23 94/14 105/24 107/25 115/5 121/14 155/5 155/19 156/24 164/14 165/11 166/5 177/22 181/6 186/1 212/1 212/25 215/23 217/3 217/6 239/17 242/11 243/3 248/20 248/23</p> <p><b>basically</b> [4] 48/3 49/22 73/17 85/10</p> <p><b>basis</b> [10] 19/16 42/16 78/25 105/2 106/21 210/19 228/4 234/11 235/16 239/16</p> <p><b>batch</b> [1] 88/15</p> <p><b>Bates</b> [37] 122/25 123/7 123/11 123/16 123/19 125/3 127/1 161/14 167/5 172/25 173/20 176/1 187/9 187/21 188/1 189/11 189/17 192/18 194/18 197/4</p>	<p>198/9 198/10 198/18 204/2 204/3 206/17 206/20 208/24 209/1 218/8 226/19 226/23 226/24 228/12 230/18 231/4 237/15</p> <p><b>Baylor</b> [1] 118/23</p> <p><b>BB</b> [1] 1/2</p> <p><b>Beach</b> [2] 1/7 1/18</p> <p><b>bear</b> [2] 151/22 220/17</p> <p><b>bearing</b> [5] 122/25 167/5 187/9 192/18 215/15</p> <p><b>became</b> [3] 12/9 39/25 204/19</p> <p><b>because</b> [64] 6/8 7/6 8/14 18/8 22/3 23/2 23/16 23/23 24/12 28/6 34/24 44/6 45/18 48/24 53/7 53/18 54/23 55/6 56/14 57/24 61/11 61/12 63/4 69/11 70/19 77/5 80/11 81/12 83/9 84/22 89/7 92/21 106/20 107/16 115/18 116/25 136/8 144/18 149/20 153/6 155/13 165/19 173/3 175/6 177/17 197/18 198/25 203/13 221/21 222/21 225/11 225/14 226/6 228/16 231/12 231/25 233/12 233/22 234/24 242/15 242/22 248/6 249/14 249/21</p> <p><b>beeps</b> [1] 117/16</p> <p><b>before</b> [61] 1/11 9/12 29/2 29/18 31/2 32/5 32/14 32/15 32/17 34/8 34/14 37/20 38/10 38/19 40/16 45/2 49/9 59/10 73/17 73/25 74/3 74/8 74/9 74/11 76/12 90/6 96/2 96/4 96/6 102/7 102/14 104/20 104/21 107/24 118/5 118/15 121/19 125/6 130/16 139/20 144/14 150/11 150/13 152/1 158/9 161/21 164/7 180/22 185/13 194/25 197/15 197/20 200/18 230/9 244/3 244/10 245/7 245/7 245/18 247/7 247/7</p> <p><b>beforehand</b> [1] 73/21</p> <p><b>began</b> [3] 12/12 24/24 66/5</p> <p><b>beggars</b> [1] 95/12</p> <p><b>begin</b> [3] 48/23 77/5 118/5</p> <p><b>beginning</b> [5] 16/10 39/8 51/13 193/8 250/4</p> <p><b>begins</b> [1] 189/1</p> <p><b>behavior</b> [1] 174/22</p> <p><b>behind</b> [2] 228/4 231/21</p>	<p><b>being</b> [31] 4/10 6/10 6/13 9/24 11/11 24/15 41/15 51/4 100/9 102/8 102/9 107/17 108/5 108/8 131/3 131/5 135/8 137/19 143/2 151/3 154/20 154/25 162/25 163/17 194/6 198/8 199/25 204/17 205/10 215/16 234/5</p> <p><b>belief</b> [1] 95/12</p> <p><b>believe</b> [67] 8/2 8/7 9/8 13/11 14/18 16/11 17/15 22/25 23/18 25/20 27/7 27/24 29/15 29/19 31/11 31/17 32/1 38/4 38/19 40/5 40/6 42/7 43/10 49/1 54/16 54/18 65/4 80/16 91/6 91/10 93/6 94/15 101/24 102/4 115/5 116/3 123/10 130/15 135/24 153/20 157/5 158/19 172/19 177/15 177/20 178/22 179/2 199/3 201/16 206/16 207/2 216/16 218/7 219/8 221/20 231/24 232/15 233/11 234/23 235/10 239/21 240/19 242/21 242/25 245/13 246/4 251/12</p> <p><b>believed</b> [1] 46/18</p> <p><b>believes</b> [2] 113/2 113/4</p> <p><b>belong</b> [5] 14/10 14/12 28/3 205/15 205/15</p> <p><b>belonging</b> [2] 14/7 120/14</p> <p><b>below</b> [1] 202/7</p> <p><b>bench</b> [1] 99/14</p> <p><b>benefit</b> [1] 252/12</p> <p><b>Berkeley</b> [1] 118/19</p> <p><b>besides</b> [2] 150/3 184/21</p> <p><b>best</b> [6] 12/25 17/6 35/13 49/5 150/21 223/24</p> <p><b>beta</b> [3] 235/25 236/4 236/10</p> <p><b>betas</b> [1] 236/11</p> <p><b>better</b> [5] 65/25 66/2 88/6 239/11 249/15</p> <p><b>between</b> [16] 16/10 16/16 38/8 44/5 44/8 60/11 60/16 60/20 64/4 70/25 112/23 120/18 186/18 187/6 203/24 229/21</p> <p><b>beyond</b> [9] 5/18 52/1 94/6 94/18 165/11 165/11 171/19 204/17 204/18</p> <p><b>big</b> [3] 41/15 133/24 252/19</p> <p><b>biggest</b> [3] 57/24 58/4 58/7</p> <p><b>bill</b> [2] 241/3 241/6</p> <p><b>billion</b> [3] 22/16 81/14</p>	<p>81/18</p> <p><b>bingo</b> [2] 71/21 72/11</p> <p><b>BIP32</b> [1] 70/21</p> <p><b>bit</b> [12] 20/13 22/15 30/14 47/22 51/9 54/22 72/18 85/6 88/15 101/12 119/19 125/4</p> <p><b>Bitcoin</b> [189] 5/15 5/20 6/16 8/17 12/2 12/2 12/5 12/7 12/8 12/9 13/18 15/24 16/7 16/8 16/11 16/21 16/23 17/5 17/9 18/5 18/13 18/15 18/16 18/23 19/9 19/12 19/21 19/25 20/5 20/6 20/12 20/13 21/23 22/23 22/24 24/25 25/1 25/2 25/17 25/23 25/25 26/2 26/5 26/14 26/16 26/17 26/18 26/20 26/21 26/24 26/25 27/25 28/8 33/8 33/9 33/24 34/23 35/7 35/17 47/13 51/18 51/20 52/16 52/24 53/22 54/8 54/11 54/14 54/18 55/3 55/5 55/9 55/13 55/16 55/21 55/23 55/24 56/4 56/18 56/21 56/22 56/23 57/1 57/5 57/6 57/6 57/8 58/17 58/18 61/3 61/17 61/21 61/23 63/6 63/18 63/23 63/24 64/2 64/4 64/5 64/6 64/7 64/9 64/11 64/12 64/20 64/21 64/25 65/1 65/7 65/11 65/17 65/22 65/23 66/10 67/24 69/23 70/2 70/8 70/18 71/1 71/4 73/2 73/2 74/5 74/16 74/23 75/4 75/7 75/16 75/20 76/8 76/18 76/22 78/7 78/11 78/17 78/21 78/23 79/1 79/5 80/14 81/8 81/18 82/12 82/18 82/20 82/22 83/1 83/4 83/12 83/23 83/24 84/4 84/16 84/23 84/25 85/3 85/14 86/3 86/5 86/6 86/7 86/10 87/1 87/16 88/7 88/15 89/7 89/11 89/25 90/5 90/15 91/24 96/5 96/7 96/8 120/16 193/2 193/3 193/4 193/9 200/5 206/13 208/1 208/1 208/7 208/10 208/15</p> <p><b>Bitcoin-related</b> [1] 120/16</p> <p><b>Bitcoins</b> [10] 16/19 28/9 81/13 83/10 85/16 86/22 186/6 205/3 205/15 206/11</p> <p><b>Bitm</b> [1] 245/6</p> <p><b>Bitmessage</b> [26] 98/15 196/19 196/22 197/7 199/10 199/12 199/14 199/24 200/1 200/4</p>	<p>200/7 200/17 201/6 202/12 202/19 203/3 203/11 203/17 203/17 242/18 242/23 243/6 243/7 243/14 245/3 245/14</p> <p><b>Bitmessages</b> [4] 196/24 242/22 243/10 245/6</p> <p><b>bitmessagev0.1.0.exe</b> [3] 200/24 202/12 202/18</p> <p><b>black</b> [2] 73/1 197/18</p> <p><b>block</b> [51] 16/11 16/11 17/12 20/5 20/6 20/9 20/10 21/19 21/23 21/25 22/1 22/22 24/25 25/7 25/24 25/25 26/1 26/20 28/6 51/18 51/19 56/5 57/6 64/6 64/19 64/21 71/12 71/18 71/19 71/23 72/4 72/12 72/16 72/23 73/17 73/17 73/17 73/23 74/4 74/18 74/20 76/17 80/4 80/7 80/14 80/15 80/17 80/18 80/19 85/3 208/10</p> <p><b>block's</b> [1] 74/1</p> <p><b>blockchain.info</b> [1] 193/6</p> <p><b>blocks</b> [5] 54/18 66/1 66/6 71/4 71/7</p> <p><b>blue</b> [1] 159/23</p> <p><b>Bogotá</b> [16] 31/16 32/16 32/21 33/9 34/15 35/23 36/21 38/11 40/18 41/21 42/8 42/10 43/9 43/10 44/7 44/8</p> <p><b>Boies</b> [7] 2/2 2/5 2/8 2/11 28/24 252/2 252/13</p> <p><b>bold</b> [1] 210/6</p> <p><b>Bond</b> [1] 193/11</p> <p><b>books</b> [1] 42/3</p> <p><b>boring</b> [1] 44/21</p> <p><b>born</b> [1] 29/8</p> <p><b>boss</b> [3] 45/15 45/16 45/18</p> <p><b>both</b> [12] 17/6 54/23 77/22 79/2 98/20 102/3 131/6 146/19 146/19 194/1 245/11 252/7 132/13 159/18 169/4 170/7 172/25 173/5 173/11 173/13 187/21 188/1 189/11 189/17 190/14 204/1 204/2 204/3 206/21 208/24 231/3 241/20</p> <p><b>bought</b> [2] 55/16 86/12</p> <p><b>Boulevard</b> [4] 2/14 2/17 2/20 2/23</p> <p><b>bounce</b> [1] 139/8</p> <p><b>box</b> [16] 158/20 158/22 158/24 158/25 159/13 159/16 159/18 160/12 160/13 160/15 160/16 160/19 226/2 226/18</p>
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<p><b>B</b></p> <p><b>box...</b> [2] 226/21 231/3  <b>brand</b> [1] 83/4  <b>break</b> [7] 20/3 32/12                  72/23 98/7 122/2 196/1                  196/2  <b>breaking</b> [1] 68/15  <b>Brenner</b> [17] 2/5 3/15                  3/17 28/23 65/21 68/14                  72/7 72/11 74/12 78/3                  86/1 87/13 90/22 98/4                  252/16 254/5 254/7  <b>Brenner's</b> [1] 69/1  <b>brief</b> [2] 91/1 95/17  <b>briefly</b> [7] 34/16 113/20                  121/14 130/15 150/12                  173/20 211/12  <b>Brightline</b> [1] 250/22  <b>bring</b> [1] 226/8  <b>broached</b> [1] 30/19  <b>broad</b> [1] 87/17  <b>broadcasting</b> [1] 9/25  <b>Broadly</b> [1] 12/18  <b>broke</b> [1] 207/3  <b>brought</b> [2] 30/22 58/5  <b>BRUCE</b> [1] 1/11  <b>BTC</b> [1] 207/4  <b>build</b> [2] 12/5 148/10  <b>building</b> [3] 9/25 10/3                  61/25  <b>bulk</b> [2] 48/23 246/19  <b>bullet</b> [1] 173/1  <b>bullets</b> [2] 173/14                  173/15  <b>bunch</b> [1] 123/6  <b>business</b> [10] 41/22                  42/10 42/11 42/13 42/13                  42/25 43/24 151/12                  151/17 155/6  <b>busy</b> [1] 79/20  <b>byte</b> [10] 19/25 20/18                  21/7 21/8 21/9 22/11                  22/14 22/25 23/3 23/20  <b>bytes</b> [2] 20/11 22/17</p>	<p>40/16 42/4 46/15 47/22                  54/1 60/15 65/16 66/12                  66/13 66/15 67/15 98/7                  139/4 140/3 150/20                  233/14 233/15  <b>can't</b> [17] 17/18 30/12                  47/6 62/1 82/5 82/7 85/1                  85/4 85/20 85/20 85/22                  86/14 113/9 183/16                  225/25 231/11 236/7  <b>candidate</b> [6] 25/1 72/16                  73/16 74/15 74/17 74/18  <b>candidates</b> [1] 19/15  <b>cannot</b> [4] 26/23 206/24                  207/1 207/1  <b>capital</b> [1] 159/15  <b>capitalization</b> [1] 81/10  <b>card</b> [2] 41/2 41/3  <b>careful</b> [1] 193/15  <b>carefully</b> [2] 24/13                  114/2  <b>carried</b> [1] 50/6  <b>case</b> [44] 1/2 3/5 4/11                  5/25 6/3 13/10 21/14                  26/10 28/25 33/15 39/10                  44/4 46/9 46/10 47/10                  74/2 75/9 81/21 81/23                  84/3 99/1 110/22 111/9                  118/10 139/12 148/10                  150/17 151/5 159/15                  163/8 185/18 185/24                  193/17 200/9 213/25                  223/1 224/7 224/22                  225/7 232/25 236/19                  251/9 252/1 252/16  <b>cases</b> [3] 21/12 84/3                  151/5  <b>catching</b> [1] 143/20  <b>categories</b> [1] 102/25  <b>cause</b> [1] 4/15  <b>CEO</b> [3] 45/9 45/16                  45/18  <b>certain</b> [17] 6/14 13/19                  13/25 24/16 35/8 35/12                  58/11 58/12 68/8 102/24                  103/6 103/8 104/24                  105/3 106/3 106/4                  121/11  <b>certainly</b> [7] 24/19                  100/11 101/17 137/22                  215/19 225/23 251/10  <b>certainty</b> [1] 212/1  <b>CERTIFICATE</b> [1]                  255/19  <b>Certified</b> [1] 255/20  <b>certify</b> [1] 255/20  <b>cetera</b> [4] 42/3 78/17                  88/21 222/25  <b>chain</b> [14] 17/12 24/25                  25/7 26/20 70/17 72/21                  77/6 77/7 77/8 85/4                  93/23 93/24 94/2 208/10  <b>chair</b> [1] 11/3  <b>challenge</b> [8] 100/8                  100/24 101/7 102/1                  112/16 112/21 115/7</p>	<p>116/13  <b>challenges</b> [1] 106/15  <b>chance</b> [10] 29/2 67/7                  67/9 67/9 67/17 85/9                  158/10 209/24 229/10                  249/11  <b>change</b> [8] 20/24 47/6                  68/14 141/4 227/12                  227/23 228/11 228/13  <b>changed</b> [16] 47/7 67/18                  106/9 112/10 126/25                  140/24 159/6 160/3                  160/5 160/23 160/24                  160/25 217/12 227/12                  227/14 227/25  <b>changes</b> [11] 107/20                  107/21 107/23 200/6                  209/20 221/11 223/5                  227/17 228/16 230/8                  230/8  <b>character</b> [1] 159/12  <b>characteristic</b> [11]                  18/12 19/8 19/10 19/11                  20/1 58/8 58/11 59/15                  59/21 60/2 60/5  <b>characteristics</b> [2] 35/9                  35/10  <b>characterization</b> [3]                  110/24 111/10 112/4  <b>characterizations</b> [1]                  244/14  <b>characterize</b> [2] 46/24                  91/5  <b>characters</b> [3] 123/6                  192/25 203/14  <b>check</b> [10] 18/8 20/14                  20/15 23/24 39/1 60/14                  85/13 85/23 85/25 194/6  <b>checking</b> [2] 17/11                  97/11  <b>chief</b> [6] 8/20 12/16                  12/21 39/8 39/14 45/7  <b>child</b> [1] 93/24  <b>children</b> [2] 94/2 250/5  <b>chronologically</b> [1]                  132/15  <b>circle</b> [1] 249/4  <b>circulation</b> [1] 236/12  <b>circumstances</b> [7]                  107/23 214/24 215/2                  215/9 216/5 216/20                  220/12  <b>circumstantial</b> [1] 47/15  <b>CIV</b> [1] 1/2  <b>civil</b> [1] 102/3  <b>claim</b> [4] 9/3 41/11                  41/13 41/14  <b>claimed</b> [1] 46/16  <b>claims</b> [2] 81/9 81/19  <b>clarification</b> [8] 37/1                  48/16 48/18 76/13                  115/12 176/12 178/23                  227/22  <b>clarify</b> [4] 68/3 92/8                  215/25 248/19  <b>class</b> [2] 43/8 43/24</p>	<p><b>classic</b> [2] 135/10 135/18  <b>clean</b> [1] 93/9  <b>clear</b> [21] 62/12 84/9                  91/8 102/15 112/22                  186/11 199/8 201/22                  204/6 213/4 213/5 214/4                  218/15 222/5 222/22                  228/6 229/2 229/6                  229/11 230/17 242/25  <b>clearance</b> [2] 9/22 10/3  <b>clearer</b> [2] 91/22 242/20  <b>clearly</b> [3] 18/9 115/24                  242/19  <b>Clematis</b> [1] 1/18  <b>CLI</b> [1] 88/15  <b>clickable</b> [1] 159/24  <b>client</b> [8] 7/13 102/4                  102/9 114/24 115/2                  140/16 203/17 241/7  <b>client's</b> [1] 140/17  <b>clock</b> [2] 234/9 235/3  <b>close</b> [3] 11/1 11/3 13/24  <b>closer</b> [2] 226/8 226/9  <b>closing</b> [1] 249/9  <b>coach</b> [2] 43/8 43/10  <b>code</b> [24] 24/25 25/6                  47/24 47/25 49/15 49/17                  49/19 49/22 50/4 50/10                  59/6 59/7 88/16 103/5                  153/12 153/15 155/23                  157/7 157/19 157/21                  159/14 200/6 203/6                  228/7  <b>coding</b> [4] 21/12 49/1                  49/4 49/10  <b>coin</b> [2] 78/25 78/25  <b>Coinbase</b> [10] 18/13                  18/16 25/2 72/3 73/20                  73/21 74/18 83/7 84/2                  92/22  <b>CoinExchange</b> [2] 167/3                  174/3  <b>coins</b> [4] 64/5 64/6 78/16                  93/17  <b>colleague</b> [2] 6/8 7/13  <b>colleagues</b> [2] 8/19                  94/14  <b>collected</b> [3] 120/14                  123/1 123/3  <b>collection</b> [4] 19/2 56/22                  56/23 84/19  <b>Colombia</b> [1] 31/17  <b>colon</b> [1] 143/6  <b>color</b> [4] 197/19 198/3                  198/25 199/10  <b>colored</b> [1] 242/20  <b>combination</b> [1] 21/9  <b>combinations</b> [1] 22/16  <b>combined</b> [1] 228/6  <b>comes</b> [2] 12/20 232/20  <b>comfortable</b> [3] 29/17                  113/18 226/14  <b>coming</b> [4] 5/12 43/9                  44/3 239/6  <b>commercial</b> [3] 40/21                  40/22 43/21</p>	<p><b>commit</b> [2] 200/5 243/6  <b>common</b> [10] 17/22                  17/22 47/2 55/22 55/24                  56/5 77/6 146/21 152/13                  182/23  <b>commonly</b> [10] 17/20                  22/14 128/4 128/6 137/2                  170/25 171/1 182/25                  191/7 203/2  <b>communicated</b> [1] 245/3  <b>communication</b> [2]                  71/16 119/4  <b>communicator</b> [1] 13/1  <b>community</b> [1] 112/1  <b>companies</b> [3] 151/3                  151/9 151/13  <b>company</b> [12] 12/1 39/5                  39/16 39/18 39/23 41/4                  41/6 42/2 136/21 163/14                  189/5 208/22  <b>compare</b> [2] 124/19                  144/17  <b>compared</b> [2] 105/16                  202/21  <b>comparison</b> [1] 157/21  <b>compel</b> [1] 4/15  <b>competent</b> [1] 207/21  <b>competently</b> [1] 108/23  <b>compilation</b> [2] 148/10                  198/12  <b>compile</b> [2] 49/25 50/2  <b>compiled</b> [3] 129/3                  203/7 203/9  <b>complete</b> [3] 48/3 51/7                  117/12  <b>completed</b> [1] 4/16  <b>completely</b> [2] 20/25                  207/15  <b>component</b> [2] 88/14                  113/17  <b>components</b> [1] 12/5  <b>compressed</b> [1] 84/17  <b>comprised</b> [2] 150/12                  152/12  <b>comprises</b> [1] 152/13  <b>compute</b> [1] 124/17  <b>computed</b> [2] 202/12                  202/19  <b>computer</b> [38] 49/11                  78/24 106/18 118/22                  118/23 118/25 119/22                  131/4 132/20 133/12                  134/10 134/14 140/10                  140/15 140/17 140/21                  140/23 141/4 143/1                  151/2 151/7 151/8                  154/21 171/13 184/16                  188/18 190/8 215/15                  233/14 233/23 234/1                  234/5 234/6 234/9                  234/12 234/24 235/12                  240/15  <b>concern</b> [1] 114/22  <b>concerned</b> [1] 79/23  <b>concerning</b> [5] 110/2                  176/3 178/10 179/22</p>
--	--	--	--	---

<p><b>C</b></p> <p><b>concerning...</b> [1] 216/19</p> <p><b>conclude</b> [2] 228/16 245/5</p> <p><b>concluded</b> [4] 221/2 222/14 245/16 253/6</p> <p><b>conclusion</b> [12] 105/7 107/24 108/9 113/18 144/14 221/16 224/8 228/8 230/24 232/13 239/7 239/16</p> <p><b>conclusions</b> [4] 212/25 213/6 222/22 232/18</p> <p><b>conditionally</b> [6] 127/18 146/2 151/24 153/3 180/18 181/1</p> <p><b>conduct</b> [2] 15/23 16/3</p> <p><b>confer</b> [2] 89/3 247/1</p> <p><b>conference</b> [2] 31/17 33/9</p> <p><b>confident</b> [3] 25/16 85/24 206/4</p> <p><b>confirm</b> [3] 50/25 51/5 215/25</p> <p><b>confirmed</b> [4] 72/12 72/24 202/23 202/24</p> <p><b>conflicts</b> [1] 148/25</p> <p><b>confronted</b> [1] 115/21</p> <p><b>confused</b> [2] 85/8 248/7</p> <p><b>confusing</b> [3] 76/11 84/16 91/7</p> <p><b>connect</b> [2] 100/13 101/23</p> <p><b>connected</b> [3] 48/25 101/23 227/3</p> <p><b>connection</b> [6] 30/8 69/20 218/14 229/21 243/5 243/12</p> <p><b>consequences</b> [1] 207/19</p> <p><b>consider</b> [19] 24/13 42/13 45/17 45/21 45/22 95/8 107/6 109/10 109/21 231/19 238/21 238/24 239/7 239/13 243/12 243/16 244/8 244/21 245/2</p> <p><b>considerable</b> [1] 46/2</p> <p><b>considered</b> [2] 42/24 154/24</p> <p><b>consistent</b> [11] 139/22 193/4 207/8 207/15 207/25 208/9 215/13 215/16 219/23 220/2 232/9</p> <p><b>constant</b> [1] 48/9</p> <p><b>constantly</b> [1] 20/13</p> <p><b>construct</b> [1] 92/22</p> <p><b>constructed</b> [2] 18/13 19/12</p> <p><b>consulting</b> [3] 118/19 120/10 120/10</p> <p><b>contain</b> [5] 27/11 83/1 84/1 85/4 131/2</p> <p><b>contained</b> [45] 20/8 63/18 63/24 65/16 103/5 105/11 111/6 125/2</p>	<p>128/19 130/21 132/18 136/9 151/2 151/8 153/12 155/22 157/7 163/19 166/20 168/16 170/24 172/3 179/9 180/5 180/10 180/17 181/12 182/3 182/20 183/13 184/1 184/9 184/14 186/6 189/18 190/15 201/23 206/12 213/19 215/12 215/16 219/22 223/8 227/18 248/10</p> <p><b>contains</b> [24] 20/7 26/1 26/2 27/5 27/12 27/13 27/15 27/25 82/22 84/6 88/3 97/13 128/25 130/24 131/1 140/19 148/10 149/2 149/9 149/24 163/4 169/23 182/14 213/18</p> <p><b>contempt</b> [1] 102/4</p> <p><b>content</b> [5] 37/16 126/23 150/6 159/8 241/1</p> <p><b>contents</b> [9] 105/9 111/4 121/24 127/12 160/2 180/3 209/16 224/11 228/7</p> <p><b>context</b> [4] 111/15 207/16 211/7 213/17</p> <p><b>continuation</b> [2] 4/14 149/18</p> <p><b>continue</b> [4] 151/19 152/7 252/2 252/14</p> <p><b>continues</b> [2] 51/20 206/21</p> <p><b>continuing</b> [1] 252/1</p> <p><b>continuous</b> [1] 48/5</p> <p><b>contract</b> [2] 12/14 39/22</p> <p><b>contractor</b> [1] 39/19</p> <p><b>contradict</b> [2] 205/10 205/12</p> <p><b>control</b> [1] 236/10</p> <p><b>conversation</b> [11] 30/11 30/15 30/18 30/25 32/13 46/25 48/3 48/7 48/13 48/15 233/20</p> <p><b>conversations</b> [5] 36/2 36/25 48/20 94/22 94/24</p> <p><b>convert</b> [4] 24/2 131/25 163/10 232/2</p> <p><b>converted</b> [3] 70/18 149/19 232/12</p> <p><b>converts</b> [1] 232/1</p> <p><b>coordinate</b> [1] 71/17</p> <p><b>copied</b> [3] 62/25 232/19 234/6</p> <p><b>copies</b> [4] 193/22 222/25 223/10 224/5</p> <p><b>copy</b> [8] 13/21 14/17 14/17 14/18 14/19 120/25 178/15 222/2</p> <p><b>copy/pasting</b> [1] 222/2</p> <p><b>copyright</b> [1] 181/18</p> <p><b>copyrighted</b> [4] 181/19 181/21 181/24 182/1</p>	<p><b>Coral</b> [3] 2/15 2/18 2/21</p> <p><b>cordial</b> [1] 252/14</p> <p><b>corner</b> [1] 217/19</p> <p><b>corporate</b> [1] 193/11</p> <p><b>Corporation</b> [4] 119/8 119/13 181/25 182/1</p> <p><b>correct</b> [249] 10/21 11/9 18/24 22/10 24/7 24/8 24/10 27/1 27/2 29/3 29/4 29/6 30/4 30/6 30/16 30/17 31/4 31/10 33/13 33/16 34/12 34/23 36/7 36/14 37/22 39/3 39/4 39/6 39/12 39/23 40/10 40/13 40/19 41/16 42/9 43/1 44/3 45/13 45/19 45/20 45/22 45/24 46/3 46/8 46/13 46/16 46/23 47/9 47/23 47/24 49/12 49/20 49/23 50/1 50/14 50/19 50/20 51/1 52/1 52/6 52/13 52/14 52/20 53/6 53/10 53/15 53/19 53/22 53/23 54/3 54/9 55/6 55/7 55/14 55/18 55/19 56/11 57/1 57/12 57/17 58/5 58/9 58/12 58/15 58/22 58/23 59/3 59/6 59/19 60/22 61/2 61/24 62/18 62/22 63/2 64/12 64/18 65/7 65/8 65/12 65/13 66/7 67/6 67/17 67/19 67/20 69/23 70/5 71/1 71/5 73/2 73/6 73/18 74/6 74/7 74/16 74/24 74/25 75/21 76/9 78/8 78/11 78/21 78/22 78/24 79/2 79/6 79/7 79/24 80/2 80/5 80/6 85/11 89/8 92/24 94/5 96/22 97/5 102/20 104/18 104/21 104/22 105/1 105/5 105/21 106/9 107/10 113/7 116/1 123/13 123/14 125/23 126/2 132/6 141/6 142/22 144/25 148/14 149/21 150/23 151/14 154/3 154/5 154/6 159/18 160/10 161/6 161/12 171/2 172/5 172/10 174/5 178/1 179/4 179/7 181/23 186/23 188/21 192/2 192/4 198/15 198/19 199/2 203/19 210/11 210/14 213/1 213/9 213/10 213/12 213/22 214/3 214/5 214/9 214/10 214/23 215/11 215/20 215/21 215/23 216/8 216/15 217/13 218/11 218/25 219/7 219/10 219/15 220/23 221/1 222/5 222/12 222/15 223/7</p>	<p>225/19 227/7 228/5 228/14 228/21 228/22 229/5 231/1 231/8 231/18 234/7 234/9 234/14 235/1 235/2 235/7 235/15 235/17 236/13 236/15 237/20 239/19 239/20 239/23 240/15 241/16 241/24 242/13 242/24 243/10 243/22 245/9 246/18 248/17 255/21</p> <p><b>corrected</b> [1] 69/12</p> <p><b>correctly</b> [11] 20/9 23/14 24/16 50/5 59/23 65/20 80/25 183/18 227/16 235/11 245/13</p> <p><b>corresponding</b> [11] 75/8 75/10 82/8 124/2 124/6 124/18 124/22 158/25 160/16 169/16 247/16</p> <p><b>corresponds</b> [3] 65/22 132/2 163/12</p> <p><b>cost</b> [5] 40/25 40/25 41/1 42/12 44/5</p> <p><b>Coughlan</b> [5] 10/10 10/13 10/17 10/22 10/25</p> <p><b>couldn't</b> [7] 10/19 18/9 39/2 78/25 79/9 86/16 91/12</p> <p><b>counsel</b> [11] 3/9 7/2 29/20 30/2 69/3 89/3 115/13 117/25 176/12 250/19 251/8</p> <p><b>counsel's</b> [1] 3/8</p> <p><b>count</b> [1] 38/5</p> <p><b>counter</b> [3] 20/22 99/12 201/17</p> <p><b>counting</b> [1] 22/7</p> <p><b>couple</b> [15] 20/3 31/4 32/14 34/7 34/8 38/7 40/16 48/18 63/24 88/20 161/21 193/17 211/11 213/8 218/17</p> <p><b>course</b> [6] 4/22 61/5 89/4 120/14 177/14 236/7</p> <p><b>court</b> [74] 1/1 1/17 3/1 6/13 6/15 8/25 9/1 9/2 10/15 13/17 14/17 28/15 29/5 29/10 31/9 33/23 34/4 37/6 47/18 48/10 48/11 53/8 55/9 71/11 81/21 81/23 89/6 94/17 95/1 98/17 99/9 104/8 105/14 107/25 108/5 108/20 112/19 118/16 120/2 121/20 122/3 122/7 123/7 125/1 132/17 146/24 150/12 152/5 152/11 154/25 157/20 158/11 159/2 160/19 162/25 169/5 172/23 173/9 173/21 175/11 181/11 182/12 184/22 185/20 186/18</p>	<p>191/18 196/1 202/5 204/18 208/18 209/19 211/12 212/14 254/12</p> <p><b>Court's</b> [7] 4/15 7/15 90/23 185/19 186/10 248/20 248/24</p> <p><b>courthouse</b> [3] 29/13 31/7 31/8</p> <p><b>courtroom</b> [7] 9/6 9/23 10/2 29/23 31/8 31/9 45/2</p> <p><b>courtroom's</b> [1] 211/10</p> <p><b>courtrooms</b> [1] 10/1</p> <p><b>courts</b> [1] 95/11</p> <p><b>cover</b> [2] 9/15 230/21</p> <p><b>covered</b> [1] 44/6</p> <p><b>CPE</b> [1] 1/17</p> <p><b>craig</b> [69] 1/6 3/6 3/7 12/20 13/3 13/17 35/24 36/6 36/16 36/24 37/3 43/6 48/13 56/4 104/16 107/8 122/20 129/23 130/9 130/13 130/13 132/21 133/1 133/2 133/6 138/16 139/2 139/13 139/16 139/18 140/3 147/24 149/25 150/2 151/11 159/6 160/3 160/5 164/6 164/13 164/21 165/21 165/23 166/2 166/17 167/2 175/10 186/8 186/19 187/7 189/8 192/16 193/8 193/10 197/8 199/15 200/18 203/25 206/19 214/14 227/13 227/13 227/14 227/24 227/25 227/25 232/19 232/20 245/12</p> <p><b>Craig's</b> [2] 12/22 12/25</p> <p><b>craig.wright</b> [2] 139/19 163/20</p> <p><b>crashed</b> [1] 49/2</p> <p><b>create</b> [17] 27/4 83/22 123/25 124/8 124/10 127/25 129/3 129/5 148/9 148/12 148/15 173/25 174/15 205/15 234/4 235/19 240/9</p> <p><b>created</b> [43] 73/25 76/18 76/22 122/5 128/23 129/7 129/10 130/11 130/12 135/15 140/7 168/24 171/11 171/12 171/14 172/8 172/16 174/3 174/21 175/2 179/23 179/25 180/11 184/8 188/17 188/19 190/8 190/9 190/19 193/16 195/11 209/18 210/8 216/11 216/13 217/8 233/23 234/2 234/12 234/25 235/13 239/19 239/24</p> <p><b>creates</b> [3] 73/16 74/18 84/6</p>
---	--	--	---	---

<p><b>C</b></p> <p><b>creating</b> [3] 123/24 182/23 215/13</p> <p><b>creation</b> [10] 148/25 178/10 179/22 202/8 202/17 203/8 215/3 215/10 216/6 216/20</p> <p><b>creator</b> [2] 98/15 129/6</p> <p><b>credibility</b> [3] 109/8 186/10 187/1</p> <p><b>credit</b> [2] 41/2 41/3</p> <p><b>criminal</b> [2] 102/4 119/23</p> <p><b>criteria</b> [72] 8/16 14/1 15/23 16/3 16/5 16/6 16/17 16/18 16/23 17/1 17/2 17/14 17/16 17/17 17/18 18/11 18/12 19/20 19/23 19/24 20/16 23/4 23/7 24/7 25/3 25/7 25/18 25/19 25/22 26/11 27/10 27/15 34/4 34/6 36/3 36/4 36/6 36/11 36/12 36/17 36/22 36/24 37/5 37/13 37/17 47/23 48/12 48/14 49/17 49/19 50/14 50/16 50/21 51/1 51/2 51/7 51/9 51/12 51/14 52/19 53/10 53/14 53/17 53/18 53/21 55/6 56/13 58/4 58/8 58/18 61/8 79/19</p> <p><b>cross</b> [18] 28/14 28/17 67/23 91/6 94/7 106/13 107/1 107/13 109/9 110/8 117/1 137/22 179/6 199/4 212/19 249/6 254/5 254/11</p> <p><b>cross-designations</b> [1] 249/6</p> <p><b>cross-examination</b> [9] 28/14 28/17 67/23 107/1 109/9 110/8 179/6 199/4 212/19</p> <p><b>cross-examine</b> [2] 106/13 137/22</p> <p><b>crosschecking</b> [1] 50/4</p> <p><b>CRR</b> [2] 1/17 255/24</p> <p><b>cryptic</b> [1] 13/2</p> <p><b>crypto</b> [1] 170/8</p> <p><b>cryptographic</b> [45] 103/7 103/8 105/10 105/23 111/5 119/5 122/1 122/8 122/9 123/21 123/24 123/25 124/8 124/24 124/25 125/5 125/12 126/1 170/9 170/10 170/23 172/1 172/12 173/23 174/25 175/5 182/24 183/22 183/25 184/4 184/6 187/16 187/19 187/21 188/3 189/9 189/12 194/8 194/13 194/23 195/10 213/3 222/1 224/10 229/7</p>	<p><b>cryptographically</b> [1] 131/17</p> <p><b>cryptography</b> [6] 5/10 5/17 8/17 118/14 135/14 208/8</p> <p><b>cryptomath</b> [1] 72/18</p> <p><b>culpa</b> [1] 99/7</p> <p><b>currently</b> [1] 118/18</p> <p><b>curser</b> [1] 159/25</p> <p><b>cut</b> [12] 45/11 51/23 56/18 57/16 57/20 57/25 58/4 58/7 61/13 61/13 205/7 222/8</p> <p><b>cuts</b> [1] 56/14</p> <p><b>CV</b> [1] 120/25</p> <p><b>cyber</b> [2] 118/18 119/11</p> <p><b>cycled</b> [1] 25/1</p> <hr/> <p><b>D</b></p> <p><b>D-2</b> [11] 14/16 14/23 15/2 15/4 25/16 32/3 38/23 64/24 67/4 67/13 88/7</p> <p><b>D-KIM</b> [1] 131/12</p> <p><b>dark</b> [3] 243/15 243/21 245/17</p> <p><b>data</b> [16] 20/10 24/24 122/5 122/10 124/9 124/11 124/12 124/14 124/16 124/21 158/18 180/10 213/18 213/21 231/21 241/15</p> <p><b>date</b> [94] 16/9 16/13 34/10 35/12 39/2 51/13 51/16 51/18 51/22 52/3 52/13 52/15 53/6 53/12 53/14 54/1 91/16 96/3 126/24 128/24 128/25 129/1 129/2 129/2 129/14 137/15 139/21 139/22 140/13 140/14 140/16 140/18 140/19 140/23 140/25 140/25 141/4 142/25 143/1 147/14 147/15 147/17 148/3 149/1 149/6 149/8 149/9 149/10 160/17 160/23 160/23 165/24 169/1 175/1 176/4 178/10 179/22 181/17 182/12 183/13 183/14 183/15 183/22 184/13 184/16 188/15 188/18 188/22 190/5 190/10 190/10 191/19 191/23 191/25 194/19 195/9 195/13 202/2 202/5 202/9 202/10 203/10 203/15 232/3 232/6 233/13 233/15 233/24 234/4 234/7 234/25 235/13 240/11 240/15</p> <p><b>dated</b> [6] 175/21 178/20 178/21 217/20 231/7 255/22</p> <p><b>dates</b> [9] 16/10 32/7</p>	<p>48/1 69/25 96/19 141/1 148/3 184/4 190/25</p> <p><b>Daubert</b> [15] 100/8 100/16 100/23 101/7 102/18 103/24 104/3 107/6 107/13 108/20 110/15 112/16 112/20 115/6 116/13</p> <p><b>dave</b> [39] 45/16 107/11 110/2 110/4 122/20 147/21 159/6 159/17 160/4 163/25 164/6 164/13 164/17 164/20 165/21 165/23 166/2 166/16 167/1 167/2 171/15 172/2 175/8 186/8 186/18 187/6 189/8 191/25 192/15 193/8 194/3 197/8 199/14 200/18 207/3 214/9 214/10 227/14 227/25</p> <p><b>Dave's</b> [2] 206/22 206/24</p> <p><b>davekleiman.com</b> [2] 147/21 160/4</p> <p><b>days</b> [7] 4/24 31/14 40/16 44/21 62/24 69/18 161/21</p> <p><b>de</b> [4] 2/14 2/17 2/20 2/23</p> <p><b>deal</b> [6] 9/13 100/15 100/16 100/25 101/8 250/5</p> <p><b>dealing</b> [1] 64/2</p> <p><b>dealt</b> [1] 114/6</p> <p><b>death</b> [1] 172/3</p> <p><b>December</b> [1] 199/16</p> <p><b>December 24th</b> [1] 199/16</p> <p><b>decide</b> [1] 207/15</p> <p><b>decided</b> [2] 251/6 251/10</p> <p><b>deciding</b> [1] 105/19</p> <p><b>decimal</b> [1] 63/24</p> <p><b>decision</b> [2] 9/5 98/12</p> <p><b>decision-maker</b> [1] 9/5</p> <p><b>declaration</b> [5] 103/2 114/25 179/16 184/22 202/23</p> <p><b>decrypt</b> [2] 124/18 185/21</p> <p><b>decrypted</b> [1] 124/6</p> <p><b>Deed</b> [10] 175/21 176/7 176/25 179/25 180/15 181/15 182/11 184/1 184/13 237/5</p> <p><b>DEF00013189</b> [1] 218/22</p> <p><b>DEF00013459</b> [1] 218/8</p> <p><b>default</b> [4] 22/5 174/22 251/13 251/14</p> <p><b>defendant</b> [23] 1/7 2/13 99/9 100/20 120/15 120/18 121/12 122/22 151/6 151/17 161/18</p>	<p>161/20 186/5 186/9 198/17 207/7 210/13 211/15 215/13 215/17 219/23 219/25 220/1</p> <p><b>defendant's</b> [6] 15/4 27/8 179/15 201/17 202/22 209/1</p> <p><b>defendants</b> [3] 4/18 201/2 201/11</p> <p><b>Defendants'</b> [1] 10/11</p> <p><b>defense</b> [9] 3/21 9/3 15/20 98/3 99/11 102/13 137/23 150/16 176/14</p> <p><b>defense's</b> [1] 251/15</p> <p><b>defining</b> [1] 113/23</p> <p><b>definitely</b> [3] 23/14 27/12 27/15</p> <p><b>definitive</b> [1] 52/24</p> <p><b>definitively</b> [3] 28/3 28/4 220/14</p> <p><b>degree</b> [1] 212/1</p> <p><b>delivery</b> [2] 139/9 149/25</p> <p><b>demonstrative</b> [25] 157/20 157/23 158/1 158/2 158/4 158/5 158/6 158/8 158/11 158/18 158/20 158/24 159/20 160/11 160/12 160/13 209/19 209/23 210/1 210/2 210/5 210/6 240/20 240/21 242/9</p> <p><b>Demonstrative 1</b> [2] 158/4 158/5</p> <p><b>dependencies</b> [2] 203/4 203/5</p> <p><b>dependent</b> [7] 50/13 51/6 52/12 52/20 53/1 53/2 59/2</p> <p><b>depends</b> [2] 21/11 213/23</p> <p><b>deposed</b> [1] 200/9</p> <p><b>deposition</b> [11] 98/14 200/11 200/13 200/16 201/3 201/10 201/12 202/23 243/8 244/20 249/5</p> <p><b>depositions</b> [1] 99/9</p> <p><b>derive</b> [4] 8/16 82/8 82/8 84/25</p> <p><b>derived</b> [5] 7/5 25/23 84/13 93/24 144/13</p> <p><b>deriving</b> [2] 77/7 77/8</p> <p><b>describe</b> [14] 13/4 23/18 119/18 120/2 120/7 121/14 122/3 122/7 123/7 123/23 150/12 152/11 174/13 174/14</p> <p><b>described</b> [9] 12/3 36/13 37/5 47/17 90/5 93/23 108/1 112/1 203/15</p> <p><b>describing</b> [1] 36/3</p> <p><b>description</b> [1] 5/18</p> <p><b>design</b> [1] 119/3</p> <p><b>designated</b> [2] 99/8 201/15</p>	<p><b>designations</b> [9] 98/18 98/20 99/12 201/17 249/6 249/6 249/11 250/1 253/3</p> <p><b>designed</b> [2] 17/8 23/3</p> <p><b>detail</b> [4] 69/10 81/22 119/20 120/7</p> <p><b>details</b> [4] 43/4 71/14 79/22 87/24</p> <p><b>determinations</b> [1] 186/10</p> <p><b>determine</b> [14] 25/3 26/5 26/15 101/7 109/7 110/3 110/14 164/12 179/24 202/10 202/17 209/14 234/13 251/9</p> <p><b>determined</b> [3] 106/4 203/1 203/7</p> <p><b>determining</b> [4] 110/22 111/8 111/19 112/2</p> <p><b>develop</b> [2] 135/20 136/5</p> <p><b>developed</b> [1] 136/6</p> <p><b>developer</b> [1] 200/7</p> <p><b>developing</b> [1] 12/7</p> <p><b>development</b> [2] 49/7 236/7</p> <p><b>developments</b> [1] 119/22</p> <p><b>device</b> [2] 133/12 134/14</p> <p><b>devoted</b> [1] 13/1</p> <p><b>diagram</b> [1] 227/15</p> <p><b>dialect</b> [4] 11/16 11/18 43/11 43/12</p> <p><b>dictated</b> [1] 51/2</p> <p><b>didn't</b> [52] 7/6 7/7 13/20 14/6 14/12 18/7 18/8 23/23 29/16 31/16 36/3 37/11 40/12 45/11 46/19 48/18 49/3 52/2 52/2 79/18 81/22 86/4 93/4 97/2 115/25 116/6 148/13 152/20 156/24 214/4 214/7 214/11 214/13 214/13 214/21 214/22 223/3 223/6 224/14 225/11 234/19 235/19 237/12 238/10 239/9 239/25 240/2 243/19 243/25 244/12 245/11 252/4</p> <p><b>died</b> [2] 171/15 171/24</p> <p><b>difference</b> [3] 44/4 44/8 112/23</p> <p><b>different</b> [37] 11/16 11/18 18/6 19/1 20/10 20/25 22/17 26/19 32/12 46/5 46/6 50/11 59/11 70/16 77/11 77/11 81/12 82/9 84/11 84/22 84/22 87/1 100/14 106/9 140/22 141/1 145/12 147/10 152/8 161/11 166/3 166/6 207/23 226/17 234/6 241/9 248/11</p>
---	--	---	--	--

<p><b>D</b>  <b>differential [1]</b> 66/22  <b>differentiate [1]</b> 126/12  <b>differently [2]</b> 22/12 248/13  <b>digest [1]</b> 249/12  <b>digital [9]</b> 5/10 118/13 124/10 124/12 124/17 135/14 137/3 182/10 183/1  <b>digits [1]</b> 203/14  <b>dining [1]</b> 41/1  <b>dire [4]</b> 102/14 103/23 104/13 254/9  <b>direct [13]</b> 11/6 33/21 67/22 100/3 116/23 118/3 125/1 136/11 173/9 206/15 238/14 254/4 254/10  <b>direction [2]</b> 36/9 229/22  <b>directly [11]</b> 45/8 45/9 62/20 62/21 86/13 108/6 116/4 186/4 186/15 186/19 219/7  <b>director [3]</b> 118/18 120/10 167/3  <b>dired [1]</b> 104/3  <b>discern [1]</b> 25/24  <b>disclosed [1]</b> 100/19  <b>disclosure [1]</b> 7/24  <b>disclosures [4]</b> 101/14 115/14 115/16 204/18  <b>discovered [1]</b> 24/9  <b>discuss [12]</b> 35/5 64/24 69/20 69/22 70/7 75/3 125/4 189/5 251/8 251/17 251/20 251/21  <b>discussed [9]</b> 33/14 36/17 70/4 130/5 140/4 192/7 217/17 220/16 223/16  <b>discussing [4]</b> 36/4 44/25 186/7 186/8  <b>discussion [3]</b> 6/25 34/22 244/23  <b>discussions [3]</b> 38/16 44/23 70/1  <b>dispense [1]</b> 15/5  <b>display [2]</b> 159/12 169/23  <b>displayed [2]</b> 174/18 180/24  <b>displaying [1]</b> 15/19  <b>displays [2]</b> 159/17 175/1  <b>dispute [2]</b> 39/12 171/23  <b>distinguish [1]</b> 64/3  <b>distracted [2]</b> 81/21 177/17  <b>distributed [1]</b> 87/22  <b>DISTRICT [3]</b> 1/1 1/1 120/13  <b>division [1]</b> 119/12  <b>DKIM [5]</b> 131/11 131/14 131/15 131/17</p>	<p>131/19  <b>docket [1]</b> 252/4  <b>Doctor [3]</b> 149/15 247/5 249/1  <b>doctor's [1]</b> 229/11  <b>doctoral [1]</b> 119/5  <b>document [229]</b> 15/11 105/8 105/12 105/14 105/19 106/5 107/18 107/21 107/25 108/6 108/7 108/15 109/17 110/22 111/9 111/19 111/23 112/2 112/9 112/18 112/24 113/2 113/11 114/14 114/15 114/24 115/3 122/17 122/23 123/4 123/12 124/9 125/2 125/5 126/13 127/19 128/19 129/12 129/20 129/25 130/22 131/15 135/15 137/15 141/5 141/16 141/17 144/9 144/18 145/2 145/6 145/24 146/3 146/4 146/20 146/21 146/23 146/24 147/6 147/7 147/11 148/4 148/7 148/25 152/13 161/2 161/3 161/15 161/17 161/20 162/6 162/9 162/10 164/9 164/10 164/12 165/9 165/20 166/4 166/4 166/5 166/20 166/25 167/1 167/16 167/18 167/25 168/1 168/16 168/21 170/19 170/20 171/20 172/7 173/22 173/23 174/7 174/9 175/23 175/25 176/4 176/5 176/13 176/13 177/20 178/14 178/15 178/20 178/21 178/24 179/5 179/6 179/15 179/22 179/23 179/25 182/8 182/9 184/2 184/13 184/19 187/20 192/8 192/12 192/14 193/1 194/9 194/16 197/16 197/22 198/24 200/21 200/22 201/1 201/4 201/6 203/21 203/23 203/24 206/16 207/14 208/21 208/22 208/25 209/10 209/12 209/14 209/20 210/10 210/12 210/22 210/23 211/6 211/7 213/6 213/7 213/20 214/1 214/7 214/8 214/8 218/9 220/21 220/25 221/2 221/13 221/16 221/18 221/18 221/22 221/24 221/25 222/5 222/10 222/10 222/14 222/25 223/9 223/16</p>	<p>225/7 226/22 227/3 228/17 228/19 228/20 229/3 229/16 229/16 230/14 230/15 231/21 231/25 232/2 232/3 232/9 233/2 233/12 233/17 233/18 233/22 234/16 234/17 234/18 234/23 235/8 235/14 235/16 237/3 237/11 237/14 237/20 237/25 238/21 238/22 239/6 239/17 239/18 239/24 240/3 240/4 240/5 240/6 240/18 241/1 241/12 241/16 242/12 242/14 247/14  <b>document's [3]</b> 148/25 182/16 239/1  <b>documents [106]</b> 6/14 102/24 103/1 103/1 103/2 103/4 103/5 103/6 103/8 104/24 105/3 105/7 105/10 105/11 105/16 105/22 106/4 106/8 107/21 110/7 110/17 111/2 111/3 111/4 111/6 111/15 112/14 113/14 115/21 115/22 115/24 115/25 116/5 116/19 121/11 121/16 121/21 122/1 126/8 126/19 151/1 151/10 153/11 153/12 155/6 155/8 161/3 166/19 167/18 168/4 169/9 175/10 178/18 178/19 184/21 184/23 185/17 185/18 185/24 186/7 186/13 186/14 186/22 198/10 198/12 208/17 211/11 211/14 211/14 212/11 212/13 214/2 214/12 214/16 214/18 214/25 215/1 215/3 215/11 215/13 215/18 216/3 216/6 216/10 216/21 217/3 217/7 220/12 222/23 223/3 223/14 223/15 223/20 223/21 224/6 224/10 224/11 224/22 225/6 225/12 225/13 225/17 226/21 227/2 232/24 237/24  <b>does [83]</b> 9/1 12/17 26/24 45/5 49/17 59/7 71/12 71/12 72/9 72/12 73/23 76/25 77/1 77/2 87/2 94/3 102/18 106/10 110/7 114/1 114/2 116/17 128/21 129/1 129/4 129/9 130/10 131/2 131/15 132/9 133/1 133/11 139/2 139/6 139/15 139/15</p>	<p>139/21 139/25 140/6 140/18 141/8 147/14 147/17 147/19 147/22 148/7 149/23 158/20 158/24 160/11 160/15 166/3 166/3 168/19 168/22 169/1 170/1 172/6 174/6 174/13 176/3 178/9 179/21 181/20 188/22 190/10 192/5 195/13 197/6 199/12 201/4 210/5 213/13 213/16 220/10 220/15 230/17 234/2 237/23 247/19 250/10 250/11 250/25  <b>doesn't [29]</b> 6/11 13/23 27/2 27/11 27/11 41/9 60/3 60/18 83/1 84/7 85/25 86/15 94/9 110/5 112/25 113/9 164/16 213/11 213/15 213/21 220/9 220/11 220/14 221/3 233/15 233/23 235/13 244/16 248/16  <b>doing [7]</b> 5/5 23/10 24/16 39/22 49/10 70/22 102/15  <b>domain [5]</b> 131/18 132/3 133/1 163/22 165/13  <b>domestic [1]</b> 119/11  <b>don't [120]</b> 4/24 5/24 7/15 7/16 8/12 8/14 8/17 8/19 8/21 13/11 20/23 24/15 25/20 25/21 26/12 27/13 30/10 30/18 30/21 31/1 32/7 37/18 38/25 39/8 41/3 41/25 43/3 43/20 45/17 46/24 47/10 51/25 55/12 55/13 55/15 56/1 62/24 67/5 67/18 69/15 69/16 69/16 71/14 74/9 75/12 75/12 75/18 75/23 75/23 75/25 76/4 77/24 81/24 82/21 83/9 83/20 85/4 85/11 86/12 89/7 89/10 91/5 92/3 96/3 96/6 96/13 96/18 96/19 98/5 98/17 98/24 100/15 113/5 115/17 116/2 133/19 152/7 153/5 156/7 164/24 165/25 171/23 198/8 198/10 202/15 207/20 215/1 215/4 215/19 215/22 216/7 216/17 217/18 217/18 219/8 219/25 221/20 222/18 223/4 224/20 224/24 225/8 225/16 225/20 225/21 231/11 234/11 235/6 236/9 236/10 236/14 236/25 238/15 240/3 242/12 242/14 244/24 245/10 249/7 252/21</p>	<p><b>done [26]</b> 32/5 41/7 47/7 49/22 53/5 58/21 61/7 62/11 62/16 63/6 72/24 76/3 79/9 79/24 89/14 92/18 97/25 102/8 137/19 179/10 205/23 218/18 219/19 220/6 224/12 250/20  <b>dotted [1]</b> 45/9  <b>double [1]</b> 97/11  <b>double-checking [1]</b> 97/11  <b>doublechecked [1]</b> 50/8  <b>down [24]</b> 16/6 16/22 16/24 20/3 25/10 27/4 32/10 32/12 38/2 56/17 57/24 58/18 60/3 72/23 88/7 90/9 97/22 122/2 169/3 170/7 235/11 247/5 249/1 249/13  <b>downloaded [3]</b> 202/11 202/18 202/21  <b>Dr [6]</b> 75/14 87/2 101/2 114/1 155/21 199/4  <b>Dr. Craig [4]</b> 3/6 3/7 104/16 151/11  <b>Dr. Edman [137]</b> 5/9 5/22 5/25 6/12 6/19 6/24 8/12 8/18 100/1 100/8 102/21 103/11 103/14 103/16 103/18 104/4 104/15 104/17 104/23 105/6 106/16 107/8 107/17 109/16 110/1 110/21 112/13 113/23 114/2 114/11 116/17 116/22 117/1 118/5 118/9 120/24 122/25 123/5 125/9 126/6 126/19 128/17 130/15 133/10 134/7 135/13 136/20 138/2 141/16 142/24 145/10 145/17 146/3 147/3 147/25 150/3 151/22 152/11 154/3 156/14 157/23 161/4 161/13 162/8 162/24 163/24 166/15 166/19 166/24 167/12 167/15 167/24 173/9 173/20 174/25 175/4 175/7 176/23 180/13 180/20 182/19 184/8 184/18 184/21 187/3 187/16 187/24 188/15 188/25 189/15 190/13 191/18 192/5 192/11 193/7 195/9 195/16 196/18 197/2 197/6 199/17 200/21 203/21 205/6 206/8 206/15 207/7 207/25 208/7 208/17 208/20 209/9 210/5 210/17 211/10 211/24 212/21 212/24</p>
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<p><b>D</b></p> <p><b>Dr. Edman... [19]</b>  216/14 218/6 221/6  224/14 224/22 226/16  227/10 227/21 229/7  230/22 232/15 232/24  241/12 242/8 242/21  244/8 244/19 246/2  247/6</p> <p><b>Dr. Edman's [7]</b> 100/19  101/19 102/8 113/17  117/11 117/24 196/7</p> <p><b>Dr. Warren's [1]</b> 243/8</p> <p><b>Dr. Wright [168]</b> 3/23  4/1 4/4 4/7 5/15 8/16  13/5 13/6 13/24 14/8  14/10 16/9 16/18 22/11  22/16 22/24 27/3 27/10  28/3 28/4 31/18 31/19  32/24 33/11 34/6 34/22  35/2 35/4 35/15 38/17  39/5 40/5 40/7 42/6  42/11 42/13 42/25 43/19  43/20 44/3 44/23 45/6  45/10 45/12 45/21 45/22  46/15 46/21 47/11 50/18  50/21 51/7 51/22 51/25  52/13 52/15 52/20 52/23  54/11 54/14 54/16 55/2  55/10 55/20 55/22 55/25  56/8 59/2 59/2 59/22  60/5 60/19 62/20 62/22  62/23 63/15 63/17 64/23  65/8 65/22 66/6 67/21  69/21 69/22 70/1 70/7  71/1 74/2 74/15 74/22  75/3 75/14 75/15 75/19  76/16 77/21 78/7 78/21  79/5 79/19 79/20 80/1  80/8 80/18 80/23 81/4  81/9 81/17 85/18 86/3  86/5 86/7 87/3 87/15  88/6 88/9 90/4 91/12  91/24 92/1 92/9 92/12  92/25 93/4 93/15 94/3  94/12 94/15 94/16 94/22  94/24 95/8 96/9 97/8  97/12 108/7 109/17  110/3 110/4 112/19  116/9 144/10 150/20  151/3 161/4 161/8  175/22 178/13 178/19  179/3 184/22 184/23  187/1 197/21 198/23  205/14 207/9 208/1  208/10 208/17 209/9  210/22 220/21 221/14  226/19 230/23 245/3  245/16</p> <p><b>Dr. Wright's [37]</b> 4/16  5/16 12/24 17/7 17/21  18/9 18/14 19/7 19/9  20/1 23/5 25/17 27/14  27/25 32/25 33/1 33/12  33/12 33/24 45/5 45/17  47/9 53/1 53/2 60/1</p>	<p>63/12 63/20 67/5 67/19  67/23 76/8 79/20 99/8  103/2 113/1 115/20  116/4</p> <p><b>drag [1]</b> 49/8</p> <p><b>drastically [1]</b> 140/22</p> <p><b>drawn [1]</b> 213/6</p> <p><b>drive [1]</b> 193/24</p> <p><b>dropped [1]</b> 16/24</p> <p><b>due [2]</b> 13/19 59/25</p> <p><b>during [9]</b> 10/1 13/18  28/1 44/19 119/1 120/14  136/25 178/13 244/25</p> <p><b>duty [1]</b> 250/19</p> <hr/> <p><b>E</b></p> <p><b>e-mail [166]</b> 1/19 39/1  62/25 110/2 110/4  122/11 122/20 124/9  126/20 127/5 127/6  127/8 127/10 127/23  129/10 129/13 129/15  129/21 129/23 129/25  130/2 130/6 130/7 130/9  130/12 130/16 130/17  130/17 130/18 130/19  130/21 130/24 131/1  131/2 131/3 131/4 131/8  131/9 131/18 132/2  132/8 132/10 132/11  132/12 132/20 132/22  133/2 133/6 133/7 133/8  133/13 137/19 138/15  138/15 138/18 138/20  139/3 139/4 139/10  139/12 139/14 139/15  139/17 139/23 139/25  140/1 140/3 140/10  140/11 140/22 141/2  141/3 141/11 141/13  143/2 143/9 143/15  144/9 145/7 145/21  145/23 146/5 146/16  146/17 146/25 146/25  148/1 148/2 148/16  148/19 149/4 149/24  153/13 153/14 156/17  157/4 158/19 158/23  159/22 160/1 160/5  160/8 160/14 160/17  161/5 161/9 162/10  162/24 163/1 163/5  163/12 163/20 163/22  163/24 163/25 164/6  164/17 165/20 165/23  166/2 166/16 166/16  166/21 166/22 167/1  169/19 169/20 169/23  169/25 174/3 174/10  175/8 187/6 187/17  188/22 189/1 189/10  190/10 190/20 192/3  192/15 193/7 194/11  195/13 203/24 206/18  226/17 226/18 226/19  227/24 230/21 230/23</p>	<p>230/24 231/7 231/9  231/17 231/19 233/3  233/10 233/16 233/18  233/20 234/20 235/1  235/20 247/15</p> <p><b>e-mailed [1]</b> 62/21</p> <p><b>e-mails [7]</b> 150/5 153/16  153/19 153/20 168/18  186/17 214/22</p> <p><b>each [19]</b> 22/20 25/4  50/17 52/18 57/4 57/4  57/12 63/18 71/16 71/17  73/19 75/20 93/23 99/11  132/10 133/20 182/10  193/5 247/21</p> <p><b>earlier [15]</b> 34/7 45/24  78/6 84/18 103/12  111/14 140/9 142/24  147/25 164/7 165/7  175/2 176/19 184/12  248/10</p> <p><b>early [4]</b> 13/6 63/23 98/8  142/17</p> <p><b>earn [1]</b> 252/9</p> <p><b>ease [2]</b> 127/4 237/7</p> <p><b>easel [1]</b> 225/22</p> <p><b>easier [3]</b> 61/12 67/1  198/25</p> <p><b>easily [5]</b> 84/25 98/25  213/9 217/12 218/18</p> <p><b>eastern [2]</b> 129/19 138/6</p> <p><b>easy [5]</b> 18/15 84/21  207/5 207/8 208/9</p> <p><b>economy [3]</b> 43/10  43/23 44/5</p> <p><b>economy's [1]</b> 43/12</p> <p><b>ecosystem [1]</b> 12/6</p> <p><b>editor [4]</b> 128/2 128/3  128/4 182/22</p> <p><b>edits [4]</b> 159/21 161/1  209/17 210/7</p> <p><b>Edman [145]</b> 5/9 5/22  5/25 6/12 6/19 6/24 8/12  8/18 100/1 100/8 101/3  101/4 101/5 102/21  103/11 103/14 103/16  103/18 104/4 104/5  104/9 104/15 104/17  104/23 105/6 106/16  107/8 107/17 109/16  110/1 110/21 112/13  113/23 114/2 114/11  116/17 116/22 117/1  118/5 118/7 118/9  120/24 122/25 123/5  125/9 126/6 126/19  128/17 130/15 133/10  134/7 135/13 136/20  138/2 141/16 142/24  145/10 145/17 146/3  147/3 147/25 150/3  151/22 152/11 154/3  155/21 156/14 157/23  161/4 161/13 162/8  162/24 163/24 166/15  166/19 166/24 167/12</p>	<p>167/15 167/24 173/9  173/20 174/25 175/4  175/7 176/23 180/13  180/20 182/19 184/8  184/18 184/21 187/3  187/16 187/24 188/15  188/25 189/15 190/13  191/18 192/5 192/11  193/7 195/9 195/16  196/18 197/2 197/6  199/17 200/21 203/21  205/6 206/8 206/15  207/7 207/25 208/7  208/17 208/20 209/9  210/5 210/17 211/10  211/24 212/21 212/24  216/14 218/6 221/6  224/14 224/22 226/16  227/10 227/21 229/7  230/22 232/15 232/24  241/12 242/8 242/21  244/8 244/19 246/2  247/6 254/8</p> <p><b>Edman's [7]</b> 100/19  101/19 102/8 113/17  117/11 117/24 196/7</p> <p><b>Edmans [1]</b> 101/2</p> <p><b>educate [1]</b> 101/16</p> <p><b>education [2]</b> 106/1  111/24</p> <p><b>educational [1]</b> 118/21</p> <p><b>effect [3]</b> 23/13 91/11  91/14</p> <p><b>effectively [1]</b> 21/23</p> <p><b>efficient [1]</b> 205/9</p> <p><b>effort [1]</b> 74/3</p> <p><b>efforts [2]</b> 50/25 81/17</p> <p><b>eight [1]</b> 20/9</p> <p><b>eighth [2]</b> 197/10 197/25</p> <p><b>either [11]</b> 9/14 30/9  30/15 50/21 59/20 76/3  94/4 116/9 116/9 137/19  239/8</p> <p><b>elapsed [2]</b> 131/24 163/9</p> <p><b>electronic [1]</b> 229/18</p> <p><b>electronics [2]</b> 9/21 9/23</p> <p><b>elicit [1]</b> 144/14</p> <p><b>eliminate [1]</b> 23/6</p> <p><b>eliminating [1]</b> 14/5</p> <p><b>ELMO [1]</b> 152/23</p> <p><b>else [22]</b> 35/3 70/7 70/13  70/15 71/19 73/14 77/2  85/15 85/24 87/2 88/1  105/6 111/18 111/21  117/16 150/4 163/16  190/15 240/4 246/18  251/20 252/23</p> <p><b>else's [1]</b> 113/1</p> <p><b>embedded [10]</b> 122/1  144/8 152/15 180/4  180/6 180/23 184/9  232/11 239/22 240/8</p> <p><b>embodied [1]</b> 68/7</p> <p><b>employed [4]</b> 39/3 39/25  110/22 118/17</p> <p><b>employee [3]</b> 12/12</p>	<p>39/23 45/6</p> <p><b>encrypt [1]</b> 124/12</p> <p><b>encrypted [18]</b> 13/23  51/3 67/24 68/5 68/10  69/11 69/11 69/13 69/13  69/14 77/21 85/19 86/11  86/14 88/3 124/5 124/14  196/23</p> <p><b>encryption [3]</b> 70/23  93/20 93/22</p> <p><b>end [14]</b> 18/20 31/3 41/5  43/3 59/6 132/6 163/6  172/10 188/20 190/7  194/11 242/19 251/11  253/3</p> <p><b>ending [11]</b> 123/1 123/8  161/14 167/5 173/20  174/12 176/1 192/18  197/3 206/16 206/20</p> <p><b>ends [4]</b> 131/12 229/22  230/9 249/4</p> <p><b>engage [1]</b> 12/4</p> <p><b>engineer [1]</b> 119/11</p> <p><b>engineering [1]</b> 12/4</p> <p><b>enormous [1]</b> 95/13</p> <p><b>enough [13]</b> 11/1 11/2  11/3 11/17 38/9 44/22  46/19 47/14 67/2 99/19  117/8 117/9 249/7</p> <p><b>ensure [1]</b> 14/5</p> <p><b>entail [2]</b> 5/13 12/17</p> <p><b>enter [11]</b> 121/1 135/1  161/23 161/24 162/15  180/25 189/22 191/10  192/17 195/1 209/2</p> <p><b>entered [28]</b> 15/4 121/5  121/7 128/15 137/25  142/6 142/11 146/13  156/5 157/17 162/3  162/22 167/10 168/13  171/8 177/11 181/8  183/4 183/9 187/14  188/13 190/3 191/16  192/23 195/7 201/25  206/6 209/7</p> <p><b>entertain [2]</b> 9/8 206/1</p> <p><b>entire [2]</b> 13/1 71/15</p> <p><b>entirely [2]</b> 92/4 219/8</p> <p><b>entities [1]</b> 26/16</p> <p><b>entitled [1]</b> 255/21</p> <p><b>entity [1]</b> 26/16</p> <p><b>entries [1]</b> 15/15</p> <p><b>envelope [1]</b> 139/2</p> <p><b>environment [2]</b> 49/5  49/8</p> <p><b>Epoch [2]</b> 131/23 163/8</p> <p><b>equals [2]</b> 131/22 132/5</p> <p><b>equivalent [1]</b> 81/11</p> <p><b>error [7]</b> 23/16 23/18  23/19 24/9 25/9 59/19  67/15</p> <p><b>errors [3]</b> 139/9 139/10  150/1</p> <p><b>ESI [3]</b> 151/2 151/7  151/9</p> <p><b>ESQ [8]</b> 2/2 2/5 2/8 2/10</p>
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<p><b>E</b>  <b>ESQ...</b> [4] 2/13 2/16  2/19 2/22  <b>essential</b> [3] 5/25 6/2 9/2  <b>essentially</b> [6] 20/6  61/19 92/10 92/23  102/22 249/9  <b>establish</b> [2] 120/17  197/19  <b>established</b> [2] 94/13  136/12  <b>estimate</b> [2] 35/13 48/10  <b>et</b> [6] 1/3 3/6 42/3 78/17  88/21 222/25  <b>et cetera</b> [4] 42/3 78/17  88/21 222/25  <b>ether</b> [1] 76/18  <b>evaluate</b> [2] 121/12  204/23  <b>evaluated</b> [1] 111/15  <b>even</b> [19] 11/17 14/10  41/15 46/7 49/9 50/6  87/10 92/6 92/17 115/24  144/19 148/13 158/2  169/21 199/24 245/16  245/17 245/17 246/16  <b>evening</b> [2] 43/16 43/16  <b>event</b> [2] 5/1 201/24  <b>events</b> [1] 217/2  <b>eventually</b> [1] 186/21  <b>ever</b> [9] 17/5 17/9 18/14  29/10 47/14 86/13 90/5  119/7 119/14  <b>every</b> [7] 59/20 67/8  73/16 75/20 83/23  159/11 241/7  <b>everybody</b> [1] 117/7  <b>everyone</b> [6] 3/2 11/2  64/11 64/14 117/22  211/10  <b>everything</b> [5] 73/18  95/11 151/4 221/11  249/16  <b>evidence</b> [93] 7/21 14/20  15/2 15/4 15/9 25/16  27/8 46/19 106/21 109/7  110/13 110/18 116/8  121/2 121/7 127/18  128/9 128/15 135/2  135/21 136/8 137/11  137/25 142/6 142/11  146/8 146/13 154/9  155/8 156/2 156/6  156/19 157/11 157/17  158/12 161/24 162/3  162/16 162/22 165/14  167/5 167/10 168/8  168/13 171/3 171/8  175/15 175/16 177/6  177/11 179/18 181/2  181/9 182/17 183/4  183/9 186/12 187/9  187/14 188/7 188/13  189/23 190/3 191/11  191/16 192/18 192/23  195/2 195/7 197/13</p>	<p>197/14 198/5 198/21  198/22 199/5 201/9  201/25 204/5 206/6  207/14 209/3 209/7  212/17 215/12 215/23  216/9 217/4 217/6  220/13 239/4 244/2  254/15 255/3  <b>EVIDENTIARY</b> [1]  1/10  <b>exact</b> [5] 53/5 199/4  223/9 223/16 225/13  <b>exactly</b> [12] 38/25 57/8  69/19 107/16 213/4  213/13 220/11 225/8  227/19 227/22 241/18  244/24  <b>examination</b> [19] 11/6  28/14 28/17 33/21 67/23  91/3 95/20 104/13 107/1  109/9 110/8 118/3  136/11 179/6 199/4  212/19 238/14 247/8  254/12  <b>examine</b> [3] 106/13  137/22 175/10  <b>examined</b> [3] 19/15  137/20 150/6  <b>examining</b> [1] 150/3  <b>example</b> [13] 13/8 28/7  106/15 108/18 132/14  140/13 151/7 152/15  159/13 174/20 214/9  214/14 247/23  <b>Excellent</b> [1] 253/2  <b>except</b> [4] 72/15 73/18  126/24 198/2  <b>exception</b> [2] 28/5  135/22  <b>exceptions</b> [1] 245/8  <b>excerpts</b> [2] 154/19  201/14  <b>exchange</b> [8] 86/13  124/4 149/3 187/6  187/17 189/10 194/11  203/24  <b>exciting</b> [1] 252/8  <b>exclude</b> [8] 8/25 9/2  14/7 16/21 17/10 19/16  23/8 23/16  <b>excluded</b> [9] 16/12  18/17 23/15 24/1 24/7  25/4 25/21 31/9 232/11  <b>excluding</b> [4] 8/3 14/10  23/25 24/15  <b>exclusion</b> [1] 16/15  <b>exclusively</b> [3] 107/19  112/17 165/12  <b>excuse</b> [5] 10/17 64/21  155/22 194/19 220/18  <b>executable</b> [1] 203/5  <b>executed</b> [1] 239/19  <b>exercise</b> [1] 81/16  <b>exhibit</b> [332]  <b>exhibit 1</b> [27] 122/16  122/25 123/6 124/23</p>	<p>126/21 126/22 126/23  144/9 144/13 144/19  145/1 145/3 153/20  161/9 172/19 172/24  173/3 173/3 173/20  173/21 174/12 175/7  202/22 224/23 229/8  229/12 230/18  <b>exhibit 10</b> [3] 138/2  180/17 181/1  <b>exhibit 16</b> [4] 198/17  198/20 199/9 242/15  <b>exhibit 2</b> [24] 15/20  126/7 126/22 127/5  127/9 145/22 145/24  147/17 154/4 155/24  161/6 162/13 166/21  167/21 170/2 219/6  219/12 219/13 219/15  219/19 220/6 224/8  227/5 230/9  <b>exhibit 24</b> [4] 120/24  120/24 121/2 121/5  <b>exhibit 25</b> [7] 133/18  134/4 134/15 134/16  135/2 137/11 138/8  <b>exhibit 26</b> [2] 141/16  142/6  <b>exhibit 27</b> [3] 153/8  154/8 156/9  <b>exhibit 28</b> [2] 153/9  154/9  <b>exhibit 29</b> [5] 156/15  156/15 156/19 157/2  157/11  <b>exhibit 3</b> [11] 146/3  146/7 146/12 146/15  147/8 147/13 167/21  219/3 219/15 219/18  220/5  <b>exhibit 30</b> [9] 161/14  161/24 161/24 163/17  163/17 166/16 179/14  231/4 231/17  <b>exhibit 31</b> [5] 162/9  162/16 162/25 177/25  248/16  <b>exhibit 32</b> [12] 166/25  167/4 167/13 168/2  169/1 169/11 169/18  170/6 170/21 170/24  174/10 233/6  <b>exhibit 33</b> [2] 167/25  168/8  <b>exhibit 34</b> [4] 170/19  171/3 171/10 172/4  <b>exhibit 35</b> [7] 176/11  176/23 176/24 177/5  178/9 179/8 179/21  <b>exhibit 36</b> [6] 180/13  180/13 180/24 181/2  181/12 181/13  <b>exhibit 37</b> [3] 182/8  182/20 183/4  <b>exhibit 38</b> [11] 185/6  187/3 187/8 187/12</p>	<p>188/23 188/25 190/13  190/15 191/20 192/5  235/9  <b>exhibit 39</b> [5] 187/24  187/24 187/25 188/7  189/20  <b>exhibit 4</b> [5] 152/1 153/4  153/13 154/8 155/21  <b>exhibit 40</b> [6] 189/15  189/15 189/16 189/19  189/22 190/6  <b>exhibit 41</b> [4] 190/22  190/23 190/24 191/10  <b>exhibit 42</b> [4] 192/12  192/18 192/21 195/16  <b>exhibit 43</b> [2] 194/16  195/1  <b>exhibit 44</b> [7] 197/3  197/13 198/5 199/9  200/21 201/9 202/3  <b>exhibit 45</b> [2] 203/21  204/5  <b>exhibit 46</b> [2] 208/21  209/2  <b>exhibit 5</b> [1] 138/6  <b>exhibit 6</b> [25] 126/7  126/23 127/5 143/22  144/24 145/3 145/11  154/4 155/24 157/5  157/8 158/19 159/21  161/6 162/13 166/21  167/21 170/3 217/25  218/2 219/6 219/11  227/6 230/8 232/17  <b>exhibit 7</b> [18] 127/18  127/21 127/22 128/8  134/22 134/25 138/3  138/5 138/9 142/13  143/5 143/14 146/15  147/9 147/12 167/19  167/20 219/4  <b>exhibit 8</b> [4] 151/25  153/8 154/8 219/4  <b>exhibit 9</b> [9] 175/14  175/20 175/21 179/2  179/15 180/21 181/20  182/4 184/18  <b>exhibits</b> [10] 126/21  133/23 146/19 151/23  152/22 155/9 227/18  247/10 254/15 255/3  <b>exhibits 2</b> [2] 126/21  155/9  <b>exhibits 30</b> [1] 247/10  <b>exist</b> [7] 142/18 148/13  149/5 163/23 169/14  184/10 235/19  <b>existed</b> [1] 79/19  <b>exit</b> [1] 5/1  <b>expect</b> [5] 4/24 22/23  23/1 240/9 252/2  <b>expecting</b> [2] 4/24 7/22  <b>expense</b> [1] 41/14  <b>expenses</b> [4] 40/9 42/6  42/25 44/2  <b>experience</b> [11] 64/2</p>	<p>106/2 111/24 136/25  236/5 236/6 237/23  240/9 240/12 241/6  252/12  <b>expert</b> [60] 5/9 5/10  6/10 6/12 6/20 6/22 6/23  7/3 7/4 7/11 7/17 100/9  100/19 101/14 102/14  102/16 102/16 107/18  108/3 108/3 108/4 108/8  108/22 109/16 110/1  112/9 112/15 112/17  121/10 135/13 135/18  135/24 136/11 154/23  164/7 164/10 164/13  164/16 164/25 165/1  165/7 165/10 165/22  204/18 207/13 208/14  210/24 214/17 215/11  216/2 216/21 217/13  217/15 217/20 221/18  237/4 237/23 238/6  238/15 238/18  <b>expert's</b> [7] 111/11  115/14 115/15 136/12  136/13 165/8 204/13  <b>expertise</b> [9] 109/6  118/12 118/13 136/1  142/2 165/2 171/1 212/1  242/4  <b>experts</b> [2] 6/2 6/25  <b>explain</b> [9] 17/3 20/3  34/1 67/21 82/2 85/9  136/16 152/4 185/10  <b>explained</b> [6] 6/16 29/22  35/6 105/13 166/13  221/11  <b>explaining</b> [1] 37/17  <b>explanation</b> [1] 178/24  <b>explicitly</b> [1] 23/2  <b>explore</b> [1] 109/13  <b>express</b> [1] 47/12  <b>expressed</b> [2] 131/24  163/8  <b>expressions</b> [1] 13/3  <b>extensively</b> [1] 219/2  <b>extent</b> [13] 15/7 121/12  154/19 155/9 164/8  164/11 165/6 165/9  185/23 198/11 210/20  216/1 240/7  <b>extra</b> [1] 14/6  <b>extract</b> [29] 127/25  143/10 143/13 144/23  145/2 153/15 157/6  162/12 168/3 169/10  170/22 177/1 180/20  180/23 182/19 188/2  188/3 189/18 194/19  194/21 194/22 205/2  221/21 221/24 222/4  222/10 222/12 223/20  229/13  <b>extracted</b> [33] 127/23  128/2 128/13 144/19  145/11 146/5 154/19</p>
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<p><b>E</b>  <b>extracted...</b> [26] 155/10  155/23 156/16 158/22  162/11 162/13 168/2  170/14 176/25 177/2  180/15 181/14 182/3  182/5 182/10 182/11  182/21 189/20 216/4  219/5 219/17 221/15  221/17 228/18 229/15  231/16  <b>extracting</b> [1] 120/17  <b>extraction</b> [1] 179/9  <b>extracts</b> [1] 154/4  <b>extraordinarily</b> [1]  79/20  <b>eye</b> [1] 50/9</p>	<p><b>fast</b> [1] 54/23  <b>FB</b> [1] 193/10  <b>FBI</b> [3] 119/14 119/19  120/4  <b>FBI's</b> [1] 119/16  <b>February</b> [1] 188/18  <b>February 28th</b> [1]  188/18  <b>federal</b> [1] 29/13  <b>fee</b> [1] 57/7  <b>feel</b> [4] 10/2 29/17 47/5  93/9  <b>few</b> [10] 4/10 25/11  36/16 50/7 58/17 62/23  62/24 128/18 193/21  246/2  <b>field</b> [74] 19/25 20/17  20/18 20/18 20/21 20/24  21/7 21/16 21/20 21/21  22/2 22/6 22/11 22/14  22/21 59/25 60/10 60/15  61/1 118/12 118/13  128/21 128/22 128/24  128/25 129/6 129/14  129/22 130/8 130/24  130/25 131/17 134/7  135/13 135/25 137/3  139/6 140/4 140/13  140/16 140/18 140/25  141/8 141/9 141/9 142/2  143/7 143/8 143/11  147/14 147/15 147/19  147/20 147/22 147/23  148/6 148/7 148/8  149/22 149/23 149/24  159/5 160/3 160/4  160/17 160/23 169/13  169/16 169/21 171/1  182/12 212/2 247/23  247/23  <b>field's</b> [1] 61/3  <b>fields</b> [16] 20/7 20/10  131/8 131/10 132/8  138/10 138/12 139/23  140/4 140/7 140/11  140/12 159/23 227/18  247/22 247/24  <b>fifth</b> [4] 17/19 18/11  18/12 57/18  <b>Fifty</b> [1] 61/21  <b>figure</b> [1] 68/12  <b>file</b> [47] 13/23 51/3  67/24 68/6 68/10 69/15  78/18 86/11 88/3 97/13  97/15 122/4 122/11  125/14 127/11 127/12  127/12 150/9 150/12  151/5 151/9 152/11  161/10 161/11 162/11  163/19 163/24 164/15  166/16 181/21 185/21  200/23 202/11 202/18  202/20 202/24 202/24  203/1 209/17 213/18  231/7 231/9 232/19  247/15 248/4 248/11</p>	<p>248/12  <b>filed</b> [1] 246/7  <b>files</b> [39] 93/21 121/23  121/25 127/1 127/3  128/7 143/8 150/7  150/20 151/2 152/15  153/13 153/16 154/4  161/6 161/9 180/5 180/6  180/9 180/10 180/15  180/23 181/14 181/17  181/18 181/20 182/2  182/3 182/5 182/11  184/1 184/6 184/9  184/14 206/22 206/24  213/3 223/8 240/8  <b>filt</b> [1] 59/12  <b>filter</b> [3] 35/9 59/13  59/16  <b>filters</b> [1] 35/11  <b>final</b> [4] 19/23 19/24  211/24 242/10  <b>finally</b> [2] 138/22 245/2  <b>financially</b> [1] 13/9  <b>finder</b> [5] 9/4 111/12  166/8 206/3 211/2  <b>finding</b> [3] 141/24  167/17 247/12  <b>findings</b> [5] 118/15  121/14 121/16 211/12  211/13  <b>finds</b> [1] 9/2  <b>fine</b> [6] 99/13 99/17  99/21 144/14 226/4  250/24  <b>fingerprint</b> [3] 124/10  124/12 124/17  <b>fingerprints</b> [1] 124/19  <b>finish</b> [2] 108/19 116/22  <b>finished</b> [1] 49/23  <b>Finney</b> [3] 28/9 56/5  80/16  <b>firm</b> [6] 28/23 30/3  118/19 120/10 252/1  252/20  <b>first</b> [80] 4/9 4/23 6/18  9/12 9/14 13/6 13/8 16/6  16/9 16/11 20/5 28/6  28/8 28/8 30/7 30/19  31/24 32/2 32/13 34/25  35/13 35/15 35/19 35/24  43/8 45/5 48/3 48/7  48/11 48/13 48/15 51/12  51/14 51/17 51/18 53/12  54/17 55/2 62/25 80/14  83/3 83/21 90/19 92/1  96/4 96/7 100/23 101/13  103/4 104/17 108/13  108/22 124/10 132/14  132/16 155/5 157/24  158/20 158/22 160/12  160/13 160/18 172/23  173/1 173/14 193/1  193/21 199/25 200/25  202/7 202/11 202/18  204/2 204/3 204/14  204/21 205/22 213/7</p>	<p>222/11 233/2  <b>firsthand</b> [1] 215/4  <b>fit</b> [2] 25/21 58/18  <b>fits</b> [1] 7/17  <b>five</b> [6] 12/23 40/21  53/14 132/8 151/23  180/7  <b>five-year</b> [1] 12/23  <b>FL</b> [7] 2/4 2/7 2/12 2/15  2/18 2/21 2/24  <b>flew</b> [4] 31/14 31/16  43/10 43/21  <b>Flexner</b> [5] 2/2 2/5 2/8  2/11 28/24  <b>flight</b> [3] 44/5 44/8 44/9  <b>FLORIDA</b> [7] 1/1 1/7  1/18 40/10 40/18 43/15  44/9  <b>flow</b> [1] 132/12  <b>fly</b> [4] 31/15 40/18 43/8  43/19  <b>focus</b> [8] 119/1 127/8  128/17 138/25 147/13  168/15 233/21 234/22  <b>focused</b> [3] 12/2 119/3  119/5  <b>focuses</b> [1] 217/13  <b>focusing</b> [1] 174/11  <b>folder</b> [1] 151/7  <b>folks</b> [2] 9/20 98/7  <b>follow</b> [14] 11/17 18/9  36/2 48/18 59/11 81/22  83/8 89/6 89/22 95/18  132/12 204/19 222/20  240/7  <b>follow-up</b> [4] 36/2 48/18  59/11 89/22  <b>follow-ups</b> [1] 95/18  <b>followed</b> [1] 20/7  <b>following</b> [9] 18/20  54/24 65/20 68/24  117/21 159/9 160/22  193/13 196/10  <b>font</b> [18] 180/4 180/6  180/9 180/10 180/15  180/23 181/14 181/17  181/18 181/20 182/3  182/5 182/10 184/1  184/6 184/9 184/14  240/8  <b>fonts</b> [6] 181/21 239/17  239/22 239/25 240/2  240/5  <b>footage</b> [1] 215/18  <b>foregoing</b> [1] 255/20  <b>forensic</b> [4] 118/13  120/13 120/16 179/9  <b>forensics</b> [4] 5/11  135/14 137/3 183/1  <b>forever</b> [1] 21/24  <b>forged</b> [1] 113/15  <b>forgery</b> [15] 111/9  111/20 112/15 112/19  112/23 112/23 113/3  113/21 114/3 114/4  114/10 114/11 114/14</p>	<p>115/1 238/6  <b>form</b> [10] 6/10 7/11  82/18 84/14 94/25  163/11 210/23 229/17  229/18 240/21  <b>formal</b> [2] 39/22 223/19  <b>formally</b> [4] 12/12 39/17  39/25 164/25  <b>format</b> [6] 143/25  152/13 193/4 199/1  229/12 248/12  <b>former</b> [1] 92/14  <b>forms</b> [1] 72/3  <b>formulating</b> [1] 243/9  <b>Forty</b> [2] 190/2 195/6  <b>Forty-three</b> [1] 195/6  <b>forward</b> [3] 11/1 104/4  199/6  <b>found</b> [3] 58/14 91/6  167/18  <b>foundation</b> [16] 42/17  86/19 87/4 87/9 88/8  94/6 133/3 136/6 137/17  142/20 144/11 144/17  145/5 145/15 156/21  164/2  <b>foundational</b> [3] 15/6  171/23 211/5  <b>founded</b> [2] 39/5 39/9  <b>founder</b> [3] 39/7 39/11  39/11  <b>four</b> [9] 20/18 22/14  56/13 80/25 138/11  153/22 159/11 184/1  184/6  <b>four-byte</b> [2] 20/18  22/14  <b>fourth</b> [5] 17/17 17/18  17/19 221/22 222/1  <b>frame</b> [2] 101/9 101/12  <b>Franklin</b> [4] 1/17  255/20 255/23 255/24  <b>frankly</b> [1] 185/20  <b>fraud</b> [12] 108/8 109/17  110/4 111/9 111/20  112/7 112/19 112/23  113/17 114/5 114/25  115/13  <b>fraudulent</b> [8] 108/14  110/23 112/5 112/11  112/15 113/13 114/7  115/14  <b>fraudulently</b> [3] 112/3  113/4 113/6  <b>free</b> [2] 10/2 93/9  <b>Freedman</b> [14] 2/2 3/11  3/12 8/4 8/10 9/16 14/23  98/4 101/13 117/15  153/5 158/14 196/12  252/19  <b>Freedman's</b> [1] 249/20  <b>freshly</b> [3] 64/4 64/6  64/9  <b>Friday</b> [5] 132/23  138/16 138/18 140/19  149/11</p>
--	--	--	--	--

<p><b>F</b></p> <p><b>friend [2]</b> 45/22 189/8  <b>friendly [1]</b> 84/14  <b>friends [2]</b> 47/3 94/14  <b>front [23]</b> 38/24 110/6  152/2 153/2 157/19  165/14 172/20 185/20  218/7 218/23 219/9  226/21 230/22 231/13  234/18 235/9 237/6  237/8 240/22 242/9  242/19 245/10 247/17  <b>FTI [1]</b> 120/10  <b>full [7]</b> 12/12 102/5  102/13 104/7 104/9  174/23 198/11  <b>full-time [1]</b> 12/12  <b>fully [3]</b> 93/1 136/15  153/6  <b>function [1]</b> 20/14  <b>further [21]</b> 16/22 17/10  17/13 19/20 19/22 23/9  23/10 23/10 23/15 28/11  38/16 90/22 95/15  135/16 150/8 205/18  211/17 212/4 230/8  246/21 247/3  <b>future [1]</b> 73/6</p>	<p>77/22 94/23 95/13 96/24  97/8  <b>generation [3]</b> 17/7  70/14 88/5  <b>genesis [1]</b> 232/21  <b>geographic [3]</b> 134/19  136/23 138/2  <b>GeoIP [1]</b> 137/2  <b>GeoIP2 [5]</b> 134/17  136/20 136/21 136/24  137/8  <b>gets [10]</b> 22/9 71/21  71/23 72/6 72/6 74/5  74/23 75/6 76/17 110/15  <b>getting [5]</b> 4/10 92/24  215/6 249/20 250/4  <b>gibberish [1]</b> 201/23  <b>GitHub [2]</b> 200/5 243/7  <b>give [23]</b> 15/18 20/24  37/20 37/25 48/9 51/7  62/20 62/20 85/9 97/12  99/11 99/19 101/14  101/25 102/10 102/19  104/23 112/7 196/1  216/18 248/16 250/2  252/11  <b>given [17]</b> 5/14 9/4 9/10  25/19 34/3 38/21 45/1  50/18 51/1 101/15 102/2  116/19 131/23 202/22  205/11 211/25 216/21  <b>gives [2]</b> 26/7 117/7  <b>giving [1]</b> 36/6  <b>glance [1]</b> 102/21  <b>global [1]</b> 120/11  <b>gmail.com [1]</b> 160/6  <b>GnuPG [22]</b> 170/15  174/21 174/22 175/1  175/6 188/2 189/16  190/19 190/24 190/25  191/3 191/4 191/5 191/8  191/19 191/23 194/17  194/20 194/22 194/24  234/3 235/18  <b>goal [1]</b> 27/9  <b>goes [12]</b> 41/15 45/18  96/16 108/5 115/1  137/21 186/25 198/9  206/23 210/23 211/6  241/1  <b>going [78]</b> 5/13 5/19  6/19 7/8 7/10 8/13 8/14  12/14 14/20 33/22 34/9  35/13 36/10 36/12 36/22  37/13 37/22 43/2 48/12  54/22 56/13 57/18 60/12  68/11 68/14 74/14 84/23  97/25 99/2 99/13 100/16  101/10 101/11 101/18  101/25 102/22 103/14  107/3 107/15 107/16  112/7 112/10 112/14  112/16 114/1 114/9  115/3 115/18 127/4  133/23 141/22 141/23  142/13 151/22 164/10</p>	<p>165/1 166/8 185/23  186/12 186/21 197/17  204/22 205/1 212/10  212/15 216/7 220/19  222/20 233/4 233/6  234/7 242/1 244/11  249/5 249/20 249/21  250/6 252/20  <b>gone [4]</b> 24/12 34/24  219/2 236/3  <b>good [29]</b> 3/2 3/4 3/10  3/12 3/14 3/15 3/17 3/18  3/20 3/22 3/24 4/2 4/3  4/5 4/6 4/8 28/19 28/20  58/2 104/15 117/22  118/5 175/18 225/4  227/21 249/23 252/6  252/8 252/11  <b>goods [1]</b> 241/4  <b>Google [4]</b> 163/15  164/15 165/13 231/25  <b>got [22]</b> 40/23 53/8  53/18 57/14 57/24 62/16  67/16 71/24 72/11 75/15  75/16 83/18 91/7 133/23  144/3 173/6 185/13  195/23 212/8 222/17  224/5 229/19  <b>gotta [1]</b> 250/5  <b>Government [1]</b> 6/1  <b>GPG [9]</b> 170/15 170/20  170/25 172/6 187/25  188/15 190/5 194/20  194/21  <b>grab [2]</b> 117/7 234/7  <b>graduate [1]</b> 119/2  <b>graph [1]</b> 225/22  <b>graphics [1]</b> 203/4  <b>great [8]</b> 46/12 69/9  99/4 116/15 116/21  117/24 246/23 250/16  <b>Greek [1]</b> 202/15  <b>gross [1]</b> 54/2  <b>grounds [2]</b> 146/11  155/2  <b>group [3]</b> 118/20 193/11  236/10  <b>guess [7]</b> 12/20 90/19  93/23 93/25 150/14  223/5 236/18  <b>guess 1 [1]</b> 150/14  <b>guys [1]</b> 94/14</p>	<p><b>handing [27]</b> 120/23  122/15 126/6 127/17  133/17 146/2 152/18  156/14 161/13 162/8  166/24 167/24 170/18  175/13 176/10 180/12  182/7 187/23 189/14  190/22 192/11 194/15  197/2 200/20 203/20  208/20 209/22  <b>handle [2]</b> 194/6 252/1  <b>handled [3]</b> 112/8 141/2  149/4  <b>handling [1]</b> 252/2  <b>handwriting [2]</b> 238/15  238/18  <b>handwritten [1]</b> 239/8  <b>happen [5]</b> 4/25 22/3  96/1 245/7 245/9  <b>happened [12]</b> 30/25  68/12 68/13 96/12 96/13  96/14 185/13 221/11  240/6 241/18 243/10  244/3  <b>happens [8]</b> 21/18 21/19  21/25 22/1 71/11 72/2  72/3 72/5  <b>happy [5]</b> 98/19 101/15  133/25 207/20 252/13  <b>hard [2]</b> 18/20 116/24  <b>hash [13]</b> 20/14 20/22  20/24 72/10 124/10  124/12 124/14 124/17  202/20 202/20 223/25  224/10 225/13  <b>hashes [3]</b> 202/13  202/21 202/21  <b>hasn't [4]</b> 24/14 124/21  137/17 216/24  <b>have 4 [1]</b> 156/8  <b>haven't [12]</b> 24/13 67/17  85/16 104/20 114/2  116/25 144/17 204/16  221/4 221/6 251/6  251/10  <b>having [12]</b> 18/20 30/15  37/15 49/4 54/23 75/10  154/22 167/16 241/16  252/4 252/7 252/12  <b>he'd [2]</b> 16/19 144/13  <b>he's [30]</b> 13/3 39/7 45/15  45/18 52/25 54/21 63/4  64/19 76/17 77/25 78/15  81/5 85/24 95/11 103/20  106/12 107/2 108/1  108/24 112/10 115/5  115/18 164/24 167/15  207/13 210/22 217/9  238/18 239/5 249/21  <b>head [6]</b> 8/12 63/20  66/15 224/24 225/10  252/25  <b>header [45]</b> 19/25 20/5  20/7 20/10 20/11 20/12  20/18 21/22 21/24 26/2  130/1 130/4 130/16</p>	<p>130/17 130/21 130/24  130/25 131/1 131/2  132/8 132/18 132/19  134/7 138/11 139/14  139/22 139/23 139/25  140/10 140/16 141/9  148/18 148/23 149/2  149/6 162/10 162/25  163/4 169/19 169/21  170/1 170/2 231/19  247/16 247/19  <b>headers [2]</b> 132/10  141/1  <b>heads [3]</b> 7/9 249/12  252/17  <b>hear [13]</b> 8/10 10/20  11/2 86/4 99/1 101/7  110/17 114/13 205/24  206/11 251/11 252/14  253/3  <b>heard [18]</b> 6/19 7/10 9/7  9/10 34/20 35/19 108/24  109/2 115/24 116/25  165/18 165/18 165/19  166/1 205/6 205/22  228/25 229/9  <b>hearing [37]</b> 1/10 4/14  7/1 31/3 31/6 31/13  32/15 32/18 34/9 34/10  37/20 38/11 38/17 38/19  40/3 40/15 40/16 42/5  42/24 43/15 44/20 44/24  50/7 58/24 100/23 102/3  102/3 103/12 109/23  121/10 151/24 161/22  175/14 175/17 196/25  204/20 205/4  <b>hearings [1]</b> 104/19  <b>Hearn [1]</b> 81/1  <b>hearsay [25]</b> 95/2  106/20 106/21 128/11  135/4 135/10 135/22  135/25 142/8 146/10  151/16 154/11 155/3  155/7 157/13 162/20  177/8 177/23 181/4  183/6 188/9 189/25  191/13 195/4 201/19  <b>held [2]</b> 84/24 206/25  <b>Hello [2]</b> 212/21 212/22  <b>help [10]</b> 35/16 37/9  37/11 47/18 98/12 101/8  101/11 101/23 117/4  157/20  <b>helped [4]</b> 93/10 244/10  244/21 245/18  <b>helpful [3]</b> 109/23  225/23 251/17  <b>helping [1]</b> 152/25  <b>here [5]</b> 3/5 4/13 5/5  9/5 9/21 11/11 11/16  26/10 29/15 29/20 30/22  31/6 31/20 35/20 40/13  40/23 41/1 42/24 48/21  65/21 76/7 90/18 99/2  107/15 117/16 126/22</p>
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<p><b>H</b>  <b>here...</b> [32] 133/20  143/20 169/10 170/5  171/19 183/15 185/22  196/5 196/15 196/15  206/8 210/9 211/2  212/24 223/22 225/16  225/21 226/3 226/12  226/18 229/22 230/1  230/1 230/2 231/4  232/20 241/18 244/23  250/15 251/19 251/21  252/21  <b>here's</b> [2] 85/8 247/18  <b>hex</b> [2] 128/3 182/21  <b>high</b> [2] 6/23 38/6  <b>high-level</b> [1] 6/23  <b>highlighted</b> [3] 183/18  199/12 199/14  <b>highlights</b> [2] 160/18  160/19  <b>HIGHSECURED</b> [1]  242/2  <b>HIGHSECURED.com</b>  [1] 208/23  <b>himself</b> [4] 60/6 81/18  93/4 135/15  <b>history</b> [7] 17/12 80/20  191/5 191/8 200/5 202/8  243/6  <b>hit</b> [3] 8/11 93/2 252/4  <b>hits</b> [1] 72/11  <b>hold</b> [13] 20/19 27/20  84/24 87/6 136/4 158/9  173/2 178/11 182/16  185/11 197/12 210/18  238/11  <b>holding</b> [2] 35/12 65/5  <b>holdings</b> [1] 193/17  <b>holds</b> [6] 84/19 86/7  86/10 124/22 155/2  193/12  <b>home</b> [2] 48/25 249/21  <b>Honor</b> [147] 3/4 3/10  3/18 3/22 3/25 4/6 4/20  5/6 6/6 6/7 6/18 7/1 7/18  7/24 8/2 8/7 8/11 9/17  9/19 10/6 10/19 14/13  14/18 15/19 18/19 27/16  27/22 69/5 88/25 89/21  90/24 95/15 95/17 97/18  97/21 98/3 98/11 98/23  99/3 99/7 99/16 99/24  100/7 100/18 101/17  102/1 102/7 102/11  102/15 104/1 104/12  106/14 106/15 106/22  106/23 107/14 107/25  108/18 110/10 112/13  112/20 113/6 113/16  113/25 114/5 114/21  114/24 115/10 116/1  116/11 117/2 120/20  122/12 126/3 127/14  133/14 135/4 135/5  135/11 136/3 137/6</p>	<p>137/10 137/13 137/17  142/8 144/2 144/11  145/5 146/10 150/23  151/14 153/18 154/11  154/18 155/2 156/11  157/13 162/18 162/20  164/2 164/18 165/4  167/7 168/10 171/5  171/18 176/16 176/19  177/8 177/12 178/16  178/20 181/4 183/6  185/2 185/14 187/11  188/9 189/25 191/13  195/4 198/7 199/3  204/12 205/19 207/12  208/4 208/11 210/20  211/17 211/21 212/10  217/10 218/3 225/25  229/6 230/3 246/21  246/25 247/3 247/17  248/2 248/9 248/25  249/23 251/22 252/21  <b>HONORABLE</b> [1] 1/11  <b>hope</b> [3] 225/23 249/24  252/1  <b>hosting</b> [1] 120/5  <b>hotel</b> [2] 40/23 40/25  <b>hotels</b> [1] 42/3  <b>hotwirepe.com</b> [3]  139/16 139/19 163/20  <b>hour</b> [2] 36/1 117/7  <b>hours</b> [6] 49/16 100/4  116/22 211/12 212/23  218/17  <b>housekeeping</b> [3] 4/21  9/13 251/23  <b>hover</b> [2] 159/25 160/8  <b>however</b> [3] 5/9 23/9  117/12  <b>http:</b> [2] 193/25 194/1  <b>http://www.netcetera.com</b>  <b>.uk</b> [1] 194/1  <b>http://www.seyhost.com</b>  [1] 193/25  <b>huh</b> [17] 29/1 33/18  34/11 35/14 40/20 53/9  53/11 53/13 55/1 60/17  61/16 67/11 71/8 73/3  102/6 205/5 230/4  <b>human</b> [2] 132/1 163/10  <b>hundred</b> [2] 25/11 38/7  <b>hundreds</b> [1] 224/6  <b>hungry</b> [1] 98/8  <b>hypothesis</b> [1] 240/7  <b>hypothetical</b> [2] 76/15  224/14  <b>hypothetically</b> [1] 75/12  <b>I</b>  <b>I'd</b> [29] 47/5 62/3 67/7  88/19 102/11 102/12  106/19 128/17 128/17  128/19 141/7 145/14  146/19 147/12 154/7  156/18 161/23 168/15  177/19 201/8 206/15</p>	<p>216/17 231/2 231/2  231/10 232/25 233/2  237/3 250/14  <b>I'll</b> [67] 8/5 8/10 8/24  9/7 9/11 9/13 10/4 11/15  17/3 59/12 62/6 63/13  64/1 76/11 79/14 91/1  91/18 94/8 95/3 96/16  99/19 100/5 100/25  101/7 101/8 104/2 104/3  110/25 112/22 128/13  137/23 141/15 142/9  144/19 151/15 156/23  162/21 166/12 171/22  177/10 178/6 181/5  183/7 186/24 187/1  191/14 195/5 196/5  201/20 201/24 205/20  205/22 205/25 206/5  207/17 207/20 211/4  211/7 212/14 228/25  229/9 236/22 236/24  238/19 239/2 242/6  244/5  <b>I'm</b> [182] 3/6 4/17 4/25  7/21 7/25 8/9 9/4 9/5  10/5 10/14 10/19 11/14  12/16 15/19 17/24 18/20  18/21 21/2 24/16 24/20  27/21 28/5 28/23 29/21  35/12 37/3 39/7 41/4  44/17 45/11 47/5 48/12  52/8 53/18 54/22 54/23  56/13 57/18 59/10 62/12  62/14 65/3 65/9 65/19  65/20 66/18 68/3 68/11  69/16 72/7 74/12 74/14  76/16 78/1 79/17 80/15  80/19 80/19 81/20 85/6  85/7 85/8 85/17 86/6  87/21 87/23 88/4 89/14  89/16 91/19 91/19 92/14  92/24 95/14 97/25 98/19  99/2 99/13 101/5 101/18  101/25 107/15 107/16  108/13 111/12 113/25  120/23 122/15 123/17  125/6 125/7 125/9  125/17 126/6 126/11  127/4 127/17 133/17  133/25 134/3 135/20  143/19 143/19 143/19  145/17 151/22 152/18  154/16 156/14 161/13  162/8 165/1 166/7 166/8  166/24 167/16 167/24  170/18 173/3 175/13  176/10 177/21 178/11  178/11 178/17 179/13  182/7 185/3 185/14  186/11 187/23 190/22  192/11 194/15 196/13  197/2 197/12 198/10  201/22 202/14 202/14  203/20 204/6 206/3  206/3 208/20 209/22</p>	<p>211/10 215/7 215/8  215/25 217/6 219/6  219/13 220/19 222/6  224/3 224/4 224/14  224/16 226/14 226/18  227/4 227/10 227/15  228/9 228/21 229/11  233/4 233/6 242/1  244/19 245/13 247/6  247/12 249/14 250/6  250/14 250/20 252/11  252/13 252/13  <b>I've</b> [29] 22/5 23/8 25/19  25/19 29/12 39/18 47/11  47/12 47/13 86/13 88/2  93/23 97/15 101/9  104/19 108/23 109/2  114/6 115/18 165/16  166/12 173/6 177/9  178/7 181/6 213/2 220/1  228/25 242/16  <b>I.D</b> [20] 82/24 84/8  90/13 90/15 90/16  146/20 146/21 147/3  147/4 147/5 147/7 147/8  161/3 166/20 167/18  168/16 223/9 223/16  225/13 233/18  <b>i.e</b> [1] 14/4  <b>idea</b> [8] 5/20 55/11  70/23 78/14 78/23 96/9  96/11 101/9  <b>identical</b> [12] 126/23  126/24 145/3 161/3  222/24 223/10 223/25  223/25 224/2 224/11  224/12 225/15  <b>identification</b> [2] 120/5  207/9  <b>identified</b> [12] 105/16  143/14 160/2 166/20  172/24 180/4 191/19  202/6 203/15 206/12  209/17 223/9  <b>identifier</b> [3] 146/21  147/5 172/9  <b>identify</b> [14] 5/15 19/7  19/9 28/2 33/23 81/17  82/20 90/9 147/6 191/18  198/19 207/10 212/17  230/2  <b>identifying</b> [1] 120/15  <b>identity</b> [4] 26/15 26/18  26/20 26/25  <b>IDs</b> [1] 146/25  <b>ignore</b> [2] 206/4 243/18  <b>ignored</b> [1] 53/5  <b>images</b> [3] 120/13  120/17 152/15  <b>imagine</b> [2] 77/24 79/21  <b>immediately</b> [1] 74/8  <b>immutable</b> [1] 21/24  <b>impeach</b> [1] 205/10  <b>implementation</b> [2]  12/19 68/8  <b>implementations</b> [1]</p>	<p>88/4  <b>implemented</b> [3] 17/8  23/12 56/23  <b>implementing</b> [1] 12/22  <b>implements</b> [1] 49/19  <b>implies</b> [1] 112/7  <b>import</b> [1] 29/22  <b>importance</b> [2] 7/5 30/7  <b>important</b> [6] 5/4 18/8  102/2 102/5 213/17  220/13  <b>impossible</b> [1] 79/5  <b>improper</b> [1] 112/9  <b>inability</b> [2] 7/14 185/20  <b>inaccurate</b> [1] 50/22  <b>inappropriate</b> [2] 9/10  102/17  <b>inauthentic</b> [20] 105/15  105/20 107/25 108/15  221/3 221/16 221/19  222/15 223/23 228/17  230/15 230/25 231/25  233/12 233/22 234/23  237/12 238/23 239/2  239/17  <b>inauthenticity</b> [2]  232/16 235/16  <b>incidentals</b> [3] 41/10  41/12 41/13  <b>include</b> [6] 124/13  140/12 170/1 174/22  230/18 234/19  <b>included</b> [4] 23/5 131/11  247/22 248/4  <b>includes</b> [9] 74/18 74/19  118/13 130/1 131/6  147/23 169/21 174/19  190/18  <b>including</b> [5] 131/11  140/3 151/3 211/14  224/11  <b>inclusive</b> [6] 14/3 14/3  25/17 33/24 66/12 151/4  <b>incomplete</b> [1] 50/22  <b>inconsistent</b> [2] 163/17  207/22  <b>incorporate</b> [1] 112/12  <b>incorrect</b> [3] 23/14 59/5  59/6  <b>increase</b> [1] 21/17  <b>incremental</b> [1] 20/22  <b>incrementally</b> [1] 21/18  <b>Indeed</b> [1] 11/19  <b>independent</b> [1] 50/25  <b>independently</b> [1] 51/5  <b>index</b> [5] 82/25 84/2  90/6 90/16 90/18  <b>indicate</b> [15] 129/4  132/9 140/18 141/8  141/10 147/14 147/19  147/22 148/4 160/22  169/14 172/6 178/10  179/21 181/18  <b>indicated</b> [3] 94/24  103/13 182/13  <b>indicates</b> [33] 129/2</p>
---	---	---	---	--

<p><b>I</b>  <b>indicates...</b> [32] 129/6  129/12 129/14 129/20  129/22 130/6 130/8  132/20 132/22 133/5  139/3 139/17 141/18  143/8 147/15 147/20  148/8 149/18 149/25  169/6 171/10 171/12  172/8 179/23 182/15  188/17 190/7 190/19  190/25 195/11 200/17  241/21  <b>indicating</b> [1] 159/9  <b>indication</b> [1] 137/15  <b>indications</b> [1] 140/2  <b>indicators</b> [2] 129/24  219/22  <b>individual</b> [9] 22/18  26/15 70/9 113/10  123/23 133/5 154/22  174/8 237/25  <b>individually</b> [1] 50/17  <b>individuals</b> [4] 26/15  142/1 215/5 237/20  <b>indulge</b> [1] 177/12  <b>industry</b> [1] 155/11  <b>infeasible</b> [1] 152/21  <b>inference</b> [1] 165/10  <b>infor</b> [1] 131/4  <b>inform</b> [3] 7/2 98/12  121/20  <b>information</b> [72] 5/24  14/1 20/7 25/23 26/2  26/8 26/13 26/17 26/21  45/3 59/5 72/20 80/1  87/11 87/15 87/21 88/22  92/12 93/16 105/13  105/17 105/20 105/24  106/16 106/17 107/20  108/1 111/16 115/5  121/23 122/4 124/4  124/5 128/19 128/22  130/17 131/2 131/4  131/6 131/7 131/9  132/18 135/17 135/18  137/3 140/6 140/10  140/14 140/15 141/21  141/24 142/2 148/24  164/16 170/22 172/3  179/9 180/14 180/20  181/14 182/19 182/24  183/12 188/2 189/18  191/2 191/5 200/23  213/18 213/19 213/21  216/1  <b>infrastructure</b> [1] 12/5  <b>inherent</b> [2] 79/4 91/12  <b>initial</b> [2] 25/9 64/24  <b>initials</b> [1] 215/15  <b>input</b> [1] 37/12  <b>inputs</b> [2] 82/23 83/9  <b>inquire</b> [1] 106/19  <b>inquiry</b> [1] 136/24  <b>insignificant</b> [2] 57/15  57/15</p>	<p><b>inspection</b> [1] 88/17  <b>instance</b> [5] 147/3 147/3  147/5 147/8 165/12  <b>instances</b> [2] 105/18  106/7  <b>instead</b> [5] 66/16 66/18  159/6 160/3 160/25  <b>Institute</b> [2] 118/24  118/25  <b>instructed</b> [2] 205/14  207/9  <b>instructions</b> [1] 152/16  <b>integral</b> [1] 56/10  <b>intend</b> [2] 98/14 100/23  <b>intent</b> [4] 115/1 171/20  186/25 211/1  <b>intention</b> [2] 14/9  186/12  <b>intents</b> [1] 57/10  <b>interacted</b> [1] 104/20  <b>interactions</b> [2] 245/12  245/12  <b>interest</b> [2] 46/2 46/13  <b>interesting</b> [3] 180/8  223/6 252/17  <b>internal</b> [10] 105/9  105/22 111/4 111/22  121/24 127/12 150/6  180/3 209/16 228/6  <b>Internet</b> [8] 48/25  105/18 105/25 106/1  111/16 111/22 119/4  134/14  <b>interpretation</b> [1] 24/14  <b>interpreting</b> [3] 12/22  12/24 23/20  <b>interrupt</b> [3] 18/3 60/23  72/8  <b>interrupted</b> [1] 152/4  <b>interview</b> [2] 243/4  243/5  <b>interviewed</b> [1] 200/6  <b>introduced</b> [8] 108/5  135/9 154/20 154/25  177/16 198/9 219/3  231/12  <b>introducing</b> [1] 212/11  <b>introduction</b> [1] 106/21  <b>invalid</b> [1] 238/4  <b>investigation</b> [4] 23/10  120/4 120/8 120/14  <b>investigations</b> [6]  118/14 118/19 119/23  119/24 120/3 120/11  <b>investigator</b> [1] 6/1  <b>invoice</b> [5] 208/22  240/19 240/24 241/3  242/2  <b>invoicing</b> [1] 41/4  <b>invoked</b> [1] 5/7  <b>involve</b> [1] 119/24  <b>involved</b> [12] 12/7 12/9  30/5 37/16 37/17 39/7  41/16 43/3 72/18 81/21  121/22 214/22  <b>involves</b> [1] 83/24</p>	<p><b>IP</b> [13] 134/10 134/12  134/13 134/18 134/20  134/21 134/23 136/22  136/25 137/4 138/3  138/5 215/14  <b>iPad</b> [3] 100/13 225/23  231/12  <b>IRA</b> [5] 1/3 3/6 3/6  203/25 206/19  <b>irrelevant</b> [1] 171/21  <b>is</b> 2 [1] 126/12  <b>is</b> 6 [1] 126/12  <b>Isle</b> [1] 194/2  <b>isn't</b> [27] 72/14 75/8  104/25 105/4 105/8  107/8 109/18 215/3  215/8 217/15 218/19  219/19 220/25 228/18  229/22 230/11 230/15  232/7 232/9 232/18  232/22 235/4 236/19  237/18 240/12 241/12  241/19  <b>issue</b> [12] 6/13 7/22 46/2  100/16 101/9 104/3  109/7 113/21 121/21  185/19 235/10 251/6  <b>issues</b> [6] 49/11 99/23  101/12 249/10 250/5  253/2  <b>it'll</b> [2] 61/11 84/3  <b>it's</b> [166] 7/15 7/16 7/25  11/18 11/18 15/9 20/10  20/11 20/21 21/4 21/23  21/23 21/24 25/13 26/1  26/1 30/22 38/7 38/8  41/3 41/6 41/6 43/2  45/11 45/12 46/1 46/10  47/6 47/8 47/10 53/18  54/23 55/17 55/22 56/2  56/3 56/7 56/10 56/10  57/10 57/21 59/7 60/8  60/9 61/19 62/3 62/6  62/9 65/9 65/21 67/5  67/10 68/18 72/15 72/20  73/17 76/3 76/11 80/13  80/13 80/21 81/14 83/3  84/13 84/15 84/19 86/13  87/18 94/3 95/11 98/5  99/1 101/7 102/2 102/5  107/16 109/3 112/10  112/11 115/4 116/16  123/10 123/12 128/6  128/13 129/19 130/18  130/18 135/8 135/10  137/16 137/17 137/23  138/22 139/8 139/11  144/15 149/18 153/6  154/14 157/4 158/1  158/2 163/6 163/15  171/1 171/6 171/22  172/19 178/20 179/10  179/18 185/1 196/2  196/6 198/2 198/8  198/18 198/21 198/21  198/25 199/5 206/16</p>	<p>207/15 207/17 207/21  210/25 211/8 212/13  213/17 215/7 216/25  220/12 221/6 221/19  225/9 225/24 226/20  227/24 230/21 231/12  231/21 232/9 232/23  233/5 234/7 235/24  239/16 240/1 240/12  241/2 241/18 241/22  241/24 242/4 242/15  242/20 242/20 244/5  245/19 246/12 247/14  249/3 252/8 252/14  252/17  <b>items</b> [1] 220/3  <b>iteration</b> [1] 25/9  <b>iterative</b> [1] 50/6  <b>itself</b> [19] 26/17 49/18  72/17 74/17 82/14 92/5  105/12 111/23 127/13  140/15 184/14 190/16  190/17 203/17 209/17  213/13 213/15 213/20  248/5</p> <hr/> <p><b>J</b>  <b>January</b> [5] 16/11 51/17  70/25 131/25 163/9  <b>January 1</b> [2] 131/25  163/9  <b>January 2009</b> [1] 16/11  <b>January 3rd</b> [2] 51/17  70/25  <b>Java</b> [2] 88/14 88/14  <b>Jimmy</b> [4] 32/24 33/3  33/4 33/11  <b>Jimmy's</b> [2] 33/7 33/8  <b>job</b> [2] 12/21 33/7  <b>John</b> [9] 104/5 104/9  118/7 200/8 200/15  201/10 243/5 244/15  254/8  <b>joking</b> [1] 47/1  <b>Jonathan</b> [8] 98/14  200/7 243/4 244/8  244/12 244/20 245/2  245/11  <b>judge</b> [7] 1/12 4/3 4/10  19/18 62/5 74/14 250/19  <b>judicial</b> [2] 62/6 136/13  <b>jumped</b> [1] 76/12  <b>jumping</b> [1] 169/3  <b>June</b> [55] 6/18 29/15  31/2 31/3 32/15 34/10  34/10 35/1 35/13 35/15  35/20 35/25 37/20 38/17  40/3 40/15 42/24 43/15  44/20 50/7 61/13 80/2  122/21 127/5 140/19  142/19 145/22 146/25  147/15 148/2 148/13  148/19 149/1 149/5  149/9 149/11 150/4  151/24 153/16 160/24  161/21 163/1 163/18</p>	<p>163/25 164/21 165/21  166/17 166/21 175/8  175/14 175/17 184/7  205/4 231/8 232/6  <b>June 2011</b> [15] 127/5  145/22 146/25 148/2  148/13 148/19 149/1  149/5 150/4 153/16  163/1 163/18 163/25  164/21 166/21  <b>June 23rd</b> [1] 232/6  <b>June 24th</b> [9] 140/19  142/19 147/15 149/9  149/11 165/21 166/17  175/8 231/8  <b>June 28th</b> [17] 6/18  29/15 32/15 34/10 37/20  38/17 40/3 42/24 43/15  44/20 50/7 61/13 151/24  161/21 175/14 175/17  205/4  <b>jury</b> [3] 133/20 211/2  226/2  <b>just</b> [151] 4/20 5/24 5/25  8/4 8/5 9/20 10/12 10/19  10/21 10/25 11/3 14/22  15/19 18/19 22/6 23/11  24/9 27/18 27/20 27/24  30/13 34/15 35/4 35/13  37/14 37/23 41/7 41/25  42/1 47/4 47/5 47/14  48/21 49/25 54/22 55/13  55/17 57/23 59/12 60/9  61/14 62/12 65/11 71/7  71/9 71/9 73/9 74/10  77/23 82/4 84/3 84/9  84/13 84/16 84/19 89/3  89/6 91/8 92/8 93/22  95/17 96/16 96/18 98/18  98/25 99/4 99/15 100/18  101/1 102/10 105/13  108/19 111/25 114/10  115/12 116/21 117/7  125/6 126/11 132/16  133/20 136/15 138/12  138/25 140/4 145/8  145/14 147/13 150/23  152/1 152/19 154/12  156/8 166/15 167/16  174/3 174/20 176/12  179/1 179/14 185/11  185/16 186/11 189/7  194/25 197/17 197/19  198/11 198/24 201/13  203/13 203/14 204/6  204/23 205/7 205/9  211/5 212/17 213/7  215/25 216/18 221/6  221/9 221/19 222/2  222/20 222/22 227/4  227/15 228/21 229/2  229/6 229/11 229/25  230/1 230/17 233/17  237/7 237/11 239/11  239/11 242/9 243/18  246/2 246/17 250/6</p>
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<p><b>J</b></p> <p><b>just...</b> [5] 251/6 251/22 252/3 252/4 252/20</p> <hr/> <p><b>K</b></p> <p><b>Kass</b> [4] 2/16 4/6 4/8 101/24</p> <p><b>Keefe</b> [3] 2/10 3/18 3/20</p> <p><b>keep</b> [4] 69/17 228/9 252/8 252/10</p> <p><b>kept</b> [1] 78/1</p> <p><b>key</b> [86] 17/20 18/1 18/2 56/15 70/14 70/15 71/18 72/13 72/14 72/17 72/19 72/21 73/20 73/21 73/22 74/3 74/15 74/17 74/19 74/20 74/21 75/8 76/19 76/23 76/25 77/1 77/2 77/3 77/4 77/13 77/17 77/18 82/5 82/6 82/8 82/9 82/10 82/13 82/14 82/15 83/2 83/16 84/6 84/7 84/10 84/13 84/14 84/24 84/25 85/1 85/2 89/8 89/11 89/18 89/25 90/8 90/15 90/17 91/13 93/25 94/4 95/22 95/22 124/1 124/2 124/4 124/4 124/5 124/6 124/13 124/19 124/22 172/6 172/9 172/13 172/17 172/24 172/25 173/14 173/25 174/1 174/2 174/6 174/9 175/4 207/2</p> <p><b>key/root</b> [1] 95/22</p> <p><b>keys</b> [45] 70/18 75/9 75/11 75/18 75/20 76/4 76/7 77/7 77/8 77/14 77/22 77/23 78/10 78/12 78/18 79/2 79/6 84/24 85/4 85/15 85/25 86/16 86/18 86/22 86/23 87/2 88/5 91/10 92/2 92/5 92/6 92/17 92/19 93/19 93/23 93/23 96/10 96/22 96/25 97/4 124/1 193/13 193/14 193/19 193/24</p> <p><b>KIM</b> [1] 131/12</p> <p><b>kind</b> [6] 12/19 48/6 48/7 186/22 223/19 248/12</p> <p><b>kinda</b> [2] 24/13 236/19</p> <p><b>KLEIMAN</b> [33] 1/3 3/6 3/7 107/11 110/2 110/4 122/20 159/6 159/17 163/25 164/6 164/13 164/17 164/21 165/21 165/23 166/2 166/16 167/1 171/15 171/24 172/2 175/8 187/7 192/1 192/16 194/3 197/8 199/14 200/18 203/25 214/9 214/10</p> <p><b>knew</b> [6] 36/24 37/3 37/3 63/2 64/18 92/12</p> <p><b>knocked</b> [2] 17/15 19/22</p> <p><b>knots</b> [1] 21/3</p>	<p><b>know</b> [138] 8/12 8/14 13/7 14/4 15/16 27/13 31/1 36/18 37/2 39/9 45/6 46/1 46/12 46/15 46/24 50/6 54/14 55/2 55/12 55/12 55/13 55/15 56/1 57/9 64/1 64/15 65/9 67/5 67/18 68/6 69/15 71/12 71/18 74/9 75/18 75/19 75/23 75/23 75/25 76/3 76/4 77/13 77/16 77/17 77/20 77/24 78/5 78/6 78/7 78/10 78/15 79/1 79/4 79/6 79/18 80/7 80/8 84/8 85/14 86/12 87/22 92/3 92/3 94/1 94/12 94/13 96/3 96/6 96/13 96/17 96/18 96/19 96/22 96/23 98/5 98/7 98/17 98/24 99/4 101/10 102/2 105/17 106/1 113/5 113/10 116/19 116/24 122/25 124/20 129/17 145/23 152/7 152/21 161/20 164/24 165/20 167/16 172/19 172/20 175/4 193/3 198/8 200/3 201/14 202/15 203/13 205/1 211/2 212/8 215/4 215/17 215/18 216/7 216/14 217/22 219/25 222/25 224/24 225/9 225/16 235/6 236/9 236/10 236/14 238/15 240/3 242/1 242/12 246/7 246/9 248/6 249/7 250/3 250/4 250/7 250/7 251/13 251/14</p> <p><b>knowing</b> [1] 73/21</p> <p><b>knowledge</b> [25] 47/12 55/22 55/24 56/5 75/10 78/20 86/15 87/10 87/15 87/19 87/20 94/14 96/17 215/2 215/4 215/9 215/20 216/5 216/15 216/19 217/2 223/24 225/6 238/2 240/24</p> <p><b>known</b> [18] 12/25 13/5 17/20 18/25 28/8 47/12 58/16 63/4 63/16 63/23 63/25 64/11 70/21 74/10 76/8 80/13 94/12 124/1</p> <p><b>knows</b> [6] 56/1 64/11 75/1 77/5 92/11 234/4</p> <p><b>Kyle</b> [2] 2/8 3/13</p> <hr/> <p><b>L</b></p> <p><b>label</b> [5] 122/25 123/16 123/19 204/2 208/24</p> <p><b>labeled</b> [2] 132/8 159/8</p> <p><b>lack</b> [1] 17/2</p> <p><b>lacking</b> [2] 87/3 87/5</p> <p><b>lacks</b> [3] 86/17 86/21 87/9</p> <p><b>laid</b> [2] 137/17 144/17</p>	<p><b>language</b> [4] 11/18 23/20 68/11 88/12</p> <p><b>laptop</b> [8] 49/4 49/7 49/9 54/16 78/16 78/19 78/24 151/8</p> <p><b>large</b> [3] 207/5 207/8 208/8</p> <p><b>largely</b> [1] 38/13</p> <p><b>larger</b> [2] 14/11 38/11</p> <p><b>last</b> [24] 4/16 7/16 10/14 12/13 39/18 46/1 61/13 61/14 82/25 95/9 95/12 100/22 104/8 104/9 122/6 123/5 124/23 138/22 173/19 200/14 218/17 229/11 237/15 240/10</p> <p><b>lastly</b> [1] 174/11</p> <p><b>late</b> [2] 4/10 43/16</p> <p><b>later</b> [13] 26/9 40/7 41/11 41/14 41/19 62/24 77/1 77/14 91/16 92/18 106/13 189/6 212/23</p> <p><b>law</b> [1] 28/23</p> <p><b>lawsuit</b> [1] 246/7</p> <p><b>lawyers</b> [17] 30/3 31/22 31/25 32/13 33/12 34/18 36/21 37/5 37/9 37/12 37/21 38/5 38/10 38/16 38/18 62/17 63/1</p> <p><b>lawyers'</b> [1] 37/9</p> <p><b>lay</b> [3] 47/15 155/17 156/20</p> <p><b>lead</b> [1] 119/11</p> <p><b>leading</b> [2] 91/17 94/6</p> <p><b>lean</b> [1] 11/1</p> <p><b>learn</b> [1] 239/11</p> <p><b>learned</b> [2] 7/5 136/10</p> <p><b>least</b> [12] 31/6 42/12 50/17 101/8 101/11 101/21 102/20 103/13 108/6 150/19 251/7 251/17</p> <p><b>leave</b> [5] 43/14 43/15 125/6 189/6 189/7</p> <p><b>leaving</b> [1] 4/25</p> <p><b>lecturn</b> [1] 226/5</p> <p><b>led</b> [1] 228/7</p> <p><b>leeway</b> [1] 107/15</p> <p><b>left</b> [9] 16/14 25/8 43/16 59/17 159/16 160/13 207/4 207/7 208/8</p> <p><b>legal</b> [7] 10/13 10/21 42/16 87/6 95/10 210/19 238/12</p> <p><b>Leon</b> [4] 2/14 2/17 2/20 2/23</p> <p><b>less</b> [2] 14/3 58/7</p> <p><b>let</b> [39] 4/15 8/5 8/5 9/12 10/4 14/22 32/11 34/8 36/4 40/8 47/21 53/7 63/16 65/24 65/24 65/24 66/2 68/3 71/20 76/11 87/6 100/25 101/1 101/13 108/19 113/20 114/10 172/20 214/4</p>	<p>217/18 217/22 230/6 234/15 234/16 235/21 237/10 242/8 249/3 250/7</p> <p><b>let's</b> [55] 20/3 30/13 51/9 51/12 53/17 53/24 56/6 57/23 61/11 62/2 62/9 68/2 68/2 68/18 70/22 71/7 71/9 71/9 71/21 100/16 101/6 101/8 107/4 122/2 127/8 131/7 131/13 131/14 132/16 143/5 144/22 145/22 147/13 148/6 153/24 158/8 159/20 160/11 168/22 170/5 170/5 172/18 173/19 174/11 187/19 190/13 190/14 190/14 196/6 197/15 222/17 230/21 233/21 240/3 249/3</p> <p><b>lets</b> [1] 136/22</p> <p><b>letter</b> [1] 159/15</p> <p><b>letters</b> [3] 159/10 159/11 210/6</p> <p><b>level</b> [1] 6/23</p> <p><b>libraries</b> [3] 49/8 203/4 203/7</p> <p><b>life</b> [1] 44/21</p> <p><b>likely</b> [4] 27/5 27/11 243/20 247/25</p> <p><b>limitations</b> [2] 166/8 166/12</p> <p><b>limited</b> [7] 6/13 11/24 11/25 105/3 109/24 115/4 165/2</p> <p><b>line</b> [90] 45/10 45/18 106/25 128/20 129/6 129/14 129/22 130/8 130/25 131/12 131/15 131/21 132/4 132/6 132/14 132/17 132/19 133/10 134/8 134/21 134/23 138/3 138/5 139/1 139/5 139/6 139/15 139/20 139/22 140/5 140/17 141/7 143/6 143/14 146/19 147/2 147/2 147/13 147/19 147/20 148/6 149/2 149/15 149/16 149/16 149/17 149/18 149/20 149/22 159/13 163/4 163/6 167/19 167/20 168/15 168/22 169/3 169/4 169/6 169/9 169/13 171/12 172/8 172/10 182/14 183/12 183/13 183/17 185/15 186/1 188/17 188/20 190/7 195/11 202/7 231/24 232/6 238/15 241/20 245/6 245/8 247/19 247/20 247/20 247/20 247/20 247/20 247/23 247/24 248/1 248/2</p>	<p><b>line</b> [12] [1] 168/22</p> <p><b>line</b> [15] [1] 129/6</p> <p><b>line</b> [16] [4] 146/19 167/19 167/20 168/15</p> <p><b>line</b> [17] [1] 147/2</p> <p><b>line</b> [20] [1] 129/22</p> <p><b>line</b> [21] [2] 130/8 147/13</p> <p><b>line</b> [23] [5] 129/14 139/20 139/22 147/19 147/20</p> <p><b>line</b> [24] [2] 143/6 143/14</p> <p><b>line</b> [25] [1] 130/25</p> <p><b>line</b> [27] [1] 149/2</p> <p><b>line</b> [28] [4] 139/5 139/6 149/15 149/22</p> <p><b>line</b> [28s] [2] 149/16 149/16</p> <p><b>line</b> [3] [3] 163/4 163/6 231/24</p> <p><b>line</b> [30] [3] 169/3 169/9 169/13</p> <p><b>line</b> [30s] [1] 169/4</p> <p><b>line</b> [32] [5] 171/12 188/17 188/20 190/7 195/11</p> <p><b>line</b> [33] [2] 172/8 172/10</p> <p><b>line</b> [34] [1] 247/23</p> <p><b>line</b> [35] [1] 247/24</p> <p><b>line</b> [4] [2] 148/6 232/6</p> <p><b>line</b> [41] [1] 139/1</p> <p><b>Line</b> [45] [1] 139/15</p> <p><b>line</b> [46] [2] 248/1 248/2</p> <p><b>line</b> [48] [1] 134/21</p> <p><b>line</b> [49] [7] 132/14 132/17 132/19 134/8 134/23 138/3 138/5</p> <p><b>line</b> [52] [1] 159/13</p> <p><b>line</b> [53] [3] 131/15 132/4 132/6</p> <p><b>line</b> [54] [1] 131/21</p> <p><b>line</b> [59] [1] 131/12</p> <p><b>line</b> [60] [1] 140/5</p> <p><b>line</b> [63] [1] 140/17</p> <p><b>line</b> [71] [1] 141/7</p> <p><b>line</b> [72s] [4] 182/14 183/12 183/13 183/17</p> <p><b>lines</b> [7] 65/3 131/11 131/13 132/7 140/6 148/3 237/25</p> <p><b>lines</b> [12] [1] 148/3</p> <p><b>lines</b> [25] [2] 131/11 132/7</p> <p><b>lineup</b> [1] 7/1</p> <p><b>link</b> [3] 159/24 160/2 160/4</p> <p><b>linking</b> [1] 59/1</p> <p><b>links</b> [1] 160/7</p> <p><b>Linux</b> [1] 48/24</p> <p><b>list</b> [87] 5/19 6/15 13/18 13/25 14/12 15/14 15/16 15/24 16/22 16/24 17/13 17/15 18/6 19/21 19/22 20/8 23/8 24/12 24/15 24/17 25/5 25/15 25/21 26/10 26/12 27/4 27/7 27/11 27/24 28/3 32/2 32/6 32/9 33/23 33/24</p>
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<p><b>L</b>  <b>list...</b> [52] 34/2 35/7  37/24 37/25 38/2 38/5  38/11 38/20 38/21 38/23  48/4 52/6 52/24 52/24  54/12 55/5 55/8 55/13  55/17 56/20 61/8 61/13  62/10 62/11 62/16 62/17  64/9 64/24 65/16 66/12  66/13 67/4 67/13 80/4  80/5 80/11 80/21 80/24  84/24 86/11 88/13 94/16  94/23 95/1 95/13 97/9  192/25 194/5 205/2  205/15 205/16 206/11  <b>listed</b> [6] 143/11 169/8  169/10 248/7 248/9  248/16  <b>listen</b> [3] 5/22 189/7  224/15  <b>lists</b> [1] 57/1  <b>litigation</b> [8] 103/3  118/16 121/12 123/2  184/24 186/9 192/9  204/11  <b>little</b> [18] 20/13 30/13  41/18 47/22 51/9 54/22  69/10 72/18 85/6 87/1  88/15 91/6 91/7 91/22  101/12 107/14 119/19  125/4  <b>live</b> [7] 11/21 11/22 29/6  29/7 99/25 118/6 118/7  <b>lived</b> [1] 220/2  <b>LLP</b> [8] 2/2 2/5 2/8 2/11  2/14 2/17 2/20 2/23  <b>loathsome</b> [1] 49/3  <b>locate</b> [1] 166/19  <b>located</b> [3] 140/14 176/1  180/6  <b>location</b> [3] 134/19  136/23 138/3  <b>locked</b> [3] 13/22 21/23  51/3  <b>lodge</b> [1] 178/2  <b>logged</b> [1] 132/23  <b>logical</b> [3] 68/15 195/19  196/2  <b>London</b> [11] 11/22  11/24 12/13 29/5 29/6  29/7 31/18 34/7 39/18  43/18 43/25  <b>long</b> [24] 12/7 12/11  13/5 20/8 20/11 35/23  36/1 36/3 49/14 77/5  77/16 80/1 84/15 93/18  97/24 98/20 100/2  117/12 149/20 169/6  170/8 212/16 232/1  251/21  <b>longer</b> [2] 84/14 116/13  <b>longterm</b> [2] 12/19  12/20  <b>looked</b> [18] 19/7 53/21  54/5 134/7 138/13  139/20 168/4 169/9</p>	<p>184/12 188/4 193/5  194/23 211/11 217/4  225/2 225/17 231/21  248/10  <b>looking</b> [17] 7/21 8/9  18/22 19/8 39/1 50/3  135/21 145/24 158/17  167/15 173/3 173/5  178/9 237/24 240/20  247/18 247/19  <b>looks</b> [2] 193/4 223/1  <b>lookup</b> [7] 134/17  134/19 136/20 136/21  136/24 137/2 137/8  <b>loose</b> [1] 249/4  <b>lose</b> [1] 13/9  <b>losing</b> [1] 85/19  <b>loss</b> [1] 193/16  <b>lost</b> [2] 125/7 173/2  <b>lot</b> [14] 37/16 79/21  81/25 82/3 84/15 131/13  157/19 172/19 183/12  203/13 211/11 212/8  214/17 222/21  <b>lots</b> [3] 46/5 46/6 185/25  <b>loud</b> [1] 193/7  <b>lower</b> [2] 159/15 159/16  <b>luck</b> [3] 88/6 252/6  252/11  <b>lunch</b> [7] 98/7 98/9  99/25 116/19 116/20  117/5 117/8  <b>lunchtime</b> [1] 250/21</p> <p><b>M</b>  <b>M-a-x-M-i-n-d</b> [1]  134/16  <b>ma'am</b> [8] 218/10 231/6  231/15 237/8 237/17  237/19 239/14 240/23  <b>machine</b> [5] 22/20 48/25  71/17 71/21 72/10  <b>machines</b> [6] 22/18  70/10 71/1 71/15 71/24  93/2  <b>magic</b> [1] 41/6  <b>magically</b> [1] 236/3  <b>MAGISTRATE</b> [1]  1/12  <b>mail</b> [187] 1/19 39/1  62/25 110/2 110/4  122/11 122/20 124/9  126/20 127/5 127/6  127/8 127/10 127/23  129/10 129/13 129/14  129/15 129/21 129/23  129/25 130/1 130/2  130/4 130/6 130/7 130/9  130/12 130/16 130/17  130/17 130/18 130/19  130/21 130/24 130/25  131/1 131/2 131/3 131/4  131/8 131/9 131/18  132/2 132/8 132/10  132/11 132/12 132/20  132/22 133/2 133/6</p>	<p>133/7 133/8 133/13  137/19 138/10 138/15  138/15 138/18 138/20  139/3 139/4 139/10  139/12 139/14 139/15  139/17 139/23 139/25  140/1 140/3 140/10  140/11 140/22 141/2  141/3 141/11 141/13  143/2 143/6 143/7 143/8  143/9 143/11 143/15  144/9 145/7 145/21  145/23 146/5 146/16  146/17 146/25 146/25  147/14 147/15 147/19  147/20 147/22 147/23  148/1 148/2 148/16  148/18 148/19 148/22  149/2 149/4 149/6  149/24 149/25 153/13  153/14 156/17 157/4  158/19 158/23 159/22  160/1 160/5 160/8  160/14 160/17 161/5  161/9 162/10 162/24  163/1 163/5 163/12  163/20 163/22 163/24  163/25 164/6 164/17  165/20 165/23 166/2  166/16 166/16 166/21  166/22 167/1 169/13  169/19 169/20 169/23  169/25 174/3 174/10  175/8 187/6 187/17  188/22 189/1 189/10  190/10 190/20 192/3  192/15 193/7 194/11  195/13 203/24 206/18  226/17 226/18 226/19  227/24 230/21 230/23  230/24 231/7 231/9  231/17 231/19 233/3  233/10 233/16 233/18  233/20 234/20 235/1  235/20 247/15  <b>mailed</b> [4] 62/21 129/22  130/8 139/21  <b>mailer</b> [2] 141/7 141/9  <b>mails</b> [7] 150/5 153/16  153/19 153/20 168/18  186/17 214/22  <b>main</b> [2] 2/9 193/25  <b>major</b> [1] 174/20  <b>majority</b> [1] 57/7  <b>maker</b> [2] 9/5 129/7  <b>makes</b> [4] 95/5 116/18  211/7 232/18  <b>making</b> [5] 41/16 83/9  85/16 106/16 207/5  <b>mammoth</b> [1] 151/8  <b>man</b> [4] 63/5 79/20 95/9  194/2  <b>manage</b> [1] 189/5  <b>managed</b> [1] 38/2  <b>manipulate</b> [7] 115/2  115/23 116/6 142/24</p>	<p>142/25 143/1 219/21  <b>manipulated</b> [11] 72/20  114/16 115/25 116/5  121/17 184/15 186/23  192/5 195/17 210/10  211/16  <b>manner</b> [3] 22/13  174/17 177/2  <b>manually</b> [5] 140/24  154/21 169/16 184/16  241/23  <b>map</b> [1] 136/22  <b>mapping</b> [2] 134/18  159/16  <b>maps</b> [3] 159/11 159/14  159/15  <b>March</b> [3] 190/8 195/12  234/25  <b>March 2nd</b> [2] 195/12  234/25  <b>March 5th</b> [1] 190/8  <b>mark</b> [4] 16/24 16/25  99/4 157/25  <b>marked</b> [31] 15/20 32/3  120/23 127/17 133/17  134/3 141/15 151/25  152/18 156/14 159/8  161/13 162/8 166/24  167/24 170/18 175/13  176/10 180/12 182/7  187/23 189/14 190/22  192/11 194/15 197/2  200/20 203/20 208/20  209/22 242/16  <b>marker</b> [5] 19/24 22/18  22/25 23/5 160/21  <b>markers</b> [1] 181/18  <b>market</b> [4] 81/8 81/10  81/11 81/13  <b>Markoe</b> [25] 2/22 3/23  3/24 6/9 7/25 10/5 11/5  15/25 21/2 27/20 27/21  30/9 30/15 32/25 36/13  87/8 89/2 90/25 92/8  92/24 93/8 97/19 97/24  254/4 254/6  <b>marshals</b> [2] 9/22 10/3  <b>master</b> [1] 118/23  <b>master's</b> [1] 119/3  <b>match</b> [10] 140/6 147/17  169/1 188/22 190/10  195/13 233/15 233/24  235/13 240/5  <b>matches</b> [1] 170/16  <b>matching</b> [1] 197/18  <b>material</b> [1] 107/13  <b>materially</b> [1] 67/18  <b>math</b> [8] 25/13 61/12  61/23 63/6 63/10 66/15  67/1 74/10  <b>matter</b> [12] 5/16 9/13  17/6 47/15 108/23 135/9  155/1 186/4 208/7 222/2  251/23 255/21  <b>matters</b> [3] 4/21 9/15  245/19</p>	<p><b>Matthew</b> [4] 104/5  104/9 118/7 254/8  <b>mature</b> [1] 236/1  <b>MaxMind</b> [2] 134/16  136/22  <b>May 10</b> [1] 191/24  <b>May 13th</b> [1] 179/16  <b>May 2015</b> [1] 184/7  <b>May 22nd</b> [2] 182/15  183/14  <b>May 25th</b> [2] 202/2  203/15  <b>maybe</b> [12] 31/1 31/14  36/1 67/16 74/9 86/10  98/8 101/13 103/11  113/22 185/9 249/15  <b>McGovern</b> [40] 2/13  3/25 4/2 6/5 8/11 9/8  9/18 10/4 30/9 30/16  32/24 98/2 99/18 100/6  101/22 103/22 104/11  104/15 106/10 114/18  116/24 158/10 185/12  201/18 205/17 205/23  209/24 211/20 212/7  218/1 226/5 226/11  229/3 229/25 246/12  247/14 248/20 252/23  254/9 254/11  <b>McGovern's</b> [2] 156/23  244/14  <b>MD5</b> [2] 202/13 202/19  <b>me</b> [110] 4/11 7/22 8/5  9/12 10/17 14/22 15/18  9/16 27/10 32/11 33/3  34/8 35/6 36/4 36/25  37/8 37/16 40/8 41/25  43/20 44/6 47/1 47/3  47/21 50/12 52/2 53/7  53/19 61/18 61/25 62/17  63/16 64/21 65/24 65/24  65/24 66/2 68/3 69/12  70/19 71/20 73/9 79/19  82/3 82/4 85/9 92/24  95/5 95/12 98/25 99/1  99/2 100/25 101/1 101/8  101/11 101/13 101/14  101/16 102/10 102/19  102/21 104/17 104/21  108/19 109/13 109/23  112/25 113/20 114/10  114/14 114/19 117/16  125/7 125/9 126/12  135/15 151/22 155/23  172/20 173/2 177/12  189/8 194/19 214/4  215/24 216/18 217/18  217/22 219/9 220/17  220/18 222/5 228/7  230/6 234/15 234/16  235/21 237/9 237/11  242/8 245/10 247/17  249/3 249/17 249/22  250/2 250/9 250/13  251/18  <b>mea</b> [1] 99/7</p>
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<p><b>M</b></p> <p><b>mean [45]</b> 12/24 12/25 15/7 17/3 28/6 36/2 36/24 37/23 38/23 38/25 41/10 41/25 42/2 43/3 45/11 52/23 56/3 57/22 60/18 64/3 66/1 86/10 91/5 91/14 91/15 95/7 96/18 101/14 129/1 131/16 133/1 133/11 139/2 139/7 139/16 168/19 174/6 181/20 198/18 214/13 216/17 217/18 227/5 234/2 249/7</p> <p><b>meaning [1]</b> 48/2</p> <p><b>means [16]</b> 53/24 54/8 68/6 96/23 96/24 112/24 114/12 122/9 168/20 174/8 179/11 227/22 234/3 243/24 243/25 249/19</p> <p><b>meant [2]</b> 14/11 31/19</p> <p><b>mechanics [1]</b> 208/7</p> <p><b>mechanism [4]</b> 7/4 51/4 71/16 78/13</p> <p><b>media [1]</b> 9/23</p> <p><b>meet [3]</b> 29/2 36/21 136/17</p> <p><b>meeting [14]</b> 32/19 32/23 33/11 33/14 34/3 34/15 35/2 35/24 36/1 36/19 37/8 37/14 38/15 38/18</p> <p><b>meetings [6]</b> 36/16 36/18 37/4 38/16 48/19 48/20</p> <p><b>meets [1]</b> 20/15</p> <p><b>member [2]</b> 9/22 37/23</p> <p><b>mentioned [7]</b> 21/16 45/24 67/22 95/11 111/14 130/15 140/9</p> <p><b>Merit [1]</b> 255/20</p> <p><b>merits [1]</b> 106/13</p> <p><b>message [6]</b> 132/12 140/24 150/1 163/5 199/17 200/5</p> <p><b>messages [6]</b> 197/8 199/19 199/21 199/23 242/18 243/1</p> <p><b>messaging [2]</b> 13/7 196/23</p> <p><b>messed [1]</b> 93/8</p> <p><b>messing [1]</b> 49/6</p> <p><b>Mestre [5]</b> 2/14 2/17 2/20 2/23 30/3</p> <p><b>met [6]</b> 13/8 31/20 31/22 34/18 38/18 104/17</p> <p><b>meta [5]</b> 128/21 128/22 128/24 148/6 148/8</p> <p><b>metadata [130]</b> 102/23 103/5 105/3 105/7 105/13 106/3 106/4 106/7 106/9 106/17 108/2 111/3 111/22 121/23 122/3 122/4</p>	<p>127/11 127/22 128/5 128/23 129/3 129/4 129/12 129/20 130/5 130/6 130/21 130/24 141/5 146/4 146/16 146/16 147/8 148/1 148/3 148/9 150/3 154/19 155/13 155/19 155/22 162/5 162/13 164/14 165/12 166/5 167/12 168/1 168/4 168/23 169/16 176/7 176/24 177/1 177/2 177/15 177/20 177/24 178/10 179/21 180/14 180/23 181/14 184/12 184/15 210/25 212/25 213/3 213/4 213/5 213/7 213/8 213/9 213/11 213/13 213/15 213/20 213/25 215/16 216/4 217/12 218/13 218/14 218/17 219/2 219/5 219/14 219/17 219/21 219/22 220/3 220/4 220/9 220/16 220/24 221/3 221/9 221/12 221/14 221/17 221/21 221/24 222/4 222/10 222/12 223/20 224/1 224/12 227/11 227/13 227/17 227/23 228/4 228/6 228/16 228/18 229/13 229/15 229/22 230/7 230/10 231/16 231/20 233/19 240/10 247/16 247/18 247/21 248/6 248/9</p> <p><b>methodo [1]</b> 109/12</p> <p><b>methodologies [3]</b> 5/14 103/9 168/4</p> <p><b>methodology [21]</b> 103/6 107/5 107/17 108/9 109/1 109/2 109/12 109/22 110/3 110/8 110/11 110/13 110/18 110/21 111/25 162/12 188/3 189/19 205/2 205/13 205/13</p> <p><b>methods [3]</b> 103/4 121/20 121/22</p> <p><b>Miami [6]</b> 2/4 2/7 2/12 2/24 98/8 249/20</p> <p><b>microphone [5]</b> 11/1 11/4 104/7 226/6 226/11</p> <p><b>Microsoft [21]</b> 129/7 129/11 129/13 130/14 139/21 140/7 141/14 142/3 142/14 142/14 142/16 142/18 149/3 149/3 149/13 160/8 180/24 182/1 183/24 184/9 236/3</p> <p><b>Microsoft's [4]</b> 141/17 141/22 141/23 236/7</p> <p><b>mid [2]</b> 12/9 12/14</p>	<p><b>middle [2]</b> 194/18 202/7</p> <p><b>midnight [2]</b> 131/25 163/9</p> <p><b>might [13]</b> 14/10 18/25 35/9 47/2 88/9 96/7 103/13 113/21 136/16 177/16 224/4 244/21 245/18</p> <p><b>might've [1]</b> 235/4</p> <p><b>Mike [1]</b> 81/1</p> <p><b>million [1]</b> 5/20</p> <p><b>milliseconds [3]</b> 163/9 232/2 232/12</p> <p><b>mind [10]</b> 42/12 47/16 63/13 71/13 112/8 113/1 113/1 113/10 113/12 116/4</p> <p><b>mine [7]</b> 21/25 22/22 54/17 71/1 72/17 74/4 78/16</p> <p><b>mined [49]</b> 13/18 16/19 21/19 22/24 25/24 26/1 26/16 27/6 28/1 28/4 51/19 51/20 52/5 54/8 54/19 55/16 60/19 64/5 65/1 65/8 65/22 66/1 66/5 66/6 69/23 70/2 70/8 71/19 72/24 73/17 74/1 75/20 75/21 78/7 78/23 79/5 80/9 80/18 80/23 81/4 81/9 83/4 87/16 91/12 91/24 92/1 92/4 93/17 96/4</p> <p><b>miner [9]</b> 21/25 22/3 22/21 58/12 61/4 73/13 73/16 73/19 74/2</p> <p><b>miners [6]</b> 20/14 20/19 20/22 21/16 71/19 84/4</p> <p><b>mines [2]</b> 71/4 71/11</p> <p><b>mining [13]</b> 16/10 17/21 20/1 20/12 22/5 52/3 52/4 52/16 64/20 72/15 91/15 93/1 93/4</p> <p><b>minted [2]</b> 64/6 64/9</p> <p><b>minus [2]</b> 138/21 138/24</p> <p><b>minute [5]</b> 4/10 7/16 68/18 82/2 246/25</p> <p><b>minutes [4]</b> 34/4 68/22 98/5 195/24</p> <p><b>mischaracter [1]</b> 109/19</p> <p><b>mischaracterized [1]</b> 44/11</p> <p><b>mischaracterizes [2]</b> 76/10 244/1</p> <p><b>missed [1]</b> 72/9</p> <p><b>misstates [1]</b> 228/23</p> <p><b>mistake [4]</b> 23/12 23/13 24/14 108/4</p> <p><b>mistaken [1]</b> 227/10</p> <p><b>MITRE [5]</b> 119/7 119/13 119/15 119/19 120/9</p> <p><b>modification [4]</b> 215/10 216/6 216/21 240/11</p> <p><b>modifications [16]</b> 150/8 159/2 212/25 213/2</p>	<p>213/24 214/2 214/25 215/5 215/14 223/5 246/3 246/4 246/15 246/16 246/17 246/17</p> <p><b>modified [27]</b> 20/13 24/12 106/5 106/6 106/8 108/16 112/10 113/11 113/15 122/6 124/21 148/2 148/3 148/4 158/25 159/9 159/10 160/17 160/22 184/16 213/21 215/18 220/11 233/19 241/23 242/2 242/12</p> <p><b>modify [2]</b> 159/7 241/15</p> <p><b>modifying [1]</b> 215/19</p> <p><b>moment [2]</b> 27/16 88/25</p> <p><b>Monday [5]</b> 99/11 99/20 100/20 100/22 249/6</p> <p><b>Monday's [1]</b> 99/19</p> <p><b>money [2]</b> 252/9 252/10</p> <p><b>monitor [1]</b> 85/3</p> <p><b>Monotype [1]</b> 181/25</p> <p><b>month [4]</b> 71/3 160/24 191/25 253/4</p> <p><b>months [4]</b> 39/25 79/9 79/9 79/24</p> <p><b>morning [29]</b> 3/2 3/4 3/10 3/12 3/14 3/15 3/17 3/18 3/20 3/22 3/24 4/2 4/3 4/5 4/6 4/8 5/5 23/11 24/11 28/19 28/20 68/16 99/16 99/20 204/25 205/11 205/22 206/9 250/20</p> <p><b>most [5]</b> 22/5 44/21 49/1 193/20 247/25</p> <p><b>motion [4]</b> 4/14 103/24 205/24 206/1</p> <p><b>motions [1]</b> 9/8</p> <p><b>motive [1]</b> 115/23</p> <p><b>mount [1]</b> 100/23</p> <p><b>mouse [1]</b> 159/25</p> <p><b>mouth [1]</b> 37/19</p> <p><b>move [38]</b> 59/10 121/1 128/8 135/1 137/6 137/10 142/5 146/7 152/8 154/7 156/1 156/18 157/10 161/23 162/15 164/3 167/4 168/7 171/3 177/5 180/25 183/3 186/6 187/8 188/6 189/22 191/10 192/17 195/1 198/4 201/8 204/4 207/5 207/8 208/9 209/2 238/19 252/20</p> <p><b>moved [6]</b> 16/21 47/7 54/9 128/9 193/21 197/20</p> <p><b>moving [2]</b> 12/13 208/10</p> <p><b>Mr [12]</b> 3/12 3/14 3/17 3/20 4/5 11/15 204/15 206/8 252/16 254/5 254/7 254/10</p> <p><b>Mr. [95]</b> 4/8 5/12 8/4</p>	<p>8/10 8/18 8/19 8/22 9/7 9/10 9/16 10/8 10/9 10/17 10/25 11/21 12/3 14/23 15/11 16/3 17/24 18/21 27/18 27/24 28/19 31/15 50/18 65/21 68/14 69/1 69/7 72/7 72/11 74/12 78/3 86/1 87/13 89/20 89/22 90/22 94/22 98/4 98/4 101/13 101/18 101/20 102/20 116/16 117/15 118/2 123/13 125/16 126/11 133/19 136/5 143/19 150/14 151/19 152/3 152/19 153/5 153/25 155/16 156/7 156/10 157/24 158/14 166/11 171/24 173/2 178/12 179/13 185/16 186/2 186/25 195/19 196/12 196/15 196/15 197/12 198/14 201/3 204/22 204/25 205/14 206/5 207/10 207/19 210/21 243/13 244/24 248/23 249/20 251/25 252/11 252/19</p> <p><b>Mr. Brenner [10]</b> 65/21 68/14 72/7 72/11 74/12 78/3 86/1 87/13 90/22 98/4</p> <p><b>Mr. Brenner's [1]</b> 69/1</p> <p><b>Mr. Coughlan [2]</b> 10/17 10/25</p> <p><b>Mr. Freedman [11]</b> 8/4 8/10 9/16 14/23 98/4 101/13 117/15 153/5 158/14 196/12 252/19</p> <p><b>Mr. Freedman's [1]</b> 249/20</p> <p><b>Mr. Kass [1]</b> 4/8</p> <p><b>Mr. Kleiman [1]</b> 171/24</p> <p><b>Mr. Rivero [1]</b> 252/11</p> <p><b>Mr. Roche [38]</b> 101/18 101/20 102/20 116/16 118/2 123/13 125/16 126/11 133/19 136/5 143/19 150/14 151/19 152/3 152/19 153/25 155/16 156/7 156/10 157/24 166/11 173/2 178/12 179/13 185/16 186/2 186/25 195/19 196/15 196/15 197/12 198/14 204/22 206/5 207/19 210/21 248/23 251/25</p> <p><b>Mr. Satoshi [1]</b> 12/3</p> <p><b>Mr. Shadders [22]</b> 5/12 8/18 8/19 8/22 9/10 10/8 10/9 11/21 15/11 16/3 17/24 18/21 27/18 27/24 28/19 69/7 89/20 89/22 94/22 204/25 205/14 207/10</p> <p><b>Mr. Shadders's [1]</b> 9/7</p>
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<p><b>M</b></p> <p><b>Mr. Warren's [3]</b> 201/3 243/13 244/24</p> <p><b>Mr. Wright [2]</b> 31/15 50/18</p> <p><b>Ms [7]</b> 3/24 4/2 226/11 254/4 254/6 254/9 254/11</p> <p><b>Ms. [51]</b> 6/5 7/25 8/11 9/8 9/18 10/4 10/5 11/5 15/25 21/2 27/20 27/21 30/15 30/16 36/13 87/8 89/2 90/25 92/8 92/24 93/8 97/19 97/24 98/2 99/18 100/6 101/22 103/22 104/11 106/10 114/18 116/24 152/25 156/23 158/10 185/12 201/18 205/17 205/23 209/24 211/20 212/7 218/1 226/5 229/3 229/25 244/14 246/12 247/14 248/20 252/23</p> <p><b>Ms. Fagan [1]</b> 152/25</p> <p><b>Ms. Markoe [17]</b> 7/25 10/5 11/5 15/25 21/2 27/20 27/21 30/15 36/13 87/8 89/2 90/25 92/8 92/24 93/8 97/19 97/24</p> <p><b>Ms. McGovern [31]</b> 6/5 8/11 9/8 9/18 10/4 30/16 98/2 99/18 100/6 101/22 103/22 104/11 106/10 114/18 116/24 158/10 185/12 201/18 205/17 205/23 209/24 211/20 212/7 218/1 226/5 229/3 229/25 246/12 247/14 248/20 252/23</p> <p><b>Ms. McGovern's [2]</b> 156/23 244/14</p> <p><b>MSG [7]</b> 161/10 161/18 162/11 163/19 164/15 248/4 248/11</p> <p><b>much [24]</b> 5/4 17/4 18/2 19/10 27/21 38/11 48/10 55/11 55/24 56/1 60/8 81/20 84/14 91/2 99/10 99/18 117/14 154/18 195/25 230/3 239/10 247/4 250/1 253/2</p> <p><b>muddled [1]</b> 91/7</p> <p><b>multiple [4]</b> 19/13 146/22 167/18 198/12</p> <p><b>must [4]</b> 5/22 8/25 31/18 231/25</p> <p><b>mutated [1]</b> 72/20</p> <p><b>myself [4]</b> 32/24 47/24 189/6 251/25</p>	<p>46/16 46/23 56/4 56/8 81/1 81/5</p> <p><b>Nakamoto's [1]</b> 12/3</p> <p><b>name [23]</b> 10/13 10/14 10/22 11/8 11/11 17/25 28/23 33/3 47/2 104/7 104/8 104/9 104/10 104/15 118/6 118/7 132/1 132/21 133/7 133/12 160/1 215/15 215/15</p> <p><b>named [1]</b> 200/23</p> <p><b>names [3]</b> 141/18 143/8 248/9</p> <p><b>narrow [3]</b> 16/7 19/20 60/3</p> <p><b>narrowed [1]</b> 58/18</p> <p><b>narrowing [1]</b> 88/7</p> <p><b>national [1]</b> 119/23</p> <p><b>native [7]</b> 143/25 198/24 231/7 231/9 231/17 232/19 247/15</p> <p><b>nature [7]</b> 59/25 102/3 116/19 120/2 186/8 239/14 251/10</p> <p><b>nChain [23]</b> 8/20 11/24 11/25 12/1 12/11 12/15 13/1 34/7 39/3 39/5 39/11 40/6 40/7 41/2 41/21 42/6 42/10 42/13 43/6 44/5 45/6 45/8 45/13</p> <p><b>nChain's [1]</b> 12/19</p> <p><b>necessarily [8]</b> 60/18 73/21 75/9 78/12 213/13 220/11 224/1 224/3</p> <p><b>necessary [4]</b> 7/7 56/10 93/16 113/12</p> <p><b>need [50]</b> 5/2 26/8 37/11 44/15 49/11 69/16 69/17 76/13 83/6 83/9 83/20 83/22 83/22 84/7 84/8 85/25 89/7 89/10 89/11 89/12 89/24 89/25 90/8 90/11 91/2 94/1 94/1 97/2 98/24 99/18 100/13 101/22 110/17 115/17 117/12 124/1 135/20 136/5 155/16 156/20 193/10 193/15 196/1 196/1 198/15 205/25 206/4 226/5 251/20 251/20</p> <p><b>needed [10]</b> 4/11 35/6 92/6 92/17 92/18 93/3 96/21 96/22 96/23 225/14</p> <p><b>needing [1]</b> 92/4</p> <p><b>needs [6]</b> 13/22 26/21 71/18 76/22 101/23 244/17</p> <p><b>negative [5]</b> 21/13 21/14 23/21 23/24 24/2</p> <p><b>network [1]</b> 134/14</p> <p><b>networks [1]</b> 119/6</p> <p><b>never [15]</b> 7/10 29/13</p>	<p>47/1 54/6 54/9 54/21 92/12 92/13 97/15 97/16 104/21 107/8 107/11 208/10 243/10</p> <p><b>nevertheless [1]</b> 154/24</p> <p><b>new [23]</b> 58/24 64/20 64/21 73/1 73/2 74/5 76/17 83/4 83/9 83/23 83/23 83/25 84/1 118/7 118/8 118/20 120/10 120/13 212/11 240/9 249/21 252/19 252/20</p> <p><b>newly [2]</b> 76/22 83/4</p> <p><b>news [2]</b> 252/8 252/9</p> <p><b>next [22]</b> 4/18 16/17 21/25 22/1 46/25 58/7 71/18 72/21 73/23 74/21 97/24 98/1 99/12 138/15 138/18 138/19 147/2 206/20 206/23 226/12 228/11 240/17</p> <p><b>Nguyen [2]</b> 32/24 33/4</p> <p><b>nine [2]</b> 156/16 188/11</p> <p><b>no [232]</b> 1/2 5/20 6/24 7/25 9/16 9/17 9/19 9/21 9/23 9/25 10/2 13/11 14/24 14/25 15/4 19/2 20/20 22/4 23/1 25/25 25/25 26/2 26/17 26/17 27/22 28/5 28/5 28/11 29/12 29/21 30/21 31/16 31/16 32/16 34/6 34/24 34/24 35/4 35/14 39/11 39/13 40/14 41/3 42/10 42/10 43/20 44/25 45/16 47/4 47/10 47/20 51/3 51/4 52/7 52/9 52/11 55/7 55/7 55/11 55/11 56/14 56/17 56/22 57/14 58/25 63/9 65/2 65/2 68/3 69/13 70/16 70/16 70/16 75/18 75/19 75/23 76/1 78/14 78/20 78/23 78/25 79/14 80/22 81/20 81/24 81/24 82/7 82/7 82/11 82/15 83/12 83/12 83/22 85/24 86/8 86/9 86/16 87/18 89/3 89/9 90/24 93/10 95/4 95/4 95/5 96/9 96/11 96/13 96/18 97/15 97/17 97/21 98/21 99/3 99/23 108/4 108/19 108/24 108/24 109/2 116/13 121/4 121/7 126/17 128/12 128/15 137/25 142/11 144/18 146/13 157/17 158/13 162/3 162/22 164/1 165/1 165/14 166/7 166/7 166/18 167/7 167/10 168/13 169/2 169/12 169/22 169/24 169/25 169/25 170/5 171/5 171/6 171/8 171/20 175/9 177/11</p>	<p>177/18 178/4 179/1 183/9 184/11 184/20 185/14 187/11 187/14 188/13 188/24 189/6 190/3 190/12 191/16 192/20 192/23 193/23 195/7 195/15 195/25 195/25 196/12 197/14 197/21 200/19 201/25 206/6 207/1 207/11 209/5 209/7 209/13 210/2 211/17 212/4 212/16 213/17 215/7 215/8 216/4 216/12 216/18 216/22 216/24 216/25 217/14 220/24 221/6 221/14 221/17 221/19 224/16 225/10 225/20 225/21 227/21 227/21 228/17 238/5 239/1 239/5 239/14 242/25 245/8 246/8 246/21 247/3 247/13 248/15 248/22 248/25 251/15</p> <p><b>nodding [2]</b> 249/12 249/14</p> <p><b>non [1]</b> 189/7</p> <p><b>non-trading [1]</b> 189/7</p> <p><b>Nonce [30]</b> 19/24 19/25 20/17 20/18 20/21 20/24 21/4 21/7 21/16 21/20 21/21 21/21 22/2 22/6 22/11 22/21 23/5 58/8 58/11 59/12 59/15 59/21 59/25 60/10 60/15 60/20 61/1 61/3 70/4 73/18</p> <p><b>none [4]</b> 90/5 162/1 169/14 245/19</p> <p><b>normal [1]</b> 169/23</p> <p><b>north [1]</b> 65/11</p> <p><b>Nos [2]</b> 156/5 181/8</p> <p><b>notable [1]</b> 70/19</p> <p><b>note [2]</b> 10/13 23/10</p> <p><b>noted [1]</b> 23/11</p> <p><b>noteworthy [6]</b> 149/10 163/21 168/16 169/19 174/17 190/16</p> <p><b>nothing [11]</b> 10/2 72/3 72/4 79/4 91/11 95/15 101/10 107/20 144/12 230/13 230/22</p> <p><b>notice [3]</b> 62/6 136/14 207/6</p> <p><b>noticing [2]</b> 152/19 252/3</p> <p><b>November [13]</b> 149/14 200/2 200/18 242/23 243/1 243/9 243/15 243/25 244/4 244/4 245/5 245/15 245/19</p> <p><b>November 12th [1]</b> 244/4</p> <p><b>November 19 [2]</b> 200/2 245/15</p> <p><b>November 19th [7]</b></p>	<p>200/18 242/23 243/1 243/9 244/4 245/5 245/19</p> <p><b>November 2012 [2]</b> 243/15 243/25</p> <p><b>number [103]</b> 3/5 14/11 15/15 15/15 20/7 21/10 21/10 21/11 21/20 22/15 22/25 23/21 23/22 24/2 24/3 37/15 37/25 38/2 38/4 54/2 55/14 65/2 65/3 65/7 65/10 66/19 71/21 73/13 75/16 90/10 90/12 112/18 121/16 123/11 126/14 127/1 128/20 130/1 131/24 134/13 134/17 140/2 145/9 149/17 152/14 158/3 163/8 165/22 169/8 174/18 174/19 174/19 174/20 174/23 177/21 180/4 185/3 186/13 197/8 198/9 199/23 209/1 209/17 209/23 211/13 212/23 213/2 215/12 218/8 218/14 218/16 218/16 218/22 219/5 219/22 220/3 220/19 220/20 221/13 223/9 223/22 223/23 224/9 225/17 226/20 226/20 226/22 226/23 227/11 228/12 229/4 230/11 230/14 230/23 231/3 231/4 231/13 232/17 232/21 232/22 237/5 242/17 242/17</p> <p><b>number 00079344 [1]</b> 231/4</p> <p><b>number 1 [13]</b> 220/19 220/20 221/13 223/22 223/23 224/9 225/17 226/20 229/4 230/11 230/14 230/23 232/22</p> <p><b>number 13189 [1]</b> 127/1</p> <p><b>number 16 [2]</b> 242/17 242/17</p> <p><b>number 18-80176 [1]</b> 3/5</p> <p><b>number 2 [6]</b> 134/17 209/23 218/22 226/23 228/12 232/17</p> <p><b>number 2413 [1]</b> 112/18</p> <p><b>number 30 [3]</b> 165/22 231/3 232/21</p> <p><b>number 31 [1]</b> 231/13</p> <p><b>number 37 [2]</b> 71/21 218/14</p> <p><b>number 4 [1]</b> 128/20</p> <p><b>number 40 [1]</b> 177/21</p> <p><b>number 50 [1]</b> 75/16</p> <p><b>number 56403 [1]</b> 198/9</p> <p><b>number 6 [3]</b> 218/8 226/22 227/11</p> <p><b>number 7 [1]</b> 218/16</p>
---	--	---	--	--

<p><b>N</b>  <b>number 8 [1]</b> 218/16  <b>number 9 [1]</b> 237/5  <b>numbers [15]</b> 21/7 21/13                  21/13 21/17 22/19 23/24                  32/9 93/3 131/22 141/19                  153/24 159/10 159/11                  198/10 210/7  <b>nuts [1]</b> 48/2  <b>NY [1]</b> 2/9</p>	<p>195/4 195/5 195/6 198/6                  199/4 199/6 201/18                  201/20 204/9 204/12                  205/18 205/19 205/20                  206/5 207/12 208/3                  208/3 208/11 209/4                  209/5 209/6 209/25                  210/2 210/15 210/20                  211/5 211/8 216/23                  224/18 228/23 236/20                  237/21 238/8 238/12                  238/12 238/13 238/19                  238/22 238/25 239/2                  239/3 240/25 241/8                  242/1 242/3 244/1 244/6                  244/11 245/22 246/10  <b>objection 4 [1]</b> 156/3  <b>objections [1]</b> 181/6  <b>objects [4]</b> 152/14                  152/17 177/2 182/24  <b>observed [1]</b> 217/3  <b>obtain [2]</b> 71/17 191/2  <b>obtained [1]</b> 50/13  <b>obviously [5]</b> 40/9 50/22                  99/9 251/5 251/14  <b>occur [3]</b> 243/1 243/2                  246/16  <b>occurred [2]</b> 242/22                  246/5  <b>OCR [1]</b> 240/7  <b>OCR'd [1]</b> 240/3  <b>OCR'ing [1]</b> 240/5  <b>October [37]</b> 13/8 127/5                  127/8 129/15 132/2                  132/24 138/17 138/18                  138/20 138/23 143/14                  144/8 145/21 146/25                  148/1 148/4 148/16                  150/4 153/16 159/22                  160/24 163/12 166/22                  168/25 171/13 174/4                  175/21 176/6 178/21                  178/22 178/23 178/24                  179/23 181/19 184/13                  192/16 237/5  <b>October 16 [2]</b> 138/20                  138/23  <b>October 17 [3]</b> 129/15                  138/17 138/18  <b>October 17th [1]</b> 132/24  <b>October 2012 [1]</b> 163/12  <b>October 2014 [14]</b> 127/5                  127/8 132/2 143/14                  144/8 145/21 146/25                  148/1 148/16 150/4                  153/16 159/22 166/22                  174/4  <b>October 2015 [1]</b> 181/19  <b>October 22nd [3]</b> 148/4                  179/23 184/13  <b>October 23rd [7]</b> 168/25                  171/13 175/21 176/6                  178/21 178/24 237/5  <b>October 24th [2]</b> 178/22                  178/23  <b>odd [1]</b> 24/17</p>	<p><b>off [15]</b> 19/22 22/16 34/9                  45/11 49/2 49/4 51/23                  61/25 97/19 189/7 205/7                  224/24 225/10 234/9                  235/4  <b>offer [5]</b> 14/20 44/15                  165/17 186/12 186/21  <b>offered [9]</b> 6/13 30/11                  30/19 46/21 47/1 100/9                  136/21 201/23 205/10  <b>offering [2]</b> 102/17                  105/2  <b>offers [1]</b> 102/14  <b>office [2]</b> 34/7 120/12  <b>officer [4]</b> 8/20 12/16                  39/14 45/7  <b>Official [1]</b> 1/17  <b>offline [1]</b> 193/17  <b>often [1]</b> 159/7  <b>oh [20]</b> 10/21 41/13 47/3                  75/7 88/2 89/4 89/16                  97/12 100/5 123/10                  125/21 134/24 145/8                  152/6 173/12 211/22                  226/7 234/15 237/10                  247/6  <b>Oh, [1]</b> 126/15  <b>Oh, 2 [1]</b> 126/15  <b>okay [360]</b>  <b>old [1]</b> 83/24  <b>once [11]</b> 16/14 17/5                  17/11 47/6 49/17 49/22                  74/22 74/22 97/10 189/8                  205/24  <b>one [114]</b> 7/3 9/13 9/25                  15/18 18/7 18/17 19/14                  19/16 21/7 21/9 22/11                  22/17 22/25 26/11 27/18                  27/20 28/7 28/8 30/22                  35/24 44/21 46/7 46/20                  47/4 47/21 51/3 52/12                  52/18 52/25 55/6 55/10                  56/14 56/17 57/12 57/19                  58/21 59/1 59/11 59/21                  65/19 67/8 67/9 70/4                  71/7 71/9 71/19 72/15                  75/25 78/14 78/15 78/20                  80/19 80/23 80/25 81/2                  82/10 82/25 83/24 83/25                  85/24 89/6 89/22 90/4                  90/6 90/19 92/3 93/10                  94/20 95/14 98/13                  106/15 108/6 109/20                  126/12 126/12 132/11                  132/14 132/16 133/24                  136/4 138/10 138/12                  138/12 139/15 140/25                  151/6 151/13 155/16                  156/11 162/18 174/19                  177/13 180/17 185/11                  189/11 193/5 193/15                  198/24 198/25 211/21                  211/24 219/9 220/17                  224/12 232/11 232/12                  242/10 246/25 247/6                  247/21 247/24 251/5</p>	<p>251/22 252/7  <b>one's [1]</b> 53/12  <b>one, [1]</b> 127/20  <b>one, 7 [1]</b> 127/20  <b>one-third [1]</b> 67/9  <b>ones [5]</b> 27/14 54/5                  193/22 223/15 225/15  <b>online [5]</b> 13/7 193/22                  236/12 236/16 236/19  <b>online ones [1]</b> 193/22  <b>only [35]</b> 12/21 17/5                  17/9 17/21 18/14 18/22                  19/14 23/23 24/11 37/2                  39/16 53/21 56/14 57/19                  73/23 85/13 85/22 86/17                  86/21 90/6 99/25 103/18                  103/20 112/16 124/1                  124/6 143/3 158/11                  174/19 193/22 198/18                  208/1 216/9 234/4                  242/25  <b>ons [1]</b> 48/19  <b>opened [1]</b> 129/11  <b>opening [1]</b> 251/25  <b>OpenSSL [1]</b> 182/22  <b>operate [1]</b> 68/9  <b>operated [1]</b> 163/15  <b>operations [1]</b> 119/16  <b>opine [4]</b> 108/14 108/15                  186/14 216/9  <b>opined [3]</b> 214/2 214/16                  237/11  <b>opinion [33]</b> 104/23                  105/2 105/14 106/11                  107/18 108/4 108/5                  109/16 111/11 112/8                  112/17 113/14 121/10                  135/19 163/24 164/16                  164/24 165/17 165/22                  166/15 175/7 184/18                  186/21 195/16 211/1                  221/18 222/16 223/22                  228/5 234/17 238/23                  239/15 243/9  <b>opinions [10]</b> 100/19                  103/24 107/2 108/3                  211/24 211/25 212/24                  213/2 215/23 216/2  <b>opportunity [2]</b> 102/13                  204/16  <b>opposed [2]</b> 106/18                  241/23  <b>order [25]</b> 3/1 4/15 7/15                  8/16 13/22 54/17 76/21                  83/11 86/21 89/10 89/24                  92/21 96/21 108/3 124/8                  133/8 170/15 176/15                  176/20 178/20 180/22                  185/19 202/10 202/17                  232/15  <b>organization [2]</b> 46/7                  119/7  <b>organized [1]</b> 43/2  <b>origin [1]</b> 122/10  <b>original [6]</b> 84/23 161/5                  161/9 218/13 229/16</p>	<p>229/16  <b>originally [2]</b> 227/24                  242/11  <b>originated [5]</b> 124/21                  131/18 132/3 132/20                  133/13  <b>originating [1]</b> 140/21  <b>others [3]</b> 47/19 58/22                  224/13  <b>otherwise [8]</b> 5/20 8/25                  18/25 24/7 40/12 45/3                  109/6 137/16  <b>our [19]</b> 5/9 7/3 7/13                  12/21 16/1 68/15 99/25                  101/22 102/4 102/9                  114/22 114/24 115/2                  137/13 164/7 177/17                  177/22 205/9 251/25  <b>outcome [1]</b> 13/10  <b>Outlook [14]</b> 129/8                  129/11 129/13 130/14                  139/21 140/7 141/14                  141/18 141/19 142/14                  142/14 142/16 142/16                  142/18  <b>output [13]</b> 18/15 57/21                  57/21 82/25 84/3 90/17                  170/20 172/6 187/25                  188/16 189/16 190/5                  194/17  <b>outputs [1]</b> 19/13  <b>outranks [1]</b> 4/11  <b>outside [8]</b> 10/1 16/13                  23/1 86/11 204/13                  210/24 238/13 242/3  <b>over [40]</b> 6/25 20/25                  21/1 31/25 33/24 46/1                  47/11 66/12 76/12                  101/18 110/15 128/13                  133/24 137/23 137/24                  142/10 146/12 151/9                  156/3 159/25 160/8                  168/12 179/18 188/11                  190/2 193/9 193/14                  193/19 195/6 206/5                  211/11 213/4 218/17                  219/2 221/9 222/21                  224/25 225/9 226/3                  252/21  <b>over-inclusive [2]</b> 33/24                  66/12  <b>overall [2]</b> 110/7 199/20  <b>overly [1]</b> 151/4  <b>overlyqualified [1]</b>                  160/6  <b>overrule [17]</b> 142/9                  155/14 162/21 166/12                  171/22 177/10 178/6                  179/11 181/5 183/7                  191/14 195/5 201/20                  205/20 211/4 211/7                  239/2  <b>overruled [12]</b> 42/18                  44/13 86/20 133/4                  142/21 145/16 146/11                  157/15 168/11 188/10</p>
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<p><b>O</b></p> <p><b>overruled... [2]</b> 190/1 199/3</p> <p><b>overruling [1]</b> 151/16</p> <p><b>oversee [1]</b> 12/18</p> <p><b>oversimplistic [1]</b> 222/19</p> <p><b>own [12]</b> 30/20 36/13 47/18 47/20 47/23 81/19 81/25 88/20 111/24 252/1 252/7 252/12</p> <p><b>owner [2]</b> 26/22 26/25</p> <p><b>owning [1]</b> 208/1</p> <p><b>owns [1]</b> 87/2</p>	<p>139/18 140/3 147/24 149/25 150/2 160/3 160/5</p> <p><b>paper [9]</b> 12/3 84/14 123/3 172/19 193/16 193/22 212/8 228/20 229/17</p> <p><b>papers [1]</b> 222/21</p> <p><b>paragraph [2]</b> 206/21 206/22</p> <p><b>parent [2]</b> 93/24 95/22</p> <p><b>parse [1]</b> 13/2</p> <p><b>parsed [1]</b> 182/22</p> <p><b>particular [51]</b> 17/19 17/21 18/7 19/14 22/20 23/19 26/10 42/5 78/15 110/13 114/24 124/11 128/23 131/8 131/10 131/18 132/11 132/12 132/23 133/7 134/11 135/16 136/25 137/4 139/11 141/11 141/13 141/24 142/3 142/25 143/2 143/4 146/22 148/9 159/11 159/16 160/1 160/23 163/5 163/13 163/14 168/24 171/14 174/16 181/17 203/8 210/7 213/23 213/25 227/12 248/11</p> <p><b>particularly [2]</b> 37/15 169/6</p> <p><b>parties [8]</b> 4/9 9/14 98/24 171/23 204/20 249/7 249/9 251/20</p> <p><b>parting [1]</b> 252/14</p> <p><b>partitions [1]</b> 206/25</p> <p><b>party [3]</b> 8/1 9/1 154/24</p> <p><b>party's [2]</b> 6/3 9/3</p> <p><b>passed [1]</b> 192/1</p> <p><b>passing [1]</b> 36/19</p> <p><b>password [3]</b> 133/7 194/6 207/2</p> <p><b>passwords [2]</b> 88/20 207/1</p> <p><b>past [1]</b> 211/11</p> <p><b>pasted [3]</b> 222/8 232/19 234/6</p> <p><b>pasting [1]</b> 222/2</p> <p><b>path [7]</b> 138/16 138/23 139/6 139/8 149/22 151/5 151/9</p> <p><b>patience [1]</b> 154/16</p> <p><b>pattern [2]</b> 58/15 58/19</p> <p><b>pause [1]</b> 248/16</p> <p><b>pay [13]</b> 17/20 18/1 18/2 19/13 40/7 41/10 41/13 41/18 56/15 57/19 57/21 70/15 73/20</p> <p><b>paying [3]</b> 19/13 43/6 83/25</p> <p><b>PCCSW01 [3]</b> 132/21 133/11 134/11</p> <p><b>PDF [91]</b> 124/25 125/1 125/14 125/19 125/22 126/20 127/3 127/12</p>	<p>127/23 129/5 129/7 129/7 129/10 129/11 130/10 130/12 130/14 143/17 144/1 144/2 144/3 144/3 144/6 144/8 144/23 146/1 146/5 149/19 150/9 150/12 152/5 152/11 152/13 152/16 153/13 153/13 153/14 153/16 154/4 154/23 156/16 156/17 158/23 159/7 159/14 159/17 159/23 160/2 160/9 161/6 161/11 169/7 169/15 170/14 172/16 173/24 179/10 180/4 180/5 180/6 184/8 184/14 184/15 199/1 209/17 209/18 210/8 213/9 213/11 213/22 217/12 217/20 218/11 218/18 218/21 218/25 219/7 219/9 219/12 221/12 222/11 222/12 223/8 227/11 227/23 228/3 228/7 240/8 240/9 241/21 248/11</p> <p><b>PDFs [14]</b> 217/13 217/15 222/18 223/4 223/10 223/17 223/24 224/1 224/5 228/11 228/17 233/19 246/4 246/4</p> <p><b>PDFX [1]</b> 143/6</p> <p><b>peer [3]</b> 108/12 196/22 196/22</p> <p><b>penalty [1]</b> 29/24</p> <p><b>pending [2]</b> 152/4 185/7</p> <p><b>people [19]</b> 37/15 46/6 60/1 60/6 60/8 60/9 60/19 61/1 61/7 75/13 101/22 115/22 115/23 236/16 238/3 244/9 244/21 244/25 245/18</p> <p><b>per [4]</b> 31/9 61/19 61/21 64/12</p> <p><b>percent [6]</b> 25/12 25/13 66/13 66/17 67/7 67/16 66/18</p> <p><b>percentage [2]</b> 66/16 66/18</p> <p><b>perfect [2]</b> 133/21 236/3</p> <p><b>perfectly [2]</b> 60/3 226/3</p> <p><b>perform [3]</b> 179/24 223/19 225/11</p> <p><b>performed [2]</b> 119/19 224/7</p> <p><b>perhaps [4]</b> 32/17 34/25 236/1 242/10</p> <p><b>period [6]</b> 13/19 28/1 39/21 71/3 220/2 244/25</p> <p><b>periodical [1]</b> 136/9</p> <p><b>periods [1]</b> 32/12</p> <p><b>perjury [1]</b> 29/24</p> <p><b>permissible [1]</b> 107/3</p> <p><b>permission [1]</b> 4/25</p> <p><b>permitted [2]</b> 113/13</p>	<p>115/4</p> <p><b>person [9]</b> 30/7 32/19 32/20 46/7 84/6 112/8 124/22 139/12 214/7</p> <p><b>person's [1]</b> 113/12</p> <p><b>personal [13]</b> 4/23 64/2 88/20 88/22 194/6 215/1 215/8 215/20 216/4 216/14 216/19 217/2 238/2</p> <p><b>personally [3]</b> 42/6 116/5 128/13</p> <p><b>perspective [3]</b> 229/22 230/7 230/10</p> <p><b>pertain [2]</b> 219/5 219/7</p> <p><b>pertains [1]</b> 218/18</p> <p><b>PGP [23]</b> 123/9 123/19 123/20 125/8 125/11 170/9 170/10 170/24 173/23 174/16 187/16 190/14 222/9 233/12 233/13 233/15 233/21 234/13 234/21 234/24 235/10 235/12 235/13</p> <p><b>Ph.d [1]</b> 118/24</p> <p><b>phase [1]</b> 109/21</p> <p><b>phone [5]</b> 4/25 61/25 62/4 117/15 134/13</p> <p><b>phones [1]</b> 10/2</p> <p><b>phrase [1]</b> 76/17</p> <p><b>phrases [1]</b> 21/3</p> <p><b>pick [3]</b> 71/7 71/9 74/14</p> <p><b>picture [3]</b> 193/10 197/18 222/20</p> <p><b>piece [8]</b> 51/2 100/14 110/13 122/4 122/10 124/9 124/11 124/21</p> <p><b>pieces [1]</b> 54/24</p> <p><b>place [3]</b> 44/24 52/12 74/23</p> <p><b>places [2]</b> 77/11 87/23</p> <p><b>plaintiff [1]</b> 176/14</p> <p><b>plaintiffs [20]</b> 1/4 2/2 3/9 3/11 3/13 3/16 3/19 4/17 6/16 7/7 8/21 14/17 28/24 118/9 123/1 123/4 135/1 204/10 205/3 251/13</p> <p><b>plaintiffs' [188]</b> 4/14 5/21 5/25 7/2 104/5 120/23 120/24 121/1 121/7 122/16 123/5 128/15 133/17 134/4 137/11 137/25 141/15 142/5 142/11 143/21 145/3 145/11 146/3 146/7 146/13 150/14 151/25 151/25 153/4 153/8 153/8 153/9 154/7 154/8 154/8 154/9 155/21 155/23 155/24 156/5 156/15 156/15 156/18 157/2 157/7 157/10 157/17 161/14 161/24 162/3 162/9 162/15 162/22 166/25</p>	<p>167/4 167/10 167/25 168/7 168/13 170/19 171/8 176/11 176/23 177/5 177/11 177/22 177/24 180/12 180/13 180/16 181/1 181/8 182/7 183/3 183/9 185/6 187/14 187/23 187/24 188/6 188/13 189/14 189/15 190/3 191/16 192/12 192/17 192/23 194/15 195/7 197/3 198/4 198/16 198/20 199/9 199/9 200/21 201/8 201/25 203/20 204/4 204/13 206/6 208/21 209/7 209/22 217/25 218/2 218/7 218/15 218/16 218/22 219/3 219/3 219/4 219/6 219/6 219/10 219/12 219/13 219/14 219/15 219/18 219/18 220/5 220/6 220/19 220/20 223/22 224/8 226/20 226/22 226/23 227/5 227/6 227/11 228/12 229/4 229/8 229/12 230/8 230/9 230/10 230/13 230/17 230/22 231/3 231/4 231/10 231/13 231/17 232/16 232/17 232/21 232/21 232/4 233/5 234/17 235/9 237/4 242/15 242/17 254/15 254/16 254/17 254/18 254/19 254/20 254/21 254/22 254/23 254/24 254/25 255/3 255/4 255/5 255/6 255/7 255/8 255/9 255/10 255/11 255/12 255/13 255/14 255/15 255/16 255/17</p> <p><b>plaintiffs' 2, 6 [1]</b> 150/14</p> <p><b>plaintiffs' 30 [1]</b> 177/22</p> <p><b>plaintiffs' 42 [1]</b> 234/17</p> <p><b>plane [1]</b> 43/20</p> <p><b>planning [3]</b> 40/12 103/19 103/21</p> <p><b>platforms [1]</b> 13/7</p> <p><b>play [2]</b> 98/25 252/21</p> <p><b>please [22]</b> 3/3 3/9 8/4 10/9 10/15 10/18 28/15 68/25 104/6 104/8 106/12 109/21 117/22 118/6 118/16 119/18 120/2 121/20 150/25 196/11 221/7 224/15</p> <p><b>pleasure [4]</b> 98/10 99/25 100/6 249/25</p> <p><b>plural [1]</b> 153/19</p> <p><b>plus [11]</b> 25/10 57/7 72/19 81/8 129/16 129/17 132/24 138/17</p>
--	--	--	--	--

<p><b>P</b>  <b>plus...</b> [3] 138/19 140/20 147/16  <b>pocket</b> [2] 41/9 41/10  <b>podium</b> [2] 100/13 101/25  <b>point</b> [31] 7/22 37/18 37/19 38/3 38/3 46/5 51/6 63/5 67/3 68/15 75/3 75/5 77/16 79/18 94/4 96/9 97/6 103/19 110/17 115/12 115/13 133/25 159/8 172/23 179/1 195/20 196/3 202/5 211/3 226/9 252/7  <b>pointing</b> [2] 183/16 230/2  <b>points</b> [1] 63/24  <b>policy</b> [1] 42/1  <b>Polytechnic</b> [2] 118/24 118/25  <b>Ponce</b> [4] 2/14 2/17 2/20 2/23  <b>poof</b> [1] 236/2  <b>pops</b> [1] 217/22  <b>portion</b> [1] 148/22  <b>portions</b> [2] 9/9 99/8  <b>position</b> [7] 5/21 12/17 49/3 115/24 116/2 164/7 251/15  <b>positive</b> [4] 21/14 23/21 23/23 24/3  <b>possession</b> [1] 96/24  <b>possibility</b> [2] 14/9 243/20  <b>possible</b> [20] 13/25 28/5 76/3 92/4 121/13 174/25 184/8 232/18 232/22 232/23 239/24 240/1 240/5 240/12 241/12 241/18 241/20 241/22 241/24 243/23  <b>possibly</b> [2] 32/6 242/22  <b>potential</b> [11] 6/16 14/5 14/7 16/23 19/21 24/9 25/1 33/15 33/23 61/8 74/16  <b>potentially</b> [4] 6/19 14/7 57/7 244/25  <b>practice</b> [3] 17/6 120/11 252/7  <b>practices</b> [1] 236/8  <b>precise</b> [3] 39/2 71/14 96/3  <b>precisely</b> [4] 72/23 80/15 165/5 223/2  <b>Precision</b> [6] 134/17 136/20 136/21 136/24 137/2 137/8  <b>predicate</b> [2] 87/10 155/17  <b>preempt</b> [1] 14/22  <b>prefer</b> [2] 11/11 47/5  <b>preferable</b> [1] 152/23  <b>preferred</b> [1] 11/13  <b>preliminary</b> [3] 9/15</p>	<p>32/8 37/21  <b>premarked</b> [1] 14/16  <b>premium</b> [1] 44/5  <b>preparation</b> [2] 121/9 196/25  <b>prepare</b> [2] 157/20 209/19  <b>prepared</b> [7] 25/6 27/7 100/12 113/4 157/23 251/8 251/17  <b>preparing</b> [1] 7/7  <b>presence</b> [1] 239/14  <b>present</b> [10] 9/6 31/7 31/8 37/14 117/25 118/1 170/2 216/10 216/13 217/7  <b>presentation</b> [1] 33/9  <b>presentations</b> [1] 253/2  <b>presented</b> [5] 6/8 6/10 6/14 164/7 164/8  <b>presenting</b> [2] 7/11 9/3  <b>presently</b> [1] 118/17  <b>preserved</b> [2] 157/15 211/8  <b>president</b> [1] 33/8  <b>presumably</b> [2] 71/15 85/23  <b>presume</b> [1] 86/10  <b>pretty</b> [2] 29/24 57/15  <b>preview</b> [2] 37/21 37/23  <b>previous</b> [7] 72/19 99/8 104/19 138/22 169/9 185/7 194/22  <b>previously</b> [22] 122/15 126/6 127/17 146/2 151/24 153/3 166/20 175/13 177/9 178/7 179/2 180/18 180/25 188/4 188/11 191/15 198/16 201/9 201/21 205/1 229/7 242/16  <b>primarily</b> [5] 88/14 119/15 119/15 119/21 120/5  <b>primitive</b> [1] 70/20  <b>printed</b> [9] 135/8 137/14 149/17 154/23 169/7 169/25 198/24 228/20 229/17  <b>printing</b> [1] 182/23  <b>printout</b> [24] 15/14 123/20 127/22 134/16 135/6 137/16 137/19 141/17 146/4 161/18 162/10 168/1 170/20 173/23 176/24 180/14 182/9 187/25 190/24 192/15 194/17 200/22 203/24 222/11  <b>printouts</b> [4] 126/20 153/12 181/13 219/5  <b>prior</b> [21] 9/22 12/13 31/14 34/21 35/15 37/4 38/17 39/20 76/15 81/16 82/23 90/1 90/3 138/12 151/18 199/24 228/24</p>	<p>243/1 243/9 243/15 243/24  <b>privacy</b> [1] 17/6  <b>private</b> [63] 40/21 70/18 75/8 75/11 75/18 75/20 76/4 76/7 76/23 76/25 77/1 77/2 77/3 77/8 77/14 77/18 77/22 78/10 78/12 78/18 78/24 79/2 79/6 82/5 82/8 82/9 84/20 84/24 84/24 85/2 85/4 85/15 85/25 86/15 86/17 86/22 86/23 87/2 89/8 89/11 89/18 89/25 90/15 90/17 91/10 91/13 92/2 92/5 92/17 93/19 93/25 94/4 96/10 96/22 96/25 97/4 124/1 124/4 124/5 124/13 124/22 174/6 174/9  <b>privy</b> [1] 87/23  <b>probably</b> [20] 12/23 18/15 21/14 36/2 36/18 44/4 45/2 48/6 49/16 50/6 54/19 67/7 81/6 81/10 81/12 88/19 97/10 116/18 195/23 242/18  <b>probe</b> [1] 239/2  <b>problem</b> [7] 27/22 126/17 177/18 178/4 197/21 212/16 247/13  <b>procedure</b> [1] 204/19  <b>proceed</b> [4] 69/3 103/25 118/2 196/16  <b>proceeding</b> [8] 13/12 13/14 32/3 33/17 101/1 102/17 110/14 240/4  <b>proceedings</b> [10] 1/10 10/1 30/8 68/24 117/21 122/16 186/4 196/10 253/6 255/21  <b>process</b> [11] 20/12 20/25 50/3 50/6 72/15 93/1 93/13 93/14 95/5 236/4 236/6  <b>processed</b> [2] 163/5 163/12  <b>produce</b> [4] 13/18 13/24 72/20 95/14  <b>produced</b> [42] 103/3 121/11 123/1 127/2 143/24 144/1 145/24 146/1 150/16 150/19 151/1 151/4 151/17 155/7 161/5 161/8 161/10 161/19 161/20 176/13 176/14 176/18 176/19 178/17 184/23 185/17 185/24 186/9 198/17 201/2 203/1 204/10 223/1 223/4 224/5 224/6 224/22 225/2 225/6 225/17 228/20 229/12  <b>producing</b> [1] 151/6  <b>product</b> [1] 141/18</p>	<p><b>production</b> [1] 151/10  <b>products</b> [1] 141/24  <b>profession</b> [3] 128/5 183/1 191/7  <b>professional</b> [1] 136/25  <b>professionally</b> [2] 11/8 13/10  <b>proffer</b> [1] 205/9  <b>profile</b> [1] 193/11  <b>profound</b> [1] 95/10  <b>program</b> [7] 88/12 122/5 129/4 139/21 170/15 196/18 203/5  <b>programming</b> [1] 23/20  <b>progressively</b> [1] 25/3  <b>promise</b> [1] 91/1  <b>proof</b> [11] 20/12 20/15 20/23 21/17 21/22 22/1 46/22 47/2 73/19 73/23 154/25  <b>proper</b> [4] 43/13 114/10 114/19 207/21  <b>properly</b> [1] 85/7  <b>proposed</b> [1] 108/22  <b>proposition</b> [1] 154/20  <b>proprietary</b> [3] 23/5 35/8 91/25  <b>protocol</b> [1] 196/22  <b>proven</b> [2] 21/18 22/8  <b>provide</b> [14] 7/14 22/1 24/17 26/12 26/24 26/24 46/22 94/16 94/25 128/22 185/21 186/6 221/3 238/10  <b>provided</b> [29] 6/15 23/8 25/15 27/7 52/23 108/9 115/5 123/4 131/3 131/7 131/9 133/6 140/16 164/14 183/22 183/24 204/14 205/3 205/3 214/17 215/11 217/15 217/20 218/21 220/18 220/24 221/15 237/4 242/8  <b>provides</b> [4] 26/17 130/17 137/18 200/23  <b>PS</b> [1] 194/5  <b>pseudonymous</b> [1] 26/18  <b>pseudorandomly</b> [1] 60/10  <b>public</b> [109] 7/4 7/14 14/1 17/20 17/22 18/1 18/2 23/6 25/7 25/17 25/23 26/4 26/7 26/14 26/20 26/22 26/24 27/4 27/25 33/24 35/16 46/2 46/13 54/8 56/15 57/1 70/15 70/18 71/18 72/2 72/9 72/13 72/14 72/17 72/19 72/21 73/19 73/20 73/22 74/3 74/5 74/15 74/17 74/19 74/19 74/21 75/9 76/18 77/4 77/7 77/13 77/17 77/22 77/23 78/17 79/2 79/6 81/18</p>	<p>82/4 82/6 82/10 82/13 82/14 82/15 82/15 82/17 82/18 82/21 83/2 83/16 83/16 84/6 84/7 84/10 84/10 84/12 84/13 84/14 84/20 84/25 85/1 85/3 85/10 85/21 89/7 89/10 89/17 89/24 90/8 91/10 91/13 91/23 92/2 92/6 92/18 96/7 124/2 124/3 124/4 124/6 124/18 142/15 152/20 158/15 185/21 191/3 191/4 205/16 208/1  <b>publication</b> [2] 136/10 136/11  <b>publicly</b> [7] 24/24 96/8 105/17 111/16 134/18 199/25 200/1  <b>publish</b> [2] 153/5 158/15  <b>published</b> [1] 162/25  <b>publishing</b> [2] 152/20 212/18  <b>pull</b> [11] 11/1 84/5 104/6 135/17 145/22 172/20 217/21 220/20 233/4 233/6 242/14  <b>pulled</b> [3] 218/6 242/16 247/24  <b>purely</b> [2] 6/9 210/24  <b>purport</b> [1] 6/11  <b>purported</b> [4] 148/25 192/15 208/22 214/8  <b>purportedly</b> [16] 122/20 163/22 167/1 172/1 174/21 176/3 186/18 187/6 188/23 190/11 192/3 193/8 195/13 199/15 199/24 235/19  <b>purports</b> [5] 112/24 164/23 165/20 176/5 239/18  <b>purpose</b> [11] 6/17 13/13 14/2 14/4 14/5 22/17 34/1 37/8 116/6 116/6 186/20  <b>purposefully</b> [1] 115/2  <b>purposes</b> [6] 42/12 42/23 57/10 112/2 151/3 178/22  <b>pursuant</b> [1] 103/1  <b>pursue</b> [1] 113/20  <b>pursuing</b> [1] 116/13  <b>pushy</b> [1] 102/12  <b>put</b> [18] 20/20 37/19 40/6 41/2 54/20 67/24 68/5 96/10 127/9 138/8 145/1 145/21 146/15 147/12 166/9 226/9 226/12 231/11  <b>puts</b> [1] 211/6  <b>putting</b> [3] 49/13 212/14 217/19  <b>PyInstaller</b> [4] 203/2 203/6 203/7 203/9  <b>Python</b> [1] 203/3</p>
---	--	---	---	--

<p><b>Q</b></p> <p><b>qualifications [8]</b> 103/23 106/11 107/5 109/11 109/22 115/6 136/17 165/8</p> <p><b>qualified [4]</b> 108/22 108/25 164/25 165/10</p> <p><b>Quantico [1]</b> 119/16</p> <p><b>question [77]</b> 36/19 42/20 46/12 48/21 53/7 55/2 59/11 72/23 73/10 73/12 76/12 77/4 79/15 84/22 85/7 86/4 86/13 87/12 87/17 87/18 91/6 91/20 92/9 92/23 92/24 93/9 95/7 104/24 108/23 110/25 112/12 116/24 143/12 145/10 145/17 152/4 152/8 152/8 155/17 164/5 164/20 164/22 165/18 165/18 165/19 165/24 166/10 166/11 185/7 199/18 199/20 199/22 211/5 211/24 213/15 216/25 218/13 219/24 220/4 220/7 221/7 221/17 222/9 224/15 224/19 224/20 225/4 227/20 235/3 237/1 239/8 239/10 239/13 242/10 244/17 247/7 247/18</p> <p><b>question's [2]</b> 47/21 87/1</p> <p><b>questioned [1]</b> 197/22</p> <p><b>questioning [4]</b> 106/25 185/15 186/1 238/16</p> <p><b>questions [28]</b> 15/6 27/19 28/11 32/11 51/10 90/23 90/23 108/21 109/21 110/16 110/18 110/19 128/18 152/1 166/6 171/21 211/18 212/4 213/8 232/25 244/12 246/2 246/22 247/3 248/20 248/21 248/23 248/24</p> <p><b>quick [6]</b> 5/1 8/4 15/15 46/25 102/21 139/1</p> <p><b>quickly [2]</b> 7/21 165/4</p> <p><b>quirk [1]</b> 23/19</p> <p><b>quite [6]</b> 30/11 49/5 58/17 84/15 89/9 91/19</p>	<p><b>Ranging [1]</b> 21/10</p> <p><b>rather [4]</b> 17/8 25/2 154/21 244/14</p> <p><b>raw [1]</b> 66/19</p> <p><b>reach [3]</b> 108/9 232/12 232/17</p> <p><b>reaching [2]</b> 221/15 224/8</p> <p><b>read [23]</b> 84/16 98/18 98/25 99/1 99/2 114/2 132/13 159/6 160/25 189/1 193/7 197/17 198/25 204/1 206/20 206/22 207/13 208/24 234/19 234/20 243/8 244/20 250/2</p> <p><b>readable [2]</b> 132/1 163/11</p> <p><b>reader [1]</b> 152/16</p> <p><b>reading [2]</b> 50/10 197/16</p> <p><b>ready [7]</b> 69/3 69/7 104/11 118/2 196/16 212/7 212/9</p> <p><b>real [1]</b> 138/25</p> <p><b>realize [1]</b> 211/1</p> <p><b>really [11]</b> 7/12 24/12 43/3 67/18 72/14 85/13 85/17 85/22 87/23 222/22 245/11</p> <p><b>Realtime [1]</b> 255/20</p> <p><b>reason [10]</b> 6/7 39/11 79/8 79/18 80/11 81/24 94/15 103/10 152/22 165/5</p> <p><b>reasonable [1]</b> 211/25</p> <p><b>reasoning [1]</b> 181/6</p> <p><b>reasons [6]</b> 168/12 177/9 178/7 188/11 191/15 201/21</p> <p><b>rebut [1]</b> 5/23</p> <p><b>rebuttal [3]</b> 6/20 6/25 7/11</p> <p><b>recall [26]</b> 20/9 30/10 30/12 30/18 30/21 30/25 31/13 32/7 38/25 48/24 49/6 62/25 79/22 80/25 103/11 115/20 178/13 225/8 227/14 228/1 228/25 229/10 243/19 244/24 245/11 245/11</p> <p><b>recalling [1]</b> 245/13</p> <p><b>receive [1]</b> 64/4</p> <p><b>received [27]</b> 5/19 6/24 99/16 124/18 129/13 129/15 131/10 132/9 132/10 132/17 132/19 133/10 134/7 138/10 138/12 138/15 138/18 138/20 138/22 139/22 141/1 163/4 199/15 199/23 199/24 242/15 247/24</p> <p><b>receives [1]</b> 124/16</p> <p><b>recently [1]</b> 81/22</p> <p><b>recess [12]</b> 68/16 68/19</p>	<p>68/22 68/23 117/15 117/19 117/20 196/6 196/6 196/8 196/9 253/5</p> <p><b>rechecking [1]</b> 67/14</p> <p><b>recipient [4]</b> 124/15 124/16 130/20 214/11</p> <p><b>recipients [1]</b> 214/18</p> <p><b>recognize [8]</b> 15/11 15/13 122/16 126/7 161/15 187/3 192/12 203/21</p> <p><b>recollection [2]</b> 38/6 198/23</p> <p><b>reconvene [1]</b> 117/10</p> <p><b>record [41]</b> 98/18 99/15 100/19 102/5 102/13 116/9 121/2 137/11 142/6 144/12 144/15 145/2 145/15 145/23 150/24 153/25 154/3 154/12 154/17 156/19 158/3 165/10 178/5 179/14 180/16 183/4 189/1 190/23 198/16 198/19 199/8 201/5 211/3 212/17 213/5 218/15 227/4 229/2 230/1 237/1 255/21</p> <p><b>record's [1]</b> 229/6</p> <p><b>recorded [1]</b> 21/24</p> <p><b>records [3]</b> 151/13 151/17 155/6</p> <p><b>recreate [2]</b> 93/16 241/16</p> <p><b>recross [3]</b> 95/20 97/20 254/7</p> <p><b>Recross-examination [1]</b> 95/20</p> <p><b>red [4]</b> 160/18 160/19 210/6 210/9</p> <p><b>redirect [5]</b> 90/25 91/3 97/19 246/24 254/6</p> <p><b>redline [1]</b> 240/19</p> <p><b>redlined [1]</b> 210/23</p> <p><b>reduce [2]</b> 17/13 25/10</p> <p><b>reduction [1]</b> 25/12</p> <p><b>reentering [1]</b> 222/2</p> <p><b>refer [1]</b> 19/24</p> <p><b>reference [11]</b> 82/24 83/1 84/1 89/12 89/25 127/4 153/19 163/19 164/15 165/13 237/7</p> <p><b>referenced [10]</b> 31/4 67/12 95/22 145/8 173/14 201/14 201/17 202/11 202/18 202/25</p> <p><b>references [2]</b> 82/23 130/2</p> <p><b>referencing [1]</b> 229/3</p> <p><b>referred [4]</b> 11/11 90/13 95/25 153/20</p> <p><b>referring [4]</b> 145/6 214/15 226/18 246/15</p> <p><b>refers [1]</b> 242/17</p> <p><b>reflect [2]</b> 155/13 158/3</p> <p><b>reflected [5]</b> 125/8</p>	<p>141/5 219/18 230/9 242/18</p> <p><b>reflections [1]</b> 155/18</p> <p><b>reflects [5]</b> 59/21 177/22 210/25 227/13 227/24</p> <p><b>refresh [1]</b> 169/5</p> <p><b>regard [5]</b> 23/4 93/13 102/11 155/7 243/3</p> <p><b>regarding [8]</b> 87/16 108/23 122/21 152/16 167/2 212/25 213/2 235/10</p> <p><b>regardless [1]</b> 154/22</p> <p><b>regenerate [1]</b> 93/16</p> <p><b>Registered [1]</b> 255/20</p> <p><b>reimbursed [1]</b> 42/6</p> <p><b>reimbursement [3]</b> 41/19 41/24 42/1</p> <p><b>reimbursements [1]</b> 42/23</p> <p><b>REINHART [1]</b> 1/11</p> <p><b>relate [7]</b> 93/20 126/21 185/24 186/15 186/19 201/4 219/7</p> <p><b>related [22]</b> 26/20 42/25 103/3 103/8 107/13 118/15 119/21 119/22 120/3 120/5 120/8 120/16 124/5 137/4 161/9 175/11 181/16 181/17 191/8 192/8 200/23 214/1</p> <p><b>relates [7]</b> 126/22 169/20 201/6 203/9 213/5 219/18 235/22</p> <p><b>relating [5]</b> 184/24 186/5 187/1 220/5 247/16</p> <p><b>relationships [1]</b> 120/18</p> <p><b>relayed [1]</b> 138/19</p> <p><b>release [7]</b> 191/5 191/19 191/23 201/6 203/10 236/7 245/14</p> <p><b>released [13]</b> 142/15 142/17 190/21 203/18 236/2 236/3 236/9 243/15 243/21 243/24 244/10 245/17 245/18</p> <p><b>releases [2]</b> 191/1 200/6</p> <p><b>relevance [10]</b> 171/18 185/2 185/10 185/18 186/1 205/21 238/25 240/25 241/8 246/10</p> <p><b>relevant [9]</b> 8/8 28/1 64/20 107/1 186/10 211/7 229/16 238/16 246/12</p> <p><b>reliability [1]</b> 137/18</p> <p><b>reliable [13]</b> 109/1 109/3 109/12 136/12 137/8 137/14 141/20 141/23 155/10 155/14 155/18 155/18 179/11</p> <p><b>relied [9]</b> 105/20 106/16 111/8 111/18 111/21 136/10 136/24 170/23</p>	<p>191/7</p> <p><b>relies [1]</b> 230/8</p> <p><b>rely [4]</b> 107/19 135/18 135/25 244/14</p> <p><b>relying [5]</b> 36/9 105/6 105/12 107/19 232/11</p> <p><b>remaining [1]</b> 18/6</p> <p><b>remedies [1]</b> 251/14</p> <p><b>remedy [4]</b> 251/9 251/9 251/12 251/15</p> <p><b>remember [2]</b> 17/18 244/23</p> <p><b>remind [3]</b> 9/20 11/15 173/21</p> <p><b>remit [1]</b> 12/18</p> <p><b>remote [1]</b> 119/16</p> <p><b>remove [1]</b> 88/19</p> <p><b>removed [2]</b> 148/23 169/15</p> <p><b>render [5]</b> 105/7 105/14 106/11 107/18 152/17</p> <p><b>rendered [2]</b> 234/17 238/23</p> <p><b>rendering [6]</b> 107/3 107/24 121/10 135/19 144/14 216/2</p> <p><b>Rensselaer [2]</b> 118/24 118/25</p> <p><b>repeat [3]</b> 18/20 20/25 42/20</p> <p><b>repeated [1]</b> 149/17</p> <p><b>rephrase [5]</b> 76/11 91/22 224/19 224/20 230/6</p> <p><b>report [12]</b> 6/22 6/23 45/8 45/9 112/15 112/17 113/24 114/2 114/3 114/12 114/23 204/13</p> <p><b>reported [2]</b> 48/15 64/23</p> <p><b>reporter [9]</b> 1/17 1/17 10/15 14/17 53/8 104/8 196/2 255/20 255/20</p> <p><b>represent [6]</b> 22/15 22/15 28/24 57/4 57/5 104/16</p> <p><b>representation [3]</b> 65/1 157/7 182/9</p> <p><b>representations [2]</b> 21/9 155/22</p> <p><b>represented [4]</b> 21/8 29/20 30/2 150/20</p> <p><b>represents [1]</b> 169/5</p> <p><b>request [3]</b> 9/1 102/12 250/3</p> <p><b>require [1]</b> 82/9</p> <p><b>required [6]</b> 68/8 82/10 88/18 93/19 94/16 95/1</p> <p><b>requirements [1]</b> 110/15</p> <p><b>requires [1]</b> 108/20</p> <p><b>requiring [1]</b> 85/14</p> <p><b>requisite [2]</b> 13/21 75/10</p> <p><b>rescanned [1]</b> 229/18</p> <p><b>research [6]</b> 12/4 12/8 118/19 119/1 119/3 119/21</p> <p><b>reserved [1]</b> 199/6</p>
---	--	--	---	---

<p><b>R</b></p> <p><b>reset [1]</b> 22/6</p> <p><b>respect [30]</b> 7/4 26/13 53/3 95/10 98/22 100/7 100/9 102/1 102/7 106/19 108/6 110/1 110/10 113/17 113/21 114/22 115/2 165/8 214/24 215/9 216/3 218/21 220/19 220/24 221/13 221/24 222/23 224/7 233/11 245/6</p> <p><b>Respectfully [1]</b> 194/3</p> <p><b>respond [5]</b> 8/5 136/3 164/18 165/5 205/25</p> <p><b>response [6]</b> 8/13 176/15 176/19 178/19 185/19 194/7</p> <p><b>responsive [1]</b> 205/21</p> <p><b>rest [3]</b> 11/16 47/15 193/23</p> <p><b>restate [3]</b> 137/13 166/11 221/7</p> <p><b>rests [1]</b> 98/3</p> <p><b>result [7]</b> 20/15 20/25 24/3 24/4 25/6 59/6 140/24</p> <p><b>resulted [1]</b> 56/14</p> <p><b>results [13]</b> 18/7 20/15 32/8 37/21 48/8 49/25 50/2 50/3 50/12 50/23 63/2 64/23 73/18</p> <p><b>resume [2]</b> 68/19 196/7</p> <p><b>retained [1]</b> 118/9</p> <p><b>return [3]</b> 139/6 139/8 149/22</p> <p><b>retyped [1]</b> 222/8</p> <p><b>reuse [2]</b> 17/2 56/17</p> <p><b>reused [1]</b> 57/14</p> <p><b>reveal [1]</b> 150/8</p> <p><b>review [18]</b> 99/9 99/10 108/12 121/11 158/10 162/5 167/12 176/7 184/23 196/24 200/11 200/13 200/25 204/17 208/17 209/25 242/11 243/5</p> <p><b>reviewed [24]</b> 98/20 106/3 111/3 111/3 121/17 139/25 172/12 172/15 173/21 177/3 192/8 200/4 200/4 200/16 211/14 213/25 214/16 214/23 216/3 218/14 218/17 223/18 223/24 224/1</p> <p><b>reviewing [6]</b> 120/13 121/23 121/24 121/24 121/25 202/24</p> <p><b>revision [4]</b> 147/6 148/1 168/20 168/24</p> <p><b>revisions [3]</b> 146/22 147/10 161/2</p> <p><b>reward [8]</b> 57/6 64/7 64/20 73/1 74/5 74/16 74/23 76/17</p>	<p><b>rid [1]</b> 57/14</p> <p><b>right [200]</b> 4/13 6/4 7/20 7/22 8/9 8/9 10/4 10/9 10/17 15/1 18/4 19/17 30/23 31/9 33/25 40/16 41/7 41/9 41/25 42/1 42/12 43/5 43/12 45/15 46/10 46/18 48/13 48/17 48/20 50/9 50/23 51/6 51/8 51/14 51/23 51/25 52/5 52/10 52/17 52/20 53/2 53/3 54/6 54/7 54/11 54/12 54/13 54/14 54/15 55/17 56/2 56/2 56/15 56/18 56/24 57/16 57/20 58/6 58/10 58/20 58/24 59/24 61/5 61/9 61/19 62/10 62/17 63/7 64/9 65/6 65/14 66/14 67/8 67/13 67/13 67/16 67/17 69/1 71/21 71/25 72/6 74/14 74/22 75/1 75/19 76/2 76/6 78/2 78/14 80/21 81/14 89/22 90/25 93/8 95/16 95/23 96/11 97/1 98/4 103/10 104/2 104/6 104/25 105/4 105/15 105/25 106/6 107/9 107/11 107/15 109/18 113/19 116/16 117/10 117/14 117/19 117/25 118/5 121/9 123/17 125/13 127/8 133/10 137/21 144/16 149/15 151/22 157/14 157/19 158/14 158/17 159/14 159/18 162/24 164/22 166/7 168/11 168/15 173/7 173/12 181/5 181/11 183/7 183/17 186/24 187/19 190/1 191/14 193/12 196/14 196/18 197/15 199/1 201/13 204/21 205/17 211/19 214/12 215/3 217/9 217/16 218/19 218/23 219/20 220/20 220/22 220/25 225/3 226/7 226/18 227/19 227/21 228/18 228/19 229/19 229/23 230/11 230/16 230/21 232/13 232/20 233/16 233/24 235/4 235/5 235/14 236/9 238/17 240/20 243/4 245/20 246/5 247/4 247/12 247/17 249/3 251/3 251/19 252/23 253/1</p> <p><b>right-hand [1]</b> 183/17</p> <p><b>rise [1]</b> 216/5</p> <p><b>risk [2]</b> 14/4 120/11</p> <p><b>Rivero [9]</b> 2/14 2/17 2/19 2/20 2/23 4/3 4/5 30/3 252/11</p>	<p><b>RMR [2]</b> 1/17 255/24</p> <p><b>Road [5]</b> 119/25 120/3 120/6 120/8 120/15</p> <p><b>Robert [2]</b> 2/10 3/18</p> <p><b>Roche [42]</b> 2/8 3/13 3/14 101/18 101/20 102/20 116/16 118/2 123/13 125/16 126/11 133/19 136/5 143/19 150/14 151/19 152/3 152/19 153/25 155/16 156/7 156/10 157/24 166/11 173/2 178/12 179/13 185/16 186/2 186/25 195/19 196/15 196/15 197/12 198/14 204/22 206/5 207/19 210/21 248/23 251/25 254/10</p> <p><b>role [3]</b> 119/10 120/3 167/2</p> <p><b>room [2]</b> 8/21 44/19</p> <p><b>root [5]</b> 77/6 93/25 94/4 95/22 96/23</p> <p><b>Rosenberg [1]</b> 4/10</p> <p><b>Ross [2]</b> 120/15 120/18</p> <p><b>rough [3]</b> 25/13 48/1 48/6</p> <p><b>roughly [3]</b> 48/6 116/22 191/25</p> <p><b>routed [3]</b> 130/19 131/3 143/2</p> <p><b>routes [1]</b> 132/11</p> <p><b>row [2]</b> 199/12 199/14</p> <p><b>rudimentary [1]</b> 225/22</p> <p><b>rule [14]</b> 7/20 7/22 8/1 8/5 8/24 18/9 31/10 99/13 102/18 104/3 107/3 135/22 136/8 136/17</p> <p><b>rule's [1]</b> 5/7</p> <p><b>ruled [2]</b> 115/18 165/17</p> <p><b>rules [6]</b> 7/21 7/24 20/20 22/4 83/8 135/21</p> <p><b>ruling [5]</b> 151/16 151/18 155/5 165/6 190/1</p> <p><b>run [8]</b> 20/14 49/18 49/25 50/2 53/14 77/10 77/12 234/5</p> <p><b>running [1]</b> 59/16</p> <p><b>runs [1]</b> 72/10</p> <p><b>rush [2]</b> 189/6 205/8</p> <hr/> <p><b>S</b></p> <p><b>sad [1]</b> 252/13</p> <p><b>safe [1]</b> 196/13</p> <p><b>same [68]</b> 11/18 26/23 38/13 41/24 43/20 52/18 60/6 60/9 61/7 77/6 84/11 117/2 124/17 124/20 124/20 134/21 134/23 139/11 144/9 145/11 145/13 145/18 145/19 147/1 147/11 148/15 149/18 156/20 157/13 159/1 161/2 162/12 162/20 166/20</p>	<p>167/18 168/3 168/10 168/11 168/18 168/20 172/17 174/2 174/9 177/2 178/7 180/22 181/6 182/21 188/3 188/10 189/19 190/1 193/12 194/21 194/24 195/4 198/2 202/24 205/19 208/3 208/11 223/9 223/16 224/2 224/7 225/13 233/18 235/3</p> <p><b>sand [2]</b> 245/6 245/8</p> <p><b>sat [1]</b> 44/19</p> <p><b>satisfy [1]</b> 102/18</p> <p><b>Satoshi [13]</b> 12/3 17/4 28/9 45/24 46/3 46/7 46/16 46/22 56/4 56/8 61/8 81/1 81/5</p> <p><b>saved [2]</b> 129/11 130/14</p> <p><b>saw [2]</b> 174/3 248/6</p> <p><b>say [38]</b> 5/19 8/13 8/15 8/24 23/13 25/14 31/19 31/20 33/3 34/20 38/23 39/17 41/12 45/12 47/8 52/2 52/18 57/19 62/3 67/7 71/9 71/21 74/4 82/11 106/3 124/9 125/9 139/25 170/5 176/18 222/8 223/17 227/5 230/1 233/7 240/3 244/12 246/5</p> <p><b>saying [5]</b> 8/22 57/14 66/21 69/16 202/15</p> <p><b>says [15]</b> 8/1 8/25 59/22 72/11 77/21 80/18 134/8 136/8 139/16 141/7 142/13 143/6 174/13 174/20 202/8</p> <p><b>scan [4]</b> 123/3 123/4 228/20 229/14</p> <p><b>scanned [1]</b> 231/11</p> <p><b>schedules [1]</b> 250/23</p> <p><b>scheme [8]</b> 21/12 41/25 41/25 87/22 95/25 97/14 103/14 103/17</p> <p><b>Schiller [7]</b> 2/2 2/5 2/8 2/11 28/24 252/3 252/13</p> <p><b>Schneur [1]</b> 2/16</p> <p><b>school [1]</b> 250/4</p> <p><b>science [5]</b> 118/22 118/22 118/23 118/23 118/25</p> <p><b>scientific [2]</b> 45/7 109/5</p> <p><b>scientist [2]</b> 12/21 39/8</p> <p><b>scope [10]</b> 6/17 6/22 7/17 94/7 165/17 165/19 204/13 204/18 210/24 238/13</p> <p><b>scratch [1]</b> 241/7</p> <p><b>screen [15]</b> 16/1 152/17 152/24 159/12 173/6 197/7 198/2 199/19 199/20 217/22 218/6 231/5 237/6 237/8 242/14</p>	<p><b>script [5]</b> 17/22 56/15 84/5 88/14 88/15</p> <p><b>scripts [2]</b> 17/19 18/6</p> <p><b>search [6]</b> 51/23 52/17 63/2 65/6 66/5 223/8</p> <p><b>searched [5]</b> 17/23 18/5 206/12 223/18 225/3</p> <p><b>seat [3]</b> 3/2 10/18 117/23</p> <p><b>seated [3]</b> 68/25 104/6 196/11</p> <p><b>second [34]</b> 5/6 8/6 15/18 16/18 27/20 35/1 36/5 53/17 53/17 53/21 56/6 65/19 94/20 102/19 103/6 108/19 109/1 125/7 127/9 130/5 136/4 158/24 158/25 160/15 160/16 160/18 162/18 169/19 177/13 182/16 185/11 210/21 220/17 237/15</p> <p><b>seconds [1]</b> 131/24</p> <p><b>secret [6]</b> 82/9 96/11 96/23 97/13 103/17 124/1</p> <p><b>secrets [4]</b> 13/21 68/8 93/18 93/20</p> <p><b>security [7]</b> 17/6 118/18 119/5 119/11 119/12 119/22 119/23</p> <p><b>seeing [2]</b> 160/7 204/14</p> <p><b>seek [2]</b> 41/19 45/3</p> <p><b>seeking [3]</b> 36/25 37/9 37/12</p> <p><b>seem [2]</b> 114/19 243/19</p> <p><b>seems [2]</b> 48/1 198/12</p> <p><b>seen [7]</b> 47/11 47/14 97/15 97/16 101/9 104/19 204/20</p> <p><b>sell [1]</b> 81/12</p> <p><b>send [4]</b> 133/8 140/23 141/11 141/12</p> <p><b>sender [5]</b> 130/19 132/22 132/22 133/1 214/4</p> <p><b>sending [1]</b> 124/14</p> <p><b>senior [1]</b> 120/9</p> <p><b>sense [6]</b> 85/12 85/13 95/5 116/17 117/1 232/18</p> <p><b>sent [42]</b> 28/9 32/8 62/24 62/25 129/21 129/23 129/25 130/3 130/5 130/7 130/9 130/13 131/5 133/6 139/10 139/12 140/1 140/11 143/9 150/1 163/1 163/18 163/22 164/12 164/17 164/20 166/2 166/17 175/8 188/23 190/11 192/3 193/8 195/14 214/8 232/3 233/3 233/16 233/24 235/20 247/20 247/24</p> <p><b>sentence [1]</b> 116/18</p>
--	---	---	--	--

<p><b>S</b>  <b>separate</b> [5] 6/21 77/6  90/10 90/12 158/12  <b>separated</b> [2] 22/16  77/25  <b>separately</b> [2] 26/21  77/11  <b>September</b> [1] 187/7  <b>September 2012</b> [1]  187/7  <b>series</b> [5] 131/22 141/1  159/10 181/13 200/5  <b>server</b> [17] 131/3 131/8  131/9 132/10 138/15  138/18 138/20 138/22  140/22 143/1 143/4  149/3 149/12 149/13  163/5 163/13 193/25  <b>servers</b> [3] 120/5 130/19  141/2  <b>service</b> [1] 136/21  <b>services</b> [1] 241/4  <b>set</b> [19] 22/9 22/21 23/3  36/23 49/7 49/9 52/13  54/2 68/8 79/19 82/22  92/25 96/4 96/21 97/4  131/8 139/11 189/4  193/24  <b>settled</b> [1] 48/11  <b>setup</b> [2] 71/15 78/24  <b>seven</b> [1] 20/9  <b>seventh</b> [1] 206/16  <b>several</b> [4] 207/4 207/8  208/8 212/24  <b>severe</b> [1] 29/25  <b>severity</b> [1] 102/2  <b>Seychelles</b> [1] 189/4  <b>SF</b> [1] 194/5  <b>SFranklinUSDC</b> [1]  1/19  <b>SHA1</b> [2] 202/13 202/20  <b>SHA256</b> [2] 202/13  202/20  <b>Shadders</b> [33] 5/12 5/12  5/19 6/8 6/18 8/14 8/18  8/19 8/22 9/10 10/7 10/8  10/9 10/10 11/8 11/13  11/15 11/21 15/11 16/3  17/24 18/21 27/18 27/24  28/19 69/7 89/20 89/22  94/22 204/25 205/14  207/10 254/3  <b>Shadders'</b> [2] 8/13  206/8  <b>Shadders's</b> [1] 9/7  <b>Shakes</b> [1] 252/25  <b>Shamir</b> [4] 87/22 97/13  103/13 103/17  <b>shape</b> [1] 94/25  <b>shared</b> [1] 124/3  <b>shares</b> [1] 87/22  <b>sharing</b> [6] 87/22 96/11  97/5 97/14 103/14  103/17  <b>she's</b> [1] 239/6  <b>shelf</b> [1] 189/5</p>	<p><b>short</b> [2] 205/8 251/14  <b>shorter</b> [3] 49/13 84/16  117/5  <b>shortly</b> [1] 43/14  <b>shot</b> [4] 47/3 197/7  198/2 199/19  <b>shot's</b> [1] 199/20  <b>should</b> [23] 15/16 17/5  23/25 24/17 25/4 57/19  61/18 72/22 93/15 97/25  108/4 112/12 153/2  205/8 205/23 218/22  231/5 234/18 242/10  244/13 251/7 251/15  252/24  <b>show</b> [23] 4/15 46/22  54/12 128/21 129/25  148/7 148/21 149/23  152/23 158/21 158/24  160/12 160/15 168/23  176/3 176/5 182/12  184/13 186/18 197/6  199/13 210/5 222/20  <b>showed</b> [1] 148/22  <b>showing</b> [5] 140/25  141/1 152/22 181/13  197/8  <b>shown</b> [9] 132/3 169/13  170/16 179/5 179/21  180/23 203/8 221/22  222/11  <b>shows</b> [19] 131/18 132/2  139/12 158/22 158/25  159/16 159/19 159/25  160/13 160/16 168/24  173/22 173/23 197/7  199/14 210/6 210/9  228/3 232/2  <b>shuffle</b> [1] 212/8  <b>sic</b> [2] 155/12 168/17  <b>side</b> [7] 101/15 116/9  138/8 145/21 146/17  146/17 183/17  <b>sides</b> [1] 98/20  <b>sidetrack</b> [1] 85/6  <b>sign</b> [5] 21/13 174/2  174/7 174/10 175/5  <b>signatories</b> [1] 238/22  <b>signature</b> [96] 58/14  103/7 103/8 122/8 122/9  123/20 123/20 123/21  123/24 123/25 124/8  124/13 124/18 124/24  124/25 125/5 125/8  125/11 125/12 126/1  131/12 131/14 131/17  131/20 170/9 170/11  170/14 170/16 170/17  170/21 170/24 171/11  171/12 171/14 172/1  172/8 172/16 172/18  173/24 173/25 174/16  174/21 175/1 175/1  175/2 175/5 175/25  176/3 182/13 182/21  183/23 187/20 187/21</p>	<p>188/1 188/4 188/17  189/12 189/17 189/19  190/7 190/14 190/16  190/17 190/18 194/8  194/13 194/18 194/20  194/21 194/24 195/10  195/11 221/21 222/1  222/9 229/8 233/12  233/13 233/15 233/21  233/23 234/1 234/4  234/12 234/13 234/21  234/24 235/11 235/12  235/13 235/19 237/18  237/25 238/3 238/4  238/7  <b>signatures</b> [19] 105/10  105/23 111/5 122/1  170/24 172/13 172/15  182/10 182/24 183/25  184/5 184/7 187/16  189/9 194/23 213/3  237/24 239/8 239/15  <b>signed</b> [10] 23/21 24/2  172/1 172/2 172/7 174/8  176/4 176/5 237/20  238/21  <b>significant</b> [2] 35/10  148/22  <b>significantly</b> [1] 245/14  <b>signing</b> [1] 182/14  <b>Silk</b> [5] 119/24 120/3  120/6 120/8 120/15  <b>similar</b> [3] 57/22 84/12  222/24  <b>Similarly</b> [1] 160/4  <b>simple</b> [2] 216/25  228/10  <b>simplify</b> [1] 153/25  <b>simply</b> [16] 7/12 95/14  112/24 113/20 115/4  151/6 165/11 166/3  179/8 185/24 207/13  215/25 217/2 222/2  228/21 244/19  <b>since</b> [12] 6/18 39/18  61/13 67/13 100/20  100/22 131/25 163/9  206/3 209/18 210/8  229/16  <b>single</b> [11] 17/10 18/14  18/16 18/23 19/14 21/8  57/19 57/21 193/22  203/5 241/7  <b>sir</b> [7] 11/23 59/12 97/23  145/18 172/22 199/11  247/12  <b>sit</b> [5] 11/2 99/2 225/21  226/2 244/23  <b>site</b> [1] 165/13  <b>sitting</b> [2] 78/19 225/16  <b>situation</b> [1] 95/22  <b>situations</b> [1] 90/4  <b>six</b> [9] 16/5 37/5 48/12  53/10 70/11 79/9 79/24  143/23 180/14  <b>Six-zero</b> [1] 70/11</p>	<p><b>sixth</b> [2] 58/8 58/21  <b>Sixty</b> [2] 70/11 80/25  <b>Sixty-four</b> [1] 80/25  <b>sized</b> [3] 206/13 207/4  208/1  <b>skew</b> [1] 50/22  <b>skip</b> [2] 56/14 193/9  <b>Skipping</b> [2] 193/14  193/19  <b>Slack</b> [1] 13/7  <b>sleep</b> [1] 249/21  <b>slight</b> [1] 251/22  <b>slightly</b> [3] 38/3 70/20  136/5  <b>slowly</b> [1] 11/17  <b>small</b> [1] 54/24  <b>smart</b> [1] 63/5  <b>smarter</b> [1] 207/3  <b>SMT</b> [2] 149/12 149/13  <b>SMTP</b> [1] 149/3  <b>softback</b> [1] 12/10  <b>software</b> [55] 12/4 12/8  13/19 13/21 13/22 17/7  17/21 20/2 22/5 22/5  23/2 23/6 35/8 51/2  54/19 54/20 60/2 60/14  68/7 78/18 88/12 91/25  92/5 96/8 128/23 129/2  141/10 141/10 141/12  142/3 148/9 148/12  148/15 149/4 152/16  159/7 174/14 174/15  190/25 194/22 194/24  199/24 200/1 201/7  203/9 203/11 234/3  234/5 235/21 235/23  240/4 240/8 244/10  245/1 245/14  <b>sole</b> [1] 105/2  <b>solely</b> [1] 108/1  <b>solo</b> [1] 252/7  <b>solution</b> [1] 20/23  <b>solved</b> [1] 21/22  <b>somebody</b> [5] 7/8 8/21  77/2 117/16 212/1  <b>somehow</b> [1] 115/25  <b>someone</b> [7] 7/22 9/2  49/2 71/18 73/14 103/12  141/4  <b>someone's</b> [1] 103/12  <b>something</b> [24] 19/1  41/8 47/6 49/2 52/5  54/17 65/2 70/15 70/20  76/13 80/9 91/11 91/13  108/14 114/13 114/16  139/1 152/5 152/24  174/23 174/24 185/13  240/4 251/7  <b>sometime</b> [2] 38/15  70/25  <b>sometimes</b> [2] 131/23  170/15  <b>somewhere</b> [2] 38/6  38/8  <b>sorry</b> [66] 3/6 4/18 7/25  10/5 10/14 10/19 11/14</p>	<p>17/8 17/24 18/3 18/21  21/2 24/20 24/21 27/21  42/20 45/11 52/8 55/7  57/21 58/1 59/10 60/23  65/19 66/18 68/3 68/3  72/7 72/22 74/12 75/5  79/17 80/15 83/23 85/6  86/4 88/4 89/14 89/16  91/19 97/25 101/5  113/25 125/6 125/7  125/9 125/17 126/11  134/3 143/19 143/19  145/17 150/13 177/21  178/11 178/11 179/13  185/4 197/12 202/14  202/14 219/6 219/13  226/7 227/4 247/6  <b>sort</b> [18] 6/17 6/21 6/23  32/7 32/8 37/21 41/24  46/19 49/17 57/22 58/14  73/25 124/10 134/13  139/8 143/24 232/1  249/12  <b>sorta</b> [1] 57/24  <b>sorts</b> [1] 135/23  <b>soundness</b> [1] 205/13  <b>soup</b> [1] 48/2  <b>source</b> [8] 88/16 141/23  157/7 157/19 157/21  191/4 200/6 203/6  <b>South</b> [2] 40/10 40/18  <b>Southeast</b> [3] 2/3 2/6  2/11  <b>SOUTHERN</b> [2] 1/1  120/12  <b>sovereignty</b> [1] 95/10  <b>speak</b> [11] 11/4 11/17  214/1 214/4 214/7  214/10 214/11 214/14  214/21 214/22 236/7  <b>speaking</b> [2] 12/18  202/15  <b>special</b> [1] 83/8  <b>specialized</b> [1] 109/6  <b>specific</b> [11] 110/7  110/16 110/18 145/9  147/6 164/5 214/6  214/13 217/18 222/7  222/13  <b>specifically</b> [12] 7/1 7/6  12/1 20/19 26/11 28/2  42/11 43/4 44/25 49/5  223/13 246/8  <b>specifics</b> [1] 32/7  <b>speculation</b> [8] 63/8  79/12 86/19 94/18 96/15  237/21 242/5 242/6  <b>speed</b> [2] 133/22 133/25  <b>spell</b> [3] 10/14 33/5  104/7  <b>spelled</b> [1] 104/10  <b>spend</b> [23] 16/18 49/6  75/4 75/7 75/17 76/21  77/15 78/8 78/10 79/1  83/11 83/23 85/4 86/3  86/5 86/6 86/14 86/22</p>
--	--	---	--	--



<p><b>S</b></p> <p><b>spend...</b> [5] 86/24 89/11 89/24 90/15 97/8</p> <p><b>spending</b> [3] 82/25 83/25 89/13</p> <p><b>spent</b> [29] 26/9 26/12 28/1 28/7 48/10 54/6 54/11 54/15 54/19 54/21 55/3 55/5 55/10 55/11 55/12 55/15 55/20 55/23 55/25 56/1 56/4 78/21 80/12 81/2 85/14 85/17 85/23 90/5 97/9</p> <p><b>splitting</b> [1] 165/25</p> <p><b>spoke</b> [3] 107/8 244/19 245/16</p> <p><b>spoken</b> [4] 30/2 34/6 104/21 107/11</p> <p><b>stage</b> [2] 109/8 110/14</p> <p><b>stamp</b> [24] 26/1 131/19 131/21 131/22 132/1 161/14 163/4 163/6 163/7 163/10 163/11 164/15 167/5 182/14 183/19 183/24 187/9 192/18 202/17 218/8 226/23 226/24 232/1 232/7</p> <p><b>stamps</b> [1] 140/22</p> <p><b>stand</b> [4] 13/9 117/24 165/6 226/12</p> <p><b>standard</b> [1] 102/18</p> <p><b>standing</b> [1] 246/17</p> <p><b>stapled</b> [1] 198/12</p> <p><b>start</b> [19] 22/7 48/22 49/10 51/13 73/12 95/23 113/22 116/17 117/11 128/20 131/7 131/14 132/12 132/16 187/19 197/16 230/21 232/16 237/11</p> <p><b>started</b> [5] 4/10 12/10 51/13 96/2 98/6</p> <p><b>starting</b> [5] 3/8 77/16 132/16 138/12 163/7</p> <p><b>starts</b> [5] 130/25 131/21 132/19 172/9 206/21</p> <p><b>state</b> [12] 63/12 87/6 104/7 112/8 113/1 113/1 113/10 113/12 115/1 118/6 145/14 220/11</p> <p><b>stated</b> [9] 177/9 178/7 185/16 188/11 191/15 201/21 233/17 238/4 244/9</p> <p><b>statement</b> [9] 135/8 136/9 207/7 207/25 208/8 219/8 221/20 231/22 232/4</p> <p><b>statements</b> [3] 114/23 154/24 215/17</p> <p><b>states</b> [8] 1/1 1/12 29/11 29/13 29/23 243/13 244/2 244/3</p> <p><b>stating</b> [1] 135/7</p> <p><b>statistically</b> [1] 57/15</p>	<p><b>stay</b> [5] 5/11 9/11 117/12 117/12 226/5</p> <p><b>stayed</b> [1] 40/23</p> <p><b>stays</b> [1] 21/24</p> <p><b>step</b> [6] 57/24 72/9 97/22 164/11 247/5 249/1</p> <p><b>Stephen</b> [4] 1/17 255/20 255/23 255/24</p> <p><b>Steve</b> [12] 5/11 5/18 6/8 6/17 8/13 8/14 10/6 10/10 11/8 11/13 206/8 254/3</p> <p><b>Steven</b> [3] 10/10 10/13 10/22</p> <p><b>still</b> [12] 18/8 32/6 46/9 46/10 50/7 52/25 59/16 60/2 145/6 196/14 236/1 245/5</p> <p><b>stone</b> [1] 22/9</p> <p><b>stop</b> [2] 71/20 196/5</p> <p><b>stopped</b> [1] 52/3</p> <p><b>stopping</b> [2] 195/19 196/2</p> <p><b>store</b> [2] 13/21 92/6</p> <p><b>stored</b> [2] 93/3 248/12</p> <p><b>story</b> [1] 81/12</p> <p><b>straggler</b> [1] 156/12</p> <p><b>straight</b> [1] 40/8</p> <p><b>Street</b> [5] 1/18 2/3 2/6 2/9 2/11</p> <p><b>stricken</b> [1] 205/24</p> <p><b>strike</b> [8] 9/8 69/21 78/6 143/11 146/6 161/5 164/3 194/20</p> <p><b>string</b> [4] 123/6 170/8 174/12 190/18</p> <p><b>structure</b> [10] 105/9 105/22 111/4 111/22 121/24 127/12 150/6 180/3 209/16 228/7 237/11</p> <p><b>studies</b> [1] 119/2</p> <p><b>stuff</b> [2] 41/15 41/18</p> <p><b>sub</b> [1] 41/12</p> <p><b>sub-incidentals</b> [1] 41/12</p> <p><b>subject</b> [12] 30/19 47/7 105/3 108/12 108/23 115/6 140/12 186/4 199/15 205/23 247/20 247/25</p> <p><b>subjectively</b> [1] 92/12</p> <p><b>submission</b> [1] 103/12</p> <p><b>submit</b> [7] 98/18 98/19 99/3 99/5 99/12 249/5 250/1</p> <p><b>submitted</b> [11] 103/1 111/19 112/18 114/24 175/10 184/22 185/19 192/9 201/10 208/18 249/11</p> <p><b>subsequent</b> [1] 120/9</p> <p><b>substance</b> [1] 121/19</p> <p><b>substantiate</b> [1] 164/16</p> <p><b>successfully</b> [5] 21/18 22/8 71/4 71/11 71/13</p>	<p><b>such</b> [12] 17/9 122/5 122/10 124/5 130/18 140/22 170/24 175/1 213/18 215/14 220/1 240/10</p> <p><b>sufficient</b> [1] 137/18</p> <p><b>sufficiently</b> [1] 109/1</p> <p><b>suggested</b> [2] 204/19 233/19</p> <p><b>suggesting</b> [3] 108/24 180/10 227/17</p> <p><b>suggests</b> [4] 144/12 148/2 163/1 211/1</p> <p><b>Suite</b> [7] 2/3 2/6 2/12 2/15 2/18 2/21 2/24</p> <p><b>sum</b> [2] 203/13 211/12</p> <p><b>superior</b> [2] 45/12 45/17</p> <p><b>support</b> [3] 12/5 119/22 120/4</p> <p><b>supported</b> [2] 119/16 120/12</p> <p><b>supporting</b> [3] 119/14 164/16 223/21</p> <p><b>supports</b> [2] 151/17 230/24</p> <p><b>suppose</b> [1] 155/11</p> <p><b>supposed</b> [5] 45/1 45/3 65/4 66/25 109/10</p> <p><b>supposedly</b> [2] 96/10 97/13</p> <p><b>sure</b> [73] 11/1 11/3 11/17 14/6 24/13 36/12 39/7 41/4 42/22 43/7 47/5 50/4 51/11 53/8 53/20 59/14 65/3 65/9 65/20 66/20 68/4 68/17 68/17 69/8 70/24 80/15 80/19 85/7 85/17 88/24 91/19 95/14 95/19 99/23 108/13 113/22 113/22 116/21 119/21 121/22 122/4 122/9 123/25 124/19 132/19 138/14 154/1 154/13 159/4 160/20 161/1 177/19 178/4 189/3 197/21 198/11 201/22 211/10 211/22 214/20 220/8 225/19 226/4 230/1 232/23 240/14 241/14 241/25 243/23 243/23 251/24 252/11 252/13</p> <p><b>surely</b> [1] 62/11</p> <p><b>surprise</b> [1] 107/16</p> <p><b>surrounding</b> [6] 107/23 214/24 214/25 215/2 215/10 216/20</p> <p><b>sustain</b> [6] 63/13 144/20 207/18 238/19 242/6 244/5</p> <p><b>Sustained</b> [16] 63/21 64/16 88/10 94/19 109/20 110/9 112/6 156/24 207/17 208/5 208/12 236/21 236/23 236/25 241/9 246/11</p>	<p><b>swear</b> [1] 10/12</p> <p><b>switch</b> [1] 170/5</p> <p><b>switched</b> [1] 49/2</p> <p><b>switching</b> [1] 170/6</p> <p><b>swore</b> [4] 10/23 144/10 175/22 209/9</p> <p><b>sworn</b> [10] 10/11 80/8 80/10 103/2 104/5 122/22 179/15 208/18 210/12 211/15</p> <p><b>system</b> [4] 26/18 95/10 96/11 97/5</p> <p><b>systems</b> [1] 119/4</p> <p><b>T</b></p> <p><b>tab</b> [2] 110/2 112/18</p> <p><b>tab 31</b> [2] 110/2 112/18</p> <p><b>table</b> [1] 6/2</p> <p><b>tack</b> [1] 48/19</p> <p><b>tack-ons</b> [1] 48/19</p> <p><b>tacked</b> [1] 36/19</p> <p><b>take</b> [23] 8/4 9/5 34/21 36/3 36/12 47/8 49/14 50/25 54/24 62/6 67/3 68/15 68/18 91/2 98/7 99/25 100/12 101/2 195/25 196/1 212/7 217/21 240/17</p> <p><b>taken</b> [3] 68/23 117/20 196/9</p> <p><b>taking</b> [6] 12/23 24/24 47/10 81/17 101/19 164/11</p> <p><b>talk</b> [13] 4/11 8/15 51/9 54/23 70/22 75/12 75/13 75/13 114/9 222/17 240/21 251/7 252/24</p> <p><b>talked</b> [9] 34/4 34/15 38/10 78/5 165/2 223/15 226/16 226/17 249/15</p> <p><b>talking</b> [8] 64/6 91/9 123/11 214/18 234/16 236/16 239/21 246/3</p> <p><b>tampered</b> [1] 108/16</p> <p><b>tangentially</b> [1] 186/15</p> <p><b>tank</b> [1] 81/13</p> <p><b>target</b> [1] 65/2</p> <p><b>task</b> [2] 13/2 14/2</p> <p><b>team</b> [2] 13/1 249/23</p> <p><b>technical</b> [4] 12/18 37/10 37/11 109/5</p> <p><b>technique</b> [2] 60/7 60/9</p> <p><b>technological</b> [1] 8/20</p> <p><b>technologically</b> [1] 152/21</p> <p><b>technology</b> [4] 12/1 12/16 39/14 101/22</p> <p><b>telegram</b> [1] 13/7</p> <p><b>telephone</b> [1] 32/19</p> <p><b>telephones</b> [1] 9/24</p> <p><b>tell</b> [26] 5/23 19/6 29/19 37/8 39/2 48/11 55/9 63/15 71/11 78/1 78/25 107/15 117/16 118/16 125/9 129/9 130/10 146/24 147/8 213/11</p>	<p>213/13 213/15 213/21 220/9 220/14 252/22</p> <p><b>telling</b> [2] 59/2 114/14</p> <p><b>tells</b> [4] 71/24 129/10 130/12 147/10</p> <p><b>template</b> [5] 17/20 17/22 17/25 241/13 241/23</p> <p><b>Templates</b> [1] 241/15</p> <p><b>tendered</b> [1] 32/2</p> <p><b>term</b> [6] 43/13 84/10 113/23 113/24 113/24 114/11</p> <p><b>terminology</b> [1] 65/20</p> <p><b>terms</b> [6] 14/3 20/4 36/11 126/23 238/7 249/25</p> <p><b>test</b> [2] 244/22 245/18</p> <p><b>tested</b> [1] 245/1</p> <p><b>testified</b> [42] 27/3 27/24 29/10 29/18 33/22 39/10 64/19 67/22 84/18 85/10 91/14 115/22 128/12 142/24 147/25 155/10 155/12 167/16 178/14 179/3 179/10 197/22 205/14 215/1 220/5 220/21 221/10 227/2 229/7 231/24 232/15 232/24 233/3 235/10 235/21 239/1 239/5 239/21 240/18 242/21 242/25 244/3</p> <p><b>testify</b> [29] 13/12 13/13 29/14 29/16 30/5 30/8 30/19 101/11 103/14 106/12 108/17 108/22 112/9 112/11 113/2 113/3 113/9 113/14 114/13 115/19 116/3 155/12 165/11 171/19 185/17 198/23 205/2 206/11 207/22</p> <p><b>testifying</b> [12] 32/14 35/20 45/2 63/19 76/7 102/22 103/16 112/14 164/9 165/2 217/3 217/6</p> <p><b>testimony</b> [109] 4/16 5/11 5/13 5/21 5/22 6/9 6/10 6/17 6/22 7/11 7/12 7/17 8/14 9/7 9/9 31/25 33/15 34/1 44/12 59/23 60/21 68/20 76/10 90/4 91/5 100/9 101/2 101/2 101/19 102/8 102/14 102/16 102/16 104/24 107/2 108/8 108/24 108/24 109/2 109/4 109/16 110/1 112/9 112/20 113/11 113/13 113/18 114/19 114/20 114/22 115/20 116/25 117/11 117/13 136/13 136/13 144/13 144/18 164/5 164/8 164/11 164/13 165/15 166/1 171/21 178/14 178/22</p>
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<p><b>T</b></p> <p><b>testimony... [42]</b> 185/23 186/13 196/7 204/25 205/10 205/21 206/9 207/13 207/22 210/24 214/17 215/11 216/21 217/13 217/15 217/20 218/21 220/18 227/10 227/14 228/3 228/24 228/25 229/1 229/9 229/10 229/13 233/11 233/22 234/20 237/4 242/8 243/3 243/13 244/20 244/24 245/10 245/13 246/13 249/12 254/3 254/8</p> <p><b>testing [8]</b> 23/25 78/16 154/16 235/24 236/1 236/4 236/6 244/10</p> <p><b>text [31]</b> 145/3 147/17 152/15 158/22 158/25 159/5 159/7 159/9 159/10 159/24 159/25 160/14 160/16 160/22 161/1 170/8 170/14 170/16 174/12 174/13 174/14 182/9 188/20 189/1 190/16 222/3 234/19 234/20 234/21 241/20 247/16</p> <p><b>TextEdit [2]</b> 159/8 160/21</p> <p><b>thank [66]</b> 5/3 6/4 6/6 8/3 8/23 10/6 10/24 15/21 18/2 19/17 19/18 21/5 27/21 28/13 60/4 60/23 60/24 68/21 69/4 69/5 78/2 89/1 89/20 89/21 95/16 97/22 99/22 104/12 113/16 116/11 117/14 117/18 123/18 125/15 125/16 125/24 126/16 134/5 134/24 144/4 154/18 156/10 157/14 157/16 158/5 158/15 167/22 173/16 176/17 178/3 183/21 206/2 210/3 211/17 211/19 217/10 218/4 229/19 230/3 233/9 247/4 248/18 249/1 249/2 253/1 253/5</p> <p><b>Thanks [1]</b> 123/15</p> <p><b>that's [152]</b> 10/22 12/1 13/1 18/4 18/24 21/21 24/8 25/19 27/2 29/4 29/5 30/4 30/6 30/17 33/1 33/13 33/16 34/18 36/10 39/4 43/2 43/13 44/2 45/14 45/20 46/9 47/21 47/24 49/13 50/5 50/20 51/3 51/6 51/8 51/14 51/18 52/3 52/12 52/14 53/23 54/7 54/13 56/5 56/24 58/6 58/10 58/21 58/23 59/7 59/24</p>	<p>60/22 62/14 65/4 67/1 67/20 68/1 68/9 70/16 70/20 72/12 72/24 74/7 74/25 76/18 78/22 79/7 80/6 80/8 80/11 80/24 81/2 82/10 83/7 86/14 86/17 87/17 89/9 97/18 99/13 99/17 99/21 105/20 108/8 108/8 109/9 109/13 109/23 112/9 114/10 114/19 114/19 116/10 117/9 128/6 131/13 132/5 134/21 144/13 144/14 144/16 152/21 157/6 159/18 163/5 164/14 165/5 165/24 171/2 172/10 173/3 176/18 179/4 188/20 192/8 198/8 198/24 207/23 213/11 213/15 214/14 215/5 216/1 216/9 219/16 219/24 220/6 221/16 225/4 226/3 226/20 227/19 232/7 234/25 235/16 237/18 239/8 239/13 240/12 240/20 241/18 241/20 242/9 242/16 243/25 244/4 245/7 245/19 248/1 248/7 248/9 248/18 250/24</p> <p><b>themselves [12]</b> 26/4 26/22 68/5 84/4 105/10 105/22 121/25 150/7 193/9 216/10 217/4 217/7</p> <p><b>theories [1]</b> 46/6</p> <p><b>there's [47]</b> 9/9 20/9 20/20 22/4 55/12 67/8 67/9 69/18 72/18 73/1 77/3 77/6 79/4 84/21 87/21 88/2 90/6 90/12 98/13 98/21 112/23 123/6 131/21 140/9 144/12 144/17 144/18 149/16 153/18 156/11 160/18 165/1 165/14 169/4 170/7 170/8 171/20 178/21 185/6 186/17 192/7 211/2 215/12 220/24 232/6 238/11 248/15</p> <p><b>therefore [5]</b> 5/25 21/19 22/23 121/18 211/16</p> <p><b>therein [2]</b> 201/23 213/19</p> <p><b>they're [14]</b> 52/20 53/1 56/23 78/12 84/12 85/12 107/22 124/20 124/20 147/1 151/16 155/7 212/14 212/16</p> <p><b>they've [4]</b> 21/18 22/8 137/14 199/5</p> <p><b>thin [2]</b> 83/10 83/13</p> <p><b>thing [7]</b> 35/19 70/16</p>	<p>85/22 86/17 86/21 89/6 241/16</p> <p><b>things [19]</b> 24/15 30/22 33/15 36/19 50/8 57/22 57/22 70/4 79/21 84/11 85/2 88/20 91/7 102/23 108/2 133/22 133/25 194/6 251/5</p> <p><b>think [109]</b> 5/19 7/6 7/15 7/16 7/17 8/11 8/24 18/15 22/12 22/19 23/12 26/12 31/1 31/14 32/6 32/11 32/16 37/18 38/12 38/24 41/3 43/2 43/12 43/13 43/20 44/4 45/14 46/9 47/1 47/2 47/5 47/7 47/10 47/11 47/13 48/15 48/23 51/18 52/18 54/23 55/22 61/12 61/23 62/21 62/24 64/19 67/22 71/6 81/2 81/3 81/24 87/18 88/2 91/7 92/23 93/10 94/13 96/4 97/24 99/20 100/2 100/12 102/2 102/15 106/25 112/22 114/10 115/8 115/20 116/8 116/18 116/22 117/2 135/17 135/20 135/21 136/5 137/21 144/16 144/16 145/8 145/10 152/3 153/22 153/25 156/7 156/8 156/20 171/23 178/18 185/6 186/24 192/7 195/23 196/1 197/21 197/23 205/23 207/20 222/19 224/20 242/18 243/19 244/2 244/13 248/1 249/14 251/6 252/23</p> <p><b>thinks [1]</b> 79/21</p> <p><b>third [6]</b> 17/1 17/2 67/9 109/4 154/24 194/1</p> <p><b>thirds [1]</b> 67/9</p> <p><b>Thirty [3]</b> 167/8 180/14 188/11</p> <p><b>Thirty-nine [1]</b> 188/11</p> <p><b>Thirty-six [1]</b> 180/14</p> <p><b>Thirty-two [1]</b> 167/8</p> <p><b>those [101]</b> 13/25 16/19 16/19 20/4 22/17 23/3 23/13 24/17 25/4 27/12 27/12 27/14 30/22 35/10 36/3 36/11 36/24 37/5 50/18 54/5 55/5 55/15 56/20 56/21 57/1 57/4 57/4 57/12 58/18 59/21 60/2 60/11 60/15 60/19 63/18 64/12 65/3 69/25 71/7 77/10 78/17 83/11 84/11 84/11 86/22 91/15 93/20 93/21 94/23 96/19 103/4 103/5 103/6 105/11 105/16 107/21 107/23 108/16 111/3 111/4 111/6 120/3</p>	<p>120/16 122/1 125/21 133/24 139/10 140/11 140/12 150/16 151/13 152/17 160/19 171/21 173/14 180/8 180/10 181/5 181/17 182/25 184/4 193/1 193/2 193/3 202/21 211/25 215/3 216/6 223/20 223/21 224/11 225/11 225/14 227/18 233/20 245/12 247/11 247/17 247/21 247/22 250/5</p> <p><b>though [9]</b> 11/18 18/7 60/1 104/19 113/20 169/22 226/6 229/12 241/20</p> <p><b>thought [4]</b> 34/20 50/4 65/21 250/3</p> <p><b>thousand [2]</b> 23/9 23/14</p> <p><b>thousands [1]</b> 224/6</p> <p><b>three [9]</b> 34/21 56/13 97/10 108/21 109/10 109/20 143/10 143/13 195/6</p> <p><b>through [38]</b> 7/4 13/6 16/12 20/14 21/14 22/19 22/20 24/5 25/1 27/6 28/6 50/17 57/23 81/16 91/24 93/1 95/5 109/5 128/18 130/19 131/3 131/13 132/7 132/17 138/10 138/11 139/14 143/2 157/21 159/2 160/19 181/11 209/20 212/14 222/21 224/15 230/18 236/4</p> <p><b>throughout [1]</b> 192/25</p> <p><b>throw [1]</b> 250/6</p> <p><b>Thursday [3]</b> 138/20 138/23 149/9</p> <p><b>thus [1]</b> 164/14</p> <p><b>tied [3]</b> 110/13 151/10 250/20</p> <p><b>timeframe [2]</b> 48/6 246/18</p> <p><b>timeline [1]</b> 34/9</p> <p><b>timer [1]</b> 148/10</p> <p><b>times [4]</b> 31/4 50/7 62/12 77/11</p> <p><b>timing [1]</b> 249/25</p> <p><b>tiny [1]</b> 20/13</p> <p><b>title [2]</b> 12/15 39/14</p> <p><b>today [39]</b> 4/13 11/12 28/21 29/2 29/18 29/20 30/5 30/23 37/6 51/20 70/21 86/3 86/5 86/6 99/14 104/18 108/1 116/22 117/13 165/7 168/5 177/3 188/4 205/8 211/25 212/24 216/22 219/3 220/16 223/15 225/16 225/21 231/12 242/15 244/24 248/6 249/8 249/8 252/24</p> <p><b>today's [1]</b> 81/7</p>	<p><b>together [6]</b> 77/12 78/1 198/13 252/2 252/15 252/24</p> <p><b>told [15]</b> 29/5 41/25 42/1 44/18 48/17 59/7 59/8 61/18 62/17 69/22 73/9 79/19 82/4 220/1 252/4 <b>too [4]</b> 43/3 149/20 250/9 252/20</p> <p><b>took [8]</b> 29/18 44/24 48/2 48/4 61/25 79/21 96/10 164/22</p> <p><b>tool [20]</b> 128/2 128/4 128/4 128/6 129/6 135/17 136/16 137/2 137/14 155/10 155/14 155/19 170/22 170/23 170/25 182/22 182/23 203/2 203/16 203/17</p> <p><b>tools [2]</b> 180/22 182/25</p> <p><b>top [11]</b> 93/24 126/13 132/11 132/13 159/13 160/13 169/20 191/21 206/18 224/24 225/10</p> <p><b>topic [5]</b> 6/20 44/25 59/11 186/25 251/17</p> <p><b>Toronto [1]</b> 34/25</p> <p><b>total [5]</b> 16/5 22/16 49/16 54/2 200/23</p> <p><b>totally [1]</b> 59/2</p> <p><b>TouchUp [2]</b> 159/8 160/21</p> <p><b>towards [1]</b> 242/19</p> <p><b>town [2]</b> 31/13 212/18</p> <p><b>trading [1]</b> 189/7</p> <p><b>training [2]</b> 106/2 111/24</p> <p><b>transact [7]</b> 28/8 76/21 83/6 83/15 83/20 89/7 93/17</p> <p><b>transacted [1]</b> 26/5</p> <p><b>transacting [1]</b> 82/21</p> <p><b>transaction [36]</b> 19/12 23/25 26/9 28/9 57/7 72/4 73/20 73/22 74/19 76/22 80/14 82/12 82/18 82/22 82/24 83/3 83/8 83/23 84/1 84/2 84/2 84/5 84/7 84/8 89/12 90/1 90/6 90/9 90/10 90/10 90/12 90/13 90/14 90/16 90/19 92/22</p> <p><b>transactions [14]</b> 18/13 18/14 18/16 18/22 19/12 19/14 20/8 25/2 72/16 73/6 82/5 82/6 82/23 83/24</p> <p><b>transcript [6]</b> 1/10 200/11 200/13 200/16 244/13 255/21</p> <p><b>transferred [1]</b> 193/21</p> <p><b>translated [1]</b> 66/9</p> <p><b>translates [1]</b> 65/11</p> <p><b>transport [8]</b> 130/1 130/4 130/25 138/11 148/18 148/23 149/2</p>
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<p><b>T</b></p> <p><b>transport...</b> [1] 149/6</p> <p><b>travel</b> [7] 40/6 40/9 41/3 41/6 42/2 42/3 42/24</p> <p><b>traveled</b> [2] 35/23 41/21</p> <p><b>traveling</b> [1] 48/24</p> <p><b>treating</b> [1] 164/25</p> <p><b>treatise</b> [1] 136/9</p> <p><b>treatises</b> [1] 135/22</p> <p><b>tried</b> [2] 81/12 240/5</p> <p><b>trier</b> [1] 109/4</p> <p><b>tries</b> [1] 21/25</p> <p><b>trip</b> [3] 42/8 42/10 249/20</p> <p><b>trouble</b> [2] 54/23 167/17</p> <p><b>true</b> [2] 42/8 215/8</p> <p><b>TrueCrypt</b> [2] 193/24 206/25</p> <p><b>truncated</b> [1] 148/23</p> <p><b>trust</b> [47] 103/3 122/21 124/25 125/1 125/14 125/19 125/22 143/17 144/6 144/8 144/9 144/23 145/6 172/16 173/24 174/7 174/8 175/11 175/21 176/8 176/25 178/19 178/20 178/21 178/23 178/24 179/25 180/15 181/15 182/11 184/1 184/13 184/24 186/5 186/7 186/7 186/9 186/15 186/16 186/19 189/2 189/4 189/8 192/8 193/12 199/15 237/5</p> <p><b>trusts</b> [1] 178/16</p> <p><b>truth</b> [5] 5/13 29/19 135/9 155/1 201/23</p> <p><b>try</b> [13] 5/15 19/7 19/8 27/3 32/12 33/22 54/22 68/11 68/12 74/4 81/17 81/24 91/22</p> <p><b>trying</b> [8] 13/2 13/4 48/1 62/14 71/1 178/17 215/25 228/9</p> <p><b>Tulip</b> [16] 122/21 124/25 125/1 125/14 125/19 125/22 143/17 144/6 144/8 144/9 144/23 145/6 172/16 173/24 174/7 174/8</p> <p><b>turn</b> [9] 4/17 101/13 123/5 158/8 175/25 182/11 197/3 197/10 197/25</p> <p><b>Twenty</b> [1] 156/16</p> <p><b>Twenty-nine</b> [1] 156/16</p> <p><b>twice</b> [1] 84/15</p> <p><b>two</b> [64] 4/20 4/24 12/23 23/9 23/13 27/18 30/22 31/1 31/14 32/12 34/21 35/5 48/4 48/5 48/9 57/22 67/9 77/10 77/25 79/9 83/24 94/13 95/9 95/12 95/17 97/10 98/13 100/4 102/25 103/4</p>	<p>103/8 116/22 124/1 124/19 125/21 145/12 147/7 147/10 149/16 149/16 151/23 153/19 161/3 167/8 169/4 173/13 173/14 178/16 178/18 178/19 181/5 184/6 184/7 186/17 187/18 217/13 217/15 219/13 222/18 224/10 226/21 227/2 227/5 228/11</p> <p><b>two-thirds</b> [1] 67/9</p> <p><b>type</b> [8] 17/21 106/25 107/2 123/20 125/12 127/1 141/10 145/24</p> <p><b>types</b> [2] 18/6 131/6</p> <p><b>typical</b> [1] 15/5</p> <p><b>typically</b> [4] 19/2 20/21 21/11 56/22</p> <p><b>U</b></p> <p><b>U.S</b> [1] 120/12</p> <p><b>Uh</b> [30] 28/5 29/1 33/18 34/11 35/14 39/7 40/20 42/14 47/10 52/7 53/9 53/11 53/13 55/1 55/15 58/16 60/17 61/3 61/16 61/25 65/9 66/8 67/11 71/8 73/3 81/20 102/6 149/2 205/5 230/4</p> <p><b>Uh-huh</b> [17] 29/1 33/18 34/11 35/14 40/20 53/9 53/11 53/13 55/1 60/17 61/16 67/11 71/8 73/3 102/6 205/5 230/4</p> <p><b>UK</b> [4] 11/22 189/5 193/11 194/1</p> <p><b>Ulbricht</b> [2] 120/15 120/19</p> <p><b>um</b> [23] 12/12 23/11 30/21 31/1 31/14 31/16 32/4 38/22 46/19 55/22 62/23 74/17 79/11 80/19 81/10 82/17 83/5 84/21 88/2 89/9 92/3 95/4 197/14</p> <p><b>un</b> [1] 210/23</p> <p><b>un-redlined</b> [1] 210/23</p> <p><b>unable</b> [3] 52/25 54/21 78/1</p> <p><b>unclear</b> [1] 32/11</p> <p><b>unconnected</b> [1] 203/10</p> <p><b>under</b> [17] 8/24 39/10 59/18 80/17 81/4 81/7 107/3 107/6 108/7 109/17 111/20 112/19 114/25 117/7 119/19 135/21 155/2</p> <p><b>underlined</b> [1] 159/24</p> <p><b>underlying</b> [3] 155/8 155/13 155/19</p> <p><b>understand</b> [51] 5/12 8/15 8/17 8/19 8/22 13/3 13/13 13/16 13/17 14/2 29/24 40/8 59/12 68/9</p>	<p>68/12 71/14 73/15 80/12 80/17 109/6 109/7 110/25 111/1 111/12 123/3 125/24 136/2 150/21 154/14 155/4 161/21 166/7 166/8 171/15 175/22 179/17 200/8 210/9 210/12 211/4 213/20 216/1 220/14 222/8 228/9 228/9 228/19 230/17 244/16 248/14 251/16</p> <p><b>understanding</b> [27] 42/5 47/12 48/14 53/19 59/22 60/21 63/17 65/7 66/5 68/1 68/13 71/3 75/14 75/15 81/8 91/20 91/23 91/25 92/25 93/14 94/3 94/9 114/12 115/15 116/12 227/15 239/16</p> <p><b>understood</b> [10] 29/17 33/22 44/2 61/14 63/18 90/3 166/3 166/5 173/18 188/10</p> <p><b>undertakes</b> [1] 74/3</p> <p><b>undertook</b> [1] 29/19</p> <p><b>undo</b> [1] 47/6</p> <p><b>unequivocally</b> [1] 245/8</p> <p><b>unfair</b> [1] 8/21</p> <p><b>unfathomable</b> [1] 97/7</p> <p><b>unfortunately</b> [2] 39/2 231/11</p> <p><b>unique</b> [5] 21/9 22/12 23/4 124/11 147/5</p> <p><b>uniquely</b> [1] 60/6</p> <p><b>unit</b> [1] 119/16</p> <p><b>UNITED</b> [5] 1/1 1/12 29/10 29/13 29/23</p> <p><b>universe</b> [2] 16/7 16/7</p> <p><b>University</b> [1] 118/23</p> <p><b>UNIX</b> [2] 131/23 163/7</p> <p><b>unknown</b> [3] 55/17 56/2 134/8</p> <p><b>unless</b> [3] 9/22 10/3 99/1</p> <p><b>unnecessary</b> [2] 112/16 112/21</p> <p><b>unpack</b> [4] 30/13 47/21 54/22 144/22</p> <p><b>unparalleled</b> [1] 47/13</p> <p><b>unprepared</b> [1] 205/1</p> <p><b>unrelated</b> [2] 81/23 233/20</p> <p><b>unsigned</b> [2] 23/22 24/3</p> <p><b>unspent</b> [3] 16/20 53/21 58/4</p> <p><b>until</b> [11] 22/8 52/3 79/19 81/21 99/11 181/22 184/10 196/7 196/8 242/23 249/11</p> <p><b>untimely</b> [2] 101/8 204/17</p> <p><b>unusual</b> [1] 20/1</p> <p><b>upcoming</b> [1] 32/17</p> <p><b>updated</b> [2] 169/16 240/10</p> <p><b>upfront</b> [1] 36/25</p>	<p><b>upon</b> [25] 9/1 50/13 51/7 52/12 53/1 105/6 105/12 105/20 106/17 111/8 111/18 111/21 115/5 156/24 164/14 165/12 166/5 170/23 212/25 217/3 230/8 232/11 239/17 242/11 252/18</p> <p><b>ups</b> [1] 95/18</p> <p><b>us</b> [28] 5/23 11/16 13/4 34/21 42/1 44/18 48/17 58/5 69/22 98/17 100/12 102/2 105/13 108/1 112/1 129/9 129/10 130/10 130/12 147/8 147/10 152/25 157/19 198/17 204/14 207/14 221/10 250/7</p> <p><b>used</b> [109] 5/14 9/24 13/19 16/6 17/1 17/5 17/9 17/11 17/17 17/21 18/6 18/11 18/23 19/23 19/25 20/11 20/21 22/12 22/15 22/17 22/18 23/20 50/14 50/16 51/12 51/16 54/17 59/3 60/1 60/2 60/6 60/6 60/8 60/9 60/10 61/1 64/4 70/9 70/14 72/15 73/25 78/16 84/10 88/3 88/4 88/13 88/14 88/16 92/21 96/7 103/6 107/17 109/12 113/24 113/24 114/11 115/14 115/15 121/21 121/22 128/5 128/6 128/22 129/3 129/5 135/14 135/17 135/25 136/16 137/3 140/23 141/9 141/11 141/12 142/1 146/21 147/5 148/9 148/12 148/15 155/11 155/19 170/15 170/22 170/25 171/1 173/25 174/2 174/6 174/9 174/14 174/15 175/4 180/22 181/21 182/25 182/25 188/3 194/22 194/24 201/9 201/11 203/3 203/16 205/2 205/12 234/3 235/18 241/15</p> <p><b>useful</b> [3] 26/13 48/8 85/12</p> <p><b>user</b> [8] 84/14 106/17 106/18 133/6 142/24 142/25 143/1 215/15</p> <p><b>user-friendly</b> [1] 84/14</p> <p><b>user-generated</b> [1] 106/17</p> <p><b>uses</b> [2] 72/19 114/4</p> <p><b>using</b> [39] 16/19 16/23 21/3 21/12 23/7 35/7 54/19 59/15 60/1 62/12 72/18 76/16 78/13 78/17 96/3 103/4 113/23 122/5 124/6 124/13 124/18</p>	<p>128/2 129/7 132/21 155/10 158/11 162/12 168/3 172/9 172/16 175/6 179/10 182/21 182/22 188/2 189/19 190/19 194/21 203/1</p> <p><b>usually</b> [4] 26/22 48/25 139/11 250/20</p> <p><b>UTC</b> [9] 129/16 129/17 132/24 138/17 138/19 138/21 138/24 140/20 147/16</p> <p><b>utility</b> [2] 134/18 203/2</p> <p><b>utilized</b> [3] 16/17 25/18 59/22</p> <p><b>V</b></p> <p><b>v2</b> [1] 174/21</p> <p><b>v2.0.1</b> [1] 174/24</p> <p><b>vaguely</b> [1] 244/23</p> <p><b>valid</b> [1] 170/17</p> <p><b>validate</b> [1] 84/5</p> <p><b>validating</b> [1] 50/10</p> <p><b>valuations</b> [1] 81/7</p> <p><b>value</b> [12] 20/20 20/20 21/21 22/20 22/21 24/4 60/11 60/16 73/8 73/9 81/8 81/11</p> <p><b>values</b> [10] 23/1 23/3 23/22 23/23 58/12 60/2 60/20 70/4 72/10 223/25</p> <p><b>variety</b> [1] 128/7</p> <p><b>various</b> [7] 25/3 87/23 120/13 130/18 141/18 190/25 203/4</p> <p><b>Vel</b> [3] 3/10 249/15 250/7</p> <p><b>Velvel</b> [1] 2/2</p> <p><b>venture</b> [2] 252/8 252/17</p> <p><b>ventured</b> [1] 252/12</p> <p><b>veracity</b> [1] 52/13</p> <p><b>verb</b> [1] 225/3</p> <p><b>verified</b> [3] 170/21 175/6 189/16</p> <p><b>verify</b> [3] 157/6 170/16 194/24</p> <p><b>verifying</b> [4] 122/9 182/23 187/25 194/17</p> <p><b>versa</b> [1] 124/7</p> <p><b>version</b> [36] 12/2 22/22 70/20 84/17 141/10 141/12 141/19 141/24 142/2 142/18 145/22 147/6 148/8 148/12 149/3 149/4 149/13 174/13 174/15 174/18 174/19 174/20 174/23 190/18 190/19 190/19 191/8 191/19 197/19 200/17 235/18 235/22 235/24 236/1 240/19 243/14</p> <p><b>versions</b> [5] 146/22 226/17 235/21 236/2 236/11</p>
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<p><b>V</b></p> <p><b>versus [3]</b> 3/6 3/7 44/8</p> <p><b>very [35]</b> 5/1 6/13 17/4 17/4 18/2 18/20 27/21 28/6 28/22 30/1 36/1 36/3 46/25 57/22 70/20 81/20 84/12 84/15 87/17 91/1 102/5 117/14 140/25 154/18 170/25 175/18 176/21 212/6 222/5 225/4 225/22 237/10 237/14 247/4 253/1</p> <p><b>via [1]</b> 159/14</p> <p><b>vice [1]</b> 124/7</p> <p><b>video [1]</b> 215/18</p> <p><b>view [6]</b> 12/20 12/23 79/18 114/13 211/5 213/17</p> <p><b>villain [1]</b> 193/12</p> <p><b>violate [1]</b> 55/6</p> <p><b>Virginia [1]</b> 119/17</p> <p><b>Virus [1]</b> 200/22</p> <p><b>vis [2]</b> 102/8 102/8</p> <p><b>vision [3]</b> 12/19 12/22 12/24</p> <p><b>voir [5]</b> 102/13 103/23 104/3 104/13 254/9</p>	<p><b>wants [2]</b> 22/3 98/17</p> <p><b>Warren [16]</b> 98/14 200/7 200/8 200/15 201/10 201/11 202/22 202/23 243/4 243/5 244/9 244/12 244/15 244/20 245/2 245/11</p> <p><b>Warren's [4]</b> 201/3 243/8 243/13 244/24</p> <p><b>Washburn [1]</b> 45/16</p> <p><b>wasn't [18]</b> 7/21 19/10 36/1 37/15 45/1 45/2 48/5 48/9 48/12 58/24 62/23 80/10 103/11 176/18 197/17 216/10 216/13 234/20</p> <p><b>waste [1]</b> 95/13</p> <p><b>watch [1]</b> 85/2</p> <p><b>water [2]</b> 44/15 44/17</p> <p><b>ways [4]</b> 50/11 106/9 194/5 207/3</p> <p><b>we'd [2]</b> 5/11 106/20</p> <p><b>we'll [21]</b> 50/16 57/24 68/19 68/19 68/22 117/10 117/11 117/12 117/14 117/19 125/4 130/4 152/1 196/6 196/7 196/8 199/6 201/24 251/3 253/3 253/5</p> <p><b>we're [36]</b> 3/5 5/5 7/10 34/9 53/2 84/9 99/24 100/11 100/16 100/23 106/16 113/18 113/23 114/1 114/9 127/21 145/24 158/17 160/7 164/25 173/5 185/22 198/18 204/14 205/8 205/23 212/10 214/18 222/19 234/15 236/16 244/11 250/3 251/19 251/21 252/24</p> <p><b>we've [19]</b> 5/19 6/19 6/24 6/24 72/11 84/10 139/20 168/4 177/3 185/24 192/7 195/23 217/17 218/17 220/16 223/15 226/16 226/16 246/3</p> <p><b>web [3]</b> 243/15 243/21 245/17</p> <p><b>website [15]</b> 120/6 120/18 135/16 141/17 141/22 141/23 142/1 190/24 191/3 191/4 193/5 200/22 202/12 202/19 243/6</p> <p><b>websites [1]</b> 200/4</p> <p><b>week [16]</b> 31/1 32/17 32/17 34/14 35/1 35/13 35/15 35/24 37/19 38/10 99/12 200/14 250/7 250/12 250/15 250/20</p> <p><b>weekend [1]</b> 7/8</p> <p><b>weeks [8]</b> 32/14 34/7 34/8 34/21 48/4 48/5 48/9 62/23</p>	<p><b>weigh [1]</b> 46/20</p> <p><b>weight [2]</b> 109/9 137/22</p> <p><b>welcome [1]</b> 252/16</p> <p><b>well [103]</b> 7/10 8/18 8/18 8/19 9/14 12/4 12/21 12/25 15/7 16/9 21/21 22/3 22/14 24/24 27/10 28/7 28/22 30/1 35/6 36/4 37/2 46/21 47/21 48/11 49/19 51/2 51/12 52/2 53/24 56/3 56/6 56/23 57/23 60/20 62/2 63/11 63/15 63/16 63/16 63/23 63/25 69/21 71/14 72/7 74/9 74/10 75/7 78/6 78/15 79/14 79/20 82/2 85/8 87/12 88/15 96/2 96/7 98/13 100/25 102/4 103/15 105/10 106/1 108/10 108/13 114/10 120/9 125/18 127/11 134/1 135/20 140/4 150/13 152/15 176/21 177/20 178/13 185/11 186/25 196/2 197/12 197/15 197/22 199/5 201/22 206/1 212/6 214/16 221/20 224/19 225/4 232/25 234/18 237/6 238/17 239/5 244/16 245/23 247/22 250/10 251/19 252/6 253/1</p> <p><b>well-known [1]</b> 12/25</p> <p><b>went [12]</b> 6/25 31/25 48/17 50/7 81/16 93/1 93/4 138/10 191/3 221/9 227/13 228/13</p> <p><b>weren't [3]</b> 7/8 40/12 60/1</p> <p><b>West [2]</b> 1/7 1/18</p> <p><b>what's [39]</b> 7/20 20/14 26/12 45/5 65/4 69/11 69/11 98/10 100/6 116/25 120/23 122/15 126/6 127/17 131/23 133/17 141/15 146/2 156/14 159/7 162/8 164/4 166/24 167/19 167/24 175/13 176/10 178/17 182/7 185/3 192/11 194/11 197/2 209/22 235/22 235/25 238/12 240/24 249/25</p> <p><b>whatever [6]</b> 15/8 59/20 93/2 145/10 234/3 250/22</p> <p><b>whatsoever [3]</b> 78/20 78/23 96/9</p> <p><b>whenever [6]</b> 69/3 104/11 118/2 196/15 212/7 212/8</p> <p><b>where [57]</b> 11/21 11/23 29/8 30/14 30/14 31/17 36/16 39/22 43/17 46/5 46/15 46/21 52/12 65/3</p>	<p>65/9 74/14 90/5 91/12 93/1 93/23 107/16 107/22 115/13 118/6 118/16 119/14 125/1 125/17 138/20 139/9 140/14 143/25 151/6 152/14 159/11 159/24 167/17 172/15 172/23 173/4 173/9 182/12 183/15 183/16 186/11 202/5 202/5 204/22 220/1 223/12 223/17 223/18 229/13 234/19 243/13 247/21 248/3</p> <p><b>whereby [1]</b> 94/24</p> <p><b>whether [57]</b> 5/23 23/25 25/4 26/5 26/9 30/18 43/6 55/15 55/20 56/24 63/17 64/25 75/16 75/18 77/4 77/20 77/22 77/25 81/11 87/10 92/1 92/9 92/10 92/10 92/13 104/24 105/19 107/2 107/18 109/22 110/22 111/9 111/19 112/2 112/11 113/3 116/4 121/13 152/21 161/4 161/8 164/9 164/12 171/20 186/5 207/15 210/22 210/25 210/25 215/7 224/5 224/16 235/6 236/9 236/11 238/2 244/19</p> <p><b>while [10]</b> 7/2 30/11 41/1 48/23 119/13 120/11 167/15 234/15 251/19 252/24</p> <p><b>white [2]</b> 12/3 197/18</p> <p><b>whittle [2]</b> 32/9 38/2</p> <p><b>whoa [3]</b> 238/11 238/11 238/11</p> <p><b>whole [4]</b> 35/19 198/8 220/13 241/16</p> <p><b>wholly [1]</b> 51/6</p> <p><b>whom [3]</b> 9/2 124/3 214/14</p> <p><b>why [14]</b> 13/13 24/11 47/5 60/3 100/15 109/3 117/16 136/16 149/16 152/22 163/21 169/13 185/22 238/15</p> <p><b>wide [1]</b> 70/21</p> <p><b>widely [1]</b> 80/13</p> <p><b>wife [4]</b> 4/23 32/25 33/1 33/12</p> <p><b>willing [2]</b> 47/8 117/4</p> <p><b>win [1]</b> 73/23</p> <p><b>window [1]</b> 199/12</p> <p><b>Windows [2]</b> 49/4 180/24</p> <p><b>winnow [3]</b> 16/6 16/22 27/4</p> <p><b>wins [3]</b> 74/4 74/23 76/16</p> <p><b>wireless [1]</b> 119/6</p> <p><b>wish [1]</b> 239/11</p>	<p><b>withdraw [3]</b> 236/22 236/24 236/25</p> <p><b>withdrawn [1]</b> 238/3</p> <p><b>within [39]</b> 7/17 28/3 63/24 103/5 105/11 105/16 111/6 125/2 128/19 130/21 139/5 153/13 157/7 160/23 163/19 165/2 165/19 168/16 172/3 180/5 181/12 182/20 183/13 186/7 190/15 203/7 210/10 212/1 213/18 215/12 215/16 216/10 219/22 220/3 227/18 240/8 246/20 247/22 248/10</p> <p><b>without [31]</b> 15/3 21/3 24/15 35/12 41/15 75/9 82/6 82/13 82/17 82/18 85/14 92/4 121/5 121/6 133/20 137/15 162/2 164/15 167/9 171/6 177/16 187/12 190/2 192/21 194/6 207/5 209/6 238/22 241/16 246/17 252/4</p> <p><b>witness [72]</b> 4/19 5/10 5/13 6/9 6/12 7/12 8/24 9/6 9/11 9/12 10/5 10/11 10/20 14/14 18/19 28/12 44/19 69/1 92/10 97/22 98/1 98/6 98/13 98/23 99/25 101/10 102/14 102/17 103/13 103/19 103/20 104/5 108/14 108/15 108/17 109/6 110/5 112/7 114/23 116/3 116/3 117/25 120/20 128/12 135/7 135/24 136/15 143/21 144/19 152/22 155/9 155/19 164/23 171/19 185/5 185/16 186/14 186/21 196/14 207/13 207/21 207/22 207/23 208/14 210/21 226/4 226/10 226/12 238/14 238/17 244/13 244/16</p> <p><b>witness' [6]</b> 9/9 68/20 96/17 228/23 242/3 246/12</p> <p><b>witnesses [3]</b> 7/3 8/3 9/1</p> <p><b>words [6]</b> 37/19 106/18 132/25 203/14 232/20 233/14</p> <p><b>work [42]</b> 11/23 11/24 12/14 20/12 20/16 20/23 21/17 21/19 21/22 22/1 22/8 34/9 36/7 36/9 37/10 39/22 47/17 47/22 48/5 48/9 49/11 49/22 53/5 67/13 67/14 69/18 69/20 72/12 72/24 73/19 73/24 77/17 79/8 118/18 119/5 119/7 119/18</p>
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<p><b>W</b></p> <p><b>work...</b> [5] 119/21 120/7 250/12 250/25 252/15</p> <p><b>worked</b> [2] 61/14 119/14</p> <p><b>working</b> [4] 12/11 32/6 39/19 50/5</p> <p><b>works</b> [4] 48/22 249/17 249/22 250/9</p> <p><b>world</b> [2] 47/14 58/17</p> <p><b>world's</b> [1] 12/25</p> <p><b>worth</b> [1] 85/11</p> <p><b>wouldn't</b> [14] 23/1 34/24 36/18 39/13 52/9 52/16 52/16 54/12 74/17 92/6 92/16 221/5 225/9 225/14</p> <p><b>wrapped</b> [2] 149/19 169/7</p> <p><b>WRIGHT</b> [196] 1/6 3/6 3/7 3/23 4/1 4/4 4/7 5/15 8/16 12/21 13/5 13/6 13/24 14/8 14/10 16/9 16/18 22/11 22/16 22/24 27/3 27/10 28/3 28/4 31/15 31/18 31/19 32/24 33/11 34/6 34/22 35/2 35/4 35/15 38/17 39/5 40/5 40/7 42/6 42/11 42/13 42/25 43/19 43/20 44/3 44/23 45/6 45/10 45/12 45/21 45/22 46/15 46/21 47/11 50/18 50/18 50/21 51/7 51/22 51/25 52/13 52/15 52/20 52/23 54/11 54/14 54/16 55/2 55/10 55/20 55/22 55/25 56/4 56/8 59/2 59/2 59/22 60/5 60/19 62/20 62/22 62/23 63/15 63/17 64/23 65/8 65/22 66/6 67/21 69/21 69/22 70/1 70/7 71/1 74/2 74/15 74/22 75/3 75/14 75/15 75/19 76/16 77/21 78/7 78/21 79/5 79/19 79/20 80/1 80/8 80/18 80/23 81/4 81/9 81/17 85/18 86/3 86/5 86/7 87/3 87/15 88/6 88/9 90/4 91/12 91/24 92/1 92/9 92/12 92/25 93/4 93/15 94/3 94/12 94/15 94/16 94/22 94/24 95/8 96/9 97/8 97/12 104/16 107/8 108/7 109/17 110/3 110/4 112/19 116/9 122/21 144/10 150/20 151/3 151/11 159/6 161/4 161/8 164/7 164/13 164/21 165/21 165/23 166/2 166/17 167/2 175/22 178/13 178/19 179/3 184/22 184/23 187/1 187/7 192/16 197/9 197/21 198/23 199/15 203/25</p> <p>205/14 206/19 207/9 208/1 208/10 208/17 209/9 210/22 214/14 220/21 221/14 226/19 230/23 245/3 245/12 245/16</p> <p><b>Wright's</b> [38] 4/16 5/16 12/24 17/7 17/21 18/9 18/14 19/7 19/9 20/1 23/5 25/17 27/14 27/25 32/25 33/1 33/12 33/12 33/24 45/5 45/17 47/9 53/1 53/2 60/1 63/12 63/20 67/5 67/19 67/23 76/8 79/20 99/8 103/2 113/1 115/20 116/4 199/4</p> <p><b>writing</b> [2] 12/10 95/9</p> <p><b>written</b> [4] 45/21 56/17 90/9 95/11</p> <p><b>wrong</b> [5] 52/15 53/18 92/24 222/6 240/15</p> <p><b>wrote</b> [3] 47/24 47/25 235/11</p> <p><b>www.netcetera.co.uk</b> [1] 194/1</p> <p><b>www.seyhost.com</b> [1] 193/25</p> <p><b>X</b></p> <p><b>X-mailer</b> [2] 141/7 141/9</p> <p><b>XMP</b> [5] 128/21 128/22 128/24 148/6 148/8</p> <p><b>Y</b></p> <p><b>y'all</b> [6] 98/7 101/11 117/14 249/5 250/1 250/4</p> <p><b>yeah</b> [162] 14/9 18/5 19/5 19/22 22/10 22/14 24/8 24/11 25/19 25/20 26/7 29/19 29/25 30/4 30/17 30/24 31/5 31/11 32/22 33/2 34/1 34/1 35/22 36/11 36/11 36/15 37/23 37/23 38/14 38/18 39/8 39/24 40/2 40/11 40/17 40/24 41/17 41/20 42/2 42/2 42/7 42/14 43/16 44/1 44/10 44/17 44/21 45/7 45/14 45/15 45/20 45/23 45/25 46/9 46/11 46/14 47/24 49/5 49/13 49/19 49/21 50/10 50/10 51/15 51/19 51/24 52/14 52/18 54/4 54/7 54/10 54/13 55/15 57/3 57/3 57/11 58/3 58/6 58/10 58/13 58/16 58/17 58/23 59/7 59/18 59/24 60/22 61/3 61/6 61/22 62/3 62/6 62/14 62/19 63/3 65/5 65/9 65/10 65/13 65/24 66/8 66/24 67/1 67/14 67/20 68/1 69/8 69/24 70/6 70/12</p> <p>71/2 71/10 71/22 72/1 72/25 73/5 73/7 74/7 74/10 74/25 75/2 76/20 77/19 80/3 80/13 80/13 81/3 81/15 83/14 85/13 88/19 88/21 89/15 90/2 90/7 90/17 90/20 90/20 93/6 93/7 93/19 94/2 94/10 97/6 97/11 98/3 98/24 99/15 106/24 114/1 115/11 123/19 135/12 150/25 169/6 169/21 177/14 177/24 222/19 233/5 242/16 247/2</p> <p><b>year</b> [11] 12/13 12/20 12/23 39/17 39/19 39/20 39/21 79/9 172/2 192/3 252/19</p> <p><b>years</b> [7] 46/1 58/17 74/9 77/13 94/13 95/9 95/12</p> <p><b>Yep</b> [8] 53/23 56/16 73/11 76/14 83/17 83/19 152/9 156/22</p> <p><b>yes</b> [284]</p> <p><b>yesterday</b> [4] 23/11 23/11 24/9 24/11</p> <p><b>yet</b> [7] 24/12 66/12 116/25 153/5 156/25 182/17 196/13</p> <p><b>yield</b> [1] 18/7</p> <p><b>York</b> [5] 118/7 118/8 118/20 120/11 120/13</p> <p><b>you'd</b> [8] 79/23 81/13 94/1 99/25 103/25 109/9 151/22 251/16</p> <p><b>you'll</b> [9] 41/18 41/19 53/19 80/4 186/13 195/25 229/10 252/14 252/16</p> <p><b>you're</b> [58] 9/24 11/3 21/2 21/12 29/5 30/2 34/20 35/20 36/22 43/8 52/12 55/7 68/14 69/3 72/16 76/7 79/23 81/4 82/20 82/25 83/9 83/24 83/25 85/15 92/9 92/10 98/8 103/19 103/22 104/11 105/12 114/14 116/12 117/16 118/2 118/16 123/10 124/14 125/22 133/23 172/21 183/16 186/11 186/20 196/15 202/14 202/15 211/2 212/9 212/17 214/14 215/6 227/16 227/21 230/2 238/6 240/19 246/15</p> <p><b>you've</b> [41] 13/12 30/2 31/3 39/16 45/21 47/1 67/16 76/12 83/12 85/10 94/12 97/16 102/21 104/17 104/21 104/23 105/13 105/20 106/3 106/4 107/11 133/23</p> <p>152/20 212/8 212/24 213/6 214/16 214/16 214/17 215/1 215/11 217/3 217/4 217/20 221/2 222/18 222/24 232/24 235/21 239/10 249/11</p> <p><b>yours</b> [3] 45/22 193/10 207/3</p> <p><b>yourself</b> [1] 47/25</p> <p><b>Z</b></p> <p><b>Zaharah</b> [5] 2/22 3/22 6/9 30/9 32/25</p> <p><b>Zalman</b> [2] 4/6 101/24</p> <p><b>zero</b> [13] 21/11 22/6 22/19 23/2 60/11 60/12 60/16 60/20 70/11 84/4 90/6 90/20 90/21</p> <p><b>zone</b> [7] 129/16 129/17 132/24 138/21 140/20 147/16 215/14</p>				
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