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| 1  | UNITED STATES PATENT AND TRADEMARK OFFICE               |
| 2  | BEFORE THE PATENT AND APPEAL BOARD                      |
| 3  | KEYSIGHT TECHNOLOGIES, ) CASE IPR2023-00446             |
| 4  | INC., ) U.S. PATENT NO. 10,567,343                      |
| 5  | PETITIONER, ) MOBILE VIDEOCONFERENCE                    |
| 6  | v. ) DEPOSITION OF                                      |
| 7  | CENTRIPETAL NETWORKS, ) DR. STUART STANIFORD            |
| 8  | INC., )                                                 |
| 9  | PATENT OWNER. )                                         |
| 10 |                                                         |
| 11 |                                                         |
| 12 |                                                         |
| 13 | MOBILE VIDEOCONFERENCE DEPOSITION OF DR. STUART         |
| 14 | STANIFORD, taken remotely before Cheryl A. Rooney, RPR, |
| 15 | CRR, Online General Notary Public within and for the    |
| 16 | State of Nebraska, beginning at 9:38 AM ET, on October  |
| 17 | 10, 2023.                                               |
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1 (Whereupon, the following proceedings  
2 were had, to-wit:)

3 DR. STUART STANIFORD,  
4 having been first duly sworn,  
5 was examined and testified as follows:

6 DIRECT EXAMINATION

7 BY MR. ENG:

8 Q. Please state your full name for the  
9 record.

10 A. Yeah. It's Stuart Staniford. My  
11 middle name is Gresley. So it's S-T-U-A-R-T.  
12 Middle name is G-R-E-S-L-E-Y. Last name is  
13 Staniford, S-T-A-N-I-F-O-R-D.

14 Q. Where do you work?

15 A. I'm self-employed.

16 Q. And what is your title?

17 A. Well, there are a couple of different  
18 things. I have a real estate business that  
19 operates under the name Radius Property. And  
20 then I do consulting under the Staniford  
21 Systems, LLC.

22 Q. You understand why you're here today?

23 A. Yeah. To be deposed on the '343  
24 Patent IPR.

25 Q. And just to clarify the record, when

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| <p>Page 5</p> <p>1 you refer to '343 IPR, are you referring to IPR<br/>2 Number 2023-00446; is that correct?<br/>3 A. That's correct, that's right, yeah.<br/>4 Q. When you say '343, I believe you're<br/>5 referring to U.S. Patent No. 10,567,343;<br/>6 correct?<br/>7 A. Yes, that's right.<br/>8 Q. Have you been deposed before?<br/>9 A. Yes, I have.<br/>10 Q. How many times have you been deposed?<br/>11 A. Seven or eight, something like that.<br/>12 Q. Okay. I'll skip some of the<br/>13 preliminary stuff, because I believe you<br/>14 understand how depositions work.<br/>15 A. Yes.<br/>16 Q. I'm just going to say that because<br/>17 this is being transcribed, please wait until I<br/>18 finish with my questions before you begin your<br/>19 answers so that we're not talking over each<br/>20 other because it's difficult for the court<br/>21 reporter to transcribe crosstalk. I'll do the<br/>22 same for you, I'll wait until you're finished<br/>23 answering before I ask my next question; do you<br/>24 understand?<br/>25 A. Yes. Thank you.</p>                | <p>Page 7</p> <p>1 A. I don't think so. I have a cold, but<br/>2 it's pretty minor.<br/>3 Q. Okay. I hope you feel better.<br/>4 A. Thank you.<br/>5 Q. Okay. Dr. Staniford, what did you do<br/>6 today to -- strike that.<br/>7 What did you do to prepare for this<br/>8 deposition?<br/>9 A. I read over a bunch of the relevant<br/>10 documents, at least including the '343 Patent<br/>11 and my declaration, the institution decision,<br/>12 patent owner's preliminary response, some, not<br/>13 all, of the exhibits. And I read them all back<br/>14 when I was preparing my declaration, but I<br/>15 haven't re-read all of them in preparation.<br/>16 Q. When you say some, but not all of the<br/>17 exhibits, which exhibits did you review in<br/>18 preparation for your deposition?<br/>19 A. I'm not going to remember in full<br/>20 detail because preparation has been sort of over<br/>21 several weeks interspersed with other<br/>22 activities, and pulling up the exhibits was sort<br/>23 of based on wanting to refresh my memory of<br/>24 particular points that I was reading, and<br/>25 documents that I just referenced.</p>                                                                         |
| <p>Page 6</p> <p>1 Q. Okay. And because this is over Zoom,<br/>2 if at any time there's any technical issues such<br/>3 as audio issues or connectivity issues, please<br/>4 let us know as soon as possible and then we'll<br/>5 work to address them; do you understand?<br/>6 A. Yes.<br/>7 Q. Okay. You mentioned this off the<br/>8 record, but is there anyone in the room with you<br/>9 now?<br/>10 A. No, there isn't.<br/>11 Q. And do you have any notes in front of<br/>12 you or on your desk?<br/>13 A. Nothing technical. Piles of real<br/>14 estate paperwork, but no, I don't have anything<br/>15 to do with this case.<br/>16 Q. Okay. During the course of this<br/>17 deposition we'll be referring to multiple<br/>18 exhibits, and you should be referring to those<br/>19 downloaded copies, instead of any personal<br/>20 copies; do you understand?<br/>21 A. Yeah. I closed all my applications<br/>22 before we started.<br/>23 Q. Great. Is there any reason, mentally,<br/>24 physically, or emotionally, preventing you from<br/>25 giving your best answers today?</p> | <p>Page 8</p> <p>1 I have specific memory of reviewing<br/>2 the original Snort paper, you know, Marty<br/>3 Roesch's Usenix paper, I think it was, from when<br/>4 he first started Snort. I've gone over Emerging<br/>5 Threats quite a bit. What else can I remember<br/>6 off the top of my head? I've dipped into a<br/>7 little bit, I can recall, the prosecution<br/>8 history of the '343 Patent. I remember<br/>9 referring briefly to a couple of sections of the<br/>10 '193 reexamination. That's off the top of my<br/>11 head. There's probably others that I'm not<br/>12 recalling.<br/>13 Q. Okay. When you mentioned -- you<br/>14 mentioned Emerging Threats there. Were you<br/>15 referring to Exhibit 1020?<br/>16 A. Yeah, exactly, mm-hmm.<br/>17 Q. Okay. Did you do anything else to<br/>18 prepare for your deposition today?<br/>19 A. Obviously the various exchanges with<br/>20 counsel, but I mean, I guess the contents of<br/>21 them are privileged. I did some poking around<br/>22 in the Wayback Machine, looking at the history<br/>23 of rules and Emerging Threats. That's what I<br/>24 remember. But again, you know, there's probably<br/>25 other things I did, but I'm not recalling off</p> |

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| <p style="text-align: right;">Page 9</p> <p>1 the top of my head.</p> <p>2 Q. Okay. Can you turn towards</p> <p>3 Exhibit 1003 that I uploaded to the chat?</p> <p>4 A. Yes, I have it.</p> <p>5 Q. Do you recognize this document?</p> <p>6 A. It appears to be my declaration in</p> <p>7 support of the IPR of the '343 Patent.</p> <p>8 Q. Is this a document -- did you review</p> <p>9 this document in preparation for your deposition</p> <p>10 today?</p> <p>11 A. Yes, I did.</p> <p>12 Q. Did you write this declaration? Did</p> <p>13 you actually put fingers to keyboard?</p> <p>14 A. Yeah, I did a fairly complete first</p> <p>15 draft in this case, yeah.</p> <p>16 Q. How long did you spend preparing the</p> <p>17 declaration?</p> <p>18 A. I started work on it in the middle of</p> <p>19 August of last year, and was working on it</p> <p>20 pretty steadily until it was submitted. And not</p> <p>21 full-time at this rate, only a couple of hours a</p> <p>22 day. I was just chewing away on it.</p> <p>23 Q. Okay. Are you familiar with the</p> <p>24 concept of claim construction?</p> <p>25 A. I believe so, yeah.</p>                                                        | <p style="text-align: right;">Page 11</p> <p>1 would understand what was being said.</p> <p>2 COURT REPORTER: (Requests</p> <p>3 clarification.)</p> <p>4 THE WITNESS: Sorry. Would</p> <p>5 understand that operator was being used as it's</p> <p>6 usually used in computer science.</p> <p>7 BY MR. ENG:</p> <p>8 Q. You mentioned the '193 Patent just</p> <p>9 now, and I believe you mentioned it earlier in</p> <p>10 your answers. For the record, are you referring</p> <p>11 to U.S. Patent No. 9,686,193, also owned by</p> <p>12 Centripetal Networks?</p> <p>13 A. That sounds right. Let me just double</p> <p>14 check the number. 9,686,193 -- yeah, that's</p> <p>15 right. The '343 Patent is a continuation of the</p> <p>16 '193.</p> <p>17 Q. Okay. So in your declaration did you</p> <p>18 provide an explanation of what you believed was</p> <p>19 the general usage of operator in mathematics and</p> <p>20 computer science?</p> <p>21 A. Yeah, there's a section in my</p> <p>22 declaration, Section 8A, which has that</p> <p>23 discussion. It's Page 79 in the internal page</p> <p>24 numbers of the declaration.</p> <p>25 Q. Okay. What's your understanding of</p>        |
| <p style="text-align: right;">Page 10</p> <p>1 Q. What's your understanding of what is</p> <p>2 claim construction?</p> <p>3 A. It's a term used in patent proceedings</p> <p>4 when some term in the patent requires a specific</p> <p>5 definition, a court or in this case the PTAB</p> <p>6 Board, will settle on a tentative form of words</p> <p>7 to hopefully clarify the claim term.</p> <p>8 Q. Did you construe any terms of the '343</p> <p>9 Patent in your declaration?</p> <p>10 MR. DONOVAN: Object to form. I</p> <p>11 don't think the court reporter got his answer.</p> <p>12 COURT REPORTER: I didn't hear</p> <p>13 him.</p> <p>14 MR. ENG: I didn't either.</p> <p>15 THE WITNESS: I provided an</p> <p>16 explanation of operator, which the Board had</p> <p>17 complained in the '193 patent for which I also</p> <p>18 submitted a declaration, that it wasn't well</p> <p>19 enough explained, but I didn't construe it.</p> <p>20 BY MR. ENG:</p> <p>21 Q. What do you mean by you didn't</p> <p>22 construe it?</p> <p>23 A. Oh, I felt it was being used in a way</p> <p>24 that was consistent with its general usage in</p> <p>25 mathematics and computer science, and a POSA</p> | <p style="text-align: right;">Page 12</p> <p>1 the meaning of operator?</p> <p>2 MR. DONOVAN: Object to form.</p> <p>3 THE WITNESS: Well, you know, I</p> <p>4 can just recite the relevant portion of my</p> <p>5 declaration. In mathematics and computer</p> <p>6 science generally, an operator is a function</p> <p>7 that takes inputs and produces an output.</p> <p>8 BY MR. ENG:</p> <p>9 Q. Did you apply that meaning of operator</p> <p>10 in rendering your opinions about the '343</p> <p>11 Patent?</p> <p>12 A. Yeah, I did, yeah.</p> <p>13 Q. You mentioned earlier that you</p> <p>14 provided an explanation for the term operator</p> <p>15 when the Board had discussed it in the context</p> <p>16 of the '193 Patent. Do you recall that?</p> <p>17 A. Yes.</p> <p>18 Q. Do you agree with the board's</p> <p>19 discussion of the term -- of the operator term</p> <p>20 in the '193 Patent IPR?</p> <p>21 A. I don't have it in front of me, but my</p> <p>22 recollection was that they complained that I had</p> <p>23 not adequately explained it. So I took some</p> <p>24 more time to explain the linkage between how</p> <p>25 it's usually used and the specifics in this</p> |

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| <p style="text-align: right;">Page 13</p> <p>1 case, right, where it's being -- you know, it's<br/>2 an operator that is being applied to a sequence<br/>3 of packets and is making, you know, a decision<br/>4 in the end as to whether or not usually to<br/>5 either block or allow the packets. That's what<br/>6 most of the discussion in the patent is about,<br/>7 though it does briefly allude to other<br/>8 possibilities, and there are other possibilities<br/>9 of what you could do with the packets.<br/>10 So, you know, specifically, whereas<br/>11 operators generally take a set of inputs and<br/>12 transform them to an output, but here the set of<br/>13 inputs is a sequence of sequence of bytes,<br/>14 right, because that's what a collection of<br/>15 packets is, each packet is a series of bytes, a<br/>16 sequence of bytes, and we have potentially a<br/>17 sequence of packets, and we're taking those and<br/>18 we're -- that's our input to the operator, and<br/>19 then our input is this block or allow decision,<br/>20 or perhaps other decisions, but usually block or<br/>21 allow. So I explained that in the patent.<br/>22 And typically in this patent we're<br/>23 seeing operators either make that decision just<br/>24 on the packet headers, or in some cases the<br/>25 operator is making the decision based on an</p> | <p style="text-align: right;">Page 15</p> <p>1 mean, Snort.org, which was hosted by Sourcefire,<br/>2 they were shipping rules, both an immunity rule<br/>3 set that had a lot of open source contributions,<br/>4 and then their own propriety rule set.<br/>5 But then the other big rule set was<br/>6 from Emerging Threats, which in the beginning<br/>7 was just a sort of complicated history, but<br/>8 basically it was this guy, Matt Jonkman, who<br/>9 started the Bleeding Snort project to collect<br/>10 Snort rules that were kind of hot off the press<br/>11 was the initial premise back in 2003, 2004. And<br/>12 then it sort of evolved in various ways, and<br/>13 became known as Emerging Threats, and eventually<br/>14 got acquired by Proofpoint, who I believe still<br/>15 ship it.<br/>16 COURT REPORTER: (Requests<br/>17 clarification.)<br/>18 THE WITNESS: Proofpoint.<br/>19 P-R-O-O-F-P-O-I-N-T. They're a company that<br/>20 eventually acquired -- I think they -- at some<br/>21 point Matt Jonkman started a company, Emerging<br/>22 Threats, and sold it to Proofpoint for, like,<br/>23 \$40 million.<br/>24 So when I was looking for Snort rules,<br/>25 when I started working on this case, I was -- I</p>                                                              |
| <p style="text-align: right;">Page 14</p> <p>1 application header field value. But my<br/>2 observation of the patent is that's not buried<br/>3 inside the operator term; that's always called<br/>4 out specifically that that's what it's doing.<br/>5 Q. Okay. Let's turn towards<br/>6 Exhibit 1020. Did you download a copy of<br/>7 Exhibit 1020, which is, I believe, broken up<br/>8 into three parts?<br/>9 A. Yeah, I have it. Let's see what the<br/>10 parts are. Okay. I put up the first part that<br/>11 starts on Page 1. And then a second part that<br/>12 starts on Page 97. And then a third part that<br/>13 starts on Page 197. Does that sound right?<br/>14 Q. Yes. Do you recognize this document?<br/>15 A. I mean, it looks like the Emerging<br/>16 Threats reference.<br/>17 Q. How did you become aware of this<br/>18 Emerging Threats reference?<br/>19 A. Well, Emerging Threats in general, you<br/>20 know, I was aware of because it was well known<br/>21 in the industry, and I was working with Snort,<br/>22 you know, from I think the very late '90s on and<br/>23 off, various guises throughout my career. So I<br/>24 was generally aware of it as, you know, kind of<br/>25 the other big rule set besides the Snort -- I</p>                                                                                                        | <p style="text-align: right;">Page 16</p> <p>1 poked around for a long time trying to find a<br/>2 good set of rules for Snort that were -- and<br/>3 then I found the Emerging Threats rules.<br/>4 BY MR. ENG:<br/>5 Q. Now, you mention Snort. Can you<br/>6 explain what Snort is?<br/>7 A. Sure. It's a popular, by far the most<br/>8 popular, open source intrusion detection system,<br/>9 I think started in the late '90s. I believe the<br/>10 first paper was '98, it was like version 1.2 or<br/>11 something. But I became aware of it around that<br/>12 time frame, and it sort of exploded into a huge<br/>13 project that many people contributed to,<br/>14 including myself a little bit. And then, you<br/>15 know, Marty Roesch, who was the initial author,<br/>16 founder of the project, started a company called<br/>17 Sourcefire, I want to say about 2000 -- I may<br/>18 have that a little bit wrong, but right around<br/>19 then, and so they continued to ship open source<br/>20 Snort but then also built a product, you know, a<br/>21 corporate enterprise product around it.<br/>22 It's basically a network detection<br/>23 system. So it examines packets on the wire,<br/>24 applies rules, and makes decisions about whether<br/>25 or not the packets are good, bad, or</p> |

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| <p style="text-align: right;">Page 17</p> <p>1 indifferent.</p> <p>2 Q. You mentioned earlier that you</p> <p>3 contributed a little bit to Snort. Can you talk</p> <p>4 more about that?</p> <p>5 A. Yeah. So back in the early 2000s a</p> <p>6 couple of coworkers -- one coworker in</p> <p>7 particular and I -- this is when I had my own</p> <p>8 company, Silicon Defense, from '97 to 2004. Jim</p> <p>9 Hoagland and I worked on a project where we did</p> <p>10 a Snort plug-in called Spade, which was a</p> <p>11 statistical anomaly detector, and we used it to,</p> <p>12 you know, pull the packets out of Snort and made</p> <p>13 statistical models of packets, and then dipped</p> <p>14 them to a parlay that we built called Spice.</p> <p>15 But the Spade piece, which was the Snort</p> <p>16 plug-in, we released open source and it became</p> <p>17 used in the community.</p> <p>18 We also -- I don't know if it's still</p> <p>19 going, but after that company ended -- it did</p> <p>20 get resuscitated, so it went for quite a while.</p> <p>21 We also worked on an algorithm. We</p> <p>22 noticed at the time that Snort's string matching</p> <p>23 approach was very brute force.</p> <p>24 COURT REPORTER: (Requests</p> <p>25 clarification.)</p>                                                                                                     | <p style="text-align: right;">Page 19</p> <p>1 Threats project; is that correct?</p> <p>2 A. Yeah, that's my understanding on</p> <p>3 Bleeding Snort. I don't know him personally,</p> <p>4 but that's my understanding.</p> <p>5 Q. And you mentioned earlier that the</p> <p>6 beginning was a sort of complicated history.</p> <p>7 Can you elaborate and tell us what you mean by</p> <p>8 that?</p> <p>9 A. Well, you know, I don't know all the</p> <p>10 ins and outs, but there was something that</p> <p>11 happened where I think the name changed from</p> <p>12 Bleeding Snort to Bleeding Threats, and then it</p> <p>13 became Emerging Threats. And I'm not sure</p> <p>14 exactly why that happened. And then there was a</p> <p>15 thing that happened where some sponsor of the</p> <p>16 project was continuing to ship the rule set, and</p> <p>17 he essentially forked it into Emerging Threats,</p> <p>18 you know. So I'm sure there was some</p> <p>19 complicated shenanigans behind the scenes. But</p> <p>20 the actual rule set itself was BSD, you know, so</p> <p>21 anybody could copy it and continue to work on</p> <p>22 it. The rules themselves seemed to be</p> <p>23 continuous.</p> <p>24 Q. You mentioned some sponsor of the</p> <p>25 project. Which sponsor was that?</p> |
| <p style="text-align: right;">Page 18</p> <p>1 THE WITNESS: Sorry. Snort's</p> <p>2 string matching approach was very brute force.</p> <p>3 It was not efficient. So we proposed a more</p> <p>4 efficient algorithm and implemented it, tested</p> <p>5 it. And they didn't use our implementation but</p> <p>6 they did sort of take the basic idea and make</p> <p>7 their own implementation of it.</p> <p>8 And we also wrote a paper on -- 2001,</p> <p>9 2002, something like that, we wrote a paper on</p> <p>10 better ways to display the alerts when you have</p> <p>11 a lot of alerts, because at the time we were</p> <p>12 monitoring incident service provider with Snort</p> <p>13 and looking at all the data, which was a huge</p> <p>14 amount in the ISP, which is exposed to the</p> <p>15 Internet. There was loads of attacks flying</p> <p>16 across the -- mostly bogus -- I call them byter</p> <p>17 attacks. So we were deluged in alerts and we</p> <p>18 worked on a system for, like, how to display the</p> <p>19 alerts so you could get through them quickly.</p> <p>20 Those are the things I remember.</p> <p>21 Q. Okay. You mentioned earlier an</p> <p>22 individual named Matt Jonkman; is that correct?</p> <p>23 A. Yeah, that's right.</p> <p>24 Q. And you mentioned earlier that it's</p> <p>25 your understanding that he started the Emerging</p> | <p style="text-align: right;">Page 20</p> <p>1 A. Don't remember off the top of my head.</p> <p>2 Q. So is it your understanding that the</p> <p>3 Bleeding Snort project became Emerging Threats,</p> <p>4 or was it your understanding that Emerging</p> <p>5 Threats was started in parallel as a different</p> <p>6 project from Bleeding Snort?</p> <p>7 A. No. I think the rules and Matt</p> <p>8 Jonkman kind of have been sort of the spine of</p> <p>9 it from the beginning, and I don't suppose he's</p> <p>10 involved after the acquisition, but whatever</p> <p>11 those transitions were, that he continued to be</p> <p>12 kind of the main guy that was putting out those</p> <p>13 rule sets.</p> <p>14 Q. My question is more about the project.</p> <p>15 Did Bleeding Snort project become Emerging</p> <p>16 Threats?</p> <p>17 A. Bleeding Snort rules became the</p> <p>18 Emerging Threats project, I can say that with</p> <p>19 confidence. What happened with legal entities,</p> <p>20 I just don't know. What legal entities there</p> <p>21 were and what happened to them, I just have no</p> <p>22 information. But you can trace individual sets</p> <p>23 that were in the rules very early and are still</p> <p>24 there.</p> <p>25 Q. When did you become aware of the</p>       |

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| <p style="text-align: right;">Page 21</p> <p>1 Bleeding Snort project?</p> <p>2 A. I don't know that I can put specific</p> <p>3 dates on it, you know, because this is 20 years</p> <p>4 ago, right. I mean, I participated in a variety</p> <p>5 of mailing lists and conferences and the like</p> <p>6 about intrusion detection. So, you know, I</p> <p>7 definitely knew about it back, for example, when</p> <p>8 I was at FireEye. Exactly when I heard about</p> <p>9 it, I don't have a specific memory of, you know,</p> <p>10 X person told me about Bleeding Snort.</p> <p>11 Q. What years would you have -- sorry, go</p> <p>12 ahead.</p> <p>13 A. Yeah, so, you know, I was doing</p> <p>14 Silicon Defense until 2004, then later in -- it</p> <p>15 goes on to later in 2004 I go to work at Nevis</p> <p>16 Networks. And there, you know, I was working on</p> <p>17 a different subsystem, but they would consult me</p> <p>18 about Snorting stuff, because I had worked on</p> <p>19 Snort a lot. So they would ask me about you</p> <p>20 know, oh, how does it do IIS URL decoding or</p> <p>21 whatever. Because they were building high</p> <p>22 speed -- they were building sort of a box that</p> <p>23 did everything, it sang and danced, but in</p> <p>24 particular it was supposed to be a network</p> <p>25 switch on the edge of the network that handled</p>                              | <p style="text-align: right;">Page 23</p> <p>1 company that was looking at all the malware we</p> <p>2 found in figuring out what command and control</p> <p>3 traffic it produced. You know, so traffic that</p> <p>4 would, for example, be exfiltration traffic, or</p> <p>5 just getting commands from botnet, getting</p> <p>6 commands from command and control server for</p> <p>7 their partner.</p> <p>8 And so they would write Snort</p> <p>9 signatures, I mean, a copy of Snort running</p> <p>10 inside a box that would, you know, go and get --</p> <p>11 you know, go try to pick up on this command and</p> <p>12 control traffic, and I would often be looking at</p> <p>13 that because I used it as a method to try to</p> <p>14 find, you know, when I would see a compromised</p> <p>15 machine because of this command and control</p> <p>16 traffic, and I hadn't seen the exploit that</p> <p>17 exploited it, I would go and save the network</p> <p>18 traffic, or just in the few minutes prior to</p> <p>19 that command and control, and see if I could</p> <p>20 troll through it and find an exploit that I</p> <p>21 didn't know about or that my code was not</p> <p>22 detecting.</p> <p>23 So you know, I had some familiarity</p> <p>24 with -- I would look at the rule and what we had</p> <p>25 picked up. And so you know, I continued to be</p> |
| <p style="text-align: right;">Page 22</p> <p>1 10 gigabit per second network feeds, and do</p> <p>2 intrusion detection on, you know, multiple of</p> <p>3 those feeds.</p> <p>4 So they had designed their own network</p> <p>5 processing chip, and it had content matching and</p> <p>6 hardware, and then they were building a Snort</p> <p>7 equivalent -- a copy of Snort, essentially --</p> <p>8 not a copy of the code, but some way it would</p> <p>9 implement the same rules, if I recall correctly.</p> <p>10 So they would ask me about it from time to time.</p> <p>11 So I had some still more peripheral involvement.</p> <p>12 Then at FireEye -- so I became a</p> <p>13 consultant there, I think, in '05 or '06, and</p> <p>14 then an employee at the beginning of, I think,</p> <p>15 2008. And then I was there until 2013, spring</p> <p>16 of 2013. FireEye also internally used Snort</p> <p>17 rules for detecting command and control traffic</p> <p>18 primarily. And FireEye's big stock in trade</p> <p>19 was -- you know, the thing that we were famous</p> <p>20 for was doing virtual machine replay in the</p> <p>21 network, and I was heavily involved, I built the</p> <p>22 code that monitored all the network packets and</p> <p>23 decided what HTML pages, or what PDFs, or</p> <p>24 whatever, to run inside the virtual machine.</p> <p>25 But there was another team in the</p> | <p style="text-align: right;">Page 24</p> <p>1 kind of just -- Snort was the lingua franca of</p> <p>2 the intrusion detection community. You know, it</p> <p>3 was like the most common system that people were</p> <p>4 using operationally a lot.</p> <p>5 So from 2005, 2006, sometime, I was</p> <p>6 working with FireEye, and that was my</p> <p>7 involvement with Snort there. So again, exactly</p> <p>8 when I heard about -- we didn't use the Bleeding</p> <p>9 Snort rules in FireEye, but I was aware of it as</p> <p>10 a project.</p> <p>11 Q. I wanted to just clarify, because I</p> <p>12 wanted to make sure that we're referring to the</p> <p>13 same thing. So my question was --</p> <p>14 A. I just want to correct one thing I</p> <p>15 just said. I actually don't know. It's</p> <p>16 possible our team did use the Snort intrusion</p> <p>17 rules and I wouldn't know. But to my knowledge</p> <p>18 we didn't formally, anyway. I guess I should</p> <p>19 say I don't really know whether or not they did.</p> <p>20 Q. Thank you. So I wanted to clarify</p> <p>21 that we're referring to the same thing. So my</p> <p>22 original question was when did you become aware</p> <p>23 of the Bleeding Snort project.</p> <p>24 A. Right.</p> <p>25 Q. And I think in your answer I think you</p>                                                        |

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| <p>Page 25</p> <p>1 might have mixed in discussion of the Snort<br/>2 software in general. But my question was about<br/>3 the Bleeding Snort project.<br/>4 A. Yeah, and I don't remember a specific<br/>5 date. I was aware of it, you know, in those<br/>6 time frames, but I don't remember exactly a<br/>7 specific meeting where it was brought up and I<br/>8 was, like, oh, what is this. I don't remember<br/>9 that. I mean, it's 20 years ago.<br/>10 Q. Were you aware of the Bleeding Snort<br/>11 project in 2010?<br/>12 A. I would have to say I think it's<br/>13 overwhelmingly likely that I was, but I don't<br/>14 specifically remember for certain.<br/>15 Q. Were you aware of the Bleeding Snort<br/>16 project in 2014?<br/>17 A. I'm sure I was, yeah. I remember<br/>18 hearing about the acquisition, and at that point<br/>19 it was, like, something that had been going on<br/>20 for a long time, that I had been aware of it for<br/>21 a long time.<br/>22 Q. When you say the acquisition, which<br/>23 acquisition?<br/>24 A. Of Emerging Threats by Proofpoint.<br/>25 Q. When did you become aware of the</p> | <p>Page 27</p> <p>1 2005 -- you know, Shah, the CEO, founder of<br/>2 FireEye, reached out to me and we had lunch and<br/>3 were talking about possibilities. And at that<br/>4 time the company was doing an zero-day worm<br/>5 detection product, it was looking for port<br/>6 scams, you know, that were sort of scanning<br/>7 across the whole network, and trying to replay<br/>8 the port. So this was, like, a couple of years<br/>9 after things like code -- the Code Red worm I<br/>10 think was 2001, and the slammer worm was in<br/>11 2003. So Shah was try to detect zero-day worms.<br/>12 And so I -- he asked me, as a<br/>13 consulting project, to sort of find false<br/>14 negatives in that product. And so I did some<br/>15 work finding false negatives in that version of<br/>16 the product. And then I did a project where I<br/>17 was, like, looking at competing approaches.<br/>18 But then that wasn't working out, they<br/>19 weren't able to sell very much of their product.<br/>20 It worked technically but they couldn't sell it,<br/>21 there wasn't product market fit, as we say. And<br/>22 so the next thing he was trying was essentially<br/>23 what we would now call threat intelligence. So<br/>24 they were getting lists of IP addresses and the<br/>25 main names of botnet controllers and detecting</p> |
| <p>Page 26</p> <p>1 Emerging Threats project?<br/>2 A. Well, I was aware that the name had<br/>3 changed.<br/>4 Q. Do you recall when you learned the<br/>5 name had changed?<br/>6 A. No, hmm-mm.<br/>7 Q. Did you learn that the name had<br/>8 changed by 2013?<br/>9 A. Yeah, I think I knew it was Emerging<br/>10 Threats. I mean, the name change was quite<br/>11 early, right. And that was within -- those name<br/>12 changes were within the first few years, if I<br/>13 recall correctly.<br/>14 Q. You mentioned earlier in your<br/>15 discussion about FireEye, but there was another<br/>16 team that was looking at exfiltration traffic.<br/>17 Do you recall that?<br/>18 A. Command and control traffic in<br/>19 general, yeah, exfiltration in particular, yes.<br/>20 Q. Do you remember what dates that team<br/>21 was working on looking at command and control<br/>22 traffic and exfiltration traffic?<br/>23 A. Well, actually, it was very early in<br/>24 the life of the company. Okay. So when I<br/>25 started talking to them -- I want to say it's</p>                                                         | <p>Page 28</p> <p>1 those. So this must have been -- it was before<br/>2 we did the web product, so this must have been,<br/>3 I want to say 2006, 2007. So that, you know, it<br/>4 was, like, basically the box was then looking<br/>5 for, you know, machines that were connecting to<br/>6 these bad IPs and bad dominions.<br/>7 There were charges with the accuracy<br/>8 of that approach, at least at that time. So I<br/>9 suggested to him -- this was at the point where<br/>10 drive-by downloads were becoming really big,<br/>11 drive-by download exploits, you know, where a<br/>12 web server is compromising the web client inside<br/>13 an interposed machine. And I suggested going<br/>14 after that. But that came -- and that's -- I<br/>15 started work on that, I think, in 2007. And<br/>16 that came after they had started looking at bad<br/>17 IPs and bad domain names. But then they kind of<br/>18 shifted.<br/>19 That team internally started<br/>20 focusing -- as we started to get a lot of<br/>21 malware internally, they started writing<br/>22 signatures that were much more about the<br/>23 protocol, the malware's protocol rather than the<br/>24 bad IPs and the bad domains because that turns<br/>25 out to be, at least in that time frame, was more</p>                                                      |

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| <p>1 accurate.</p> <p>2 So I remember that shift because it</p> <p>3 was in this phase where, you know, Shah was</p> <p>4 going through a series of business models trying</p> <p>5 to find the thing that would actually work</p> <p>6 before he ran out of money, you know, or the</p> <p>7 goodwill of his investors, and the web product</p> <p>8 that I was involved in building turned out to be</p> <p>9 a huge hit and that was the foundation of the</p> <p>10 company's IPR.</p> <p>11 Q. You mentioned earlier that they had</p> <p>12 started -- it had shifted to trying to look at</p> <p>13 machines that were connecting to bad IPs and bad</p> <p>14 domains; right?</p> <p>15 A. Yeah, right.</p> <p>16 Q. Do you remember what time frame that</p> <p>17 was?</p> <p>18 A. Yeah, I mean, I want to say 2006,</p> <p>19 2007, that was, like, the focus.</p> <p>20 Q. Okay. And you mentioned there was</p> <p>21 challenge -- I think the word you said was</p> <p>22 challenges, challenges with the accuracy of that</p> <p>23 approach; is that correct?</p> <p>24 A. Yeah, I mean, I think the problem they</p> <p>25 were -- and this is sort of -- I wasn't directly</p>                                                                                                                                                                                                    | <p>Page 29</p> <p>1 know, most of the website was okay, but if you</p> <p>2 went down here into this subspace of the URLs,</p> <p>3 there was bad -- you know, that particular</p> <p>4 server that was handling that portion of the</p> <p>5 URL, the path space was now hosting malware. So</p> <p>6 the problem, you know, you could block a lot of</p> <p>7 stuff, but the problem was only in this little</p> <p>8 subpiece.</p> <p>9 So anyway, you know, so you have to be</p> <p>10 fairly, you know, specific as to exactly what it</p> <p>11 is that the bad stuff -- where it is, because if</p> <p>12 you block too broadly, then obviously you block</p> <p>13 a user trying to get to an asset that's not in</p> <p>14 fact compromised. Those are the recollections</p> <p>15 of the kind of issues that we were running into</p> <p>16 at the time.</p> <p>17 Q. Do you recall if they released a</p> <p>18 product with that approach that blocks the bad</p> <p>19 IPs and the bad domains at the time? Or was it</p> <p>20 more of an internal project, an internal</p> <p>21 investigation?</p> <p>22 A. That's a good question. I'm not -- I</p> <p>23 would think probably, but I don't specifically</p> <p>24 remember. So the version of the product that</p> <p>25 I -- that had the web -- the web product was</p>                                    |
| <p>Page 30</p> <p>1 working on that myself a whole lot, but this is</p> <p>2 my recollection of talking with the Shah,</p> <p>3 because we were having a lot of talks at the</p> <p>4 time about the company and its direction. And</p> <p>5 my recollection is, you know, there are a couple</p> <p>6 of different issues.</p> <p>7 One is if some IP -- the bad guys are</p> <p>8 constantly compromising servers and then using</p> <p>9 them for command and control, or sending out</p> <p>10 spam, or you know, stealing information or</p> <p>11 whatever it is they do. And then, you know,</p> <p>12 system administrators and network defenders are</p> <p>13 always finding these compromised machines and</p> <p>14 cleaning them up. So there's a very high rate</p> <p>15 of churn in, you know, the assets that the bad</p> <p>16 guys have. They're always having to get more,</p> <p>17 and then the ones they've had for a while are</p> <p>18 always getting cleaned up.</p> <p>19 So you block from the perspective of,</p> <p>20 you know, maintaining a list of bad IPs, you're</p> <p>21 blocking something, but then it turns out it's</p> <p>22 been cleaned up and now it's okay again. But</p> <p>23 you're still blocking it and now you're annoying</p> <p>24 the users. So with domains it was often the</p> <p>25 case that, like, in some complex website -- you</p> | <p>Page 31</p> <p>1 version 4.0 of the product, so probably, you</p> <p>2 know, this thing was in 3.2 or 3.1 or whatever.</p> <p>3 Those early versions, they only had a handful of</p> <p>4 customers, you know, and we were heavily reliant</p> <p>5 on -- I think I can say this at this point --</p> <p>6 I'm sure I can say this -- we had boxes on</p> <p>7 Stanford and Harvard, you know, and again, this</p> <p>8 is back in the mid-2000s, and so we were looking</p> <p>9 at their traffic to validate the various</p> <p>10 approaches that the company was going through,</p> <p>11 and I think there were a small handful of</p> <p>12 commercial customers but not a lot. It was only</p> <p>13 after the 4.0 product came out that we started</p> <p>14 to really make a lot of big sales. But they</p> <p>15 probably shipped it, but I don't remember. I</p> <p>16 couldn't tell you for certain. You know, we</p> <p>17 were certainly testing it on the customer</p> <p>18 networks that we had access to.</p> <p>19 Q. You mentioned the term false negatives</p> <p>20 earlier in your testimony. Do you recall that?</p> <p>21 A. Did I say false negative? I don't</p> <p>22 remember, but, sure --</p> <p>23 Q. What's a false negative?</p> <p>24 A. A false negative is when you fail</p> <p>25 to -- when a product is supposed to be detecting</p> |

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| <p style="text-align: right;">Page 33</p> <p>1 a particular category of badness and it misses<br/>2 some instances of it that it should have<br/>3 detected. You know, so it's one of two types of<br/>4 error. The other is false positive where you<br/>5 claim that something is bad but it's really not.<br/>6 Q. What's the downside to having false<br/>7 positive?<br/>8 A. Well, false positives, you know, have<br/>9 a significant commercial impact because they --<br/>10 you know, they're highly visible to the<br/>11 customer, right. If you report something to the<br/>12 customer that you claim is bad and they go off<br/>13 and investigate it and it turns out not to be<br/>14 bad, you know, then the security team are<br/>15 annoyed that they used up the credibility with,<br/>16 you know, some user that they claimed was<br/>17 malware and was desktop and it wasn't, you know,<br/>18 and they wasted a bunch of time. So if a<br/>19 product has a lot of false positives, you know,<br/>20 it becomes unusable. A few are usually<br/>21 tolerable, but not too many.<br/>22 Q. Okay. So is it your understanding --<br/>23 would it be correct to say that, was it, false<br/>24 positives are a fairly big disadvantage?<br/>25 A. I mean, as I said, depending on the</p>     | <p style="text-align: right;">Page 35</p> <p>1 wade through very large amounts of data to find<br/>2 bad stuff, you know, because sometimes, you<br/>3 know, if you're a large corporation and the<br/>4 adversary is a foreign intelligence service,<br/>5 there can be very, very high stakes. So the<br/>6 effort people are willing to make can be very<br/>7 large. So I think you have to contextualize it,<br/>8 you know.<br/>9 Q. You mentioned earlier in your<br/>10 testimony about how you prepared for this<br/>11 deposition. You mentioned the Wayback Machine.<br/>12 Do you recall that?<br/>13 A. Yeah.<br/>14 Q. What is the Wayback Machine?<br/>15 A. It's a service that periodically<br/>16 goes -- my understanding of it is it<br/>17 periodically goes out and captures copies of<br/>18 websites and archives them and, you know, saves<br/>19 copies of the website as they were at various<br/>20 points in the past, you know. So you can go<br/>21 into some website that's existed for a while and<br/>22 poke through and it will have saved a copy --<br/>23 you know, maybe it will have saved three copies<br/>24 in 2003 and five copies in 2004, or whatever,<br/>25 depending on the specific website. So you know,</p>                                                                             |
| <p style="text-align: right;">Page 34</p> <p>1 scale of them, you know, in commercial practice,<br/>2 some false positives are tolerable. But you<br/>3 know, if you're purchasing more false positives<br/>4 than true positives, then the customer is<br/>5 probably going to get pretty unhappy.<br/>6 It depends on the context, too. You<br/>7 know, it depends on what they perceive their<br/>8 alternatives to be. If they perceive that, you<br/>9 know, bad stuff is happening that they really<br/>10 need to know about, and there's no way to get to<br/>11 it, they might put up with a product that has a<br/>12 lot of false positives because they're willing<br/>13 to make a lot of effort to solve whatever the<br/>14 problem is, you know.<br/>15 So in recent years, maybe the last<br/>16 decade or so, the term threat hunting has become<br/>17 popular, you know, and that refers to customers<br/>18 having very large databases of all kinds of<br/>19 events from every possible source of<br/>20 instrumentation on the network and on the hosts,<br/>21 and trolling through those using all kinds of<br/>22 clever strategies, you know, to try to find bad<br/>23 stuff, right.<br/>24 So that term has a connotation of<br/>25 customers making very high levels of effort to</p> | <p style="text-align: right;">Page 36</p> <p>1 at somewhat random seeming intervals, as far as<br/>2 I can tell, as a consumer of the service, it<br/>3 will save copies of different web pages.<br/>4 Q. So if a website has changed, you can<br/>5 use the Wayback Machine to look at previous<br/>6 versions of that website; is that correct?<br/>7 A. Exactly. So my understanding is it's<br/>8 used in legal proceedings of various kinds a lot<br/>9 these days, right. My understanding is they<br/>10 keep a faithful copy of how that website was at<br/>11 the time of -- you know, at the time that they<br/>12 say they downloaded it. And, yeah, so you can<br/>13 sort of track the evolution of the page.<br/>14 Q. So can you navigate the web pages, the<br/>15 archived copies in the Wayback Machine?<br/>16 A. You may or may not be able to,<br/>17 depending on -- again, this is my experience of<br/>18 it. If they saved both the page that you are on<br/>19 and the page you're trying to navigate to, then<br/>20 you may well be able to follow the link.<br/>21 However, it's sometimes the case that they save<br/>22 one page and not the other and then you can't.<br/>23 So it just depends.<br/>24 Q. You mentioned earlier that the FireEye<br/>25 company was acquired by -- sorry, strike that.</p> |

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| <p style="text-align: right;">Page 37</p> <p>1 You mentioned earlier the Emerging</p> <p>2 Threats project was acquired by a company called</p> <p>3 Proofpoint; is that right?</p> <p>4 A. Yeah, that's right.</p> <p>5 Q. So did the website change -- did the</p> <p>6 Emerging Threats website change to redirect to</p> <p>7 Proofpoint?</p> <p>8 A. I don't remember that off top of my</p> <p>9 head. I have a half memory that Emerging</p> <p>10 Threats, that that still works, but I couldn't</p> <p>11 say for sure without going back and referring to</p> <p>12 something.</p> <p>13 Q. You mentioned earlier in your</p> <p>14 testimony that in preparation for this</p> <p>15 deposition you reviewed the Wayback Machine, and</p> <p>16 in particular, histories of rules and Emerging</p> <p>17 Threats; is that correct?</p> <p>18 A. Yep.</p> <p>19 Q. Which web pages from the Wayback</p> <p>20 Machine did you review?</p> <p>21 A. I poked around and looked at the --</p> <p>22 where the rules were, and the growth of the size</p> <p>23 of the rule set, and existence -- you know, this</p> <p>24 is after I had read your preliminary response,</p> <p>25 right. And I poked around and looked at, you</p>                                                                                                                | <p style="text-align: right;">Page 39</p> <p>1 know, how long has any given rule been the --</p> <p>2 you know, I don't have chapter and verse at my</p> <p>3 fingertips at the moment, but, you know, some of</p> <p>4 the rules have been there a long time.</p> <p>5 MR. ENG: I think we would like</p> <p>6 to request discovery of what documents you</p> <p>7 looked at on the Wayback Machine.</p> <p>8 MR. DONOVAN: I will consider</p> <p>9 that request and respond separately.</p> <p>10 MR. ENG: Okay, thank you.</p> <p>11 BY MR. ENG:</p> <p>12 Q. Can you turn for us to Paragraph 206</p> <p>13 of your declaration, please. I believe it's on</p> <p>14 Page 125 of 128.</p> <p>15 A. So Paragraph 206, did you say, of my</p> <p>16 declaration?</p> <p>17 Q. Correct.</p> <p>18 A. Yep, I'm there.</p> <p>19 Q. Do you see the sentence where it says</p> <p>20 that you were made aware of the existence of the</p> <p>21 Bleeding Snort project on multiple occasions?</p> <p>22 A. Yep, mm-hmm.</p> <p>23 Q. Can you describe the multiple</p> <p>24 occasions and the dates on which you were made</p> <p>25 aware of the existence of the Bleeding Snort</p>                                                                                                                            |
| <p style="text-align: right;">Page 38</p> <p>1 know, the growth of the rule set over time and</p> <p>2 the -- since, you know, how old were some of the</p> <p>3 rules that were in the -- you know, what is the</p> <p>4 EX-1020.</p> <p>5 Q. When you say the rules, which rules</p> <p>6 are you referring to?</p> <p>7 A. Well, you know, Emerging Threats, the</p> <p>8 EX-1020, is made up of 11,000 and something</p> <p>9 individual rules, right? You know, this was an</p> <p>10 open source project in which rules are being</p> <p>11 contributed by a community, you know. So you</p> <p>12 can see each rule is sort of typically prefaced</p> <p>13 by a comment that starts with a hash sign,</p> <p>14 which, like, in the beginning of your first</p> <p>15 piece of the EX-1020, you know, the very first</p> <p>16 rule says by Jaime Blasco, a couple of them by</p> <p>17 Jaime Blasco, and then, you know, by David</p> <p>18 Wharton.</p> <p>19 So my understanding is, you know,</p> <p>20 those are basically acknowledgements of the</p> <p>21 person that contributed to this rule in the</p> <p>22 first place to the Emerging Threats rule set,</p> <p>23 right. So then you can sort of trace back, you</p> <p>24 know, various versions of this rule set that</p> <p>25 existed via the archive earlier and see, you</p> | <p style="text-align: right;">Page 40</p> <p>1 project?</p> <p>2 A. Yeah, I think you already asked me the</p> <p>3 specific dates, and I already answered. You</p> <p>4 know, I generally remember that I was aware of</p> <p>5 this project for a long time, but I don't have a</p> <p>6 specific memory of when first, you know, because</p> <p>7 it was a well-known project in the community.</p> <p>8 Q. Okay. Can you turn to the previous</p> <p>9 page, Paragraph 204?</p> <p>10 A. Yep.</p> <p>11 Q. Do you see in that last sentence where</p> <p>12 you wrote: I analyzed many of the rules of</p> <p>13 Emerging Threats, including those discussed in</p> <p>14 this declaration, and based on my experience,</p> <p>15 the Emerging Threats rules appear to be true</p> <p>16 copies of the rules that existed in 2010.</p> <p>17 A. Yeah, I see that.</p> <p>18 Q. Okay. So is it your testimony that</p> <p>19 you recall the substance of the Emerging Threats</p> <p>20 rules that existed in 2010?</p> <p>21 A. No, more that they look like Snort</p> <p>22 rules that would be sensible for that time frame</p> <p>23 and that I downloaded them from archive.org,</p> <p>24 which said that they were available in 2010. I</p> <p>25 was aware of the project for a long time, but I</p> |

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| <p style="text-align: right;">Page 41</p> <p>1 don't believe that I actually used these rules<br/>2 in 2010.<br/>3 Q. What do you mean by they would be<br/>4 sensible for that time frame?<br/>5 A. That they don't have later features<br/>6 that showed up in the rule set and in the Snort<br/>7 rules that showed up later.<br/>8 Q. What features are you referring to<br/>9 that showed up later in the rule set?<br/>10 A. Well, for example, later versions of<br/>11 Emerging Threats because you know, we went<br/>12 through a few different versions. But later<br/>13 versions say exactly when the rule was, when the<br/>14 rule was added to the rule set. But that's not<br/>15 a feature that this version has. So you know,<br/>16 you don't know from just looking at these rules<br/>17 when a particular rule was added. And later you<br/>18 did except that, you know, they start in,<br/>19 like -- if I remember correctly, this is from<br/>20 the top of my head -- 2010. So it was not a<br/>21 feature that was present at this time, but later<br/>22 rules, if they were before 2010, it just says<br/>23 2010.<br/>24 Q. Where -- can you elaborate more on<br/>25 that? Where would the date be added to the</p>                                    | <p style="text-align: right;">Page 43</p> <p>1 people who were aware of it and did consider it,<br/>2 you know, did contribute a rule.<br/>3 And then, you know, of course there's<br/>4 this press release which I found, you know,<br/>5 where Centripetal themselves are sort of, you<br/>6 know -- or at least their marketing department<br/>7 is acknowledging it as -- I forget what the term<br/>8 was, but they're, you know, acknowledging the<br/>9 Emerging Threats as the de facto standard in<br/>10 network-based malware threat detection. So, you<br/>11 know, that would be another piece of evidence<br/>12 that it had become very well known at least by<br/>13 the time of that press release, right.<br/>14 Q. When you say the press release, are<br/>15 you referring to Exhibit 1082?<br/>16 A. Yeah, that's right.<br/>17 Q. You have an excerpt in page --<br/>18 Page 129 of your declaration, but I'm going to<br/>19 upload a full copy to the chat.<br/>20 Let me know when you have it<br/>21 downloaded and open.<br/>22 A. Will do. For some reason that does<br/>23 not -- for some reason I'm having technical<br/>24 issues here, it's not opening. I see it in the<br/>25 window, in the Zoom window. I don't know why,</p> |
| <p style="text-align: right;">Page 42</p> <p>1 rule? Where would you find that in the rule,<br/>2 the date of when it was added to the rule set?<br/>3 A. I don't remember the specific format.<br/>4 I'd have to get that -- you know, I'd have to<br/>5 get later rule sets.<br/>6 Q. You testified earlier that Emerging<br/>7 Threats was a well-known project in the<br/>8 community. Do you recall that?<br/>9 A. Yeah, I do, yeah.<br/>10 Q. What's your -- what's the basis for<br/>11 your assertion? What evidence can you point to<br/>12 that supports that it was a well-known project<br/>13 in the community?<br/>14 A. Well, you know, that's my recollection<br/>15 of what I thought at the time. So that's one<br/>16 thing. The internal evidence of the rule set,<br/>17 right, is you have -- I don't know exact number,<br/>18 I suppose if I worked hard enough I could figure<br/>19 it out, but you have at least hundreds of<br/>20 different contributors who are acknowledged as<br/>21 having contributed rules, right? So at least<br/>22 hundreds of people knew enough about the<br/>23 project, and you have to figure that, you know,<br/>24 the people that were aware of it who didn't<br/>25 contribute a rule, which may be larger than the</p> | <p style="text-align: right;">Page 44</p> <p>1 Jeff, but that is not opening.<br/>2 MR. DONOVAN: Jeff, we've been<br/>3 going for about an hour 15. Would it be a good<br/>4 time for a break and we can figure out this<br/>5 technical issue, as well?<br/>6 MR. ENG: Yeah, let's do that.<br/>7 How long would you like?<br/>8 MR. DONOVAN: Let's go off the<br/>9 record.<br/>10 MR. ENG: Sure.<br/>11 (10:51-11:02 A.M. - Recess taken.)<br/>12 BY MR. ENG:<br/>13 Q. Dr. Staniford, before we went on<br/>14 break, do you recall me mentioning Exhibit 1082?<br/>15 A. Yes.<br/>16 Q. And I uploaded a copy of it and were<br/>17 you able to download it and open it fine?<br/>18 A. Yeah, I think so. I have it in front<br/>19 of me.<br/>20 Q. Okay. Exhibit 1082, do you recognize<br/>21 this document?<br/>22 A. Yeah, it looks like the press release<br/>23 that I accepted on my declaration there,<br/>24 Centripetal press release about Emerging<br/>25 Threats.</p>                                                                                                                                                                                                                                                                           |

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| <p style="text-align: right;">Page 45</p> <p>1 Q. You mentioned earlier that you found<br/>2 this press release; is that correct?<br/>3 A. Yeah, yep.<br/>4 Q. How did you find the press release?<br/>5 A. I believe I was just Googling around.<br/>6 I don't remember at this point the specific<br/>7 terms. But at some point I think it was Google<br/>8 and I stumbled across it. It was a surprise.<br/>9 Q. When you say it was a surprise, what<br/>10 do you mean by that?<br/>11 A. That Centripetal specifically had<br/>12 commented on the Emerging Threats rules.<br/>13 Q. I see. Okay.<br/>14 So turning to Exhibit 1082, do you see<br/>15 on Page 1, do you see what is a date line on the<br/>16 press release, the line beginning Lafayette,<br/>17 Indiana?<br/>18 A. August 19, 2014, yes, I see that.<br/>19 Q. Okay. What's your understanding of<br/>20 that date line there?<br/>21 A. My assumption is that, you know,<br/>22 generally speaking when marketing puts out press<br/>23 releases, you know, they do it on a specific<br/>24 date, and I'm assuming this is the date they put<br/>25 the press release out.</p>     | <p style="text-align: right;">Page 47</p> <p>1 BY MR. ENG:<br/>2 Q. Okay. Did you use Exhibit 1082, this<br/>3 press release, to evaluate what a person of<br/>4 ordinary skill in the art would understand at<br/>5 the time the invention was made?<br/>6 MR. DONOVAN: Object to form.<br/>7 THE WITNESS: I mean, obviously<br/>8 the detailed analysis is all based on the<br/>9 EX-120, which is the 2010 version of the<br/>10 Emerging Threats, the open source Emerging<br/>11 Threats rule set.<br/>12 BY MR. ENG:<br/>13 Q. Okay. So that's Exhibit 1020, but my<br/>14 question is whether or not you used Exhibit 1082<br/>15 to inform your opinion about what a person of<br/>16 ordinary skill in the art would know about<br/>17 Emerging Threats at the time the invention was<br/>18 made.<br/>19 MR. DONOVAN: Object to form.<br/>20 THE WITNESS: You know, I would<br/>21 say here's a project that I reference in my<br/>22 declaration showing that it started in 2004. I<br/>23 think the press release says 2003. But either<br/>24 way, you know, and I was aware of it, well aware<br/>25 of it, and then obviously by 2014 Centripetal is</p>                                     |
| <p style="text-align: right;">Page 46</p> <p>1 Q. So is it your understanding that this<br/>2 press release was published on August 19, 2014?<br/>3 A. That's what I have to assume, yeah. I<br/>4 don't know of any reason why that would be<br/>5 wrong.<br/>6 Q. Okay. What is the effective filing<br/>7 date of the '343 Patent?<br/>8 A. Let me make sure I get it right.<br/>9 MR. DONOVAN: Object, calls for<br/>10 legal conclusion.<br/>11 BY MR. ENG:<br/>12 Q. I'll direct you to Paragraph 56 and 57<br/>13 of your declaration. Can you turn to that?<br/>14 A. Yes, right. So the relevant thing is<br/>15 57, right, where it says: For the purposes of<br/>16 the Inter Partes Review, I have been instructed<br/>17 to assume that the effective filing date of each<br/>18 of the challenged claims is March 12, 2013.<br/>19 Q. So is it your understanding that this<br/>20 press release was published after the priority<br/>21 date of the '343 Patent?<br/>22 MR. DONOVAN: Same objection.<br/>23 THE WITNESS: Well, let me say,<br/>24 it's my understanding that August 2014 is later<br/>25 than March 2013, let me say that.</p> | <p style="text-align: right;">Page 48</p> <p>1 well aware of it. So a claim that, you know, it<br/>2 was -- and it was hundreds of people that<br/>3 contributed to it over the years. To claim that<br/>4 it was completely unknown up until prior to take<br/>5 over of the patent, and then suddenly became<br/>6 massively famous, such that Centripetal wanted<br/>7 to put out a press release about how they were<br/>8 using whichever of the set of Emerging Threats<br/>9 rules, you know.<br/>10 BY MR. ENG:<br/>11 Q. Dr. Staniford, when you cited to this<br/>12 press release in your declaration, were you<br/>13 aware that the -- that the press release had a<br/>14 date that postdated the priority date of the<br/>15 '343 Patent?<br/>16 A. Yeah, I'd read it, mm-hmm.<br/>17 Q. In forming your opinions about the<br/>18 validity of the '343 Patent, did you incorporate<br/>19 any other documents that postdated the priority<br/>20 date of the '343 Patent?<br/>21 A. I'm not sure I buy the premise of the<br/>22 question. I don't off the top of my head<br/>23 remember the date of every exhibit to the<br/>24 declaration.<br/>25 Q. Which part is unclear about my</p> |

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| <p>1 question?<br/>2 A. I think there was an implied premise<br/>3 to the question that my validity analysis relied<br/>4 on this document, which I don't agree with. I<br/>5 mean, you know, I've worked on this patent<br/>6 family twice before, right, with the '552, and<br/>7 the '193. My view from the very beginning was<br/>8 the disclosure was written by somebody who was<br/>9 not familiar with the state of the art, didn't<br/>10 know to reference any of the prior systems, and,<br/>11 you know, the specification just doesn't<br/>12 disclose anything that was marvelous at the time<br/>13 that it was -- you know, it was very late. And<br/>14 so I've held that opinion for a long time,<br/>15 right, mm-hmm.<br/>16 Q. Does your validity analysis of the<br/>17 '343 Patent rely on Exhibit 1082?<br/>18 A. You asked me that before and I think I<br/>19 answered it.<br/>20 Q. I'm not sure -- I just want to make<br/>21 sure I clarify. Because I believe earlier you<br/>22 answered that -- one of my earlier questions had<br/>23 an implied premise that your validity analysis<br/>24 relied upon this document, and then you said, I<br/>25 don't agree with that premise; is that correct?</p> | <p>Page 49<br/>Page 51<br/>1 And, you know, yeah, that's what I'll say about<br/>2 it.<br/>3 And the other evidence I cite in my<br/>4 declaration, right, you know, I cited -- I<br/>5 forget the exact exhibit number, but I cited<br/>6 press releases -- not press releases, but press<br/>7 coverage, you know, in the computer security<br/>8 press of the project when it started, right. So<br/>9 it was covered. Let me find the exhibit for<br/>10 you. I mean, Exhibit 1050, Leading Edge of<br/>11 Snort. You know, it was something from IT Pro<br/>12 Today. Just finding where in my declaration I<br/>13 cite it. Right, so 1050 was the thing being<br/>14 cited, on Page 123, internal page numbers of my<br/>15 declaration: A new Web site, the Bleeding Edge<br/>16 of Snort, is available for those who use Snort<br/>17 IDS. Right. I don't have 1050 in front of me<br/>18 but from the URL in my declaration, you know,<br/>19 it's from IT Pro Today, right. So this is<br/>20 contemporary press coverage in the technical<br/>21 press that this was known about from the<br/>22 beginning.<br/>23 BY MR. ENG:<br/>24 Q. So on Page 123 of your declaration,<br/>25 you're citing to Exhibit 1050. I'm reading the</p> |
| <p>1 A. Yeah.<br/>2 Q. Okay. So I just want to clarify. So<br/>3 does your validity analysis of the '343 Patent<br/>4 rely on Exhibit 1082?<br/>5 MR. DONOVAN: Object to form.<br/>6 THE WITNESS: No, I didn't use it<br/>7 in doing my validity analysis. I relied on<br/>8 Sourcefire and on the Emerging Threats,<br/>9 reference to the 2010 rule set, which is Exhibit<br/>10 1020.<br/>11 BY MR. ENG:<br/>12 Q. Did you rely on Exhibit 1082 to inform<br/>13 your opinion about what a person of ordinary<br/>14 skill in the art at the time of the invention<br/>15 was made would have known?<br/>16 MR. DONOVAN: Object to form,<br/>17 asked and answered.<br/>18 THE WITNESS: I mean, I think as<br/>19 I said before, right, it's evidence that this<br/>20 project had become extremely well known, such<br/>21 that Centripetal wanted to be associated with it<br/>22 as of 2014, not disputing the date of the press<br/>23 release. That is consistent with my memory that<br/>24 this project was well known and it was, like,<br/>25 the leading nonSourcefire open source rule set.</p>                                                                                                                           | <p>Page 50<br/>Page 52<br/>1 first line, it says: A new Web site, the<br/>2 Bleeding Edge of Snort.<br/>3 A. Yeah.<br/>4 Q. Is it your testimony that that is the<br/>5 same thing as Emerging Threats?<br/>6 A. Yeah. Maybe you could provide me with<br/>7 a copy of the EX-1020 --<br/>8 Q. Sure.<br/>9 MR. ENG: Okay, I've uploaded it.<br/>10 THE WITNESS: Okay, I have it.<br/>11 Okay, yeah, that's what I believe that this is<br/>12 about, the Bleeding Snort/Bleeding<br/>13 Threat/Emerging Threats rule set.<br/>14 BY MR. ENG:<br/>15 Q. But this article says: The Bleeding<br/>16 Edge of Snort. Is that the same thing as<br/>17 Bleeding Snort?<br/>18 A. I believe so, yeah.<br/>19 Q. Well, what's the basis of your<br/>20 understanding that those are the same things?<br/>21 A. I just think that's -- it's the right<br/>22 date, it's the right description. You know, I<br/>23 don't specifically remember -- I'd have to go<br/>24 back and look at what the website was called at<br/>25 that time frame. There's not going to be two</p>                                                                                                                                                                             |

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| <p style="text-align: right;">Page 53</p> <p>1 projects with such similar names that started at<br/>2 the same time frame.<br/>3 Q. So it's your testimony that the<br/>4 Bleeding Edge of Snort, Bleeding Snort, and<br/>5 Emerging Threats are all the same project;<br/>6 correct?<br/>7 A. Same rule set, yes, that's what I'm<br/>8 sure of, mm-hmm.<br/>9 Q. What about the organizations<br/>10 themselves?<br/>11 A. As I -- when you asked me that before,<br/>12 I don't specifically know the history of, you<br/>13 know, who and what at what different point<br/>14 source. The rules were released under the SD<br/>15 rules, but was this incorporated or was this<br/>16 just Matt Jonkman as a sole owner? I couldn't<br/>17 tell you off the top of my head. I don't know<br/>18 what the -- I mean, I wasn't privy to those<br/>19 kinds of details. I mean, the Emerging<br/>20 Threats -- the EX-1020, in its copyright notice,<br/>21 you know, in the first chunk of the EX-1020 that<br/>22 you provided me with, about ten lines down or so<br/>23 it says: Copyright (c) 2003-2010, Emerging<br/>24 Threats.<br/>25 Q. I'm trying to understand. You said</p>                                                                                                                | <p style="text-align: right;">Page 55</p> <p>1 the whole point was to put out these very<br/>2 realtime rules, and you know, so the name as a<br/>3 brand was known. The corporate entity that was<br/>4 behind that brand I haven't paid attention to.<br/>5 I mean, I'm sure at some point he incorporated<br/>6 because there was something for Proofpoint to<br/>7 acquire, but the specifics I do not know.<br/>8 BY MR. ENG:<br/>9 Q. Is it your understanding -- sorry, go<br/>10 ahead.<br/>11 A. I never did business with Emerging<br/>12 Threats. I just was aware of it as a person in<br/>13 the small community myself. You know, it was a<br/>14 big whale in my community.<br/>15 Q. In the community was it better known<br/>16 as Bleeding Snort or better known as Emerging<br/>17 Threats?<br/>18 A. Well, in the beginning it was -- I<br/>19 understood the name was Bleeding Snort. My<br/>20 understanding of the sequence was it was<br/>21 Bleeding Snort and then it became Bleeding<br/>22 Threats and then Emerging Threats. But I don't<br/>23 know the reasons for the name changes. I mean,<br/>24 I assume it has to do with the usual, somebody<br/>25 complained it was too close to something else,</p> |
| <p style="text-align: right;">Page 54</p> <p>1 it's your testimony that it's certainly the same<br/>2 rule set between Bleeding Edge of Snort,<br/>3 Bleeding Snort, and Emerging Threats; is that<br/>4 correct?<br/>5 A. You know, the community rules, right,<br/>6 the big set of rules that they provided that was<br/>7 open source. I mean, I think at a certain<br/>8 point, and I don't know when, you know, they<br/>9 were also putting out a commercial rule set that<br/>10 you had to pay for. I don't know when that<br/>11 started. But you know -- and I've not relied on<br/>12 it in any way, nor do I have any access to it.<br/>13 So I'm talking about the sort of well-known open<br/>14 source Emerging Threats rule set.<br/>15 Q. Okay. So is it your testimony that<br/>16 the Emerging Threats organization was well known<br/>17 to a person of ordinary skill in the art, or is<br/>18 it that the Emerging Threats rule set was well<br/>19 known to a person of ordinary skill in the art<br/>20 at the time of the --<br/>21 MR. DONOVAN: Object to form.<br/>22 THE WITNESS: Sorry to interrupt.<br/>23 The Emerging Threats brand, let's say, and the<br/>24 Emerging Threats rules, and how we say a brand<br/>25 may have existed because of the rules, right,</p> | <p style="text-align: right;">Page 56</p> <p>1 but I don't know.<br/>2 Q. But earlier you said that they<br/>3 wouldn't have -- people wouldn't have released<br/>4 two projects that have similar names. Do you<br/>5 recall that, in the same time frame?<br/>6 COURT REPORTER: (Requests<br/>7 clarification.)<br/>8 THE WITNESS: I was agreeing with<br/>9 him that I did say it, mm-hmm.<br/>10 BY MR. ENG:<br/>11 Q. So I'm trying to understand. So now<br/>12 what I'm hearing is it sounds like -- so that if<br/>13 there are similar names, then people would<br/>14 release -- sorry. They might start out with<br/>15 similar names and then they might change them so<br/>16 that people know that what's what is what's<br/>17 different; is that what you're saying?<br/>18 A. A huge part of rules that a bunch of<br/>19 people contributed to, and Matt Jonkman was the<br/>20 guy that was doing it. That's the continuity at<br/>21 the time, mm-hmm.<br/>22 Q. So turning back towards Exhibit 1050,<br/>23 in this case where we have this project called<br/>24 Bleeding Edge of Snort, how do we know that this<br/>25 is the same as Bleeding Snort or it's another</p>                                           |

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| <p style="text-align: right;">Page 57</p> <p>1 project that had a slightly different name that<br/>2 needed a name change?<br/>3 A. I believe it's the same project.<br/>4 Q. What's the basis of your belief that<br/>5 it's the same project?<br/>6 A. Because there was only one famous<br/>7 Bleeding Snort project.<br/>8 Q. If it was so famous, why would the<br/>9 organization rename themselves as Emerging<br/>10 Threats instead?<br/>11 A. As I already testified, I don't know<br/>12 why they changed their name. I would just be<br/>13 speculating. I was not privy to whatever<br/>14 considerations were -- you know, my guess is not<br/>15 necessarily better than yours on that particular<br/>16 point.<br/>17 Q. Okay. I'm going to turn towards the<br/>18 institution decision that I uploaded. I believe<br/>19 that is -- it's the file name 2023-08-07 PTAB<br/>20 Decision to Institute Paper 9.<br/>21 A. Yeah, I see it.<br/>22 Q. Did you -- let me know when you have<br/>23 it open.<br/>24 A. Yeah, I have it.<br/>25 Q. Did you review this document in</p>                           | <p style="text-align: right;">Page 59</p> <p>1 intelligently, I would want to go back and<br/>2 refresh my memory of the discussion leading up<br/>3 to that sentence. If you don't mind me taking<br/>4 time to do that, I'm happy to do that.<br/>5 Q. Sure, take your time. How long would<br/>6 you need?<br/>7 A. I'm not sure. Let me sort of start in<br/>8 the sections in the middle of, and I'm just,<br/>9 like, trying to establish the context that<br/>10 they're talking about.<br/>11 Okay, I read the institution decision<br/>12 from the start of Page 29, ie the claim<br/>13 limitation (1e) discussion through the sentence<br/>14 that you are drawing my attention to. So let's<br/>15 see how we get on with that. I may at some<br/>16 point have to shore up my memory of the<br/>17 documentation in more detail, but let's start<br/>18 with that.<br/>19 Q. Okay. Would you like me to re-ask my<br/>20 question?<br/>21 A. Go ahead.<br/>22 Q. Okay. So is it your understanding<br/>23 that the Board in that paragraph is referring<br/>24 to -- when they say those first three rules,<br/>25 it's referring to rules with SID:2002526,</p>                                                  |
| <p style="text-align: right;">Page 58</p> <p>1 preparation for your deposition today?<br/>2 A. I reviewed it a few weeks ago.<br/>3 Q. Are there any portions of the Board's<br/>4 institution decision that you disagree with?<br/>5 MR. DONOVAN: Object to form.<br/>6 THE WITNESS: Nothing that I<br/>7 recall.<br/>8 BY MR. ENG:<br/>9 Q. And can you turn to Page 31 of the<br/>10 institution decision.<br/>11 A. Yeah, I'm there.<br/>12 Q. On the second paragraph starting with,<br/>13 We are not persuaded, okay, the second sentence<br/>14 reads: With respect to those first three rules,<br/>15 petitioner has not argued their applicability<br/>16 with respect to this limitation.<br/>17 Okay. So just as a foundation --<br/>18 A. I see that --<br/>19 Q. Okay. As a point of foundation, so in<br/>20 referring to those first three rules, is it your<br/>21 understanding that the Board is referring to<br/>22 rules with SID:2002526, SID:2002034, and<br/>23 SID:2001328; is that correct?<br/>24 A. You know, in order to -- I see the<br/>25 sentence, but in order to kind of discuss it</p> | <p style="text-align: right;">Page 60</p> <p>1 SID:2002034, and SID:2001328; correct?<br/>2 A. Yeah, I mean, that's how I read the<br/>3 document, yeah, because, I mean, those are the<br/>4 three that are listed at the beginning of the<br/>5 previous paragraph. So my assumption is that,<br/>6 yeah, the way I would read it is that when the<br/>7 Board says with respect to those first three<br/>8 rules, the Board is citing back to the three it<br/>9 listed at the beginning of the previous<br/>10 paragraph.<br/>11 Q. Do you agree with the Board's<br/>12 statement that petitioner has not argued their<br/>13 applicability with respect to this limitation?<br/>14 A. You know, to answer that, I'd have to<br/>15 go review my declaration again. I don't, off<br/>16 the top of my head, remember which rules were<br/>17 cited for which claim elements. It's in my<br/>18 declaration, but I need to go back and refresh<br/>19 my memory of that.<br/>20 Q. Can you turn towards exhibit number --<br/>21 sorry. Exhibit -- Page Number 159 of your<br/>22 declaration, Paragraph 262.<br/>23 A. Yeah, I'm at Paragraph 262.<br/>24 Q. And the heading shows a limitation<br/>25 (1e); correct?</p> |

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| <p>Page 61</p> <p>1 A. Right, along with (8e) and (15e),<br/>2 yeah.</p> <p>3 Q. Using this section to refresh your<br/>4 recollection of your declaration, do you agree<br/>5 with the Board's statement that petitioner has<br/>6 not argued the first three rules applicability<br/>7 with respect to limitation (1e)?</p> <p>8 MR. DONOVAN: Object to form.</p> <p>9 THE WITNESS: Well, in the text<br/>10 of my discussion of detailed validity analysis<br/>11 of (1e), you know, which starts on Paragraph 262<br/>12 and ends on Paragraph 269, in there I am<br/>13 specifically discussing the rule that ends in<br/>14 2003021, you know, in that specific section.<br/>15 But, you know, we'd have to look through more<br/>16 parts of my declaration, right, because there's<br/>17 another section where I talk at length about --<br/>18 you know, because you guys had argued in the<br/>19 prosecution, and to some extent in the '1923<br/>20 re-examination, that Sourcefire, you know,<br/>21 doesn't ever mention exfiltration and it's just<br/>22 an intrusion prevention system, and it would<br/>23 never have occurred to a POSA to use this<br/>24 Sourcefire system for exfiltration, and I knew<br/>25 very well that that was completely wrong, right.</p> | <p>Page 63</p> <p>1 happening, right. And that was, like, 2006,<br/>2 something like that, you know, so -- and I knew<br/>3 very well there were exfiltration Snort rules,<br/>4 so I had this whole section in my declaration<br/>5 that is kind of, like, look, there really are a<br/>6 lot of exfiltration Snort rules and a person<br/>7 would have known this, right.</p> <p>8 BY MR. ENG:</p> <p>9 Q. So in Paragraph 263 of your<br/>10 declaration, you discuss rule SID:2003021;<br/>11 correct?</p> <p>12 A. Yeah, yep.</p> <p>13 Q. Okay. So is it your testimony that<br/>14 rule SID:2003021 meets the limitation --<br/>15 satisfies the limitation (1e)?</p> <p>16 A. Yep. I mean, that's what this section<br/>17 of my declaration is saying.</p> <p>18 Q. Okay. Is it your testimony that there<br/>19 are other rules in the Emerging Threats rule set<br/>20 that also satisfies the limitation (1e)?</p> <p>21 A. Yeah, I believe that allows them,<br/>22 yeah. I'm happy to go through and find some<br/>23 more examples if you want.</p> <p>24 Q. Sure. Let's go through them one by<br/>25 one. Can you give me another example of a rule</p>                                                                                                                                                                        |
| <p>Page 62</p> <p>1 So I -- because exfiltration has been -- as I<br/>2 document in the background section of my<br/>3 declaration, right, exfiltration has been a<br/>4 concern in the intrusion detection community for<br/>5 a very long time, you know, and -- either under<br/>6 that name or under the name Data Leak<br/>7 Prevention, DLP, and that there was an entire<br/>8 space of DLP products that the inventor of this<br/>9 patent was blissfully ignorant of, apparently.</p> <p>10 COURT REPORTER: (Requests<br/>11 clarification.)</p> <p>12 THE WITNESS: Exfiltration has<br/>13 been a concern, you know, since the very<br/>14 beginning of the field, right, and either under<br/>15 that name or under the name Data Leak<br/>16 Prevention, DLP, you know, there's an entire<br/>17 space of DLP products just targeted at detecting<br/>18 exfiltrations in action, right.</p> <p>19 I had a friend when I was at Nevis, a<br/>20 guy that I worked with, Tarique Mustafa, who<br/>21 went and did a startup -- I think I cite one of<br/>22 his patents -- he went and did a startup in DLP<br/>23 where he was trying to use some fancy -- you<br/>24 know, at the time, fancy AI to better detect,<br/>25 you know, exfiltrative information as it was</p>   | <p>Page 64</p> <p>1 that you believe satisfies limitation (1e)?</p> <p>2 A. Give me a minute. So one example<br/>3 would be in your second chunk of the EX-1020, at<br/>4 the bottom of Page 155 there is a rule with SID<br/>5 ending in 3937. I mean, if we can agree they<br/>6 all start with 200, so if we can just use the<br/>7 last four digits to refer to the SIDs.</p> <p>8 Rule 3937 is an example of the rule,<br/>9 the message is "ET TROJAN Bandoak<br/>10 iwebho/BBB-phish trojan leaking user data". And<br/>11 the rule is advertising that it is looking for<br/>12 this BBB-phish trojan exfiltrating user data,<br/>13 and calls it leaking rather than exfiltrating,<br/>14 but same difference. And it's looking for,<br/>15 like -- you know, it's looking for stuff going<br/>16 from the local network to remote HTTP ports, and<br/>17 then establish TCP connection, and then it's<br/>18 looking for content POST 20, which is hex va<br/>19 space -- no, hex va colon, and then a slash. So<br/>20 it's looking for -- that's within six bytes of<br/>21 the beginning of the connection.</p> <p>22 So it's looking for a HTTP POST to a<br/>23 URL that starts with slash, and then, you know,<br/>24 buried in there it's looking for -- so that's an<br/>25 example of this is exfiltration use case. You</p> |

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| <p style="text-align: right;">Page 65</p> <p>1 can see it's looking for, like,<br/>2 application/x-www-form-urlencoded. It's looking<br/>3 for encoded form in an HTTP POST going to a<br/>4 remote web server, you know, and then there's<br/>5 some more stuff that's, like, specific to the<br/>6 guts of that particular trojan. I mean, that's<br/>7 one example that would be responsive to your<br/>8 question, I think.<br/>9 Q. Did you cite to this rule in your<br/>10 declaration?<br/>11 A. No, and you were asking me for other<br/>12 rules and Emerging Threats, so this one I did<br/>13 not cite to. I'm just responding to the<br/>14 question you asked me.<br/>15 Q. How did you become aware of this rule,<br/>16 2003 at 937?<br/>17 A. By wrapping through the document<br/>18 looking at rules that have content:"POST", you<br/>19 know, which is a technique of exfiltration that<br/>20 is known back to at least the Zuk Patent in<br/>21 2002, was it, cited in my background section.<br/>22 Q. But this rule isn't cited in your<br/>23 declaration; correct?<br/>24 A. I mean, I didn't think you were asking<br/>25 me about my declaration. I thought you were</p>                                                                              | <p style="text-align: right;">Page 67</p> <p>1 example of an exfiltration rule. And that one<br/>2 is just looking for Social Security numbers in<br/>3 any kind of IP traffic of any protocol that's<br/>4 over the Internet, or an IP network. And then I<br/>5 also discuss 3021, which is the -- one that's --<br/>6 I explicitly discuss in the (1e) analysis as an<br/>7 example of an exfiltration rule.<br/>8 Q. Okay. So is it your testimony that --<br/>9 scratch that.<br/>10 Is it your opinion that the Rule 2526<br/>11 satisfies limitation (1e) of the '343 Patent?<br/>12 A. Well, it's -- I mean -- well, as<br/>13 quoted in Emerging Threats, it does depend on<br/>14 the analysis of my declaration, right, because<br/>15 as quoted in Emerging Threats, it's an alert<br/>16 rule, right? But it's clearly an alert rule<br/>17 looking for an exfiltration, so it's an example<br/>18 to the point that you guys have earlier made in<br/>19 the prosecution of the '343 Patent, right, where<br/>20 you were claiming it would never occur to anyone<br/>21 to use Sourcefire for exfiltration, right.<br/>22 Here's somebody using Snort for exfiltration.<br/>23 However, it's an alert rule, but I document in<br/>24 my documentation that Sourcefire discloses the<br/>25 procedure for changing the alert rules to drop</p> |
| <p style="text-align: right;">Page 66</p> <p>1 asking about other rules in Emerging Threats.<br/>2 Q. No, I wasn't -- okay, yeah, I was<br/>3 asking about other rules in your declaration<br/>4 that weren't mentioned in the limitation (1e)<br/>5 section of your declaration that you believed<br/>6 satisfied (1e).<br/>7 A. You mean that were exfiltration rules.<br/>8 Hold on. Give me a minute to -- so in the<br/>9 background section of -- well, not in the<br/>10 background section. The section on Emerging<br/>11 Threats, I cite 2526, an exfiltration rule. I<br/>12 cite -- these are probably the ones I'm<br/>13 referring -- that the Board is referring to. I<br/>14 cite -- I mean, that one is, like, basically<br/>15 looking for, you know, top secret, nofor. It's<br/>16 looking for kind of data labeled with U.S.<br/>17 classification markings leaving the network via<br/>18 HTTP.<br/>19 I cite as an exfiltration rule the --<br/>20 2034 as an exfiltration rule, which is looking<br/>21 for -- that's looking for -- it's harmed at HTTP<br/>22 ports, so it's looking for stuff leaving a local<br/>23 HTTP server -- it's looking for the password<br/>24 file leaving the local HTTP server.<br/>25 And then I cite 1328 as another</p> | <p style="text-align: right;">Page 68</p> <p>1 rules and explicitly -- you know, it's sort of<br/>2 well known, and I think Sourcefire says it,<br/>3 that, you know, you start out with your rules in<br/>4 alert because there might be false positives. I<br/>5 mean, for the best rule in the world, Snort<br/>6 wasn't known for false positives in the rules,<br/>7 when you apply them to a large network.<br/>8 And so you would -- you know, you<br/>9 would go through and you would tune your rule<br/>10 set, right. So there was a process that you<br/>11 would typically go through where you -- because<br/>12 usually the sources of false positives were,<br/>13 like, localized to particular things, so you<br/>14 would identify these false positives that are<br/>15 caused by this, that, or the other website,<br/>16 let's turn this rule off or edit the rule, or<br/>17 whatever you were going to do to resolve the<br/>18 false positive rate.<br/>19 And then once you tuned your rule set<br/>20 to your satisfaction, you might turn some of the<br/>21 rules into drop rules, right, when you had high<br/>22 confidence that the rule was not going to block<br/>23 traffic that it shouldn't be blocking. So,<br/>24 mm-hmm.<br/>25 Q. Okay. So looking on page -- on</p>                                                |

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| <p style="text-align: right;">Page 69</p> <p>1 Paragraph 213 of your declaration, this is<br/>2 discussing Rule 2002526. In the context of you<br/>3 mentioning tuning the rule set, do you see how<br/>4 the rule is -- there's a hash tag in front of<br/>5 the word alert?<br/>6 A. Just to clarify, we're in paragraph<br/>7 213? Yeah, right.<br/>8 Q. Okay, so what does the hash tag mean<br/>9 in front of the keyword alert?<br/>10 A. It's a comment, that the rule is<br/>11 commented out at the time that they ship the<br/>12 rules out.<br/>13 Q. What does that mean, to be commented<br/>14 out? Functionally, what does it mean to be<br/>15 commented out?<br/>16 A. Well, if you just loaded the entire<br/>17 rule set into all 11,000, into your Snort, then<br/>18 ones that commented out would not be turned on<br/>19 at all, until you uncommented them, right. And<br/>20 while I'm speculating, you know, I would<br/>21 speculate the reason in this case is this is an<br/>22 expensive rule to run. This is running a<br/>23 regular expression over a fairly large volume of<br/>24 traffic, and, you know, it's looking for<br/>25 classification-type markings which would</p>                                                                                                | <p style="text-align: right;">Page 71</p> <p>1 you know about, if anything, about regular<br/>2 expressions. But a regular expression is a way<br/>3 of expressing, of matching -- it's a very sort<br/>4 of expressive language for matching something, a<br/>5 broad class of grammars and languages, in<br/>6 computer science.<br/>7 So often you can use too much more<br/>8 complicated matching than just matching a<br/>9 straight exact string what in Snort is a content<br/>10 match. You can match very complex arbitrary<br/>11 expressions, you know, and write down centaur<br/>12 mini-language of what's going to match this<br/>13 expression. But they're fairly expensive to<br/>14 check.<br/>15 So typically you would match -- you<br/>16 would first have a couple of content matches,<br/>17 we're using the keyword content, which is an<br/>18 exact string match, or at most maybe, you know,<br/>19 is going to check lower case and upper case.<br/>20 You would have those to shield the regular<br/>21 expression and only if those match, so you were<br/>22 down into a much smaller subset of the traffic,<br/>23 would you have some big hurry regular<br/>24 expression.<br/>25 So that's -- that was sort of typical</p>                                                                                                            |
| <p style="text-align: right;">Page 70</p> <p>1 probably only be a concern, you know, if you<br/>2 were a kind of organization that handled<br/>3 classified documents, right.<br/>4 So if you were a health care provider<br/>5 or a manufacturing, you know, an auto<br/>6 manufacturer, or a bank, you know, you're<br/>7 probably not handling classification materials,<br/>8 right. So there's a lot of networks where it<br/>9 wouldn't make any sense to turn this rule on.<br/>10 And looking for a regular expression without a<br/>11 content match ahead of it is typically an<br/>12 expensive thing to do. So that's why -- and<br/>13 again, I'm speculating, obviously. I don't know<br/>14 the mind of the person that wrote this rule, but<br/>15 me looking at it as an intrusion detection<br/>16 expert, that's what I would guess as to why it's<br/>17 commented there.<br/>18 Q. When you say it's an expensive rule to<br/>19 run, what do you mean by that?<br/>20 A. Well, if you see the keyword pcre,<br/>21 followed by, you know, top secret, TS, blah blah<br/>22 blah, nofor, et cetera et cetera, the pcre<br/>23 is -- I think it stands for Perl Compatible<br/>24 Regular Expressions. So it's a feature of Snort<br/>25 that I guess I have to -- I don't know how much</p> | <p style="text-align: right;">Page 72</p> <p>1 practice in rule writing, as I recall it. So<br/>2 that would be what I think is going on as to why<br/>3 this is commented, again, combined with the fact<br/>4 that not everybody needs to look for top secret<br/>5 information. But you know, it certainly teaches<br/>6 the POSA about the possibility of the rule. You<br/>7 know, I mean, our concern here is what would the<br/>8 POSA understand, not what Snort would do, right.<br/>9 I mean, the fact that it's -- it's not going to<br/>10 have any effect on what the POSA can take away<br/>11 from the rule.<br/>12 Q. To clarify, when you say it's<br/>13 expensive to run, you're referring to expensive<br/>14 in terms of computing resources; right?<br/>15 A. Yeah, yeah. Snort, you know, you're<br/>16 matching down this long, two dimensional chain<br/>17 header, chain option thing, you add lots of<br/>18 rules to it. You know, for the longest time it<br/>19 was a single-threaded system so you could only<br/>20 use one processor. You know, that's fixed<br/>21 nowadays. But the -- you know, certainly if you<br/>22 were going to stick 11,000 rules in it, you<br/>23 know, there's potential for it to be -- you<br/>24 know, to limit -- if you're on a small network,<br/>25 it might be fine, right, but the more you're</p> |

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| <p style="text-align: right;">Page 73</p> <p>1 trying to put a lot of network traffic through<br/>2 it, you know, the more careful you're going to<br/>3 have to be about which rules -- and the standard<br/>4 Snort implementation. I mean, as I say, I<br/>5 mentioned, I worked on how to accelerate the<br/>6 Snort thing, that was key to mapping tons of<br/>7 gigabits per second of traffic, but it wasn't<br/>8 open source Snort, you know.<br/>9 Q. Can you turn to Paragraph 217 of your<br/>10 declaration.<br/>11 A. Okay, I'm at 217.<br/>12 Q. In this section do you discuss rule<br/>13 SID:2002034?<br/>14 A. Yeah, that's the rule in 217, yeah.<br/>15 Q. Is it your testimony that rule<br/>16 SID:2002034 renders obvious the claim limitation<br/>17 (1e) of the '343 Patent?<br/>18 A. Yeah, in combination with the rule<br/>19 set. I mean, this is a rule that is intended to<br/>20 be run with Snort, with Sourcefire, and it is<br/>21 clearly an exfiltration rule. It is password<br/>22 via HTTP, you know, and then I go through in my<br/>23 declaration that it's that format that's in that<br/>24 first content match, the root 3a x, blah blah<br/>25 blah, matches the format for Unix/Linux password</p> | <p style="text-align: right;">Page 75</p> <p>1 MR. DONOVAN: Object to form.<br/>2 THE WITNESS: I would agree that<br/>3 in combination with Sourcefire, which was the<br/>4 system that was designed to run this rule, it<br/>5 would render that obvious to the POSA, yeah.<br/>6 This rule is basically looking for Social<br/>7 Security numbers in the clear, and any IP<br/>8 traffic, which would be a bad thing on almost<br/>9 any network. And specifically, you know, it's<br/>10 not that Social Security numbers are going to<br/>11 indicate someone is trying to exploit your<br/>12 network. It's an indication of information<br/>13 moving that should not be in the clear, you<br/>14 know. That's an exfiltration concern.<br/>15 BY MR. ENG:<br/>16 Q. Is this Rule 2001328, is this rule<br/>17 commented out?<br/>18 A. Yep, I think so. Yeah, it is.<br/>19 Q. Why is this rule disabled?<br/>20 A. You know, can I kind of speculate? I<br/>21 can't tell you for sure what was in the mind of<br/>22 the person that wrote the rule. But my reaction<br/>23 when I read it, you know, the application -- the<br/>24 alert ID, any any any any any, that means this<br/>25 rule is going to get applied to every single IP</p> |
| <p style="text-align: right;">Page 74</p> <p>1 file, right. So this is -- I think, if I recall<br/>2 correctly, the patent even specifically calls<br/>3 out this is an example of exfiltration, right,<br/>4 either a summary or something. Just give me a<br/>5 sec. Yeah, I mean, in the patent, the EX-1001,<br/>6 starting at about line -- Column 2 Line 54, the<br/>7 patent says: For example, administrators may<br/>8 utilize such functionality to prevent one or<br/>9 more exfiltrations, (e.g. file transfers<br/>10 containing sensitive information, posting of<br/>11 log-in credentials (user names and passwords) et<br/>12 cetera), to network nodes (e.g. websites) that<br/>13 they may not trust.<br/>14 So this rule is exactly looking for<br/>15 what it's talking about in that portion of the<br/>16 summary, mm-hmm.<br/>17 Q. Can you turn to Paragraph 221 of your<br/>18 declaration. Do you see rule SID:2001328?<br/>19 A. Hold on. I'm not there. Sorry. Did<br/>20 you say 221?<br/>21 Q. Yes.<br/>22 A. Yeah, mm-hmm.<br/>23 Q. Is it your opinion that Rule<br/>24 SID:2001328 renders obvious the claim limitation<br/>25 (1e) of the '343 Patent?</p>                                                       | <p style="text-align: right;">Page 76</p> <p>1 packet on the network, right, so there's no --<br/>2 this particular rule does not restrict the<br/>3 5-tuple. I mean, it could but --<br/>4 COURT REPORTER: (Requests<br/>5 clarification.)<br/>6 THE WITNESS: It does not<br/>7 restrict the 5-tuple, the technical term for the<br/>8 network address and ports and the protocol.<br/>9 So as written, this rule, you know,<br/>10 allows any 5-tuple, except you have to have at<br/>11 least the IP protocol, and then it's applying<br/>12 this regular expression to -- you know, is<br/>13 basically looking for Social Security numbers.<br/>14 So again, this has to run over an awful lot of<br/>15 traffic looking for Social Security numbers.<br/>16 So I would think somebody that really<br/>17 wanted to use this rule would narrow that down<br/>18 somehow, you know -- unless they were just on a<br/>19 very small network, I would think you would want<br/>20 to narrow it down, and not -- you know, to<br/>21 something a little more targeted. That would be<br/>22 my guess, just reading the rule. I don't know<br/>23 for sure.<br/>24 Q. When you say narrow it down, do you<br/>25 mean modify this rule?</p>            |

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| <p style="text-align: right;">Page 77</p> <p>1 A. For example, yeah. My view is -- you<br/>2 know, it's important to understand. My view is<br/>3 very much that, you know, a POSA at this point<br/>4 in 2013, would be able to read and write Snort<br/>5 rules; right. This thing -- Snort had been out<br/>6 at this point for 15 years. I was teaching my<br/>7 Cornell students and, like, testing them in the<br/>8 quizzes on whether or not they could take some<br/>9 HTTP request and write a Snort rule about it,<br/>10 right.<br/>11 So my view is the POSA can read and<br/>12 write Snort rules, and can certainly take a rule<br/>13 and, you know, modify it to a particular<br/>14 situation if that's what they need to do.<br/>15 Q. Have you written Snort rules before?<br/>16 A. Yep, yep, absolutely.<br/>17 Q. Do you see the comments above the<br/>18 Rule 2001328, there's a comment that starts:<br/>19 Submitted. And the second line says: This rule<br/>20 is disabled by default.<br/>21 Do you see that?<br/>22 A. Yeah.<br/>23 Q. Can you read that?<br/>24 A. I do, yeah. I mean, the comments say<br/>25 submitted by Patrick Harper. pcre by Matt</p>                                                                                                                    | <p style="text-align: right;">Page 79</p> <p>1 from what it's doing -- but it goes to the issue<br/>2 that it's exfiltration, right, you're not<br/>3 looking for the Social Security numbers moving<br/>4 around within your network, on the inside of the<br/>5 network. You're looking for them on the<br/>6 outside, meaning as it's leaving your firewall<br/>7 to go off to the rest of the Internet.<br/>8 Q. Can you turn to page Paragraph 159 of<br/>9 your declaration.<br/>10 A. Okay, I'm at 159.<br/>11 Q. Do you see the rule SID:2006409?<br/>12 A. Yep.<br/>13 Q. Is it your opinion that this rule<br/>14 renders obvious the claim limitation (1e) in the<br/>15 '343 Patent?<br/>16 MR. DONOVAN: Object to form.<br/>17 THE WITNESS: I'm just reading my<br/>18 discussion of the rule in my declaration. I<br/>19 mean, I don't rely on it in my declaration for<br/>20 matching (1e). You know, this discussion here<br/>21 is in the introduction of the overall claim. So<br/>22 I mean, it goes to the issue of how good is just<br/>23 match -- I mean, okay. I mean, we have here<br/>24 certainly initially of matching on the 5-tuple,<br/>25 right, so we have the first stage of</p>                 |
| <p style="text-align: right;">Page 78</p> <p>1 Jonkman. This rule is disabled by default. It<br/>2 should generally be run on the outside of your<br/>3 network, not internally. Enable it where<br/>4 useful.<br/>5 Q. What does that mean, running on the<br/>6 outside of your network?<br/>7 A. Well, the way I would read that is<br/>8 that it goes to the issue of this being a -- you<br/>9 know, I'm thinking of it in the context of a<br/>10 typical network architecture where, you know, an<br/>11 enterprise network would have an internal -- you<br/>12 know, an internal network and then a firewall,<br/>13 and then it would go out to the rest of the<br/>14 Internet, right, and the firewall would restrict<br/>15 the traffic that could come in and go out.<br/>16 And so by running a rule on the<br/>17 outside of the network, you're saying the<br/>18 internal traffic has come to the firewall to get<br/>19 there, and external traffic most likely is going<br/>20 to make it through the firewall. I mean, some<br/>21 traffic will not be allowed through the<br/>22 firewall, and nonetheless would be seen by this<br/>23 rule if it was running outside the network.<br/>24 And so, you know, to me that goes to<br/>25 the issue of -- you know, it's obvious anyway,</p> | <p style="text-align: right;">Page 80</p> <p>1 Centripetal's two-stage matching.<br/>2 Then we have, you know, matching on an<br/>3 application header field value POST, right,<br/>4 which is the technique that the '343 Patent in<br/>5 its HTTP-EXFILL operator essentially says, hey,<br/>6 we could block the POSTs and PUTs and not block<br/>7 the GETs, right, as a push to exfiltration, you<br/>8 know, which is not a new technique. There<br/>9 are -- at least in the Zuk Patent in 2002.<br/>10 But we have that here, we have content<br/>11 produced, you know, and then we're explicitly<br/>12 applying this to, you know, basically everything<br/>13 other than -- everything above Port 80 -- weird<br/>14 ports, right, so it's -- and to me that's<br/>15 everything that's in the patent.<br/>16 Q. Okay. Can you turn to Paragraph 282<br/>17 of your declaration.<br/>18 A. Okay, I'm at 282.<br/>19 Q. Do you see rule SID:2010234?<br/>20 A. Yeah, mm-hmm.<br/>21 Q. So is it -- so this rule is cited with<br/>22 regards to your testimony about rule -- about<br/>23 claim limitation (5a) and (12a); correct?<br/>24 A. Yeah, that's right, mm-hmm.<br/>25 Q. Is it also your belief that this</p> |

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| <p style="text-align: right;">Page 81</p> <p>1 rule 2010234 renders obvious limitation (1e) of<br/>2 the '343 Patent?<br/>3 MR. DONOVAN: Object to form.<br/>4 THE WITNESS: Well, certainly<br/>5 matching the content:"POST" again like the --<br/>6 you know, like the patent says, you know. The<br/>7 patents disclose technique of exfiltration<br/>8 detection, right, in HTTP-EXFIL --<br/>9 COURT REPORTER: (Requests<br/>10 clarification.)<br/>11 THE WITNESS: Of exfiltration<br/>12 detection, you know, in HTTP-EXFIL, which is the<br/>13 name of an operator that the patent uses as an<br/>14 example. You know, the idea there is it would<br/>15 allow the GETs through and block other HTTP<br/>16 methods.<br/>17 This is doing the -- now, do I think<br/>18 that's actually a very good exfiltration<br/>19 technique? No. But that's what the patent is<br/>20 saying. And this is certainly matching on<br/>21 contents, right, with the addition that it's<br/>22 narrowed to a specific URL, right. So it's<br/>23 testing a uricontent:"/senm.php?data= and then<br/>24 it's looking for another data=, right. So these<br/>25 are, I assume, you know, specific features of</p>                                                                                                | <p style="text-align: right;">Page 83</p> <p>1 thing to do, right? If you go back -- let me<br/>2 find the relevant section of my declaration.<br/>3 Yeah, so Paragraph 120 in my declaration. In<br/>4 the background, background section, and it's<br/>5 referring to the Zuk Patent, which is a guy<br/>6 called Nir Zuk, an Israeli guy out of Check<br/>7 Point that worked -- ended up founding Palo Alto<br/>8 Networks, but in between he had a company he<br/>9 started called OneSecure, which was an IPS type<br/>10 of product around the 2000 time frame, but I<br/>11 guess this patent was founded in 2002.<br/>12 So this is, like, the first wave of<br/>13 IPSs that are trying to actually block traffic<br/>14 rather than just -- you know, and he discloses<br/>15 here this -- I have this full quote at the<br/>16 bottom of Page 66: In order to avoid -- okay,<br/>17 that's the quote from the patent. But he's --<br/>18 oh, he's doing it in the context of FTP.<br/>19 So I quote here: A packet filtering<br/>20 firewall with stateful inspection also has the<br/>21 ability to examine a packet in order to allow<br/>22 certain types of commands within an application<br/>23 while disallowing others. For example, a<br/>24 stateful inspection firewall can allow the FTP<br/>25 "get" command while disallowing the "put"</p> |
| <p style="text-align: right;">Page 82</p> <p>1 the piece of malware this FakeAV/Trojan/Guzz<br/>2 that this thing is advertising that it's<br/>3 detecting, right.<br/>4 So it's much more narrowly targeted to<br/>5 detect POSTs, you know, to URLs, and with -- you<br/>6 know, basically with a URL that matches the -- I<br/>7 guess these contents. We don't know if they're<br/>8 in the body, but the POST is depth 5, so that's<br/>9 definitely the HTTP POST at the beginning.<br/>10 Yeah, so, insofar as HTTP-EXFILL is a method of<br/>11 HTTP exfiltration detection of prevention, this<br/>12 also is matching on POST and as written, is<br/>13 alerting on it, but a POSA would certainly know<br/>14 they if they wanted to block these, they could<br/>15 change it to say drop instead of alert and then<br/>16 it drop.<br/>17 Q. You mentioned that you didn't think<br/>18 that blocking HTTP methods was a very good<br/>19 exfiltration technique; is that correct? Can<br/>20 you elaborate on that?<br/>21 A. That just saying let's block all the<br/>22 POSTs to some 5-tuple with no additional data is<br/>23 going to have a lot of false positives. I mean,<br/>24 I guess what I would say is, again, it's more<br/>25 like a firewall thing to do than an obvious</p> | <p style="text-align: right;">Page 84</p> <p>1 command.<br/>2 But you know, doing it in HTTP rather<br/>3 than FTP, the commands even have the same name,<br/>4 so "get" and "put" are still there. So this is<br/>5 in his background section. So he's disclosing<br/>6 an IPS in 2002, but he has a really nice<br/>7 background section, like columns of it, where he<br/>8 goes through the history of firewalling and<br/>9 intrusion detectioning, and he's talking here<br/>10 about what firewalls need to do prior to his IPS<br/>11 disclosure, which he's making in 2002, right.<br/>12 So here's this technique of, you know,<br/>13 you can block -- you know, if it's your policy,<br/>14 you can block all the puts, but, you know -- so<br/>15 it was a very well-known thing to do, but it's<br/>16 kind of untargeted, right. You're going to<br/>17 break a lot of applications that depend upon<br/>18 something or other being uploaded, right.<br/>19 Q. Okay. Can you turn towards<br/>20 Paragraph 277 of your declaration?<br/>21 A. Okay, I'm at 277.<br/>22 Q. Yeah. Is it your opinion that this<br/>23 rule SID:2005319 renders obvious limitation (1e)<br/>24 of '343 Patent?<br/>25 MR. DONOVAN: Object to form.</p>                                                                                                                   |

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| <p style="text-align: right;">Page 85</p> <p>1 THE WITNESS: You know, this rule<br/>2 advertises that it's, you know, looking at some<br/>3 kind of -- I don't know what LP is. Some kind<br/>4 of spyware data. It's looking at TCP traffic<br/>5 that's going from anywhere in the local network<br/>6 to --<br/>7 COURT REPORTER: (Requests<br/>8 clarification.)<br/>9 THE WITNESS: TCP, it's an<br/>10 acronym, TCP, usually capitalized.<br/>11 It's looking at TCP traffic going from<br/>12 anywhere in the local network to remote HTTP<br/>13 servers, and it's saying if the content is<br/>14 POST -- so we have, again, the HTTP-EXFILL<br/>15 technique matching of -- you know, that it's a<br/>16 POST versus some other kind of HTTP method.<br/>17 Depth:5 is making sure that it's at the<br/>18 beginning of the packeted connection.<br/>19 And then it's got some additional --<br/>20 it's got basically one additional match, it has<br/>21 to be URL, has to have the /zuzu.php column and<br/>22 r=, right.<br/>23 Q. In the beginning of your answer --<br/>24 A. I think -- one thing I would say about<br/>25 this rule, I mean, it does say Spyware Checkin,</p>                                                                                     | <p style="text-align: right;">Page 87</p> <p>1 A. Correct.<br/>2 Q. Why did you turn towards the comments<br/>3 part of the rule?<br/>4 A. I mean, you asked me about the rule<br/>5 and I just started reading it from the top,<br/>6 mm-hmm.<br/>7 Q. Does the comment help inform you what<br/>8 the rule is about?<br/>9 A. It may or may not. I mean, in this<br/>10 case I'm not sure what LP means, so it's not as<br/>11 informative as it might be. But it does tell us<br/>12 it's the intent of the rule writer was to detect<br/>13 some spyware. So, you know, I mean, from that<br/>14 standpoint it's suggesting that the thing it's<br/>15 trying to detect is likely to exfiltrate, right.<br/>16 Spyware means, you know, a piece of software<br/>17 that's going to reside -- you know, Hubstaff<br/>18 uses software that's going to reside on your<br/>19 system and spy on you, and then tell whoever got<br/>20 in there what you're doing, right. That's the<br/>21 implication of spyware.<br/>22 So the comment certainly suggests that<br/>23 this software is capable of exfiltrating data.<br/>24 I mean, I don't know what else, you know -- I<br/>25 don't know what else a POSA would read into</p> |
| <p style="text-align: right;">Page 86</p> <p>1 right, which I think goes to the point I was<br/>2 just making that it's a POST, but the rule<br/>3 message suggests that the purpose of the POST is<br/>4 for the spyware to just check in with its<br/>5 command and control server. I mean, it's a<br/>6 little cryptic, but that's how I would read<br/>7 that. That's what I think it would suggest to a<br/>8 person.<br/>9 Because it's very common for bots on<br/>10 the network to periodically check in with their<br/>11 command and control server, just sort of take a<br/>12 look at the command and control server and say,<br/>13 hey, boss, is there anything I should be doing?<br/>14 And if it's just a check-in -- now, maybe they<br/>15 are also shipping data that's a keylogger and,<br/>16 it's, you know -- who knows without going and<br/>17 researching the specific piece of malware, but<br/>18 the message suggests check-in, you know, that<br/>19 it's a regular check-in with the command and<br/>20 control server. I think that's what a POSA<br/>21 would take from it.<br/>22 Q. So at the beginning of your answer<br/>23 you -- I believe you were reading from the<br/>24 comments, like where it said from spyware LP<br/>25 data.</p> | <p style="text-align: right;">Page 88</p> <p>1 spyware.<br/>2 Q. I also noticed that you mentioned<br/>3 Spyware Checkin. That phrase comes from the<br/>4 message part of the rule; is that correct?<br/>5 A. Yes, that's right. The message is the<br/>6 thing that would pop up on your user interface<br/>7 if this rule fires. So it's intended to give<br/>8 the user some suggestion of the point of the<br/>9 rule so, you know, they have a starting place<br/>10 for, you know, what they might care about.<br/>11 Q. Can you turn towards Paragraph --<br/>12 MR. ENG: Actually, you know<br/>13 what, it's 12:30. Let's go off the record for a<br/>14 second.<br/>15 (12:34-1:16 p.m. - Lunch recess<br/>16 taken.)<br/>17 BY MR. ENG:<br/>18 Q. Dr. Staniford, did you speak with<br/>19 anyone during the break about your testimony<br/>20 today?<br/>21 A. I did not.<br/>22 Q. Can you turn towards Exhibit 1003,<br/>23 starting on Paragraph 262.<br/>24 A. Paragraph 262. Okay, I have 262 up.<br/>25 Q. Do you recall prior testimony of us</p>                                                                                                                                                               |

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| <p>1 discussing this rule?<br/>2 A. I don't recall that we had a whole lot<br/>3 of substantive discussion of it, but we touched<br/>4 on the existence of my declaration, right.<br/>5 Q. Okay. So does this rule have a<br/>6 comment?<br/>7 A. It says application data stream, above<br/>8 it.<br/>9 Q. What's your opinion about what that<br/>10 means?<br/>11 A. You know, it's just saying that it's a<br/>12 data stream for some application. It's a fairly<br/>13 generic message.<br/>14 COURT REPORTER: (Requests<br/>15 clarification.)<br/>16 THE WITNESS: It's suggesting the<br/>17 rule has something to do with detecting an<br/>18 application data stream. It's not a very<br/>19 informative comment.<br/>20 BY MR. ENG:<br/>21 Q. Is it reasonable to say that this<br/>22 Snort rule is intended to target application<br/>23 data streams?<br/>24 A. Well, you know, the message is rather<br/>25 more specific, right. It's ET policy, so it's</p>                                                                                                                                                                                                                             | <p>Page 89</p> <p>1 maybe SSL1 never saw the light of day, SSL2 was<br/>2 like the first real version, and then they did<br/>3 SSL3, and then it was taken over by the IETF,<br/>4 which is the main Internet standards body.<br/>5 And they took SSL, improved it<br/>6 initially a bit, but since then a lot, and<br/>7 called it TLS, which I think is transport layer<br/>8 security, or -- I think that's right. I think<br/>9 we have the RFC as an exhibit, so if we really<br/>10 need the name to be right, we can look it up.<br/>11 Basically it's the IETF successor of SSL. So<br/>12 these are the standard encryption -- standard<br/>13 method for encrypting web data.<br/>14 Initially web data is what Net Scape<br/>15 was doing, but since then TLS has been used for<br/>16 the transport other protocols as well, although<br/>17 still probably the web is the most important<br/>18 one.<br/>19 Q. What does the part of the message<br/>20 about the "unusual port" signify?<br/>21 A. Well, you know, it's all these<br/>22 high-numbered ports over 1024. Generally<br/>23 speaking -- this is from memory, so I think it's<br/>24 roughly right, but I might not have the details<br/>25 exact -- the ports below 1024 are well-known</p> <p>Page 91</p>                                               |
| <p>1 saying that it's some kind of possible policy<br/>2 violation, TLS/SSL, Encrypted Application Data<br/>3 on Unusual Port SSLv3, right. So the message is<br/>4 suggesting.<br/>5 And then if you look at the actual<br/>6 rule, it's looking for established SSL<br/>7 connections. That's what that flowbits:isset<br/>8 thing -- isset.BS.SSL.Established, that's what<br/>9 that is doing. But the port is not 443. It's<br/>10 1024 to 65535. It's looking for SSL traffic on<br/>11 high-numbered ports. I go through in my<br/>12 declaration, you know, how that content is<br/>13 matching a TLS record.<br/>14 Q. So let's look closer at the message<br/>15 part that you just mentioned. It says ET<br/>16 POLICY. So is ET -- is it your understanding<br/>17 that ET stands for Emerging Threats?<br/>18 A. That's my assumption, yeah.<br/>19 Q. So what does the acronyms TLS and SSL<br/>20 stand for?<br/>21 A. So the related protocols. SSL stands<br/>22 for secure socket layer, and it was -- you know,<br/>23 it's an encrypted transmission protocol that was<br/>24 initially developed in the mid-'90s, I think, by<br/>25 Net Scape. So they went through -- I think</p> | <p>Page 90</p> <p>1 ports that are managed by an organization called<br/>2 IANA, you know, and the ports above that were<br/>3 not historically managed, you know, or more left<br/>4 for users to do whatever. So they're popularly<br/>5 known in network security as high-numbered ports<br/>6 on the server side. And so this is looking for,<br/>7 you know, encrypted data on an unusual port.<br/>8 Q. What's the usual port for the<br/>9 encrypted data?<br/>10 A. Well, if it was HTTPS, which is HTTP<br/>11 running over SSL, the standard port is 443. So<br/>12 if it's at 443, we know it was targeting HTTPS<br/>13 on the standard port. This rule is looking for,<br/>14 you know, TLS, but being used on a high-numbered<br/>15 port.<br/>16 So I mean, I have some issue with this<br/>17 because while I was at FireEye, you know, my<br/>18 boss, again, was the founder and CEO, but he had<br/>19 been an engineer, he was very technical, very<br/>20 bright, he was worried -- as we were getting<br/>21 into -- you know, when I started at FireEye, we<br/>22 were still in the time frame when you could kind<br/>23 of ignore encryption, but the world was starting<br/>24 to move to -- you know, more towards where it is<br/>25 today, where most traffic is encrypted. And so</p> <p>Page 92</p> |

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| <p style="text-align: right;">Page 93</p> <p>1 he was worried about particularly encrypted<br/>2 traffic escaping. And so he was pushing for<br/>3 features in the product that were looking for<br/>4 large transmissions of data.<br/>5 And so if I remember correctly, it was<br/>6 implemented in a couple of different ways. One<br/>7 is we were just flagged in the user interface<br/>8 when there was a large encrypted transmission<br/>9 from, you know, the client to the server, so<br/>10 kind of an upload, you know, as a possible<br/>11 exfiltration. But then also specifically in my<br/>12 module, he was pushing me to consider this as a<br/>13 feature that if we saw this -- you know, if we<br/>14 saw this feature, to consider running -- you<br/>15 know, to raise the -- again, this is, like --<br/>16 the context here is I'm writing this code that<br/>17 looks at all the HTML pages and draw the script,<br/>18 and PDF and Flash coming back from the World<br/>19 Wide Web into an enterprise network, our<br/>20 customer network, and trying to decide whether<br/>21 it might be malicious HTML or PDF or whatever,<br/>22 and then run it in a virtual machine to confirm<br/>23 whether it misbehaved in the virtual machine.<br/>24 But the virtual machines are slow, so my<br/>25 algorithms had to be very fast but less precise,</p> | <p style="text-align: right;">Page 95</p> <p>1 Q. You said you released a feature that<br/>2 would look for a bunch of data encryption going<br/>3 out; is that right?<br/>4 A. Yeah, yeah, that's right.<br/>5 Q. Did the feature have a name?<br/>6 A. I don't remember. I mean, the feature<br/>7 of my module definitely did not. My module was<br/>8 not visible to the customer at all under normal<br/>9 circumstances, I mean, you know, like if we were<br/>10 doing deep elbow shooting onsite. But there was<br/>11 some feature that was in the user interface that<br/>12 was designed to give the user a flavor of<br/>13 whether there seemed to be large data objects<br/>14 leaving the possibly infected IP. But I don't<br/>15 remember what it was called.<br/>16 Q. You're saying -- what was the<br/>17 feature -- what was the name of the software<br/>18 that it was a feature of?<br/>19 A. So it was -- you know, our product was<br/>20 shipped, in those time frames, as prepackaged<br/>21 appliances. It was called different things at<br/>22 different times. It was called a Web MPS, but<br/>23 most of the time I was there Web MPS was<br/>24 probably malware protection system.<br/>25 We also had an email product that was</p> |
| <p style="text-align: right;">Page 94</p> <p>1 and then confirm in the virtual machine.<br/>2 So he wanted to have as a feature<br/>3 large encrypted transmissions. And that would<br/>4 buy us -- if we saw a big chunk of encrypted<br/>5 data going out, we would be more likely, then,<br/>6 to run it in the virtual machine. So I<br/>7 implemented that feature, and it's a long time<br/>8 ago, but my recollection is it was somewhat<br/>9 useful; not amazing, but somewhat useful.<br/>10 Q. What time period was this?<br/>11 A. You know, I would have to say it<br/>12 wasn't right away. I would guess that it was in<br/>13 the period when Shah was still very focused on<br/>14 the technology of the product. I would guess<br/>15 2010-ish, give or take a year. It was<br/>16 definitely significantly before I left, which<br/>17 was during the 2013 -- because I had actually at<br/>18 the time had implemented it and using it for a<br/>19 while.<br/>20 Q. Did you say you left in 2013?<br/>21 A. Yeah, yeah.<br/>22 Q. What month in 2013?<br/>23 A. I don't remember off the top of my<br/>24 head. It was the spring, but I don't remember<br/>25 the exact date.</p>                                                                                                                                                                              | <p style="text-align: right;">Page 96</p> <p>1 looking for malicious email, and then we had a<br/>2 sort of forensic-oriented product where you<br/>3 could just feed it a whole bunch of samples and<br/>4 it would run them in the virtual machine.<br/>5 But the product I was involved with<br/>6 was for detecting malicious web pages and it was<br/>7 called the Web MPS. Later I think it might have<br/>8 been called -- I forget. It changed its name<br/>9 but most of the time I was there it was the Web<br/>10 MPS.<br/>11 Q. Earlier on we were discussing the idea<br/>12 of the unusual port, and you used a phrase, you<br/>13 said, I have an issue with this. Do you recall<br/>14 that?<br/>15 A. No, I don't remember saying that.<br/>16 Sorry, can you read back to me what --<br/>17 Q. Right. I asked you what the usual<br/>18 port for encrypted data was, and I think you<br/>19 said something to the degree of it's version<br/>20 443. Then you said I have some issue with this<br/>21 because while I was at FireEye --<br/>22 A. Oh, okay, that's a typo. I said I<br/>23 have some history with this, not issue. So I<br/>24 was kind of launching into the anecdote about<br/>25 FireEye because it's relevant to this rule.</p>   |

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| <p style="text-align: right;">Page 97</p> <p>1 Yeah, so I was describing my history with the<br/>2 concept that this rule seems to be trying to<br/>3 capture. I recognized the name when I read it.<br/>4 Q. So turning back towards the text of<br/>5 the rule 20030021. The message parameter<br/>6 doesn't say anything about exfiltration;<br/>7 correct?<br/>8 A. It doesn't use that word, right. It's<br/>9 saying encrypted application data on unusual<br/>10 port. I take the policy keyword to be sort of<br/>11 suggesting to the user, you might want to think<br/>12 whether you will allow this or not. But --<br/>13 yeah, mm-hmm.<br/>14 Q. The comment of the rule doesn't<br/>15 mention exfiltration; correct?<br/>16 A. No, it doesn't.<br/>17 Q. Okay. Does the rule contain a<br/>18 reference URL parameter?<br/>19 A. It has two of them.<br/>20 Q. What's the significance of a reference<br/>21 parameter in general?<br/>22 A. In Snort rules it's basically a way to<br/>23 include a link to auxiliary information about<br/>24 the rule, you know, and so those rules can be in<br/>25 a variety of different places. In this case it</p>                                                     | <p style="text-align: right;">Page 99</p> <p>1 you can put a link to anything at all. So you<br/>2 know, my experience is usually when you go to<br/>3 .EmergingThreats.net, there's not a whole lot<br/>4 there. That's why I'm unsure whether I checked<br/>5 it or not, because I kind of learned that it's<br/>6 not usually that informative. But I can't say<br/>7 specifically in this case. I didn't write down<br/>8 whether I did or not, and I don't remember.<br/>9 But, you know, often there are some<br/>10 references to some security write-up of what the<br/>11 specific threat was, and then they can sometimes<br/>12 be pretty informative. I mean, a lot of the<br/>13 links are dead at this point, so then you're<br/>14 trolling back in the Wayback Machine to see if<br/>15 you can still find some version of it.<br/>16 But sometimes you get informative<br/>17 discussion of -- you know, like a lot of these<br/>18 rules, at least -- because I was searching for,<br/>19 you know, rules that had a POST in, rules that<br/>20 had form data, seemed to be uploading form data,<br/>21 rules that had well-known forms of exfiltration<br/>22 data like credit cards and Social Security<br/>23 numbers and that kind of stuff, right.<br/>24 But then there was lots of rules that<br/>25 were, like, the activity of some trojan, some</p> |
| <p style="text-align: right;">Page 98</p> <p>1 only has -- I don't remember if I checked those<br/>2 links or not, to be honest. Did I say if I did?<br/>3 Most of the time the Emerging Threats rules, the<br/>4 actual Emerging Threat links are not super<br/>5 informative, they don't -- haven't documented<br/>6 most of their rules very well, but I don't know<br/>7 if I checked in this particular case.<br/>8 Q. You're not sure if you checked --<br/>9 you're not sure if you visited the URLs listed<br/>10 in the rules; correct?<br/>11 A. No, I don't remember. I mean, I did<br/>12 in some cases with some rules, particularly if<br/>13 they were nonEmerging Threats rules, but I don't<br/>14 remember whether I did in this case or not.<br/>15 Q. You said in some cases with some<br/>16 rules. Can you clarify which rules you're<br/>17 referring to?<br/>18 A. I don't remember specifically.<br/>19 Q. But sometimes you do check the URLs<br/>20 listed in the reference rule?<br/>21 A. Yeah, I might have done.<br/>22 Q. What kind of documentation might be in<br/>23 the URLs?<br/>24 A. Well, it's highly variable. You know,<br/>25 I mean, it's just the general mechanism by which</p> | <p style="text-align: right;">Page 100</p> <p>1 piece of malware, right, because that's what a<br/>2 lot of these rules are, where it's, like, some<br/>3 trojan that's installed -- because it's a pretty<br/>4 good thing to detect, right, if you see the<br/>5 well-known communication patent of a particular<br/>6 piece of commercial software connecting out of<br/>7 your network out to some remote commander<br/>8 control server, you know, if the signature is<br/>9 good, that's a bad sign and you ought to go see<br/>10 what's going on with that probably infected<br/>11 machine, right.<br/>12 So you know, a lot of these rules in<br/>13 here that I looked at are the cause of various<br/>14 trolling around in Emerging Threats were of that<br/>15 flavor. And sometimes the link has a writer,<br/>16 you know, that's about the specific malware,<br/>17 which make it a lot more detailed, right,<br/>18 because ideally you find something that was<br/>19 written by somebody who had reverse engineered<br/>20 that piece of malware and figured out what it<br/>21 did. But in other cases you're just looking at<br/>22 the rule and figuring out what can be inferred<br/>23 from the rule itself.<br/>24 COURT REPORTER: (Requests<br/>25 clarification.)</p>                                                                               |

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| <p style="text-align: right;">Page 101</p> <p>1 THE WITNESS: What can be<br/>2 inferred from the rule itself.<br/>3 BY MR. ENG:<br/>4 Q. You mentioned that you were searching<br/>5 for rules that had a -- I think you said POST<br/>6 data, is that the word you used?<br/>7 A. That had a POST in the rule, matching<br/>8 POST, because as we discussed before lunch, this<br/>9 was known back in the '90s, known in the Zuk<br/>10 Patent -- let me be a little more specific.<br/>11 The way HTTP works, you can perfectly<br/>12 well attach -- when you send out a HTTP request,<br/>13 it's a GET. You can perfectly well attach a<br/>14 body to that request, and it can have whatever<br/>15 data, right. So it's not the case that a GET is<br/>16 certain not to be exfiltration. It could be<br/>17 exfiltration of all kinds of stuff.<br/>18 Likewise, a POST doesn't have to have<br/>19 a body. You can have a POST that doesn't post<br/>20 anything. So it's basically convention, the GET<br/>21 is used -- I don't know, maybe the RFC shows<br/>22 that. I don't remember. But it's convention,<br/>23 essentially, that GETs requesting data and POSTs<br/>24 reports pushing data up. But you know, it's a<br/>25 widely known convention and so, you know, it's</p> | <p style="text-align: right;">Page 103</p> <p>1 A. Yeah, I would say -- I mean, in<br/>2 general, yeah. In general they're correlated<br/>3 with -- I mean, it varied some over time.<br/>4 They're correlated with doing weird, sneaky<br/>5 things, right. I mean, because usually, you<br/>6 know, if you were running a regular service, you<br/>7 advertise it on the well-known port so people<br/>8 will find it, right, because if you put your web<br/>9 server or your HTTPS server on a high-numbered<br/>10 port, now you have to have a colon port number<br/>11 in the URL in order to find the service, right.<br/>12 So yeah, high-numbered ports have<br/>13 always been, like, you know, it's not slam dunk,<br/>14 this is bad. But your choice of the word<br/>15 correlate is good. They've always been kind of<br/>16 a little bit smelly, as a server port, right.<br/>17 Client is different, because client, the<br/>18 operating system just cycles through all the<br/>19 ports. And so client port is very often high<br/>20 numbered. It doesn't particularly mean anything<br/>21 on the server side.<br/>22 Q. Did you cite any evidence in your<br/>23 declaration that substantiates that using an<br/>24 unusual high-numbered port for SSL could be an<br/>25 exfiltration operation?</p> |
| <p style="text-align: right;">Page 102</p> <p>1 been well known, you know, well over a decade,<br/>2 that, you know, PUTs and POSTs are more likely<br/>3 to have exfiltrated data than GETs. But it is<br/>4 just a heuristic.<br/>5 Q. If the message parameter of rule<br/>6 2003021 doesn't mention exfiltration and the<br/>7 comment doesn't mention exfiltration, why do you<br/>8 believe this rule is configured to prevent an<br/>9 exfiltration operation?<br/>10 A. Well, you know, it goes back to what<br/>11 is -- you know, what else -- I mean, it's<br/>12 certainly not detecting any kind of intrusion,<br/>13 right. It's using an old version of SSL and a<br/>14 high-numbered port. It's not got any signature<br/>15 for -- you know, for detecting any particular<br/>16 kind of exploit technique, right. So it's<br/>17 basically -- so data is going out in a weird<br/>18 way, you know, by 2010, when this rule set<br/>19 was -- SSL version 3 was very old.<br/>20 So you know, and my experience is we<br/>21 were using essentially this for exfiltration<br/>22 detection at FireEye. So that's why I think<br/>23 that.<br/>24 Q. Was it known that a high-numbered port<br/>25 is correlated with exfiltration operations?</p>                             | <p style="text-align: right;">Page 104</p> <p>1 A. I would have to go back and look at<br/>2 the discussions of the rule. I mean, I guess<br/>3 the answer is I don't remember off the top of my<br/>4 head. I could go through, search through my<br/>5 declaration, if that's useful to you, but<br/>6 obviously you have the document itself, so...<br/>7 Q. No, that's okay. I'll move on.<br/>8 If you turn one page back to Page 156,<br/>9 and I want you to look at the claim language in<br/>10 Paragraph (1e).<br/>11 A. Yep, mm-hmm.<br/>12 Q. Okay. So it says: Responsive to<br/>13 determining that the second portion of packets<br/>14 that comprises data corresponding to the second<br/>15 criterion specified by one or more operators,<br/>16 specified by the at least one matching packet<br/>17 filtering rule, applying -- then it goes on.<br/>18 So in that part I just read, there is<br/>19 a mention of one or more operators; correct?<br/>20 A. Yes, there is.<br/>21 Q. Okay. So looking at the rule<br/>22 SID:2003021, which part of this rule satisfies<br/>23 the operator element?<br/>24 MR. DONOVAN: Object to form.<br/>25 THE WITNESS: 3021. So the</p>                                                                                                                            |

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| <p style="text-align: right;">Page 105</p> <p>1 responsive to is referring back -- let me just<br/>2 find the claim -- is responsive to determining<br/>3 the second portion of packets comprises data<br/>4 corresponding to the second criterion specified<br/>5 by one or more operators.<br/>6       So I read the claim, that's (1e) step<br/>7 that's referring back to determining based on<br/>8 application header field value, second portion<br/>9 of packets, based on whether the first portion<br/>10 of packets, blah blah blah, right.<br/>11       So of course, the overall analysis is,<br/>12 you know, do the combination of these teachings<br/>13 suggest the claim limitations to oppose them,<br/>14 right, when talking about the combination of<br/>15 Sourcefire and the Emerging Threats reference.<br/>16       But I read the one or more operators<br/>17 that are referred to in the responsive step (1e)<br/>18 as referring back to the determining step based<br/>19 on application header field value in the second<br/>20 portion of packets, right. So you know,<br/>21 obviously there's lots of stuff in Sourcefire<br/>22 about looking at rules with application header<br/>23 field values.<br/>24       In the case of this specific rule, we<br/>25 do have -- and I go through kind of, like -- in</p> | <p style="text-align: right;">Page 107</p> <p>1 field value.<br/>2 BY MR. ENG:<br/>3       Q. So I want to make sure I understand<br/>4 correctly. So the operator plain term -- so<br/>5 you're mapping the operator claim term to the<br/>6 content keyword; is that correct?<br/>7       MR. DONOVAN: Object to form.<br/>8       THE WITNESS: Well, I mean,<br/>9 content can match lots of different things. But<br/>10 in this particular case it's matching the TLS<br/>11 record header field value, and so I would say<br/>12 TLS is an application, so it's an application<br/>13 header field value, right. And the claims are<br/>14 not just calling for any old operator, right. I<br/>15 read them as calling for an operator that, based<br/>16 on an application header field value, you know,<br/>17 there's this second determining step, the 1D<br/>18 step.<br/>19 BY MR. ENG:<br/>20       Q. So looking at that Paragraph 260, I'm<br/>21 just looking at the text. So you wrote that:<br/>22       The operator being applied to packets<br/>23 of this profile was, in part -- then you're<br/>24 quoting the flowbits parameter; is that correct?<br/>25       A. Let me just get back in there a sec.</p>                  |
| <p style="text-align: right;">Page 106</p> <p>1 my declaration I have a whole section going<br/>2 through what are the possible ways in which the<br/>3 Snort rule language can map onto, you know,<br/>4 operators checking application header field<br/>5 values and so on.<br/>6       But going back to -- so that's just<br/>7 kind of all preamble. I guess I'm establishing<br/>8 my own foundation.<br/>9       Going back to 103 -- I'll pull it up<br/>10 again -- so you know, we're looking for an<br/>11 operator that is matching an application header<br/>12 field value, and in this case we have that<br/>13 because we have this content 17 03 00 depth:4,<br/>14 and that's -- you know, this is Paragraph 260,<br/>15 mainly, of my declaration -- that's matching the<br/>16 header structure of TLS.<br/>17       So later on in 261 I point out the<br/>18 Snort content operator is looking for hex bytes<br/>19 (17), which is a particular record type in TLS<br/>20 corresponding to application data followed by 03<br/>21 and 00, and the other SSL 3, major and minor<br/>22 numbers, right. So this is matching the header<br/>23 of the TLS record protocol in that content<br/>24 match. So I would say that's definitely an<br/>25 operator that's matching an application header</p>                              | <p style="text-align: right;">Page 108</p> <p>1 Where are you exactly?<br/>2       Q. Paragraph 260 of your declaration.<br/>3       A. Okay, I'm in 260. Please repeat the<br/>4 question.<br/>5       Q. Yes. I'm just reading that sentence:<br/>6       The operator being applied to packets<br/>7 of this profile was, in part, and then you<br/>8 cite -- you quote in here, the flowbits:isset,<br/>9 et cetera, et cetera.<br/>10       A. Yeah, that -- I mean, you have to have<br/>11 kind read the rules, but that essentially is<br/>12 checking whether the SSL -- whether this is an<br/>13 established SSL connection.<br/>14       Q. Okay. But my question is are you<br/>15 considering this an operator, or is this a<br/>16 criteria of an operator? Which one is it?<br/>17       MR. DONOVAN: Object to form.<br/>18       THE WITNESS: Well, it's<br/>19 certainly -- I mean, okay. I think there's more<br/>20 than one way to map the claim language. The<br/>21 claim language is quite flexible, right, because<br/>22 you have -- first of all, the rule can have one<br/>23 or more operators, right. So the claim language<br/>24 is explicitly allowing there could be any number<br/>25 of operators in a rule.</p> |

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| <p style="text-align: right;">Page 109</p> <p>1 And then the determining step of this<br/>2 operator into the second stage of the packet<br/>3 sort of two-staged logic is that the determining<br/>4 is based on an application header field value,<br/>5 right. So I read that to be -- first, to be<br/>6 application header field value in there, you<br/>7 know, as part of that determining step, but<br/>8 based on does not mean exactly the same as,<br/>9 right.<br/>10 And so for it to be operator, you<br/>11 know -- so then when we've got multiple tests in<br/>12 the rule, and the patent allows us one or more<br/>13 operators, and then we're determining based on<br/>14 an application header field value. I mean, a<br/>15 lot of these Snort rules are testing several<br/>16 application header field values before they<br/>17 fire, right. And in my reading of this claim<br/>18 you have multiple ways to divide up, okay, which<br/>19 tests are going in which operator, right. So<br/>20 that's the context.<br/>21 So then in terms of your specific<br/>22 question, we -- this content match 1703 is the<br/>23 part I'm specifically saying is definitely<br/>24 matching application header field value that's<br/>25 in this rule.</p> | <p style="text-align: right;">Page 111</p> <p>1 looking for these classification markings,<br/>2 right.<br/>3 So this is sort of a pretty clear<br/>4 case, right, where it's not -- you know, there's<br/>5 nothing in here about an exploit. It's looking<br/>6 for classified data leaving a network as it's<br/>7 going to some external net, which means the rest<br/>8 of the Internet, on an HTTP port, right. So it<br/>9 may not use the exfiltration term, but it's very<br/>10 clear that that's what the concern is.<br/>11 Q. Do you see the reference URL<br/>12 parameters in the rule 2002526?<br/>13 A. Yep.<br/>14 Q. Did you review or visit the reference<br/>15 URLs for Rule 2002526?<br/>16 A. I don't remember.<br/>17 Q. If the rule doesn't mention<br/>18 exfiltration, why do you believe this rule is<br/>19 configured to prevent an exfiltration operation?<br/>20 A. Because it's looking for the top<br/>21 secret data leaving the network, you know. I<br/>22 mean, that's just about the -- I mean, if you're<br/>23 an organization that handles classified data,<br/>24 that's just about the paradigm case of any data<br/>25 leaving your network unencrypted that you don't</p>                          |
| <p style="text-align: right;">Page 110</p> <p>1 BY MR. ENG:<br/>2 Q. Okay. Let's turn to Paragraph 213 of<br/>3 your declaration.<br/>4 A. Okay, I'm at 213.<br/>5 Q. Okay. So Paragraph 213 contains the<br/>6 text of rule SID:2002526; correct?<br/>7 A. 2526, yep, mm-hmm.<br/>8 Q. Okay. The comments of -- does the<br/>9 rule 2002526 have a comment?<br/>10 A. Yep. Says: US Top Secret not<br/>11 Releasable to Foreign Nationals.<br/>12 Q. Okay. The comment on 2002526 does not<br/>13 mention exfiltration; correct?<br/>14 A. It doesn't use that word, no.<br/>15 Q. Okay. Does the message parameter of<br/>16 rule 2002526 mention exfiltration?<br/>17 A. No, it doesn't use the word, but, you<br/>18 know, it's clear that it's looking for top<br/>19 secret -- there's a whole bunch of these<br/>20 Emerging Threats that look for different flavors<br/>21 of U.S. classification marks, right. And it's<br/>22 looking for -- we know from the 5-tuple that<br/>23 it's looking for information flowing from the<br/>24 local -- anywhere in the local network to remote<br/>25 HTTP ports, remote HTTP servers, and it's</p>                                                                                                                        | <p style="text-align: right;">Page 112</p> <p>1 want to leave your network, right. There's just<br/>2 no circumstance under which classified data<br/>3 should be flowing out of your network<br/>4 unencrypted. And so, you know, that suggests --<br/>5 it's labeled Top Secret NOFORN, which I<br/>6 understand means -- you know, I have an exhibit<br/>7 on my different classification levels. But I<br/>8 understand it means essentially it's a U.S.<br/>9 classification marking that means that it shan't<br/>10 be shown to any nonU.S. citizens. And you know,<br/>11 so this is looking for that data going in the<br/>12 clear across the Internet.<br/>13 Q. You mention unencrypted. Does this<br/>14 rule say anything about encrypted or<br/>15 unencrypted?<br/>16 A. Well, I'm relying on the fact that<br/>17 it's going to HTTP ports in the 5-tuple, do you<br/>18 see that --<br/>19 Q. Yes.<br/>20 A. -- on the fourth line of the excerpt.<br/>21 It doesn't say HTTPS ports, it says HTTP ports,<br/>22 which implies unencrypted HTTP. And then the<br/>23 actual regular expression, pcre, is searching<br/>24 for Top Secret and NOFORN, whatever, and if it<br/>25 was encrypted, that wouldn't do us any good</p> |

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| <p style="text-align: right;">Page 113</p> <p>1 because it wouldn't be in the TLS handshake<br/>2 saying it was secret data, right. It would be<br/>3 in some document that was in the body of an HTTP<br/>4 request. And so this is -- so the whole rule<br/>5 just wouldn't work if it was targeting encrypted<br/>6 data, right.<br/>7 But you know, in a pre2010 time frame<br/>8 we had a lot of malware that was not using<br/>9 encrypted communication, right. So it was not<br/>10 unusual to see exfiltration -- in that time<br/>11 frame it was not unusual to see exfiltration<br/>12 happening in the clear.<br/>13 Q. What's the basis of your belief that<br/>14 in the pre2010 time frame that there was malware<br/>15 that was not using encrypted communication?<br/>16 A. Well, you know, I was active at<br/>17 FireEye, you know, where I was working on this<br/>18 web product from 2007 to 2013, and my job was to<br/>19 detect malicious websites that were infecting --<br/>20 you know, that were infecting customer laptops,<br/>21 whatever, customer client machines.<br/>22 And you know, usually the immediate<br/>23 consequence of an exploit would be installation<br/>24 of some kind of malware hit, some kind of trojan<br/>25 hit that then was going to give the bad guys</p>  | <p style="text-align: right;">Page 115</p> <p>1 find it, we never found the exploit. And so I<br/>2 was forever -- you know, and I was tube<br/>3 scientist to the organization, right, from 2008<br/>4 on. So I was forever trolling -- trying to<br/>5 dream up new ways of finding -- you know, you're<br/>6 dealing with enormous amounts of traffic on the<br/>7 wire, right, multiple gigabits per second, so<br/>8 hundreds of thousands of packets per second, and<br/>9 my code had to read, and so it's a real<br/>10 needle-in-the-haystack problem.<br/>11 So I was forever trolling through,<br/>12 looking for something that would kind of be a<br/>13 clue that I might have missed something. And<br/>14 then whenever my code would see one of these<br/>15 clues, it would drop the network traffic and it<br/>16 would save on disk the network traffic from the<br/>17 previous few minutes, and I would get loads of<br/>18 these P CUPS and then start trolling through and<br/>19 see, you know, why did I miss this.<br/>20 So I looked at a whole lot of malware.<br/>21 At the time I was, like, sometimes giving<br/>22 industry presentations on, you know, the state<br/>23 of malware and stuff like this, right, on -- so<br/>24 I was looking at a lot of malware about how it<br/>25 got in, and then what it did once it was in, at</p> |
| <p style="text-align: right;">Page 114</p> <p>1 access to that box for whatever their purpose<br/>2 was. You know, maybe it was stealing<br/>3 information. Maybe it was stealing -- you know,<br/>4 maybe it was trying to steal money, you know,<br/>5 they were banking trojans that were trying to<br/>6 inject themselves into the customer's banking<br/>7 transactions. Or maybe it was trying to, in a<br/>8 case like this, steal top secret information or<br/>9 some kind of valuable information.<br/>10 As I mentioned, I -- you know, there<br/>11 was this team that was developing Snort rules<br/>12 that were, you know, in spirit, like some of<br/>13 these Emerging Threats rules that were looking<br/>14 for particular trojans.<br/>15 And you know, I was often kind of<br/>16 looking at -- because I was always trying to<br/>17 find all false negatives, right, that would be<br/>18 my big worry in my module, because false<br/>19 positives in my particular module could cause a<br/>20 performance issue, but they would be -- you<br/>21 know, I was a prefilter to the virtual machine<br/>22 replay stage, so that would prevent customers<br/>23 from seeing false positives.<br/>24 But if I didn't pick up on a malicious<br/>25 thing, then that was it, you know, we didn't</p> | <p style="text-align: right;">Page 116</p> <p>1 least as you could see it from the network. You<br/>2 know, I couldn't tell what it was doing on the<br/>3 host, right. So I was very hands-on in<br/>4 investigating the activities of malware and<br/>5 trying to figure out how to make my module<br/>6 detect more of it.<br/>7 Q. What about in the 2013 time frame, was<br/>8 it common for malware to be using encrypted<br/>9 communication for exfiltration?<br/>10 A. My memory -- you know, it was becoming<br/>11 increasingly more of a concern. And this was --<br/>12 I don't remember statistics at this point. You<br/>13 know, this is why my boss was, like, bugging me<br/>14 to look for large encrypted objects. It was<br/>15 becoming more of a concern than it had been. It<br/>16 still was -- you know, most malware<br/>17 communications were uninflected and you could<br/>18 see it in the clear.<br/>19 But you know, it was sort of a -- I<br/>20 would characterize it in the last few years of<br/>21 my tenure there as sort of an emerging concern<br/>22 because, you know, people were getting more and<br/>23 more worried -- there was a faction within the<br/>24 computer security community that was always<br/>25 pushing for more and more stuff to be encrypted,</p>                                                        |

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| <p style="text-align: right;">Page 117</p> <p>1 and of course, to the extent we were having<br/>2 success detecting the bad guys through the<br/>3 unencrypted communications, they had an<br/>4 incentive to start encrypting them, right. So<br/>5 they did.<br/>6 But I couldn't give you, you know,<br/>7 detailed statistics of what fraction of -- you<br/>8 know, of course, we probably wouldn't know,<br/>9 right, because at that time we wouldn't<br/>10 necessarily know what was in the encrypted<br/>11 communications.<br/>12 Q. So if an exfiltration action was using<br/>13 encrypted communications, would this<br/>14 rule SID:2002526 be able to prevent it?<br/>15 A. It strikes me as pretty unlikely,<br/>16 right. I mean, the reason being that you have<br/>17 this regular expression, the thing that starts<br/>18 with pcre on the sixth line of the quote there,<br/>19 you know, this looking for Top Secret or TS or<br/>20 NOFORN, you know, separated by various other<br/>21 things, you know, that's the classification<br/>22 header for a classified document.<br/>23 So as I think I mentioned before,<br/>24 usually a document is going to be in the body in<br/>25 an HTTP request, whereas an encrypted</p>                                                                | <p style="text-align: right;">Page 119</p> <p>1 first clause. So if your whole document is<br/>2 encrypted, you know, the whole document is<br/>3 gobbledegook, that match is just not going to<br/>4 work.<br/>5 Q. You used a phrase, I think it was,<br/>6 talking about a custom or crude encryption, I<br/>7 think you used the word xor, XOR'd, is that<br/>8 correct, X-O-R?<br/>9 A. Yeah. It's the logical operator,<br/>10 exclusive OR.<br/>11 THE WITNESS: Cheryl, so this<br/>12 X-O-R, all capitalized.<br/>13 COURT REPORTER: Thank you.<br/>14 THE WITNESS: Even that would<br/>15 defeat this troll because, I mean, what that was<br/>16 typically is basically take every byte of the<br/>17 HTTP body, the document, and XOR that byte with<br/>18 a fixed byte.<br/>19 So just all the, you know -- I<br/>20 forget -- I'm not a cryptographer. I forget<br/>21 what the exact name of that cypher was, but it's<br/>22 very crude, right, and a code breaker would<br/>23 defeat it in a second. But it will stop a plain<br/>24 text rule match like this, right, because each<br/>25 byte of top secret will now be a different byte,</p> |
| <p style="text-align: right;">Page 118</p> <p>1 communication -- assuming it's TLS. I mean, in<br/>2 principle, the bad guys can make up their own<br/>3 encryption and do it however they want. And<br/>4 there was some of that. You know, we saw some<br/>5 stuff where they XOR'd whatever it was, very<br/>6 crude 2000-year-old ciphers. So we did see<br/>7 some, like, very custom, usually very poor<br/>8 encryption.<br/>9 But the obvious thing to do is just<br/>10 use -- the bad guys, is just use TLS, same as<br/>11 everybody else does. And then, you know, the<br/>12 only thing that's encrypted is, like, the<br/>13 beginning of the handshake -- that's<br/>14 unencrypted, is the beginning of the handshake<br/>15 and the record headers.<br/>16 All the application data and certainly<br/>17 any document including its classified markings<br/>18 will be encrypted and therefore, matching an<br/>19 explicit top -- that top/sSecret, that means top<br/>20 followed by a space followed by some kind of<br/>21 white space followed by secret, right, so that<br/>22 would match up space secret or top tab secret,<br/>23 maybe top new line secret. And then the bar TS<br/>24 says you can either have top space secret or<br/>25 just TS, and either of those will match that</p> | <p style="text-align: right;">Page 120</p> <p>1 right. XOR transformation will take every byte<br/>2 to some other byte. It's reversible. So even<br/>3 the most desultory encryption would stop a<br/>4 plain -- you know --<br/>5 COURT REPORTER: (Requests<br/>6 clarification.)<br/>7 THE WITNESS: Even the most<br/>8 desultory encryption will stop plain text<br/>9 matching of the content.<br/>10 BY MR. ENG:<br/>11 Q. So outgoing traffic is not an<br/>12 indicator of an exfiltration operation; correct?<br/>13 MR. DONOVAN: Object to form.<br/>14 THE WITNESS: Well, exfiltration<br/>15 is going to be a subset of outgoing traffic, you<br/>16 know. Probably most of the outgoing traffic is<br/>17 going to be legitimate, you know, and a small<br/>18 fraction is going to be illegitimate.<br/>19 BY MR. ENG:<br/>20 Q. Okay. Looking at the rule<br/>21 SID:2002526, can you point to me which one is<br/>22 the operator as recited in the claims?<br/>23 MR. DONOVAN: Object to form.<br/>24 THE WITNESS: I'm not -- I mean,<br/>25 this is in the Emerging Threats rules, right.</p>                                                   |

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| <p style="text-align: right;">Page 121</p> <p>1 I'm relying on the combination of Sourcefire and<br/>2 these rules as to what would be obvious to the<br/>3 POSA. I just want to make sure I speak<br/>4 carefully here. This rule is speaking to the<br/>5 concern about, you know, other encryption rules,<br/>6 this is clearly encryption, and is making that<br/>7 obvious to the POSA. But it's not -- well,<br/>8 okay. It doesn't have a content match for an<br/>9 application header field value. It's more<br/>10 content match.<br/>11 So then the question is this flow to<br/>12 server established -- did I take a position on<br/>13 that? To me, that's a direction to the TCP<br/>14 stream preprocessor. I don't think I took a<br/>15 position on it, that I can recall. I don't<br/>16 think I'm going to try and think that through on<br/>17 the fly and maybe get it wrong.<br/>18 But again, I mean, the larger point<br/>19 is, right, what do these disclosures make<br/>20 obvious to the POSA. It's the combination of<br/>21 them.<br/>22 Q. The rule 2002526 doesn't disclose<br/>23 determining a packet header field value<br/>24 corresponds to criterion in the packet filtering<br/>25 rule; correct?</p> | <p style="text-align: right;">Page 123</p> <p>1 standard terminology in Snort rules. You have<br/>2 to define what your home net is, but it's<br/>3 defined to be some range of IP addresses that's<br/>4 your network, whatever that is, so usually some<br/>5 CIDR range.<br/>6 So it's testing, you know, that the<br/>7 source IP matches some specified set of source<br/>8 IPs, and it's allowing any client port, and then<br/>9 it's testing external net, which again is -- you<br/>10 know, you can define the constant, but it's<br/>11 generally set up to be the rest of the Internet.<br/>12 And then it's testing for HTTP ports,<br/>13 which is a configurable variable, but it's<br/>14 usually the ports that HTTP is commonly served<br/>15 from, and by far the most important being port<br/>16 80. So those are all --<br/>17 COURT REPORTER: (Requests<br/>18 clarification.)<br/>19 THE WITNESS: That it's testing<br/>20 port 80.<br/>21 So all five of those are testing --<br/>22 well, client port is kind of a meld test, but<br/>23 they're all testing packet header field values.<br/>24 BY MR. ENG:<br/>25 Q. I want to clarify my question before,</p> |
| <p style="text-align: right;">Page 122</p> <p>1 A. Sorry. Repeat the question.<br/>2 Q. Yeah. Rule 2002526 does not disclose<br/>3 determining a packet header field value<br/>4 corresponding to criteria in the packet filter<br/>5 rule; correct?<br/>6 A. That's the (1b) determining step;<br/>7 right? I mean --<br/>8 Q. 1(b) and -- (c) yes.<br/>9 A. Hold on, let me find the rule. Remind<br/>10 me of the paragraph we were at.<br/>11 Q. Just now we were at Paragraph 213.<br/>12 But the parts of limitation (1c) starts at 249.<br/>13 A. Okay, but you are asking me<br/>14 specifically about rule 2526, right?<br/>15 Q. Right.<br/>16 A. And you're asking me, then, does it<br/>17 disclose a test of a packet filtering -- of a<br/>18 packet header value. And it clearly does do<br/>19 that because it specifies alert TCP. So that's<br/>20 testing the protocol field, which is in the IP<br/>21 header. So I would certainly, you know -- I<br/>22 would fail a POSA that didn't know that TCP was<br/>23 one of the protocols in the IP header.<br/>24 And then it's testing that the source<br/>25 IP addresses are in home net. Well that's</p>                                                                 | <p style="text-align: right;">Page 124</p> <p>1 because I think said limitations 1(c), but I<br/>2 meant to say 1(d). So on paragraph -- on<br/>3 page --<br/>4 A. Then that would be the application<br/>5 header field test, rather than the packet header<br/>6 field test, right.<br/>7 Q. Application field test; correct.<br/>8 Application header field value, that's what I<br/>9 meant to say.<br/>10 A. Got it, okay.<br/>11 Q. So which operator is determining --<br/>12 A. You asked me this question --<br/>13 COURT REPORTER: (Requests<br/>14 clarification.)<br/>15 BY MR. ENG:<br/>16 Q. So which operator is determining the<br/>17 second portion of packets based on an<br/>18 application header field value?<br/>19 A. Yeah, so you asked me this question<br/>20 before, and I believe my answer was to point out<br/>21 that what's important here is the combination of<br/>22 the references and what they make obvious to the<br/>23 POSA. And then I pointed out that it doesn't<br/>24 have a content match as in the previous example<br/>25 that we were looking at.</p>                                                                                  |

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| <p style="text-align: right;">Page 125</p> <p>1 And then I looked at the flow to<br/>2 server established, and I stated that I don't<br/>3 think I've taken a position on whether or not<br/>4 that was matching a -- was matching an<br/>5 application at the field value. And I don't<br/>6 want to try and figure that out on the fly and<br/>7 possibly get it wrong. So I'm declining to<br/>8 state on that basis.</p> <p>9 Q. I'm going to turn to Paragraph 217.<br/>10 A. Yeah.<br/>11 Q. So this is looking at rule<br/>12 SID:2002034.<br/>13 A. Yes; correct.<br/>14 Q. Okay. Does this rule have a comment?<br/>15 A. Does this rule have what?<br/>16 Q. A comment.<br/>17 A. Yes, but the comment just says: By<br/>18 Matt Jonkman.<br/>19 Q. The rules comment does not mention<br/>20 exfiltration; correct?<br/>21 A. It does not have that word in it. It<br/>22 just is a tradition to the author, which is kind<br/>23 of the main guy in this whole rule set.<br/>24 Q. The rule 2002034's message parameter<br/>25 does not mention exfiltration; correct?</p>                                                                                                                                                                | <p style="text-align: right;">Page 127</p> <p>1 A. I mean, I'm guessing, but what it<br/>2 would suggest to me would be that it was some<br/>3 kind of step following on from the attack,<br/>4 something that happened after the attack.<br/>5 Q. Okay. In this rule SID:2002034, which<br/>6 is the operator -- rather -- yeah, which is the<br/>7 operator that specifies criteria for determining<br/>8 based on an application header field value?<br/>9 MR. DONOVAN: Object to form.<br/>10 THE WITNESS: I don't think this<br/>11 rule in itself discloses a test -- well, okay.<br/>12 All right, we again have the flow, keyword, flow<br/>13 established from server, which I haven't taken a<br/>14 position on. And I'm not confident I can figure<br/>15 out on the fly correctly. So I'm reserving<br/>16 that.<br/>17 It does have a content match, which is<br/>18 matching the first line of the password file. I<br/>19 struggle -- I don't think I would want to defend<br/>20 a claim that the format of the password file is<br/>21 an application header field value. You know,<br/>22 somebody might try to claim that maybe it's a<br/>23 gray issue, but I don't think I would be<br/>24 comfortable defending that. So that's my answer<br/>25 on that. Again, the same caveat, right, the</p> |
| <p style="text-align: right;">Page 126</p> <p>1 A. It doesn't use the word exfiltration<br/>2 but it says possible etc/passwd via HTTP (linux<br/>3 style), right. So again, I refer you to the<br/>4 summary of the patent, the EX-1001, Line 56, 57,<br/>5 right, where, you know, he gives examples of<br/>6 exfiltration including posting of log-in<br/>7 credentials, user names, and passwords.<br/>8 So this rule in the message is saying<br/>9 possible etc/passwd via HTTP. So the POSA is<br/>10 going to know the etc/passwd is the path to the<br/>11 password file in Linux systems, so he's going to<br/>12 read this and know, you know, this is the<br/>13 password file moving over to HTTP, you know, and<br/>14 this is the same thing, the patent is saying is<br/>15 exfiltration.<br/>16 So you have to know a little bit. You<br/>17 have to know that etc/passwd is the password<br/>18 file used in systems, but that is totally<br/>19 something a POSA should know.<br/>20 Q. Did you review the reference URLs<br/>21 mentioned in the rule ID 2002034?<br/>22 A. I don't remember.<br/>23 Q. What does the phrase attack response<br/>24 mean? Like attack response possible mean in the<br/>25 message parameter?</p> | <p style="text-align: right;">Page 128</p> <p>1 analysis is what are the references in<br/>2 combination make obvious to the POSA.<br/>3 BY MR. ENG:<br/>4 Q. Let's dig more into that, maybe. So<br/>5 the references, in combination, that we're<br/>6 discussing is Exhibit 1004, a Sourcefire<br/>7 reference, and the Emerging Threats reference;<br/>8 correct?<br/>9 A. Yeah, right.<br/>10 Q. And I think we discussed earlier the<br/>11 Sourcefire system is fairly similar to the Snort<br/>12 system; correct?<br/>13 A. Well, okay. I would clarify that.<br/>14 Snort is one subsystem within the overall<br/>15 Sourcefire product sweep. You know,<br/>16 Sourcefire -- you know, the company started<br/>17 around Snort, Marty Roesch built Snort before he<br/>18 had Sourcefire as a company. And Sourcefire the<br/>19 product, which Sourcefire the manual is<br/>20 documenting, you know, had Snort but then it<br/>21 initially added like a user interface layer, and<br/>22 enterprise management stuff. Then it added this<br/>23 RNA component, and RUA, user -- I forget what<br/>24 the acronym stands for. So there were a whole<br/>25 bunch of things that were in Sourcefire. But</p>                                                                                                 |

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| <p style="text-align: right;">Page 129</p> <p>1 the relevant thing here, by and large, is the</p> <p>2 fact that it contained Snort and relied on Snort</p> <p>3 for its rules.</p> <p>4 Q. Okay, that's right. So --</p> <p>5 A. Sourcefire included Snort, but --</p> <p>6 Q. Okay. Is it fair to say that</p> <p>7 Sourcefire uses Snort rules?</p> <p>8 A. Yes, yes, that is fair to say.</p> <p>9 Q. Okay. Is it also fair to say that the</p> <p>10 Emerging Threats reference discloses Snort</p> <p>11 rules?</p> <p>12 A. Yes. It's a large collection of Snort</p> <p>13 rules, that's what it is.</p> <p>14 Q. So would a person with ordinary skill</p> <p>15 in the art, combining the teachings of the</p> <p>16 Sourcefire reference and the teaching of the</p> <p>17 Emerging Threats reference, come up with a Snort</p> <p>18 rule that satisfies the challenge claim?</p> <p>19 A. Yeah, I believe they would, yeah.</p> <p>20 Q. What would that rule look like?</p> <p>21 A. You want me to write a Snort rule on</p> <p>22 the fly?</p> <p>23 Q. Well, did you write a Snort rule in</p> <p>24 your expert declaration that would satisfy the</p> <p>25 challenge claim?</p>                                                                                                                                                                                      | <p style="text-align: right;">Page 131</p> <p>1 do; people actually did it.</p> <p>2 Q. So are you saying that there's rules</p> <p>3 in the Emerging Threats reference that meets all</p> <p>4 the limitations of the challenge claim, but you</p> <p>5 didn't point to it in your declaration?</p> <p>6 A. Well, in my declaration I'm, like,</p> <p>7 analyzing each feature. Again, you know, my</p> <p>8 understanding is the test is what's obvious to</p> <p>9 the POSA based on the combination of the</p> <p>10 references.</p> <p>11 In prosecuting this patent, you know,</p> <p>12 the main argument the patenter made and that the</p> <p>13 patent office accepted was it wouldn't be</p> <p>14 obvious to a POSA to write an exfiltration rule,</p> <p>15 right. That's what you guys are claiming. So</p> <p>16 the rest of it wasn't too much in dispute, I</p> <p>17 don't think.</p> <p>18 And you know, so I went through and</p> <p>19 grabbed rules that were obviously exfiltration</p> <p>20 rules and made this point, right. And then</p> <p>21 elsewhere -- you know, in other declarations</p> <p>22 previously, we sort of analyzed what Sourcefire</p> <p>23 itself discloses, which is a lot, right, because</p> <p>24 Sourcefire -- the rules themselves, are a</p> <p>25 two-stage matching process in which you first</p>                     |
| <p style="text-align: right;">Page 130</p> <p>1 A. You mean -- okay. So again, the</p> <p>2 analysis is -- does it suggest that the</p> <p>3 references taken in combination suggest all the</p> <p>4 features of the claims, right, and I strongly</p> <p>5 believe they do, and we documented that in</p> <p>6 detail.</p> <p>7 You're going after, you know, can we</p> <p>8 have all these features in a single rule, right.</p> <p>9 Not just the combination of the references</p> <p>10 suggest it's obvious, but can we have a single</p> <p>11 rule that has everything, right. And yeah, I</p> <p>12 mean, that's easy. I mean, this thing is going</p> <p>13 from -- you know, these rules we've looked at</p> <p>14 that are going to HTTP ports have</p> <p>15 content:"POST", you know. I showed you in my</p> <p>16 declaration that, you know, has all of that</p> <p>17 stuff. So there's bunches of rules.</p> <p>18 I mean, I pulled out particular rules</p> <p>19 to illustrate particular features in writing</p> <p>20 this declaration. But there's bunches of rules</p> <p>21 in there that are matching a trojan, start with</p> <p>22 content:"POST", and have some kind of 5-tuple,</p> <p>23 and I targeted the trojan exfiltrating, you</p> <p>24 know, the -- exfiltrating data. So we don't</p> <p>25 just need to speculate about what a POSA would</p> | <p style="text-align: right;">Page 132</p> <p>1 match, right -- the stock paper has this pretty</p> <p>2 picture with the data structure that's not</p> <p>3 originally used. Well, you first match the</p> <p>4 chain header that matches the 5-tuple, and then</p> <p>5 you match the chain options, which -- and</p> <p>6 include -- are very often to include matching</p> <p>7 application header field values, right.</p> <p>8 So I wasn't trying to get it all into</p> <p>9 one rule, and I don't think that's the test.</p> <p>10 However, it certainly is the case that there are</p> <p>11 lots of rules like that, because, you know, a</p> <p>12 trojan is posting data to a remote site, you</p> <p>13 know, is stealing the data, right, which is a</p> <p>14 lot of what trojans do, and there's lots of</p> <p>15 rules like that in Emerging Threats. So you</p> <p>16 know, if you want it all in one rule, it's</p> <p>17 there. But it's not what I was trying to do in</p> <p>18 my declaration.</p> <p>19 Q. You've testified prior today that</p> <p>20 you've written Snort rules before; correct?</p> <p>21 A. Yes, I have, yes.</p> <p>22 Q. Okay. Can we try that now? Can we</p> <p>23 try coming up with a Snort rule based off of the</p> <p>24 teachings of the combination of references that</p> <p>25 would satisfy the challenge claim?</p> |

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| <p>Page 133</p> <p>1 A. So you want one rule that says --<br/>2 well, I mean, do you need me to make up a new<br/>3 one, or can we just use that one that I pointed<br/>4 you to earlier in Emerging Threats? I'm happy<br/>5 to make up a new one if you want, but...<br/>6 Q. Which earlier one did you point to me<br/>7 in Emerging Threats? There's a bunch.<br/>8 A. Let me see if I can find it. It's the<br/>9 last full rule at the bottom of Page 155.<br/>10 MR. DONOVAN: What page did you<br/>11 say?<br/>12 THE WITNESS: It's 155,<br/>13 Exhibit 20, and so this is the second chunk of<br/>14 the three chunks they provided, and the message<br/>15 is ET TROJAN Bandoob iwebho/BBB-phish trojan<br/>16 leaking user data.<br/>17 So if I might, Jeff, I'll just walk<br/>18 you through it.<br/>19 BY MR. ENG:<br/>20 Q. Sure. Try to go slow for the<br/>21 reporter.<br/>22 A. Thank you for the reminder. Cheryl,<br/>23 feel free to stop me if it's confusing. So the<br/>24 rule -- the comment is just the author, Joe<br/>25 Stewart, and then the rule starts out alert tcp</p>                                                                                                                                                                                    | <p>Page 135</p> <p>1 6. So this is looking for the HTTP method being<br/>2 POST as opposed to GET or whatever. So that's<br/>3 the first line of it.<br/>4 Then this -- few more content matches.<br/>5 There's a content HTTP 1.1. So that's the<br/>6 version number at the end of the first line of<br/>7 the HTTP header. And then a content type of<br/>8 application x-www-form-urlencoded. So that's<br/>9 one of two application data types that I used<br/>10 for font data in HTTP. The other one's like<br/>11 multipart, form data or something. This one is<br/>12 a simple -- the form is included in the body of<br/>13 the HTTP request just as a name equals value<br/>14 separated by ampersands. So this is looking for<br/>15 the fact that the HTTP header is advertising<br/>16 that it's form data, basically, within 150 bytes<br/>17 of the POST.<br/>18 And then it wants the existence of a<br/>19 content length header, and then it's looking for<br/>20 the next content match is 0d0a0d0a within 12.<br/>21 Do you see that at the end of the second line?<br/>22 Q. Yes.<br/>23 A. So that's characteristic of the way<br/>24 HTTP requests a structure. I had a little<br/>25 tutorial in my background section of my</p>                         |
| <p>Page 134</p> <p>1 \$HOME_NET any, and then an arrow, and then<br/>2 external net, HTTP ports. So this is your<br/>3 testing on application header data. Sorry, I<br/>4 misspoke. This is the first stage, this is<br/>5 testing on packet header values, right. The TCP<br/>6 is testing on the protocol, and the IP header is<br/>7 TCP, as opposed to UDP or ICMP or some other<br/>8 protocol.<br/>9 Then it's testing at the source<br/>10 port -- the source address is coming from the<br/>11 local network. Any client port will do. It's<br/>12 going to the external network, probably the<br/>13 Internet, and then it has to be HTTP ports, so<br/>14 you know, very likely AT and whatever else a<br/>15 given user -- the system might have configured.<br/>16 The message tells us that it's a<br/>17 trojan leaking user data. So it strongly<br/>18 suggests this is an exfiltration concern. Then<br/>19 we've got the flow established to server.<br/>20 That's basically telling the TCP stream<br/>21 processor that we want to look at established<br/>22 connections going from the client to the server,<br/>23 which is also consistent with a 5-tuple test.<br/>24 Then it's looking for content:"POST"<br/>25 20, which is a colon, and then there's a depth</p> | <p>Page 136</p> <p>1 declaration. But the header ends with /R/N/R/N<br/>2 and in HEX that's 0d0a0d0a. So this is looking<br/>3 for the basically extra blank line that ends the<br/>4 header and starts the body.<br/>5 Then it's looking for<br/>6 content:"VISITED_URL", so it's looking for this<br/>7 particular content inside the body of the HTTP<br/>8 request. And then that's the end of the test,<br/>9 right, that's the end of anything you could call<br/>10 an operator because the rest of it is like --<br/>11 the classtype is trojan-activity and the<br/>12 reference:url.<br/>13 So there you've got, you know, several<br/>14 tests that are undisputed as -- you've got the<br/>15 first determining step in the bracket header<br/>16 fields, in the 5-tuple, the beginning of the<br/>17 rule, and then you've got content:"POST", right,<br/>18 which is pretty much explicitly what the<br/>19 HTTP-EXFILL thing is saying, with the one<br/>20 difference that it's adding this slash at the<br/>21 end of it. So the URL is immediately following<br/>22 the method, and an HTTP request has to start<br/>23 with URL -- has to start with slash. Sorry.<br/>24 And then you're looking for a<br/>25 particular content type. So there again, you</p> |

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| <p style="text-align: right;">Page 137</p> <p>1 know, content type is clearly an application<br/>2 header on an HTTP application. The value here<br/>3 that it's looking for is<br/>4 application/x-www-form-urlencoded.<br/>5 You know, so you've got at least two<br/>6 that are very unambiguously application header<br/>7 field values that are being tested on. You<br/>8 know, of course, the claim allows one or more<br/>9 operators, right, so you can have multiple<br/>10 involved in the decision making.<br/>11 And then, you know -- and then<br/>12 finally, in this case we alert, but as discussed<br/>13 in my declaration, you know, the POSA would know<br/>14 that they could change this to drop, you know,<br/>15 once they change the rule set. And this is a<br/>16 highly specific rule with very particular<br/>17 structure with this VISITED_URL that just<br/>18 glancing at it would not seem to have a high<br/>19 false positive risk. I mean, I guess you would<br/>20 need to run it on your network to really know<br/>21 for sure, but at least on the face of it.<br/>22 Q. Okay, thank you for the explanation.<br/>23 So I want to make sure I understand.<br/>24 It didn't sound like you made too many changes<br/>25 to the rule as it is; is that correct?</p> | <p style="text-align: right;">Page 139</p> <p>1 rule. But that's trivial to change, and a POSA<br/>2 would certainly know how to do that.<br/>3 And then it says -- I mean, we have --<br/>4 it says it's a trojan leaking user data. I<br/>5 mean, I did look up the link in this case and it<br/>6 was a campaign of phishing emails to executives<br/>7 that was trying to steal data. But there was<br/>8 also a strong hit in the www-form-urlencoded --<br/>9 application/X-www-form-urlencoded, right, that<br/>10 is specifically looking for -- it's going to<br/>11 label the data uploaded as the contents of form.<br/>12 So you know, popular -- this is a very<br/>13 popular trojan thing to do, to basically every<br/>14 time you use it, fills in a form in the browser,<br/>15 swipe the data, and upload it to a malware<br/>16 command and control, and the theory that's often<br/>17 log-in credentials.<br/>18 I mean, that requires a little more<br/>19 sophistication, but the message is, like, trojan<br/>20 leaking user data. It's pretty clear that<br/>21 that's the trojan exfiltration using data, so<br/>22 you don't want to --<br/>23 Q. I see. So in this case -- let me make<br/>24 sure I understand. This trojan leaks user<br/>25 data -- does the word leaking have a particular</p> |
| <p style="text-align: right;">Page 138</p> <p>1 MR. DONOVAN: Object to form.<br/>2 THE WITNESS: Right, no. So I<br/>3 asked you, do you need me to make up a new rule,<br/>4 or can we just look at the one I showed you<br/>5 before as an example. I mean, you know, if you<br/>6 want me to make up a new rule, I can do it.<br/>7 This is the real rule that's already --<br/>8 BY MR. ENG:<br/>9 Q. Right, okay. So what it sounds<br/>10 like --<br/>11 A. I mean, I'm just probably going to<br/>12 take this rule and copy the important things and<br/>13 simplify it, right. I think this does it for<br/>14 you.<br/>15 Q. Okay. But it sounds like that this<br/>16 rule, in your opinion, meets the limitations of<br/>17 the challenge claim; correct?<br/>18 MR. DONOVAN: Object to form.<br/>19 THE WITNESS: Well, I walked you<br/>20 through it. You know, you've got the packet<br/>21 header field value tests in the 5-tuple. You've<br/>22 got several content matches that are clearly<br/>23 matching application header field values, for<br/>24 the second determining 1(d) step. You know,<br/>25 it's configured as an alert rule, not a drop</p>                                                                                                                               | <p style="text-align: right;">Page 140</p> <p>1 meaning in the art?<br/>2 A. To me, you know, yeah, it means that<br/>3 the -- you know, the nonmetaphorical use of a<br/>4 leak is water coming out of a pipe where it's<br/>5 not supposed to, right. So here, you know, it's<br/>6 a metaphor for data leaking -- so I'll go back<br/>7 to, I have an exhibit in my declaration, which<br/>8 is the Gartner report for the DLP market, right.<br/>9 DLP was Data Leak Prevention. So, yeah, data<br/>10 leak was a term that was also used for<br/>11 exfiltration.<br/>12 Q. I believe you brought it up, so I'm<br/>13 just going to upload it for completeness. Right<br/>14 now I'm uploading Exhibit 1088.<br/>15 A. I misspoke. It was data loss<br/>16 prevention. Yeah, I have it. Okay. All right.<br/>17 I stand corrected on that. It was data loss.<br/>18 Yeah, to me, data leak means the flow of data<br/>19 going where it shouldn't.<br/>20 Q. Is there a difference in the art, to a<br/>21 person of ordinary skill in the art, between the<br/>22 words data loss and data leak?<br/>23 A. I mean, yeah, to me they're both about<br/>24 that -- the DLP market was basically about<br/>25 picking up on -- you were losing your data, and</p>                                                            |

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| <p style="text-align: right;">Page 141</p> <p>1 there's content to where stuff was -- I think<br/>2 I'm correct in saying these are all, you know,<br/>3 products that are looking -- I guess I should<br/>4 not get -- see, I take them to be phrases that<br/>5 are both suggesting a concern with data leaving<br/>6 the protected environment when it shouldn't. So<br/>7 it means the same thing as exfiltration.<br/>8 Q. And then you mentioned earlier that<br/>9 you were able to visit the reference URLs<br/>10 mentioned in this rule; correct?<br/>11 A. Yeah, right.<br/>12 Q. And I think we stated it for the<br/>13 record, but just to be clear, we've been<br/>14 discussing rule 2003937.<br/>15 A. Correct.<br/>16 Q. So this rule mentions a trojan, I<br/>17 believe it's called Bandoock; is that correct?<br/>18 A. Yeah. And then there's a<br/>19 iwebho/BBB-phish, right.<br/>20 Q. And then you mentioned that this is --<br/>21 this trojan, when the user is filling out like a<br/>22 web form, it will leak out the data. So like<br/>23 interactively, when a person is using a web<br/>24 browser to fill out a form and it gets swiped<br/>25 and uploaded to, I guess you said, a malware</p>                                                                         | <p style="text-align: right;">Page 143</p> <p>1 the data, and so I would expect that usually a<br/>2 keylogger would exfiltrate the data over the<br/>3 network. In principle, you know, the keylogger<br/>4 could record it on a disk and somebody could<br/>5 come and pick up the disk later and I would<br/>6 still call it a keylogger. But the usual case,<br/>7 you know, is going to be the keylogger is being<br/>8 installed over the network somehow and it's<br/>9 going to steal the keylog data over the network.<br/>10 MR. ENG: Would you like to take<br/>11 a ten-minute break?<br/>12 THE WITNESS: That sounds good.<br/>13 (2:55-3:06 p.m. - Recess taken.)<br/>14 BY MR. ENG:<br/>15 Q. Dr. Staniford, did you speak with<br/>16 anyone during the break?<br/>17 A. No, I did not.<br/>18 Q. Do you recall right before we went on<br/>19 break we were discussing rule SID:2003937?<br/>20 A. Yes.<br/>21 Q. When did you first become aware of<br/>22 this rule?<br/>23 A. After I read your -- from the<br/>24 response, you know, I started trolling through<br/>25 looking for additional rules to make the point.</p>                                                             |
| <p style="text-align: right;">Page 142</p> <p>1 command and control area?<br/>2 A. I don't think I made that comment in<br/>3 the -- I think I said it's a popular trojan<br/>4 thing to do in general, you know, as a data<br/>5 stealer because the contents of forms are so<br/>6 often, you know, as you probably know from your<br/>7 own experience when you're filling out a form on<br/>8 a website, you know, you're logging in, you're<br/>9 putting in your credit card to buy something,<br/>10 you know, it's often sensitive data that's going<br/>11 into the form, so just stealing all the forms<br/>12 was a known thing for trojans to do.<br/>13 Yeah, that wasn't the only thing. I<br/>14 mean, they would keylog, right, I mean they<br/>15 would literally steal every key press on your<br/>16 keyword and put them all up. But that's a lot<br/>17 more data. They could steal your mass PIQs.<br/>18 They could take pictures of you through the<br/>19 camera on your computer, you know.<br/>20 Q. Are keyloggers a form of data<br/>21 exfiltration?<br/>22 A. Well, a keylogger generally refers to<br/>23 the software that's recording all your keys. In<br/>24 general, since the point of it is to steal it,<br/>25 the bad guys are going to want to get away with</p> | <p style="text-align: right;">Page 144</p> <p>1 So in short, as part of the preparation for the<br/>2 deposition.<br/>3 Q. Earlier you testified, you mentioned<br/>4 in preparation for your deposition today you had<br/>5 reviewed the '193 reexamination case; is that<br/>6 correct?<br/>7 A. I don't think that's exactly what I<br/>8 said. I'd have to look back at the record. But<br/>9 I don't believe I reviewed it in totality. I<br/>10 think I just have a recollection of dipping<br/>11 briefly into the '193 re-examination. I don't<br/>12 even know if I can remember why off the top of<br/>13 my head. You were just asking for all the<br/>14 documents I looked at, and I was trying to<br/>15 remember.<br/>16 Q. In preparing --<br/>17 A. Actually, I have a recollection of<br/>18 checking that and the '343 prosecution history<br/>19 probably just, you know, around areas that I had<br/>20 cited in my declaration, but I don't remember<br/>21 exactly. Because I'm just trying to get<br/>22 everything back into my memory, right, not<br/>23 having thought about this too much since I did<br/>24 the declaration.<br/>25 Q. Okay. In preparing your declaration,</p> |

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| <p style="text-align: right;">Page 145</p> <p>1 did you review the '193 re-examination?</p> <p>2 A. Yeah, I mean, I have a discussion of</p> <p>3 it in my declaration, right, so yeah.</p> <p>4 Q. Did you review the patent office's</p> <p>5 allowance of the '193 Patent?</p> <p>6 A. Do I cite it? I mean, back when I was</p> <p>7 working on my '193 declaration I obviously would</p> <p>8 have done. I don't remember if I did -- I mean,</p> <p>9 if I reviewed it, I would have cited it.</p> <p>10 Q. Let me be more precise.</p> <p>11 Preparing your declaration, did you</p> <p>12 review the patent office's notice of intent to</p> <p>13 issue ex parte re-examination certificate?</p> <p>14 A. I don't remember.</p> <p>15 MR. ENG: I'm going to upload</p> <p>16 Exhibit 1085.</p> <p>17 THE WITNESS: Okay, I have 1085</p> <p>18 up.</p> <p>19 BY MR. ENG:</p> <p>20 Q. Okay. Can you turn to page -- let's</p> <p>21 start on Page 5.</p> <p>22 A. Are you using internal page numbers or</p> <p>23 are they exhibit numbers?</p> <p>24 Q. I believe they're one and the same,</p> <p>25 exhibit numbers.</p>                                                                                               | <p style="text-align: right;">Page 147</p> <p>1 A. Yeah, I think so. I'm just going to</p> <p>2 verify that. Paragraph 62, you know, I cite to</p> <p>3 this ex parte reexamination. So you know, I</p> <p>4 definitely read the portions that I'm citing to</p> <p>5 you.</p> <p>6 Q. And then Paragraph 64 you're also</p> <p>7 referring to the '193 case; is that correct?</p> <p>8 A. Yep.</p> <p>9 Q. So turning back to Page 7,</p> <p>10 Exhibit 1085 --</p> <p>11 A. Yep.</p> <p>12 Q. -- this is these are reasons for</p> <p>13 patentability and/or confirmation. In the first</p> <p>14 paragraph are -- actually, okay. Do you see</p> <p>15 where it says: However, the examiner agrees</p> <p>16 with the patent owner's argument that Sourcefire</p> <p>17 does not disclose a filtering process, which</p> <p>18 includes a series of steps recited in the</p> <p>19 claims, and a person of ordinary skill in the</p> <p>20 art would unlikely to be motivated to apply a</p> <p>21 first operator to drop packets associated with a</p> <p>22 particular type of transfer, and a second</p> <p>23 operator to forward packets not associated with</p> <p>24 a particular type of bad transfer toward a third</p> <p>25 network recited in the claim.</p>                            |
| <p style="text-align: right;">Page 146</p> <p>1 A. Because I have a thing that says</p> <p>2 Page 5 at the top, but Keysight EX-1085 at the</p> <p>3 bottom. But if we use the exhibit numbers, it</p> <p>4 will probably be clear.</p> <p>5 Q. Okay, the numbers at the bottom right.</p> <p>6 A. Right. So you mean Page 5 and the</p> <p>7 exhibit page numbers at the bottom right, okay.</p> <p>8 So notice of intent to issue ex parte</p> <p>9 reexamination certificate.</p> <p>10 Q. Right. Okay, on the next page do you</p> <p>11 see that section: Statement of reasons for</p> <p>12 patentability and their confirmation?</p> <p>13 A. Yep, I see it.</p> <p>14 Q. Do you recall reviewing this document</p> <p>15 when preparing your declaration for the '343</p> <p>16 Patent?</p> <p>17 A. I definitely reviewed portions of the</p> <p>18 1085. Obviously, you know, like a lot of these</p> <p>19 things, it's huge. But in preparing -- in</p> <p>20 preparing (6c) of my declaration, which is the</p> <p>21 antecedence to the '343 Patent, I believe that's</p> <p>22 right.</p> <p>23 Q. You're referring to Section 60,</p> <p>24 beginning on Page 36 of your declaration; is</p> <p>25 that right?</p> | <p style="text-align: right;">Page 148</p> <p>1 Do you see that part?</p> <p>2 A. I see that paragraph.</p> <p>3 Q. And then the last sentence, do you see</p> <p>4 where it says: In view of the objective indicia</p> <p>5 of non-obviousness presented in the record, the</p> <p>6 examiner agrees to withdraw the objection based</p> <p>7 on obviousness.</p> <p>8 Do you see that?</p> <p>9 A. I see this paragraph, I see what it</p> <p>10 says, yes.</p> <p>11 Q. Okay. In preparing your declaration,</p> <p>12 did you consider the evidence of -- well, first</p> <p>13 of all, what is your understanding of objective</p> <p>14 indicia of non-obviousness?</p> <p>15 A. So I'm a little worried here because I</p> <p>16 definitely did not review my '193 declaration,</p> <p>17 right, or the '193 Patent claims in preparation</p> <p>18 for this deposition. So I'm just -- I don't</p> <p>19 want to get off my skis and be opining about</p> <p>20 '193 beyond what I wrote in my declaration when</p> <p>21 I'm here to be deposed about the '343, right,</p> <p>22 and these claims I have studied recently.</p> <p>23 Q. Okay, I understand that. I mean, my</p> <p>24 questions will be all relevant towards the '343</p> <p>25 Patent. So just to rephrase -- restate the</p> |

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| <p>1 question.<br/>2 What is your understanding of<br/>3 objective indicia of non-obviousness?<br/>4 A. You know, I don't know what the --<br/>5 without having gone back and reviewed the<br/>6 record, it's not obvious to me, just reading<br/>7 this paragraph in isolation, what the objective<br/>8 indicia of non-obviousness that the patent<br/>9 examiner is referring to when he or she says<br/>10 it's presented in the record. I'm not sure what<br/>11 they're alluding to without going and doing a<br/>12 bunch more review.<br/>13 Q. Can you turn towards Paragraph 30 of<br/>14 your declaration and let me know if that<br/>15 refreshes your recollection?<br/>16 A. Page 30 or --<br/>17 Q. 3-0 of --<br/>18 A. Page or paragraph?<br/>19 Q. Paragraph.<br/>20 A. Okay. So are you asking in general<br/>21 about reconsiderations, or the specific<br/>22 objective indicia presented in the record that<br/>23 the examiner is referring to in this paragraph<br/>24 that you pointed me?<br/>25 Q. Right now I'm going to ask you about</p>                                                                               | <p>Page 149</p> <p>1 So my question is did you review any<br/>2 evidence of secondary considerations in the '193<br/>3 re-exam when you were rendering your opinions<br/>4 about the '343 Patent?<br/>5 A. I'm not going to remember off the top<br/>6 of my head. I'd have to go through my<br/>7 declaration and see what I said.<br/>8 Q. Okay. You have a paragraph starting<br/>9 on 296, Paragraph 296. Maybe that might refresh<br/>10 some of your recollection, and then let me<br/>11 know -- let me know if that refreshes your<br/>12 memory.<br/>13 A. Yeah, so I mean, this is expressing my<br/>14 opinion with respect to the '343, you know, that<br/>15 I articulated earlier in the context of the<br/>16 actual patent disclosure that I've always felt<br/>17 that it's very late, very derivative of stuff<br/>18 that was very well known.<br/>19 Q. So in rendering your opinions about<br/>20 the validity of the '343 Patent, you did not<br/>21 review the evidence of non-obviousness --<br/>22 evidence of objective indicia of non-obviousness<br/>23 in the '193 re-exam; correct?<br/>24 A. I said I did not remember. I mean, if<br/>25 you want to point me to that, I'm happy to take</p> <p>Page 151</p> |
| <p>1 in general.<br/>2 A. So in general, as I said in my<br/>3 declaration, the secondary considerations are<br/>4 basically stuff other than the intrinsic<br/>5 evidence of the patent itself, you know, as it<br/>6 says in the declaration, commercial success of<br/>7 the products covered by the patent claims, if<br/>8 there's an appropriate nexus to the claimed<br/>9 invention, right, if the thing that the patent<br/>10 claim's occurring is really the thing that the<br/>11 customers are finding valuable and painful: A<br/>12 long-felt need for the invention, failed<br/>13 attempts by others to make the invention, et<br/>14 cetera, et cetera. I can read the paragraph<br/>15 that you have at the --<br/>16 Q. Okay. So now turning back towards<br/>17 Exhibit 1085, the last sentence where it<br/>18 discusses -- where the examiner mentions obvious<br/>19 indicia of non-obviousness presented in the<br/>20 record of the '193 Patent, okay?<br/>21 A. Yeah. Point me to where he's<br/>22 referring to in the record, so I can review<br/>23 that.<br/>24 Q. Okay. Let me finish my question<br/>25 first.</p> | <p>Page 150</p> <p>1 a look.<br/>2 Q. In Paragraph 297 of your declaration<br/>3 you mention that it was your understanding that<br/>4 the patent owner had argued evidence showing<br/>5 objective indicia of non-obviousness in the IPR<br/>6 of the '552 Patent; correct?<br/>7 A. Yep, that's what it says there, yeah.<br/>8 Q. You don't mention -- you don't mention<br/>9 in this paragraph that it was your -- you don't<br/>10 mention in this paragraph that you are aware of<br/>11 evidence showing objective indicia of<br/>12 non-obviousness in the '193 Patent re-exam;<br/>13 correct?<br/>14 A. I don't mention it, that's correct. I<br/>15 mean, in this section, Section 10, objective<br/>16 indicia of non-obviousness, I discuss the '343<br/>17 and the '552. I do not mention the '193, that's<br/>18 correct.<br/>19 Q. Do you recall earlier in your<br/>20 testimony we discussed the rule SID:2003937 with<br/>21 the, I think it was, the Bandoek trojan malware?<br/>22 A. The rule for Emerging Threats<br/>23 directly?<br/>24 Q. Correct.<br/>25 A. Yeah.</p> <p>Page 152</p>                                                                                                                            |

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| 1<br>2<br>3<br>4<br>5<br>6<br>7<br>8<br>9<br>10<br>11<br>12<br>13<br>14<br>15<br>16<br>17<br>18<br>19<br>20<br>21<br>22<br>23<br>24<br>25 | <p style="text-align: right;">Page 153</p> <p>Q. I think you mentioned that you became aware of that rule after reading our -- the patent owner's preliminary response; correct?</p> <p>A. Yeah, that was part of my deposition prep, yeah.</p> <p>Q. Why did you feel the need to look for a rule like that?</p> <p>A. You know, I was looking for additional rules that had a POST end, and that would -- you know, my contention is there's a lot of rules that fall under these claims, so I just started trolling through looking for them, and --</p> <p>COURT REPORTER: (Requests clarification.)</p> <p>THE WITNESS: Yeah, I just started trolling through looking for the ones that had content:"POST", you know, because that's what Zuk says to do in 2002, right, and I found a bunch and then I ran a couple of them and stuff, mm-hmm.</p> <p>MR. ENG: I have no further questions.</p> <p>MR. DONOVAN: I have no questions. We will read and sign.</p> <p>COURT REPORTER: (Requests orders</p> |  |
| 1<br>2<br>3<br>4<br>5<br>6<br>7<br>8<br>9<br>10<br>11<br>12<br>13<br>14<br>15<br>16<br>17<br>18<br>19<br>20<br>21<br>22<br>23<br>24<br>25 | <p style="text-align: right;">Page 154</p> <p>for the record.)</p> <p>MR. ENG: Standard order is fine for us.</p> <p>MR. DONOVAN: Standard is fine here, too.</p> <p>(Exhibit A marked for identification at the conclusion of the deposition.)</p> <p>(2:30 p.m. - Adjournment.)</p> <p style="text-align: center;">** ** *</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |

|    |                                                  |
|----|--------------------------------------------------|
| 1  | C E R T I F I C A T E                            |
| 2  | STATE OF NEBRASKA )                              |
| 3  | COUNTY OF DOUGLAS ) Ss.                          |
| 4  | I, Cheryl A. Rooney, Registered                  |
| 5  | Professional Reporter, General Notary Public     |
| 6  | within and for the State of Nebraska, do hereby  |
| 7  | certify that the foregoing testimony of STUART   |
| 8  | STANIFORD was taken by me in shorthand and       |
| 9  | thereafter reduced to typewriting by use of      |
| 10 | Computer-Aided Transcription, and the foregoing  |
| 11 | 155 (one hundred fifty-five) pages contain a     |
| 12 | full, true, and correct transcription of all the |
| 13 | testimony of said witness, to the best of my     |
| 14 | ability;                                         |
| 15 | That I am not a kin or in any way                |
| 16 | associated with any of the parties to said cause |
| 17 | of action, or their counsel, and that I am not   |
| 18 | interested in the event thereof.                 |
| 19 | IN WITNESS WHEREOF, I hereunto affix             |
| 20 | my signature and seal this 24th of October,      |
| 21 | 2023.                                            |
| 22 | _____                                            |
| 23 | CHERYL A. ROONEY, RPR                            |
| 24 | GENERAL NOTARY PUBLIC                            |
| 25 | Registered Professional Reporter                 |
|    | My Commission Expires: November 24, 2026         |

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