

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

3
4 NETFLIX, INC.,)
)
5 Petitioner,) CASE NO.
) IPR2020-01582
6 vs.)
)
7)
8 AVAGO TECHNOLOGIES)
9 INTERNATIONAL SALES PTE.)
LIMITED,)
)
Patent Owner.)
10 _____)

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12
13 REMOTE DEPOSITION OF DAVID ROSENBLUM, PH.D.

14 FRIDAY, AUGUST 6, 2021

15 7:30 A.M.
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24 REPORTED BY: KATHERINE FERGUSON, CSR NO. 12332

25 JOB NO. 197950

<p style="text-align: right;">Page 2</p> <p>1</p> <p>2</p> <p>3</p> <p>4</p> <p>5 August 6, 2021</p> <p>6 7:30 a.m.</p> <p>7</p> <p>8</p> <p>9 Deposition of DAVID ROSENBLUM, PH.D., held</p> <p>10 remotely, before Katherine Ferguson, Certified</p> <p>11 Shorthand Reporter.</p> <p>12</p> <p>13</p> <p>14</p> <p>15</p> <p>16</p> <p>17</p> <p>18</p> <p>19</p> <p>20</p> <p>21</p> <p>22</p> <p>23</p> <p>24</p> <p>25</p>	<p style="text-align: right;">Page 3</p> <p>1 APPEARANCES:</p> <p>2</p> <p>3 FOR PETITIONER:</p> <p>4 SHEPPARD, MULLIN, RICHTER & HAMPTON</p> <p>5 BY: JEFFREY LIANG, ESQ.</p> <p>6 379 Lytton Avenue</p> <p>7 Palo Alto, California 94301</p> <p>8</p> <p>9 FOR PATENT OWNER:</p> <p>10 ADSERO</p> <p>11 BY: DANIEL YOUNG, ESQ.</p> <p>12 8210 Southpark Terrace</p> <p>13 Littleton, Colorado 80120</p> <p>14</p> <p>15</p> <p>16</p> <p>17</p> <p>18</p> <p>19</p> <p>20</p> <p>21</p> <p>22</p> <p>23</p> <p>24</p> <p>25</p>
<p style="text-align: right;">Page 4</p> <p>1 FRIDAY, AUGUST 6, 2021</p> <p>2 7:30 A.M.</p> <p>3</p> <p>4 DAVID ROSENBLUM, PH.D.,</p> <p>5 called as a witness by and on behalf of the Patent</p> <p>6 Owner, and having been first duly sworn by the</p> <p>7 Certified Shorthand Reporter, was examined and</p> <p>8 testified as follows:</p> <p>9</p> <p>10 EXAMINATION</p> <p>11 BY MR. LIANG:</p> <p>12 Q Hi, Dr. Rosenblum. Good morning.</p> <p>13 A Good morning.</p> <p>14 Q Can you please state your name for the</p> <p>15 record?</p> <p>16 A My name is David Samuel Rosenblum.</p> <p>17 Q And I want to go over a few preliminary</p> <p>18 issues.</p> <p>19 How many depositions have you given</p> <p>20 previously?</p> <p>21 A This is my first.</p> <p>22 Q Let me go over some basic ground rules</p> <p>23 then.</p> <p>24 You understand that you're under oath to</p> <p>25 tell the truth today, right?</p>	<p style="text-align: right;">Page 5</p> <p>1 A Yes.</p> <p>2 Q And since we are -- we are taking -- well,</p> <p>3 there's a court reporter here, so we'll need verbal</p> <p>4 responses for the court reporter --</p> <p>5 A Okay.</p> <p>6 Q -- as opposed to nods or head shakes, we'll</p> <p>7 need yeses and nos, things of that sort.</p> <p>8 A Okay.</p> <p>9 Q And we can take a break when you need it.</p> <p>10 I ask that there's no question pending. So if you</p> <p>11 have a question pending, we finish the question and</p> <p>12 then we can take a break if needed.</p> <p>13 A Okay.</p> <p>14 Q You understand that today you're not</p> <p>15 allowed to discuss your testimony with your counsel</p> <p>16 during the breaks, correct?</p> <p>17 A Yes, I understand.</p> <p>18 Q Now, if you don't understand one of my</p> <p>19 questions, just let me know and I'll rephrase it,</p> <p>20 alright?</p> <p>21 A Okay.</p> <p>22 Q But unless you say otherwise, I'll assume</p> <p>23 that you understood the question; is that fair?</p> <p>24 A Okay. Fair enough.</p> <p>25 Q Now, you understand that you have to answer</p>

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1 my questions today unless your attorney instructs
2 otherwise?
3 A Yes, I understand.
4 Q Are you on any medication today?
5 A No.
6 Q Is there any reason that you can't provide
7 truthful and accurate testimony today?
8 A No reason.
9 Q Today you are here to give testimony in the
10 inter partes review proceeding involving U.S. Patent
11 Number 8,572,138; is that correct?
12 A Yes, that's correct.
13 Q And during today, if I refer to that as the
14 "138 patent," you'll understand that I'm talking
15 about U.S. Patent 8,572,138; is that fair?
16 A Yes, that's right, the Sundar patent.
17 Q Now, you submitted a declaration in this
18 proceeding, correct?
19 A Yes, that's right.
20 Q I believe that's Exhibit 2001, correct?
21 A That sounds right.
22 Q Now, are there any errors in your
23 declaration?
24 A Not that I'm aware of. Not that I've
25 noticed since submitting it.

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1 stand behind it.
2 Q How much time did you spend preparing your
3 declaration?
4 A You know, I guess there's different aspects
5 of that. There were two or three months of
6 discussions with counsel discussing different aspects
7 of the patent and the asserted prior art. The
8 declaration is the result of those discussions. So
9 depends whether you're talking about the full period
10 of discussions plus actual drafting and review of the
11 declaration or if you're referring just to the
12 drafting of the document itself and the review of the
13 content of the document. The drafting and review
14 took place over, I would say, a period of a couple of
15 weeks.
16 Q And just roughly, how many hours are we
17 talking about; 10 hours? 20 hours?
18 A Again, are you referring to the full period
19 of discussions plus the drafting and review or just
20 the document itself?
21 Q Let's just start with the document itself.
22 A I would say that I -- I personally probably
23 spent a total of, let's say, four or five hours,
24 roughly, on it in terms of reviewing the initial
25 draft, deciding on changes, suggesting changes, you

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1 Q Is there anything in your declaration that
2 you want to change?
3 A Nothing. No.
4 Q Did you draft your declaration?
5 A I drafted it in collaboration with counsel.
6 Q Did you draft -- do the first draft of your
7 declaration?
8 A I didn't personally write the first draft,
9 no.
10 Q What portion of the declaration did you
11 draft?
12 A The -- in terms of personally writing the
13 words for the declaration, there are probably on the
14 order of a half dozen paragraphs, I would say.
15 Q Which paragraphs would those be?
16 A If I can refer to my declaration here, I'm
17 looking at my declaration, so paragraph 139 was a
18 paragraph that I provided, paragraph 140 is a
19 paragraph that I provided, drafted and provided,
20 paragraph 147. I believe these were three
21 paragraphs -- the three paragraphs that I provided, I
22 would say, in the late stages of the -- you know, the
23 collaborative discussion and drafting of this
24 declaration. I would also say at the end of the day,
25 everything in this declaration is my opinion and I

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1 know, ensuring that my understanding of things was
2 clear in the document, drafting these additional
3 paragraphs that I just mentioned to you. Four or
4 five hours, maybe a little more than that, but in
5 that ballpark I would say.
6 Q And then other than the four to five hours
7 talking about some of the analysis work you mentioned
8 before that, how long did you spend working on this
9 proceeding before the drafting of your declaration
10 began?
11 A Again, I could check my records if that
12 would help, but my guess would be roughly 20 hours,
13 let's say, 20, 25 hours in my own personal review
14 time of the materials, discussion with counsel.
15 Q What materials did you review in
16 preparation while you were preparing your
17 declaration?
18 A I reviewed the Sundar patent, I reviewed
19 the Khandekar and Le patents, I read through the
20 Stone and Sidebottom patents. The other exhibits
21 that have been provided as part of the record here,
22 I've looked through them, familiarized myself with
23 them, but probably not to the extent that I reviewed
24 those documents that I just mentioned.
25 Q Would it be fair to say that everything

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1 that you reviewed during your work in this proceeding
2 leading up to your declaration, that everything you
3 reviewed in preparation for the declaration is cited
4 somewhere in your declaration were the materials
5 considered?

6 A I think that's fair to say. I mean, if
7 there was, you know, maybe some words, some concept,
8 some reference to, you know, some particular system,
9 I might have looked it up on the internet. But I
10 think the -- I think it's fair to say that the
11 declaration by and large is based on my review of
12 those materials that I just mentioned.

13 Q What terms did you look up on the internet?

14 A Oh, I can't even remember. I'm just -- you
15 know, it's just -- there might have been something
16 where I thought, let me try to double check that and
17 find something on the internet; maybe there was an
18 acronym somewhere that I wasn't quite sure what it
19 referred to and I wanted to confirm my understanding
20 of it. But I don't have a specific understanding of
21 what those searches were.

22 Q So for the deposition today, do you have
23 any documents accessible to you that are related to
24 this proceeding?

25 A So I have printed copies of eight of the

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1 binder, do you have access to any other physical
2 documents in your room that are related to this
3 proceeding?

4 A No.

5 Q Okay. Now, you -- we are taking this
6 deposition remotely over Zoom and so we are on our
7 computers using Zoom.

8 A Right.

9 Q So I would ask that you use your computer
10 only for Zoom for this deposition and not to use your
11 computer to access other information or communicate
12 with other people during this deposition; is that
13 fair?

14 A Okay. That's fair, yes. I have all of my
15 windows closed except for the Zoom window and one
16 browser window for access of the shared file.

17 Q Great. And that share file, I'll let you
18 know when we upload exhibits for review.

19 A Okay.

20 Q Now, the -- if you look, for example, at
21 the 138 patent, Exhibit 1001, if you look at the
22 bottom, there's a stamp that says Exhibit 1001.

23 A Right.

24 Q So the exhibits that have been submitted in
25 this proceeding have stamps at the bottom, Exhibit

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1 documents in front of me here. If necessary, I could
2 open up PDFs of other documents on my computer. I'm
3 assuming documents that you're going to ask me
4 questions about, though, would have actually showed
5 up in that share file folder.

6 Q What eight documents do you have in front
7 of you?

8 A So I have the -- I have a full copy of the
9 Sundar patent. I have a copy of the petition for the
10 review for the inner partes review. I have a copy of
11 the patent owner response. I have a copy of my
12 declaration. I have a copy of the Khandekar patent,
13 copy of the Le patent, copy of the Sidebottom patent
14 and a copy of the Stone patent. Those are the
15 documents that I have in front of me in hard copy
16 form inside of a binder.

17 Q And other than those eight documents that
18 you have in a binder, do you have access to any other
19 physical documents in your room?

20 A I have my office library. It's a bookshelf
21 with textbooks, conference proceedings, journals,
22 those sorts of things, but nothing I would be able
23 to --

24 Q Let me rephrase I guess.
25 Those eight documents that you have in your

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1 1000 something or Exhibit 2000 something.

2 Do you see that?

3 A Yes. Bottom of each page, yes.

4 Q Have you reviewed any exhibits or any
5 documents other than the ones that have been
6 submitted in this proceeding?

7 A Not that I can recall, no.

8 Q How much time did you spend preparing for
9 this deposition?

10 A Oh, I would say, again, on the order of
11 four, five hours reviewing my declaration, going
12 through the patents one last time, you know, having a
13 final conversation with counsel.

14 Q Did you review any documents during your
15 preparation for this deposition?

16 A Well, I just mentioned the patents, the
17 Sundar patent, Khandekar, et cetera, reviewed my
18 declaration, went through it again, made sure I had a
19 good sense of the structure and where different
20 things were located. Those are the primary
21 documents. I did -- you know, some of the exhibits
22 were things that I hadn't really looked through
23 before. I reviewed those, made sure that I had --
24 put it this way, I made sure that I had at least
25 looked through and familiarized myself with the

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1 outlines of at least any of the exhibits that I
 2 hadn't previously reviewed in detail let's say, put
 3 it that way.

4 Q So did you say that you just reviewed some
 5 outlines of exhibits?

6 A No. No, I must have misspoken. No, I
 7 didn't say that. What I said or what I meant, at
 8 least, was any exhibits that I had not previously
 9 reviewed in detail for a very detailed precise
 10 understanding of the content, I went through and made
 11 sure that I was at least familiar with, you know, the
 12 gist of what the exhibit was about.

13 Q Okay. Which exhibits would those be that
 14 you reviewed more carefully?

15 A The ones I reviewed more carefully were the
 16 ones I reviewed previously; the Sundar patent,
 17 Khandekar, Le, perhaps to a somewhat lesser extent
 18 Stone and Sidebottom. Those are the grounds, of
 19 course, for the challenges to the claims in Sundar
 20 and those are the ones that I reviewed most deeply.
 21 Other documents I reviewed to a lesser extent.

22 Q Which documents did you review to a lesser
 23 extent?

24 A Well, let's see, so if I can find that list
 25 of documents, for example, in -- I'm looking now at

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1 back and focussed my attention on the areas that I
 2 felt were most relevant to the -- to the challenges.

3 Q How much time in total have you spent, not
 4 just in preparation for the deposition today, but
 5 just in total, how much time have you spent reading
 6 and reviewing the 138 patent, roughly?

7 A Again, it's probably on the order of three,
 8 four hours, maybe five hours. I should say that
 9 these estimates of time spent are very approximate.
 10 It's just kind of intuitive sense of the amount of
 11 time that I spent on things. It might have been
 12 more, might have been less. At least in the case of
 13 the 138 patent, I spent at least four hours reviewing
 14 it.

15 Q Okay. I guess -- so I'm just trying to
 16 make sure I understand.

17 You said roughly four hours total effort
 18 reviewing it, right; is that what you said?

19 A Roughly, yes.

20 Q Okay. Do you believe you have an adequate
 21 understanding of the 138 patent?

22 A Yes, I do.

23 Q Is there anything you think is unclear
 24 about the 138 patent?

25 A I can't think of anything, no.

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1 page Romanette 7 -- sorry, page Romanette 6 in the
 2 patent owner's response. I'm looking at the list of
 3 exhibits here. So the -- let's see, so certainly
 4 Exhibit 1001. I looked a little bit at some of the
 5 prosecution file history, but certainly not in any
 6 great depth. I did review the declaration of
 7 Dr. Shenoy (ph) very carefully. Apologize for not
 8 mentioning that one before. Exhibits 1004 to 7,
 9 those are the ones that I reviewed in detail. And
 10 looking at the remaining exhibits in the list in the
 11 1000s at least, Exhibits 1008 through 1017 are
 12 exhibits that, you know, I sort of browsed through
 13 just to familiarize myself with their content, except
 14 for Exhibit 1015 because it's in Japanese. And then
 15 Exhibit 2001, of course, is my own. I read the
 16 deposition transcript very carefully of Dr. Shenoy,
 17 2002. 2003, I browsed through for familiarity.
 18 2004, 05, 06, those are exhibits I submitted in
 19 conjunction with my declaration.

20 Q How much time have you spent reading and
 21 reviewing the 138 patent in preparation for this
 22 deposition?

23 A Reading and reviewing the 138 patent, I
 24 would say roughly on the order of three hours. I did
 25 a very careful read at the beginning and then went

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1 Q When were you first approached by Avago
 2 regarding being an expert for them in this
 3 proceeding?

4 A I believe it was in March of this year.

5 Q How are you being compensated for your work
 6 in this matter?

7 A Sorry, you asked how am I being
 8 compensated?

9 Q Right.

10 How are you being compensated for your work
 11 in this IPR proceeding?

12 A So I'm billing \$500 per hour for every hour
 13 spent on the work on this patent.

14 Q Have you ever worked as an expert in any
 15 other patent matter before this?

16 A Not in patent matters. Not as an expert
 17 witness. I've been an inventor on a number of
 18 patents.

19 Q Have you -- have you ever worked as an
 20 expert in any litigation matter before this one?

21 A I served -- well, I'm not sure if
 22 Department of Labor, alien certification case would
 23 count as litigation. I provided expert affidavits
 24 on, I believe it was two alien certification cases.
 25 I also provided an expert affidavit for kind of a

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1 contractual dispute in a county court in the UK. And
2 if I'm not mistaken, those would be the three
3 instances where I provided expert witness work in a
4 legal setting.
5 Q Have you ever been a nontestifying
6 consultant for any legal matters other than the ones
7 you just mentioned?
8 A Not that I can think of.
9 Q And you get what I'm asking about, right,
10 how sometimes there are experts that give depositions
11 and testify and then there's sometimes experts that
12 are just giving advice on the side.
13 So I wanted to get a sense for whether you
14 had been an expert giving advice on the side?
15 A No, I understood. You meant something on a
16 somewhat more informal basis. And you know, as I
17 say, I can't -- can't think of anything unless you
18 were to count, you know, consulting with colleagues.
19 So many of the patents that I've worked as an
20 inventor on were done as part of my work with a
21 startup company about 15, 20 years ago. And there
22 were other patents to come out of that company. And
23 so I, you know, advised the patent attorneys
24 developing those patents, I worked with the inventors
25 to make suggestions. So I suppose you could consider

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1 A I would consider myself to be a person of
2 extraordinary skill in the art. I certainly have the
3 attributes of a person of ordinary skill in the art,
4 but by virtue of expertise and research and education
5 my expertise probably goes beyond that of a person of
6 ordinary skill.
7 Q Do you consider yourself to be an expert in
8 virtualization?
9 A I have worked on research projects
10 involving virtualization, so I have expertise in
11 virtualization.
12 Q What kind of research projects have you
13 worked on involving virtualization?
14 A To give you one example, my most
15 highly-cited research is research on
16 publish-subscribe style communication. It's a
17 particular style of communication for large-scale
18 distributed systems. A key element of what was done
19 in that research was to design architectures and
20 protocols for specialized network routers that would
21 support this style of communication. And those
22 network routers are essentially virtual machines that
23 provide this publish-subscribe extraction to other
24 software applications while implementing that
25 abstraction with respect to lower level protocols and

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1 that to be consultative on patents where I wasn't
2 listed as an inventor.
3 Q Have any of the patents where you've been
4 listed as an inventor, have any of those patents been
5 asserted in litigation?
6 A Not that I'm aware of.
7 Q And beyond being an expert, have you been a
8 witness in any litigation?
9 A No.
10 Q So sometime today we may refer to a term,
11 "person of ordinary skill in the art."
12 Are you familiar with that term?
13 A Yes, I outlined in my declaration what I
14 consider to be a person of ordinary skill in the art.
15 Q And today, if I refer to the person of
16 ordinary skill in the art by an acronym, POSITA,
17 spelled P-O-S-I-T-A, you'll understand that I'm
18 referring to that person of skill in the art; is that
19 fair?
20 A Yes, that's fair. I've seen that reference
21 made in many of the documents, in Dr. Shenoy's
22 declaration for example, and in my own I believe.
23 Q Do you consider yourself to be a person of
24 ordinary skill in the art in the area of
25 distributed booting systems?

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1 resources of the underlying network and underlying
2 distributed system.
3 Q So those routers would run virtual machine
4 managers and then they would have virtual machines
5 running on top?
6 A You could think of it that way, yes. The
7 piece of router software running on a particular node
8 in the distributed system could be considered the
9 analog of the virtual machine manager like we find in
10 Sundar, and then the runtime environment that a
11 software application would connect to could be
12 considered the analog of the virtual machine that you
13 find in the Sundar patent.
14 Q You said "could be considered the analog."
15 It wasn't actually a virtual machine?
16 MR. YOUNG: Objection, form.
17 THE WITNESS: It was a -- I would call it a
18 virtual machine, at least as a concept, as I
19 understand the concept of a virtual machine.
20 BY MR. LIANG:
21 Q Is there something that would be a more apt
22 term to use? It seems like you were hesitant
23 originally to call it a virtual machine manager and a
24 virtual machine.
25 MR. YOUNG: Objection, form.

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1 THE WITNESS: Well, I can tell you if you
2 look in the papers that I published on that work, I
3 did not use the term "virtual machine." But as far
4 as I'm concerned, the concept is analogous.
5 BY MR. LIANG:
6 Q What terms did you use in that paper?
7 A Used the term "router," used the term
8 "overlay" for example in the -- you know, in the
9 particular sub area of computing dealing with
10 networks. It's quite common to refer to these kinds
11 of abstraction layers that you put on top of the
12 underlying network (audio drop) those as overlays
13 rather than virtual machines. But unfortunately, in
14 computer science, we lots of times invent new terms
15 for concepts that already exist and for which there
16 exists, you know, perfectly adequate terms already.
17 It's just kind of the nature of the field.
18 Q So your testimony today is that a network
19 abstraction layer is a virtual machine; is that
20 correct?
21 MR. YOUNG: Objection, form.
22 THE WITNESS: I believe that it's -- that
23 it's reasonable to characterize that kind of software
24 that I described as a virtual machine. It's
25 providing an abstraction with certain kinds of

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1 of (indecipherable) that you've looked at over the
2 years.
3 A Yes.
4 Q And you mentioned your current research
5 focuses on the use of machine learning for various
6 things including the Internet of Things.
7 So what type of distributed systems have
8 you focussed on in your research?
9 A So -- well, I guess the easy answer is to
10 say anything from, let's call it a local network or
11 enterprise network of nodes constituting a
12 distributed system, all the way to the full-blown
13 internet.
14 Q It seems like you have a lot of papers --
15 I'm just looking through your CV. It seems like you
16 have a lot of papers on sensor networks or mobile
17 sensor networks; is that right?
18 A I've done some work with sensors, the use
19 of sensors in the Internet of Things, the
20 exploitation of sensors that reside on smart phones
21 that could be used to sense things in the environment
22 of the smart phone for different purposes such as
23 activity recognition, for example.
24 Q Have you published any papers that actually
25 use the word "virtual machine"?

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1 functionality that are accessible to software
2 applications.
3 BY MR. LIANG:
4 Q And which paper are you referring to?
5 A So if you -- if you were to look at my CV,
6 I'm not sure which page number this is of the
7 declaration PDF file, but if you were to look at -- I
8 have separate page numbers on the bottom of the CV
9 that was included with my declaration. So if you
10 were to look at -- sorry -- page 8 of my CV, paper
11 J16, design and evaluation of a wide area event
12 notification service, that's kind of the primary
13 publication on that line of research, the culmination
14 of that line of research. And it also happens to be
15 my most highly-cited publication, 2200 citations in
16 Google Scholar, roughly.
17 Q Now, if we go to your -- if we go to
18 page -- stamped page 5 of your declaration, towards
19 the beginning, paragraph 6, let me know when you get
20 there.
21 A Sorry, you said paragraph 6; is that
22 correct?
23 Q Right. Paragraph 6 of your declaration.
24 A Of my declaration. Okay. I've got that.
25 Q You discuss a wide range

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1 A I think it's possible that I have. It
2 would be probably some paper dealing with work that I
3 did with cloud-computing, work that I did with
4 service discovery and distributed environment service
5 composition, service adaptation. There was a variety
6 of work that I did about 15 years ago on those kinds
7 of things.
8 Q So 15 years ago, you're thinking roughly
9 the 2006 timeframe?
10 A Somewhere around then, maybe a little bit
11 later. I worked in a European project called
12 "sensoria" where we were doing modelling of service
13 adaptation, service composition, doing this modelling
14 for purposes of verifying that the desired effects of
15 the service composition and service discovery,
16 service adaptation were being done correctly.
17 Q Can you -- withdrawn.
18 You have your CV in front of you, correct?
19 A Okay.
20 Q Can you point me to any of your papers
21 listed in your CV that actually use the word "virtual
22 machine"?
23 MR. YOUNG: Objection, form.
24 THE WITNESS: I can't point for certain to
25 such a paper. I -- let's see here. I can point you

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1 to the kinds of words that I was mentioning just a
2 moment ago where --
3 BY MR. LIANG:
4 Q We can do that in a moment.
5 Let's start with the first question of
6 whether you can point me to any of your papers that
7 are listed in your CV where the paper would use the
8 word "virtual machine"?
9 MR. YOUNG: Objection, form.
10 THE WITNESS: Offhand, I can't point you to
11 one.
12 BY MR. LIANG:
13 Q Okay. And which papers in your CV relate
14 to the cloud-computing projects you had described
15 previously?
16 A So if we go to -- let's see, it should be
17 around page 13 of the CV. Sorry, it looks more like
18 the -- if you look, for example, page 13, there is
19 conference paper C63, Bilari (ph), context to where
20 adaptive cloud service discovery for mobile systems.
21 In addition, if you go to -- again, let me find it
22 here quickly -- if you go to page 12, conference
23 paper C85, probabilistic model checking of perturbed
24 MVPs with applications to cloud-computing. So those
25 are the two that come to mind that have

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1 differences between the concept of virtual machine in
2 Sundar and the concept of virtual machine in
3 Khandekar and Le. So as terms, fine; as concepts, we
4 need to discuss that.
5 Q Got it. We'll definitely get into that
6 later today.
7 But in terms of abbreviation, if I use the
8 abbreviation "VM," you'll understand I'm using that
9 as an acronym for virtual machine, correct?
10 A Yes, that's right.
11 Q And if I use the abbreviation "VMM," you'll
12 understand that I'm referring to the term "virtual
13 machine manager," correct?
14 A Yes, or virtual machine monitor, depending
15 on the context.
16 Q Okay. You'd agree that virtual machines
17 were known and used before the 138 patent, correct?
18 A Yes.
19 Q Why were virtual machines used in the art
20 before the 138 patent?
21 MR. YOUNG: Objection, form.
22 THE WITNESS: The primary reason for using
23 virtual machines is to provide a layer of -- or to
24 provide a measure of independence from underlying
25 hardware.

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1 cloud-computing in the title.
2 Q You have several patents listed in your CV.
3 Do you have any patents that -- withdrawn.
4 Do you have any patents on virtual
5 machines?
6 A No patents on virtual machines.
7 Q So I want to make sure we're on the same
8 page about certain acronyms that may show up today,
9 probably will be mentioned today.
10 A Okay.
11 Q The first one is VM, the letters VM.
12 Is it correct that the term "virtual
13 machine" is often abbreviated as VM?
14 A Yes, that's true.
15 Q And the term "virtual machine manager" is
16 often abbreviated as VMM; is that right?
17 A Yes.
18 Q Okay. If I use the term "VM" today, you'll
19 understand I'm referring to a virtual machine; is
20 that fair?
21 A I'll understand that when you use the term
22 "VM," you're using that as shorthand for virtual
23 machine. I would say we need to be careful in
24 discussing the context in which you're asking the
25 question, though, because I believe there are

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1 BY MR. LIANG:
2 Q What do you mean by "provide a measure of
3 independence from underlying hardware"?
4 A So that software applications running on
5 top of a virtual machine don't have to concern
6 themselves with the, let's say, peculiarities or
7 low-level characteristics of the underlying hardware,
8 that the virtual machine kind of shields, if you
9 will, the software application from being exposed to
10 those underlying details. As far as the software
11 application is concerned, the virtual machine is the
12 underlying hardware.
13 Q Why was it beneficial for virtual machines
14 to provide a measure of independence from underlying
15 physical hardware?
16 A Basically otherwise it complicates the
17 development of software systems. It provides
18 portability, for example. If I have a software
19 application that I want to be able to run on, let's
20 say, three different hardware platforms, if I can --
21 if I can provide virtual machines that can run on top
22 of those three different platforms, the development
23 of the virtual machines would be much simpler than
24 the development of three different versions of the
25 presumably larger software application.

<p style="text-align: right;">Page 30</p> <p>1 Q I see.</p> <p>2 So the use of virtual machines allows the</p> <p>3 same software application to run on different</p> <p>4 underlying physical hardware platforms; is that</p> <p>5 right?</p> <p>6 A Yes.</p> <p>7 Q Have you ever heard of a hypervisor?</p> <p>8 A Yes.</p> <p>9 Q What's a hypervisor?</p> <p>10 A It's the piece of software that runs on top</p> <p>11 of either a host operating system or on the</p> <p>12 underlying bare metal machine to provide the virtual</p> <p>13 environment needed by a virtual machine.</p> <p>14 Q So I want to walk through the two versions</p> <p>15 that you just mentioned. So the first one is a piece</p> <p>16 of software that runs on top of a host operating</p> <p>17 system. In that case, the -- withdrawn.</p> <p>18 The hypervisor is a virtual machine</p> <p>19 manager, correct?</p> <p>20 A Yes.</p> <p>21 Q And in the first instance you mentioned,</p> <p>22 when the virtual machine manager is running on top of</p> <p>23 the host operating system, then the virtual machine</p> <p>24 manager would be an application and then the host</p> <p>25 operating system would be something such as Windows</p>	<p style="text-align: right;">Page 31</p> <p>1 or Linux, correct?</p> <p>2 A Yes.</p> <p>3 MR. YOUNG: Objection --</p> <p>4 THE WITNESS: From the perspective of that</p> <p>5 underlying system, the host operating system, the VMM</p> <p>6 would appear to be application.</p> <p>7 BY MR. LIANG:</p> <p>8 Q And in the second category you mentioned,</p> <p>9 the VMM runs directly on the bare metal of the</p> <p>10 machine, so directly on the hardware; is that right?</p> <p>11 A Right.</p> <p>12 Q And in that case, the virtual machine</p> <p>13 manager would be the operating system itself,</p> <p>14 correct?</p> <p>15 MR. YOUNG: Objection, form.</p> <p>16 THE WITNESS: I'm not sure I would go that</p> <p>17 far to draw that analogy. The virtual machine</p> <p>18 manager in that situation probably would not have</p> <p>19 the -- you know, the full array of characteristics</p> <p>20 and functionality that one finds in a software</p> <p>21 system.</p> <p>22 BY MR. LIANG:</p> <p>23 Q But it would be acting as its own operating</p> <p>24 system, correct?</p> <p>25 A In a sense, sure.</p>
<p style="text-align: right;">Page 32</p> <p>1 Q You used the term "host operating system."</p> <p>2 Is it correct that the host operating</p> <p>3 system would be the operating system that's running</p> <p>4 on the physical computer while a guest operating</p> <p>5 system would be the operating system that's running</p> <p>6 inside a virtual machine?</p> <p>7 A Yes. Those are the usual terms that are</p> <p>8 used for those things.</p> <p>9 Q I'd like to turn to your declaration,</p> <p>10 paragraph 25.</p> <p>11 A Okay. I've got that.</p> <p>12 Q And for reference, this is -- we are</p> <p>13 looking at stamped page 10 of Exhibit 2001, your</p> <p>14 declaration, right?</p> <p>15 A Yes, that's right.</p> <p>16 Q Now, in this paragraph, you say that</p> <p>17 "Dr. Shenoy (inaudible) variety of tasks that a</p> <p>18 POSITA would have been able to perform, I do not</p> <p>19 necessarily agree that a POSITA would have been</p> <p>20 required to perform those tasks."</p> <p>21 Do you see that?</p> <p>22 A Yes.</p> <p>23 Q Now, you say that you do not necessarily</p> <p>24 agree that a POSITA would have been required to</p> <p>25 perform those tasks, but do you agree that a POSITA</p>	<p style="text-align: right;">Page 33</p> <p>1 would have at least been able to perform the tasks</p> <p>2 that Dr. Shenoy listed?</p> <p>3 A No, I don't necessarily agree with that.</p> <p>4 Q Do you agree that a POSITA, in 2006, would</p> <p>5 have had the knowledge and skills to create a</p> <p>6 distributed computing system with a network of</p> <p>7 computing devices and servers?</p> <p>8 A I believe that some POSITAs, some persons</p> <p>9 of ordinary skill would be able to. It would depend</p> <p>10 on their specific education, background and work</p> <p>11 experience. But for the sake of argument, I think we</p> <p>12 can say that there would have been, you know, a good</p> <p>13 number of such persons able to do that.</p> <p>14 Q Do you agree that a POSITA, in 2006, would</p> <p>15 have had the knowledge and skills to use virtualized</p> <p>16 computing systems including the use of commercially</p> <p>17 available software from VMware such as ESX and GSX</p> <p>18 software?</p> <p>19 A Yes.</p> <p>20 Q Do you agree that a POSITA, in 2006, would</p> <p>21 have had the knowledge and skills to create images of</p> <p>22 physical and virtual machines including images that</p> <p>23 include virtual machine managers, operating systems</p> <p>24 and applications?</p> <p>25 A Yes.</p>

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1 Q Do you agree that a POSITA, in 2006, would
2 have had the knowledge and skills to use rules
3 engines and other knowledge-based systems to
4 automatically deploy images to nodes of a distributed
5 computing system?

6 A That's an example of a skill that I think
7 would be very dependent on the specific educational
8 background and experience where, you know, as I say
9 in my declaration, a person of ordinary skill is
10 somebody with a bachelor's degree and two years of
11 experience. For working with a rules engine, I think
12 it's less likely. It's not impossible and there
13 certainly would have been people that have those
14 skills, but I wouldn't say that it was -- put it this
15 way, I wouldn't say that it would be universally
16 expected that a POSITA would have those skills.

17 Q Is it your understanding that a POSITA is
18 presumed to be aware of all pertinent prior art?

19 A Yes.

20 Q And in forming your opinions for this
21 proceeding, did you apply an understanding that a
22 POSITA is a hypothetical person who is presumed to be
23 aware of all pertinent prior art?

24 A Yes.

25 Q And you do agree that rules engines were

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1 actually begins on the previous page, it begins on
2 page 11; is that right?

3 A Yes, that's right.

4 Q For the 138 patent, the virtual machines
5 are provided by the virtual machine manager running
6 on an application node; is that correct?

7 A Yes.

8 Q In your view, providing a virtual machine
9 is the same thing as creating a virtual machine; is
10 that right?

11 A Yes.

12 Q A virtual machine manager is required for a
13 virtual machine to run; is that right?

14 A Yes.

15 Q And for the 138 patent, the virtual machine
16 managers are executed on application nodes; is that
17 right?

18 A Yes.

19 Q The virtual machine manager runs and
20 manages the virtual machine; is that correct?

21 A Yes.

22 Q A virtual machine cannot exist without a
23 virtual machine manager that is running and managing
24 it; is that right?

25 A That's right. I would say at least in

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1 known in the art, correct?

2 A Yes.

3 Q Okay. So then the hypothetical POSITA, you
4 would agree, would have had knowledge and skills to
5 use rules engines as they were known in the art,
6 correct?

7 A Yes.

8 Q Would a POSITA, in 2006, have had the
9 knowledge and skills to implement multi-tier
10 applications and web services on distributed computer
11 systems?

12 A 2006, yes.

13 Q Would a POSITA, in 2006, have had the
14 knowledge and skills to implement systems to monitor
15 the status and state of distributing computing
16 systems?

17 A Yes, I believe that's possible.

18 Q If we turn to your declaration, paragraph
19 28.

20 A Okay.

21 Q Let me know when you get there.

22 A I'm there.

23 Q Okay. So we're looking at your
24 declaration, Exhibit 2001. The stamped page at the
25 bottom is stamped page 12. And I guess paragraph 28

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1 the -- you know, in the context of the Sundar patent.
2 If you look in the Khandekar patent, Khandekar calls
3 the captured images virtual machines. So Khandekar
4 might argue that virtual machines can exist without
5 the virtual machine manager.

6 Q And is it your view that Khandekar uses the
7 term "virtual machine" to refer to what the 138
8 patent describes as the virtual disk image?

9 A Yes.

10 Q So for a virtual machine, as that term is
11 used in the 138 patent, then a virtual machine cannot
12 exist without a virtual machine manager that is
13 running and managing it, correct?

14 A Yes, that's correct. I think the 138
15 patent clearly spells out every time there's a
16 discussion of a virtual machine, that virtual machine
17 is created or provided as a result of executing a
18 virtual machine manager.

19 Q The physical node on which a virtual
20 machine manager is executing is a physical computer,
21 correct?

22 A Yes.

23 Q So in other words, by physical computer, I
24 mean it's -- it includes physical hardware like a
25 processor, hard drives, things that you can actually

<p style="text-align: right;">Page 38</p> <p>1 see; is that fair?</p> <p>2 A Yes, physical component, electronic</p> <p>3 components, cables, a box, yes.</p> <p>4 Q And then virtual machines run on top of the</p> <p>5 virtual machine manager that's on a physical node,</p> <p>6 correct?</p> <p>7 A Yes.</p> <p>8 Q So then the physical node on which a</p> <p>9 virtual machine resides is a physical computer,</p> <p>10 correct?</p> <p>11 A Yes.</p> <p>12 Q For the 138 patent, the image instances of</p> <p>13 software applications are images of virtual machines,</p> <p>14 correct?</p> <p>15 MR. YOUNG: Objection, form.</p> <p>16 THE WITNESS: No, that's not correct.</p> <p>17 BY MR. LIANG:</p> <p>18 Q Okay. For the 138 patent, what are the</p> <p>19 image instances of software applications?</p> <p>20 A There are image instances of a guest</p> <p>21 operating system, image instances of individual</p> <p>22 software applications, image instances of a</p> <p>23 collection of software applications and guest</p> <p>24 operating systems that had been previously installed</p> <p>25 on top of a virtual machine and then snap-shotted.</p>	<p style="text-align: right;">Page 39</p> <p>1 But they're not virtual machines themselves.</p> <p>2 Q I see.</p> <p>3 So for the 138 patent, the image instances</p> <p>4 of software applications are virtual disk image files</p> <p>5 from virtual machines; is that correct?</p> <p>6 MR. YOUNG: Objection (inaudible).</p> <p>7 THE WITNESS: At least with respect to the</p> <p>8 claims, that's not a requirement of the -- of the</p> <p>9 independent claims at least. That's -- to say that</p> <p>10 they're virtual disk image files, that's an</p> <p>11 additional limitation that you find in one of the</p> <p>12 dependent claims. So the independent claims are</p> <p>13 agnostic even about the forms of those image</p> <p>14 instances.</p> <p>15 Q I see. So one type of image instance of</p> <p>16 software -- withdrawn.</p> <p>17 For the 138 patent, one type of image</p> <p>18 instance of a software application is a virtual disk</p> <p>19 image file; is that correct?</p> <p>20 A Yes. That's recited in Claim 2, I believe.</p> <p>21 Q What other types of image instances of a</p> <p>22 software application are disclosed by the 138 patent?</p> <p>23 A The 138 patent specifically mentions guest</p> <p>24 operating systems as one such example. The 138</p> <p>25 patent mentions generally software applications. I</p>
<p style="text-align: right;">Page 40</p> <p>1 believe it gives a couple of examples in there. One</p> <p>2 of the examples is recited in one of the dependent</p> <p>3 claims. So for example, dependent Claim 4 recites a</p> <p>4 server application as being one of the kinds of image</p> <p>5 instances of software applications. And my memory is</p> <p>6 a little fuzzy, but the specification may mention --</p> <p>7 may mention other examples. It might mention desktop</p> <p>8 software or other examples of software applications</p> <p>9 that could be imaged in the form of image instances.</p> <p>10 Q How would desktop software be imaged in the</p> <p>11 form of an image instance?</p> <p>12 A It would be imaged using the -- the second</p> <p>13 kind of image capture process as taught by Sundar.</p> <p>14 Q So for the 138 patent, the term "software</p> <p>15 applications" refers to both the operating system and</p> <p>16 the applications; is that correct?</p> <p>17 A Yes.</p> <p>18 Q So for example, it would refer to both</p> <p>19 Microsoft Windows and Microsoft Office if those were</p> <p>20 the software system applications, correct?</p> <p>21 A Yes, for example.</p> <p>22 Q For the 138 patent, deployment of an image</p> <p>23 instance of a software application does not require</p> <p>24 executing that image instance, correct?</p> <p>25 MR. YOUNG: Objection to form.</p>	<p style="text-align: right;">Page 41</p> <p>1 THE WITNESS: There's no -- there's no</p> <p>2 explicit requirement that deployed software</p> <p>3 applications be executed.</p> <p>4 BY MR. LIANG:</p> <p>5 Q And does Claim 1 require executing --</p> <p>6 withdrawn.</p> <p>7 Does Claim 1 require booting of virtual</p> <p>8 machines?</p> <p>9 MR. YOUNG: Objection.</p> <p>10 THE WITNESS: No. I don't see any language</p> <p>11 in Claim 1 where I would make that interpretation.</p> <p>12 BY MR. LIANG:</p> <p>13 Q Does Claim 1 require the virtual machine</p> <p>14 manager to actually be executing on an application</p> <p>15 node?</p> <p>16 A It doesn't require anything to be executed.</p> <p>17 It describes what happens when the virtual machine</p> <p>18 manager is executed.</p> <p>19 Q When the virtual machine manager is</p> <p>20 executed, it provides a plurality of virtual</p> <p>21 machines, correct?</p> <p>22 A Yes, that's correct.</p> <p>23 THE REPORTER: I'm sorry, there's a loud</p> <p>24 noise going on.</p> <p>25 (Discussion was held off the record.)</p>

<p style="text-align: right;">Page 42</p> <p>1 MR. LIANG: Let's take a break now. How</p> <p>2 long do you want to break for?</p> <p>3 MR. YOUNG: Usually we do 10 minutes.</p> <p>4 MR. LIANG: Let's do 10 minutes then.</p> <p>5 THE WITNESS: So I'll come back at 48 after</p> <p>6 the hour.</p> <p>7 (Brief recess)</p> <p>8 BY MR. LIANG:</p> <p>9 Q In the context of the 138 patent, what is a</p> <p>10 virtual machine manager?</p> <p>11 A A virtual machine manager is the piece of</p> <p>12 hardware that sits between virtual machines and</p> <p>13 either the underlying host operating system or the</p> <p>14 underlying bare hardware.</p> <p>15 Q In your last answer, I believe you may have</p> <p>16 said the virtual machine manager is hardware. Did</p> <p>17 you mean -- is that what you meant?</p> <p>18 A No, it's a piece of software.</p> <p>19 Q I think there may have been a little slip</p> <p>20 there. Let me ask you again.</p> <p>21 In the context of the 138 patent, what is a</p> <p>22 virtual machine manager?</p> <p>23 A Virtual machine manager is a software</p> <p>24 application running on top of a physical node.</p> <p>25 Q Okay. Does the 138 patent disclose any</p>	<p style="text-align: right;">Page 43</p> <p>1 examples of virtual machine manager software?</p> <p>2 A Yes, it mentions the VMware products. I</p> <p>3 don't remember specifically. It might have mentioned</p> <p>4 one other product as an alternative example, but I</p> <p>5 certainly remember it mentioning the VMware products,</p> <p>6 ESX for example.</p> <p>7 Q Okay. And if you refer to the 138 patent,</p> <p>8 Exhibit 1001, do you see any other virtual machine</p> <p>9 manager software that is mentioned other than VMware</p> <p>10 software?</p> <p>11 A I don't remember specifically. In some of</p> <p>12 the -- some of these exhibits I remember there was a</p> <p>13 mention of another -- I believe there was a mention</p> <p>14 of another nonVMware product or nonVMware software,</p> <p>15 commercial software. I don't remember specifically</p> <p>16 if there were other examples.</p> <p>17 Q Okay. And you don't remember specifically</p> <p>18 if there's anything -- if there are other specific</p> <p>19 virtual machine manager software mentioned in the 138</p> <p>20 patent itself?</p> <p>21 A Right, I don't remember other than the</p> <p>22 VMware products.</p> <p>23 Q Does the 138 patent disclose how a POSITA</p> <p>24 would go about creating new virtual machine manager</p> <p>25 software?</p>
<p style="text-align: right;">Page 44</p> <p>1 A It discloses how image instances of virtual</p> <p>2 machine managers could be created. It doesn't --</p> <p>3 doesn't disclose how to, for example, design and</p> <p>4 implement a new kind of virtual machine manager.</p> <p>5 Q Okay. So for the virtual machine manager,</p> <p>6 a POSITA reading the 138 patent would use software</p> <p>7 that was known in the art such as VMware software,</p> <p>8 correct?</p> <p>9 A Yes. And I believe the Sundar, the 138</p> <p>10 patent basically encourages that view, encourages</p> <p>11 that approach.</p> <p>12 Q In the context of the 138 patent, what is a</p> <p>13 virtual machine?</p> <p>14 A A virtual machine is an environment that</p> <p>15 gives -- sorry, strike that. It's something that</p> <p>16 gives software applications access to a -- to the</p> <p>17 resources of a virtual hardware environment. I think</p> <p>18 I mangled that a little. Basically it's an</p> <p>19 environment that emulates computer platform or</p> <p>20 hardware platform.</p> <p>21 Q Would you agree that for the 138 patent, a</p> <p>22 virtual machine is the software required to emulate a</p> <p>23 computer platform?</p> <p>24 MR. YOUNG: Objection, form.</p> <p>25 THE WITNESS: I would say that it's the</p>	<p style="text-align: right;">Page 45</p> <p>1 software that is emulating a computer platform.</p> <p>2 BY MR. LIANG:</p> <p>3 Q For the virtual machines in the embodiment</p> <p>4 of the 138 patent, what is the specific software that</p> <p>5 is used to emulate a computer platform?</p> <p>6 A It's the software capability, the software</p> <p>7 that's provided by the virtual machine manager so</p> <p>8 that when you execute the virtual machine manager,</p> <p>9 the functionality of the virtual machine manager is</p> <p>10 to create these virtual machines.</p> <p>11 Q Is there a part of the 138 patent that</p> <p>12 describes the specific software components that are</p> <p>13 used to emulate a computer platform?</p> <p>14 MR. YOUNG: Objection, form.</p> <p>15 THE WITNESS: I'm not aware. I don't</p> <p>16 recall any part of the 138 patent that describes, as</p> <p>17 I would put it, the internal workings, let's say, of</p> <p>18 a virtual machine.</p> <p>19 BY MR. LIANG:</p> <p>20 Q Would it be fair to say that the 138 patent</p> <p>21 relies on the background knowledge of a person of</p> <p>22 ordinary skill in the art to understand the</p> <p>23 components of a virtual machine?</p> <p>24 MR. YOUNG: Objection, form.</p> <p>25 THE WITNESS: I wouldn't -- I wouldn't</p>

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1 necessarily say that. I mean, the whole purpose of a
2 virtual machine is so that the software applications
3 or developers of the software applications that are
4 to run on the virtual machine don't have to worry
5 about the internal details of the virtual machine
6 except to the extent that the applications or the
7 developers of those applications need to understand
8 that the applications are running, for example, on an
9 X86 computer. But the internal implementation of how
10 the virtual machine achieves that emulation to
11 software applications I don't believe is something
12 that a person of ordinary skill would have to
13 understand.

14 Q Would a POSITA have known what software is
15 used to emulate a computer platform for the virtual
16 machines in the 138 patent?

17 A I mean, to the extent that you're trying to
18 draw distinction between the software -- the virtual
19 machine abstraction and the software that implements
20 that abstraction, I don't see that a person of
21 ordinary skill would have to understand a
22 distinction. Maybe I'm not understanding your
23 question very well.

24 Put it this way: A person of ordinary
25 skill wanting to use -- wanting to run software

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1 emulating bare metal machines. They aren't
2 themselves bare metal machines in the sense they
3 don't have a physical existence.

4 BY MR. LIANG:

5 Q So then for the embodiments of the 138
6 patent, the virtual machines that are emulating bare
7 metal hardware, those virtual machines are provided
8 by the virtual machine manager, correct?

9 A Yes, that's right.

10 Q So in -- so then in those embodiments of
11 the 138 patent, the virtual machines that are
12 emulating bare metal hardware, those are provided by,
13 in some embodiments, VMware ESX software, correct?

14 A Yes.

15 Q VMware virtualization software included
16 functionality to execute image instances of software
17 applications on virtual machines, correct?

18 MR. YOUNG: Objection, form.

19 THE WITNESS: I'm sorry, could you repeat
20 the question?

21 BY MR. LIANG:

22 Q Sure.

23 VMware software included the functionality
24 to execute image instances of software applications
25 on virtual machines, correct?

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1 applications on a virtual machine would have to
2 understand that they need some sort of virtual
3 machine manager that can create the virtual machine
4 on which the software can be deployed. Beyond that
5 understanding, for example, your previous question
6 about internal workings of the virtual machine
7 software, I don't believe a person of ordinary skill
8 would need to know that.

9 Q I see.

10 So the software that provides the virtual
11 environment that emulates physical computer platform
12 for the virtual machine in the 138 patent, that
13 software would just be a component of the virtual
14 machine manager, for example, VMware ESX software?

15 A Yes. However it's specifically
16 implemented, it would essentially present to the
17 software applications this interface that provides
18 that emulation of the particular underlying hardware
19 environment, physical computer platform environment.

20 Q So you mentioned that --

21 Let me ask you this: Is it your opinion
22 that the virtual machines in the 138 patent are bare
23 metal virtual machines?

24 MR. YOUNG: Objection, form.

25 THE WITNESS: It's my opinion that they're

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1 A It included the functionality to provide --
2 or includes the functionality to provide the virtual
3 machines on which software applications could be
4 executed.

5 Q And VMware software also has the
6 functionality to load and execute those software
7 applications on its virtual machines, correct?

8 MR. YOUNG: Objection, form.

9 THE WITNESS: Yes.

10 BY MR. LIANG:

11 Q Does the 138 patent explain how exactly a
12 virtual machine is created by a virtual machine
13 manager?

14 A Only to the extent that it says that the
15 virtual machines are created when the virtual machine
16 manager is executed.

17 Q So then when using the embodiments of the
18 138 patent, how would a person of ordinary skill in
19 the art create a new virtual machine?

20 A According to the 138 patent, they would
21 execute a virtual machine manager, or specifically,
22 again, in the context of the 138 patent, they would
23 first deploy an image instance of a virtual machine
24 manager on some node and then execute that image
25 instance. The result of executing the image instance

<p style="text-align: right;">Page 50</p> <p>1 would be the creation of one or more virtual 2 machines.</p> <p>3 Q So in the context of the 138 patent, what 4 does it mean to create a virtual machine?</p> <p>5 A It means to initiate an instance of this 6 emulation of some computer platform.</p> <p>7 Q What does a newly-created virtual machine 8 contain?</p> <p>9 A Nothing. It's as if there's a bare 10 metal -- a bare metal machine that's come into 11 existence.</p> <p>12 Q How can something be created if it has 13 nothing in it?</p> <p>14 MR. YOUNG: Objection, form.</p> <p>15 THE WITNESS: There's certainly some 16 runtime artifacts created by the virtual machine 17 manager that make this newly-created virtual machine 18 available to deployed software applications. So it 19 depends whether we're talking about at the level of 20 the implementation of the creation of a virtual 21 machine where there's some runtime artifacts, 22 whatever they might be, you know, bits of memory that 23 have been set aside for this virtual machine, 24 whatever it might be, or if we're talking about the 25 abstract concept of what that virtual machine is</p>	<p style="text-align: right;">Page 51</p> <p>1 exposing to deployed software applications. As far 2 as a deployed software application is concerned, 3 there's this new computer platform that's become 4 available now for execution of software applications.</p> <p>5 Q What do you mean by runtime artifacts?</p> <p>6 A It's whatever software resources that are 7 established or come into existence as a result of 8 a -- of an initiation of a virtual machine during the 9 execution of the virtual machine manager.</p> <p>10 Q When a virtual machine is created, in your 11 view it has no operating systems or applications, 12 correct?</p> <p>13 A Well, that's -- that's my view based on the 14 teachings of 138 patent, yes, the 138 patent. In the 15 view of the 138 patent, when a virtual machine is 16 created, what's being created is essentially a bare 17 metal machine, an emulation of a physical computer 18 platform. It has no operating system or any other 19 applications executing on it yet.</p> <p>20 Q A newly-created virtual machine would 21 contain a virtual processor, correct?</p> <p>22 A Yes.</p> <p>23 Q It would also contain a virtual memory, 24 correct?</p> <p>25 A Yes.</p>
<p style="text-align: right;">Page 52</p> <p>1 Q And a newly-created virtual machine would 2 include virtual devices, correct?</p> <p>3 A Yes.</p> <p>4 Q And a newly-created virtual machine would 5 include a blank virtual disk; is that right?</p> <p>6 A Possibly.</p> <p>7 Q After a virtual machine is created, is the 8 virtual machine running?</p> <p>9 MR. YOUNG: Objection, form.</p> <p>10 THE WITNESS: It's not running. There's 11 nothing running on it. It's -- I mean, to the extent 12 that a real physical computer is running, even if 13 there's no software applications executing on it, 14 one -- a person of ordinary skill would not consider 15 a bare virtual machine with no software applications 16 deployed on it to be running, executing.</p> <p>17 BY MR. LIANG:</p> <p>18 Q The virtual processor would not be 19 executing any instructions; is that right?</p> <p>20 A Right.</p> <p>21 Q So the virtual machine would not be running 22 anything before a guest operating system is installed 23 on it, correct?</p> <p>24 A Correct.</p> <p>25 Q What is the virtual machine doing, then,</p>	<p style="text-align: right;">Page 53</p> <p>1 before it has a guest operating system installed?</p> <p>2 A It's waiting for something to be done with 3 it.</p> <p>4 Q For the -- if you could turn to the 138 5 patent and turn to Figure 25. Let me know when you 6 get there.</p> <p>7 A Figure 25. Okay, I'm there. That's 8 stamped page 27 of Exhibit 1001.</p> <p>9 Q Would you agree that Figure 25 is a 10 flowchart illustrating an exemplary procedure for 11 creating and capturing the golden image for a 12 particular virtual machine manager?</p> <p>13 MR. YOUNG: Objection, form.</p> <p>14 THE WITNESS: For capturing an image 15 instance of a particular virtual machine manager, 16 yes, I would agree with that.</p> <p>17 BY MR. LIANG:</p> <p>18 Q Okay. If we could take a look at Figure 19 26, would you agree that Figure 6 (sic) illustrates 20 an exemplary procedure for creating an image instance 21 of software applications?</p> <p>22 MR. YOUNG: Objection, form.</p> <p>23 THE WITNESS: Yes. You said Figure 26; is 24 that correct?</p> <p>25 BY MR. LIANG:</p>

<p style="text-align: right;">Page 54</p> <p>1 Q Correct. Figure 26 illustrates an</p> <p>2 exemplary procedure for creating an image instance of</p> <p>3 software applications, correct?</p> <p>4 A Yes.</p> <p>5 Q So in Figure 26, I want you to take a look</p> <p>6 at step 24.</p> <p>7 A The step marked 424; is that what you mean?</p> <p>8 Q Yes, the step marked 424. It says "install</p> <p>9 an operating system on a virtual machine."</p> <p>10 Do you see that?</p> <p>11 A Okay.</p> <p>12 Q Step 424 installs a guest operating system</p> <p>13 onto the virtual machine -- withdrawn.</p> <p>14 Step 424 installs a guest operating system</p> <p>15 onto the virtual machine, correct?</p> <p>16 A Yes.</p> <p>17 Q At this point when the guest operating</p> <p>18 system is being installed on the virtual machine, the</p> <p>19 virtual machine has to be running, correct?</p> <p>20 A Yes, it has to have some capability of</p> <p>21 accepting this -- this installation of the operating</p> <p>22 system.</p> <p>23 Q In order for a virtual machine to run,</p> <p>24 there must be a virtual machine manager that is</p> <p>25 running and managing the virtual machine, correct?</p>	<p style="text-align: right;">Page 55</p> <p>1 A Yes. That's done with steps 420 and 422.</p> <p>2 Q Now, if we look at step 430 -- sorry,</p> <p>3 426 --</p> <p>4 A Okay.</p> <p>5 Q -- there is -- that's a step to install</p> <p>6 applications on the operating system, correct?</p> <p>7 A Yes.</p> <p>8 Q And then step 428 performs any needed</p> <p>9 configuration to the operating system or</p> <p>10 applications, correct?</p> <p>11 A Yes.</p> <p>12 Q Step 430 takes a snapshot of the virtual</p> <p>13 disk of the virtual machine, correct?</p> <p>14 A Yes.</p> <p>15 THE WITNESS: It looks like Jeff just</p> <p>16 disappeared.</p> <p>17 MR. YOUNG: Yep, I agree. Let's just hold</p> <p>18 tight.</p> <p>19 THE WITNESS: Okay.</p> <p>20 (Brief pause)</p> <p>21 MR. LIANG: I got dropped. I think I'm</p> <p>22 back. Can you hear me?</p> <p>23 MR. YOUNG: Yes. You can look back at the</p> <p>24 realtime and see where it was left off.</p> <p>25 BY MR. LIANG:</p>
<p style="text-align: right;">Page 56</p> <p>1 Q I believe we were looking at step 430 here</p> <p>2 about taking a snapshot; is that right?</p> <p>3 A Yes, I believe that's right.</p> <p>4 Q Okay. So step 430 takes a snapshot of the</p> <p>5 virtual disk of the virtual machine, correct?</p> <p>6 A Yes.</p> <p>7 Q To take a snapshot of the virtual disk, the</p> <p>8 virtual machine is suspended and it's virtual disk</p> <p>9 image is copied, correct?</p> <p>10 MR. YOUNG: Objection, form.</p> <p>11 THE WITNESS: The -- yes, the content of</p> <p>12 the virtual disk would be copied for separate</p> <p>13 storage, yes.</p> <p>14 BY MR. LIANG:</p> <p>15 Q For the 138 patent, the virtual disk image</p> <p>16 file includes an operating system and applications</p> <p>17 installed, correct?</p> <p>18 A In this particular example, I would say</p> <p>19 yes, that particular virtual disk image file contains</p> <p>20 an operating system and applications, plural, as</p> <p>21 specified in step 426.</p> <p>22 Q And in fact, the challenge claims allow the</p> <p>23 virtual disk image file to include an operating</p> <p>24 system and applications installed, correct?</p> <p>25 A Yes.</p>	<p style="text-align: right;">Page 57</p> <p>1 MR. YOUNG: Objection, form.</p> <p>2 BY MR. LIANG:</p> <p>3 Q The snapshot taken at step 430 is an image</p> <p>4 instance of a software application, correct?</p> <p>5 A Yes.</p> <p>6 Q So then for the challenge claims, the image</p> <p>7 instances of a software applications -- withdrawn.</p> <p>8 For the challenge claims, the image</p> <p>9 instances of software applications can be snapshots</p> <p>10 of already-running virtual machines, correct?</p> <p>11 MR. YOUNG: Objection, form.</p> <p>12 THE WITNESS: They can be snapshots of the</p> <p>13 virtual disks of already -- sorry, of already-running</p> <p>14 virtual machines or of previously-running virtual</p> <p>15 machines.</p> <p>16 BY MR. LIANG:</p> <p>17 Q And then after this snapshot of a</p> <p>18 previously-running virtual machine is deployed to a</p> <p>19 node with a virtual machine manager, then the</p> <p>20 snapshot can be resumed on that different node,</p> <p>21 correct?</p> <p>22 MR. YOUNG: Objection, form.</p> <p>23 THE WITNESS: So the snapshot of the</p> <p>24 virtual disk can be deployed on some virtual machine</p> <p>25 on the new node. And if memory serves, the 138</p>

<p style="text-align: right;">Page 58</p> <p>1 patent talks about persistent and nonpersistent 2 virtual disks where the persistent ones would be a 3 resumption essentially. 4 BY MR. LIANG: 5 Q For VMware ESX software, a snapshot of -- 6 withdrawn. 7 I also want to make sure we get the 8 abbreviation correctly. So we've been talking about 9 the software called ESX, and am I correct it's VMware 10 software, that is all caps, the letters ESX? 11 A Yes, that's right. 12 Q VMware ESX software captures virtual 13 machine disk image files as .vmdk files, correct? 14 MR. YOUNG: Objection, form. 15 THE WITNESS: Yes. 16 BY MR. LIANG: 17 Q So then to take a snapshot of the virtual 18 disk of the virtual machine in step 430, a POSITA 19 would have used VMware ESX software to capture a 20 .vmdk file, correct? 21 MR. YOUNG: Objection, form. 22 THE WITNESS: They could have, yes. 23 BY MR. LIANG: 24 Q That's one of the ways that's disclosed by 25 the 138 patent, right?</p>	<p style="text-align: right;">Page 59</p> <p>1 A Yes, it's taught as an example in passing 2 in the discussion of this image capture process 3 described in Figure 26. 4 Q Does the 138 patent disclose any other 5 techniques for capturing a snapshot other than VMware 6 software? 7 A Well, I would say that the 138 patent uses 8 VM -- excuse me, VMware software as an example of one 9 possible way of doing it. 10 Q Right. 11 And does the 138 patent disclose any other 12 specific ways to capture a snapshot other than using 13 VMware software? 14 A Does it mention -- I don't remember 15 exactly, but I believe it mentions, is it the GSX 16 product as well, perhaps not in this particular place 17 in the patent specification, but possibly elsewhere 18 where it discusses virtual machine manager products 19 in general. 20 Q Okay. Can you -- do you know where -- can 21 you point to any specific places where the 138 patent 22 discusses? 23 A I could have a look here. Okay. Well, I 24 see two instances of the specific mention of VMware 25 ESX. I don't see mentions of other VMware products</p>
<p style="text-align: right;">Page 60</p> <p>1 or other virtual machine manager products. It could 2 be that I'm mixing this up with one of the other 3 patents where other products were mentioned. 4 Q If we go back to Figure 26, I want to look 5 at that last step, step 432. Let me know when you 6 get there. 7 A Okay. I'm there. 8 Q The last step, 432 of Figure 26, captures 9 the virtual disk to the control node, correct? 10 A Yes. 11 Q And this means the -- this means the 12 snapshot that was taken in 430 is stored in the 13 control node, correct? 14 MR. YOUNG: Objection, form. 15 THE WITNESS: It's stored in the software 16 image repository that's used by the control node for 17 its deployment functionality. I think that's 18 explained a little bit better in the textual 19 specification. 20 BY MR. LIANG: 21 Q After an image instance of a software 22 application is captured, it's stored in a software 23 image repository, correct? 24 A Yes. 25 Q So I'd like to take a look at column 33 of</p>	<p style="text-align: right;">Page 61</p> <p>1 the 138 patent, Exhibit 1001. Let me know when you 2 get there. 3 A Okay. I see column 33. 4 Q All right. And if we look at line 42 -- 5 A Okay. 6 Q -- column 33, line 42, there's a paragraph 7 that begins at that line that describes a two-phase 8 capture process, correct? 9 A Yes. 10 Q And then the rest of this paragraph, from 11 column 33, 42, then describes how an image of a 12 virtual machine manager is captured, correct? 13 A Yes, that's correct. 14 Q Would you agree that this process for 15 capturing an image of a virtual machine manager is 16 the first phase of the two-phase capture process? 17 A Yes, I would agree with that. 18 Q The next paragraph starting column 33, line 19 55, explains how the image instances of software 20 applications are captured, correct? 21 A Yes. 22 Q Do you agree that this second paragraph 23 starting in column 33, line 55, would be the second 24 phase of the two-phase capture process? 25 A Yes.</p>

<p style="text-align: right;">Page 62</p> <p>1 Q The next paragraph starting column 34, line</p> <p>2 1, states, "After the generation of image instances</p> <p>3 for virtual machine manager 402 and virtual disk</p> <p>4 image files 408, control node 12 may deploy the image</p> <p>5 instances of virtual machine manager 402 to one or</p> <p>6 more nodes in (inaudible) 13."</p> <p>7 Do you see that?</p> <p>8 A Yes, I see that.</p> <p>9 Q Would you agree that the deployment of</p> <p>10 image instances of virtual machine managers comes</p> <p>11 after the generation of image instances for the</p> <p>12 virtual machine manager and virtual disk image files?</p> <p>13 MR. YOUNG: Objection, form.</p> <p>14 THE WITNESS: I would agree that it comes</p> <p>15 after the generation of image instances of the</p> <p>16 virtual machine manager. I'm not sure that it's</p> <p>17 required that it come after the generation of image</p> <p>18 instances of the virtual disk images or the software</p> <p>19 applications.</p> <p>20 BY MR. LIANG:</p> <p>21 Q Well, at least in this description in the</p> <p>22 specification, it does explain that the deployment of</p> <p>23 image instances of the virtual machine manager comes</p> <p>24 after generation of the image instances of the</p> <p>25 virtual machine manager and virtual machine disk</p>	<p style="text-align: right;">Page 63</p> <p>1 image file, correct?</p> <p>2 A Yes, you're correct. So that first</p> <p>3 sentence there at the top of column 34 says that</p> <p>4 "After generation of" -- I'll insert words -- "both</p> <p>5 the image instances for virtual machine manager and</p> <p>6 virtual disk image files, control node may deploy the</p> <p>7 image instances of the virtual machine manager," yes.</p> <p>8 Q So then in this description, spanning</p> <p>9 columns 33 and 34, the two-phase capture process</p> <p>10 generates the image instances of the virtual machine</p> <p>11 managers and image instances of software</p> <p>12 applications, correct?</p> <p>13 A Yes.</p> <p>14 Q The images are then stored in a software</p> <p>15 image repository, correct?</p> <p>16 A Yes.</p> <p>17 Q And then the control node deploys images</p> <p>18 after the image instances of virtual machine managers</p> <p>19 and image instances of software applications are</p> <p>20 generated and stored on the control node, correct?</p> <p>21 A As described at the top of column 34, yes,</p> <p>22 that's the way that happens.</p> <p>23 Q I want to take a look at Figure 27.</p> <p>24 A Okay. I've got that in front of me.</p> <p>25 Q So Figure 27 is an exemplary procedure for</p>
<p style="text-align: right;">Page 64</p> <p>1 deploying a virtual machine manager, correct?</p> <p>2 MR. YOUNG: Objection.</p> <p>3 THE WITNESS: Yes.</p> <p>4 BY MR. LIANG:</p> <p>5 Q Withdrawn. Let me clarify -- well, let me</p> <p>6 clarify that question. I think we're on the same</p> <p>7 page, but just to be clear.</p> <p>8 Figure 27A is an exemplary procedure for</p> <p>9 deploying a virtual machine manager to a node,</p> <p>10 correct?</p> <p>11 A It's a flowchart of such an exemplary</p> <p>12 procedure, yes.</p> <p>13 Q And then Figure 27B is a flowchart</p> <p>14 illustrating an exemplary procedure for deploying</p> <p>15 a -- an image instance of a software application to a</p> <p>16 node, correct?</p> <p>17 A Yes.</p> <p>18 Q You'd agree that the challenged claims do</p> <p>19 not require the use of tiers, correct?</p> <p>20 MR. YOUNG: Object to form.</p> <p>21 THE WITNESS: That's correct, they don't</p> <p>22 require the use of tiers. The tiers are discussed in</p> <p>23 some of the dependent claims. The independent claims</p> <p>24 certainly don't require the use of tiers.</p> <p>25 BY MR. LIANG:</p>	<p style="text-align: right;">Page 65</p> <p>1 Q The challenged claims do not require</p> <p>2 creating a new tier, correct?</p> <p>3 MR. YOUNG: Objection, form.</p> <p>4 THE WITNESS: That's correct.</p> <p>5 BY MR. LIANG:</p> <p>6 Q And the challenged claims do not require</p> <p>7 specifying captured OS, an application image for a</p> <p>8 new tier, correct?</p> <p>9 MR. YOUNG: Objection, form.</p> <p>10 THE WITNESS: Sorry, could you restate that</p> <p>11 question.</p> <p>12 BY MR. LIANG:</p> <p>13 Q The challenged claims do not require</p> <p>14 specifying captured OS/application image for a new</p> <p>15 tier, correct?</p> <p>16 MR. YOUNG: Objection, form.</p> <p>17 THE WITNESS: That's not required. It's</p> <p>18 not explicitly mentioned and certainly not in the</p> <p>19 independent claims.</p> <p>20 BY MR. LIANG:</p> <p>21 Q And the challenged claims do not require</p> <p>22 setting targets for a tier, correct?</p> <p>23 MR. YOUNG: Objection, form.</p> <p>24 THE WITNESS: Again, that's not explicitly</p> <p>25 mentioned in the independent claims.</p>

<p style="text-align: right;">Page 66</p> <p>1 BY MR. LIANG:</p> <p>2 Q The challenged claims do not require</p> <p>3 activating a tier, correct?</p> <p>4 MR. YOUNG: Objection, form.</p> <p>5 THE WITNESS: Same answer as before.</p> <p>6 BY MR. LIANG:</p> <p>7 Q The challenged claims do not require all of</p> <p>8 the steps that are described with respect to Figure</p> <p>9 27B, correct?</p> <p>10 MR. YOUNG: Objection, form.</p> <p>11 THE WITNESS: Again, in the -- certainly in</p> <p>12 the independent claims you would not find recitations</p> <p>13 that are analogs to some of those steps.</p> <p>14 BY MR. LIANG:</p> <p>15 Q So therefore, the challenged claims do not</p> <p>16 require all the steps described for 27B, correct?</p> <p>17 MR. YOUNG: Objection, form.</p> <p>18 THE WITNESS: That's correct.</p> <p>19 BY MR. LIANG:</p> <p>20 Q The challenged claims do not require all</p> <p>21 the steps that are described with respect to Figure</p> <p>22 27A, correct?</p> <p>23 MR. YOUNG: Objection, form.</p> <p>24 THE WITNESS: That's correct.</p> <p>25 BY MR. LIANG:</p>	<p style="text-align: right;">Page 67</p> <p>1 Q Earlier we discussed the two-phase capture</p> <p>2 process described in column 33; do you recall that?</p> <p>3 A Yes.</p> <p>4 Q Do the challenged claims require the</p> <p>5 two-phase capture process described in column 33,</p> <p>6 starting line 42?</p> <p>7 A Yes, they do.</p> <p>8 Q Where in the challenged claims is it</p> <p>9 required -- is the two-phase capture process</p> <p>10 required?</p> <p>11 A So if you look in Claim 1 in the software</p> <p>12 image repository limitations, what's required by</p> <p>13 those limitations is that you have separate storage</p> <p>14 of image instances of a virtual machine manager on</p> <p>15 the one hand and separate -- and storage of image</p> <p>16 instances of software applications on the other hand.</p> <p>17 So somehow or another, some image creation or image</p> <p>18 capture process has to be carried out whereby you</p> <p>19 wind up with two different kinds of image instances;</p> <p>20 image instances of a virtual machine manager, image</p> <p>21 instances of a software application -- of one or more</p> <p>22 software applications.</p> <p>23 Q So as long as you perform some kind of a</p> <p>24 process where you wind up with two different kinds of</p> <p>25 image instances, image instances of virtual machine</p>
<p style="text-align: right;">Page 68</p> <p>1 manager and the image instances of software</p> <p>2 applications, then that's what Claim 1 would require,</p> <p>3 right?</p> <p>4 A As long as you've done those and placed</p> <p>5 those image instances in the software image</p> <p>6 repository, then that's the extent of what's required</p> <p>7 with respect to creation of image instances in Claim</p> <p>8 1.</p> <p>9 Q So Claim 1 -- withdrawn.</p> <p>10 One way to create those two different types</p> <p>11 of images would be the two-phase capture process</p> <p>12 described in column 33, correct?</p> <p>13 A Yes, that's correct. And I believe the</p> <p>14 patent uses the phrase "exemplary procedure"</p> <p>15 conveying the idea that this is an example of how it</p> <p>16 could be done.</p> <p>17 Q Right.</p> <p>18 So the two-phase capture process is an</p> <p>19 example of how it could be done, it's not actually</p> <p>20 required by the challenged claims, correct?</p> <p>21 MR. YOUNG: Objection, form.</p> <p>22 THE WITNESS: Well, I'll say once again,</p> <p>23 it's required to the extent that you need to create,</p> <p>24 somehow or another, these two different and separate</p> <p>25 kinds of instance images.</p>	<p style="text-align: right;">Page 69</p> <p>1 BY MR. LIANG:</p> <p>2 Q The creation of those two different and</p> <p>3 separate kinds of image instances can be performed in</p> <p>4 using other processes beyond the specific two-phase</p> <p>5 capture process that's described in the 138 patent,</p> <p>6 correct?</p> <p>7 A Hypothetically it's possible. I think</p> <p>8 the -- the two-phase capture process as its</p> <p>9 exemplified in Figures 25 and 26 certainly contain</p> <p>10 all the important elements one would need in order to</p> <p>11 create those image instances. So there might be some</p> <p>12 additional embellishments in some other procedure,</p> <p>13 there might be some slightly different way of doing</p> <p>14 one thing or another. But I think the essence of</p> <p>15 what's needed to create those image instances is</p> <p>16 there in those exemplary procedures.</p> <p>17 Q Claim 1 does not require performance of the</p> <p>18 two-phase capture process described in column 33,</p> <p>19 lines 42 to 57, correct?</p> <p>20 A It doesn't state explicitly that two-phase</p> <p>21 capture process is required. But again, I would just</p> <p>22 say that given the requirement of having a software</p> <p>23 image repository that contains those two kinds of</p> <p>24 image instances, some kind of process is required to</p> <p>25 have been carried out to create those image</p>

<p style="text-align: right;">Page 70</p> <p>1 instances.</p> <p>2 Q Right.</p> <p>3 So the two-phase capture process can be</p> <p>4 used to create the image instances recited in Claim</p> <p>5 1, but it's not required; is that fair?</p> <p>6 A The two-phase capture as described in the</p> <p>7 specification of the 138 patent, that's what you</p> <p>8 mean, your question? It's not required.</p> <p>9 Q I'd like to go back to your declaration.</p> <p>10 And take a look at paragraph --</p> <p>11 A I'm hearing the background noise again. I</p> <p>12 didn't hear what paragraph.</p> <p>13 Q Paragraph 60.</p> <p>14 A 6-0, okay.</p> <p>15 Q I guess we've also -- before we get into</p> <p>16 it, we've also been going for about an hour.</p> <p>17 Do you want to take a break?</p> <p>18 A I would prefer to have a comfort break. I</p> <p>19 could make that quick.</p> <p>20 Q Let's do it, yeah. Let's just stop for</p> <p>21 about 10 minutes.</p> <p>22 A Ten minutes, sure. I could come back at 56</p> <p>23 after the hour.</p> <p>24 (Brief recess)</p> <p>25 BY MR. LIANG:</p>	<p style="text-align: right;">Page 71</p> <p>1 Q I'd like to turn to actually paragraph 69</p> <p>2 of your declaration, Exhibit 2001, and that is the</p> <p>3 stamped page 34. Let me know when you get there.</p> <p>4 A Paragraph 69. Okay, I'm there.</p> <p>5 Q In paragraph 69, you discuss Dr. Shenoy's</p> <p>6 testimony, correct?</p> <p>7 A Yes, that's correct.</p> <p>8 Q And you agree with the characterizations of</p> <p>9 the 138 patent that are described in paragraph 69 of</p> <p>10 your declaration, correct?</p> <p>11 A Yes, the existence of a three-step</p> <p>12 deployment process. Yes, I agree with that.</p> <p>13 Q And you agree that the image instance of</p> <p>14 the virtual machine manager deploys before the image</p> <p>15 instance of the software applications, correct?</p> <p>16 A Yes.</p> <p>17 Q You agree that once the image instance of</p> <p>18 the virtual machine manager is deployed on the node,</p> <p>19 it creates the virtual machine, correct?</p> <p>20 MR. YOUNG: Objection --</p> <p>21 THE WITNESS: It's executed and then</p> <p>22 creates the virtual machine.</p> <p>23 BY MR. LIANG:</p> <p>24 Q And you agree that the virtual machines</p> <p>25 onto which this application software is -- withdrawn.</p>
<p style="text-align: right;">Page 72</p> <p>1 Do you agree that the virtual machines onto</p> <p>2 which the application software image instances are</p> <p>3 deployed must be the same virtual machines that are</p> <p>4 provided by the virtual machine managers executing on</p> <p>5 the application nodes, correct?</p> <p>6 A Yes.</p> <p>7 Q And am I -- my apologies, I'm actually</p> <p>8 looking at paragraph 73 of your declaration.</p> <p>9 A Okay.</p> <p>10 Q And that -- in paragraph 73, it states "the</p> <p>11 virtual machines onto which these application</p> <p>12 software image instance are deployed must be the same</p> <p>13 virtual machines that are provided by the virtual</p> <p>14 machine managers executing on the application nodes."</p> <p>15 Do you see that?</p> <p>16 A Yes.</p> <p>17 Q Claim 1 requires that the image instances</p> <p>18 of the virtual machine manager are executed at the</p> <p>19 application nodes, correct?</p> <p>20 A Yes. I mean, it says when they're executed</p> <p>21 on the application nodes, then virtual machines are</p> <p>22 created.</p> <p>23 Q Right.</p> <p>24 And it's your opinion that Claim 1, as a</p> <p>25 matter of logic, requires that the image instances of</p>	<p style="text-align: right;">Page 73</p> <p>1 the virtual machine manager are executing at the</p> <p>2 application nodes, correct?</p> <p>3 A Yes, that's correct.</p> <p>4 Q And those executing virtual machine</p> <p>5 managers provide a plurality of virtual machines,</p> <p>6 correct?</p> <p>7 A Yes.</p> <p>8 Q And Claim 1 requires deploying image</p> <p>9 instances of software applications on the specific</p> <p>10 virtual machines that are provided by virtual machine</p> <p>11 managers executing on the application nodes, correct?</p> <p>12 A Yes.</p> <p>13 Q In paragraph 122 of your declaration, if</p> <p>14 you flip to --</p> <p>15 A I've got 122 in front of me.</p> <p>16 Q You have this -- in paragraph 122, you</p> <p>17 reach the same conclusion about the challenged claims</p> <p>18 under the principle of antecedent basis.</p> <p>19 Do you see that?</p> <p>20 A Yes.</p> <p>21 Q So when Claim 1 refers -- so you say, "the</p> <p>22 challenged claims require under the principle of</p> <p>23 antecedent basis that the virtual machines onto which</p> <p>24 the image instances of software application are</p> <p>25 deployed must be the same virtual machines that are</p>

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1 created/provided when the virtual machine manager
2 executes on the application node."
3 Do you see that?
4 A Yes.
5 Q So when Claim 1 refers to the plurality of
6 virtual machines, it is referring to the actual
7 virtual machines that are created by the virtual
8 machine managers that are executing on application
9 nodes, correct?
10 A Yes. The precise way it's stated in Claim
11 1 is when executed, when the virtual machine managers
12 execute, then they create the virtual machines.
13 Q Right.
14 And as a matter of logic, Claim 1 requires
15 that the virtual machine managers are executing so
16 that they can create the plurality of virtual
17 machines that are referred to elsewhere in the claim,
18 correct?
19 A Yes, that's correct.
20 Q So then when Claim 1 refers to the
21 plurality of virtual machines, it's referring to
22 actual virtual machines that are created by the
23 virtual machine managers that are executing on the
24 application nodes, correct?
25 A Yes, that's correct.

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1 A I wouldn't agree with that. I mean, the
2 virtual machine manager does manage one or more
3 virtual machines. That's its purpose.
4 Q But when you read this portion of the
5 specification, it seems clear that Claim 1 does not
6 require that the virtual machine manager is actually
7 running, correct?
8 MR. YOUNG: Objection, form.
9 THE WITNESS: If there to be virtual
10 machines in existence, then Claim 1 requires the
11 virtual machine manager to be executed or running.
12 BY MR. LIANG:
13 Q This line, column 32, line 60, seems
14 consistent with Claim 1 which would only require that
15 the virtual machine manager must be able to manage
16 virtual machines when executed, it doesn't actually
17 require that the virtual machine manager is actually
18 managing the virtual machines, correct?
19 MR. YOUNG: Objection, form.
20 THE WITNESS: Well, if you read Claim 1, it
21 doesn't say capable. It says, "when executed on the
22 application nodes, the image instances of the virtual
23 machine manager provide a plurality of virtual
24 machines."
25 BY MR. LIANG:

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1 Q And after a virtual machine disk image file
2 is copied to an application node, the virtual machine
3 manager software allows that virtual machine disk
4 image file to be resumed on a virtual machine at that
5 node, correct?
6 A Yes.
7 Q And in order for a virtual machine to be
8 resumed on a node, that means virtual machine manager
9 software must be executing on that node, correct?
10 A Correct.
11 Q So I'd like to -- I'd like to turn to
12 Exhibit 1001, the 138 patent, and go to column 32,
13 line 59. Let me know when you get there.
14 A Okay. So I'm at column 32, line 59.
15 Q Okay. So in the 138 patent, Exhibit 1001,
16 column 32, starting on line 60 there's a sentence
17 that says, "as used herein, a virtual machine manager
18 is a software program that is capable of managing one
19 or more virtual machines."
20 Do you see that?
21 A Yes.
22 Q You would agree that the virtual machine
23 manager just has to be capable of managing one or
24 more virtual machines, it doesn't actually have to be
25 managing them, correct?

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1 Q So Claim 1 requires that the virtual
2 machine manager must actually manage one more virtual
3 machines; is that right?
4 A Yes.
5 Q I'd like to go back to Claim 24.
6 A Claim 24 the 138 patent?
7 Q Figure 24.
8 A Figure 24. All right. Okay. Figure 24 of
9 the 138 patent, I've got that.
10 Q Okay. So Figure 24 -- you see Figure 24,
11 there's a physical node, virtual machine manager and
12 other components as well, right?
13 A Yes, I see that.
14 Q Do you agree that Figure 24 illustrates an
15 exemplary configuration of a physical node?
16 A It's an exemplary configuration of a
17 physical node and certain software running on that
18 physical node.
19 Q Now, each of -- you see there are several
20 virtual machines depicted, right; row 404A, 404B
21 and 404N.
22 Do you see that?
23 A Yes.
24 Q And there's a corresponding OS/app box for
25 each one; 406A, 406B and 406N, correct?


<p style="text-align: right;">Page 78</p> <p>1 A Yes.</p> <p>2 Q And each of the boxes, 406A, B and N,</p> <p>3 include an operating system and applications,</p> <p>4 correct?</p> <p>5 A Yes.</p> <p>6 Q The operating system and applications are</p> <p>7 stored in the virtual disk of the virtual machine,</p> <p>8 correct?</p> <p>9 A They're -- well, they're deployed on the</p> <p>10 virtual machine and as a result of the deployment,</p> <p>11 they're residing in the virtual disk.</p> <p>12 Q So the virtual disk of the virtual manager</p> <p>13 contains the operating system and applications,</p> <p>14 correct?</p> <p>15 MR. YOUNG: Objection, form.</p> <p>16 THE WITNESS: I think you mean the virtual</p> <p>17 disk of the virtual machine. You said virtual</p> <p>18 manager, I believe.</p> <p>19 BY MR. LIANG:</p> <p>20 Q Let me reask the question so we're clear.</p> <p>21 The virtual disk of the virtual machine</p> <p>22 contains an operating system and applications,</p> <p>23 correct?</p> <p>24 A Yes.</p> <p>25 Q And as a general matter, if a virtual</p>	<p style="text-align: right;">Page 79</p> <p>1 machine is running on a computer, then a virtual</p> <p>2 machine manager must also be running to provide and</p> <p>3 manage that virtual machine, correct?</p> <p>4 A Yes.</p> <p>5 Q And if a virtual machine exists on a node,</p> <p>6 then a virtual machine manager must be running on</p> <p>7 that node, correct?</p> <p>8 A Yes.</p> <p>9 Q Claim 2 of the 138 patent recites the image</p> <p>10 instances of the plurality of software application --</p> <p>11 well, do you see that?</p> <p>12 A Yes. Claim 2 you said. I should mention</p> <p>13 I'm hearing that background noise again. It's not as</p> <p>14 bad as it's been at times, but now it just</p> <p>15 disappeared now that I mentioned it.</p> <p>16 Q It does seem to be a little bit like --</p> <p>17 it's like a ghost, whenever somebody talks about it</p> <p>18 it goes away. If it ever becomes -- if it ever</p> <p>19 becomes an issue, just let me know, we can pause. It</p> <p>20 seems to be intermittent.</p> <p>21 A It's okay now. I thought you had said</p> <p>22 Claim 2, but I wasn't a hundred percent certain.</p> <p>23 Q Yeah, I'm looking at Claim 2 of the 138</p> <p>24 patent. Let me know when you get there.</p> <p>25 A Yeah, I'm there.</p>
<p style="text-align: right;">Page 80</p> <p>1 Q Okay. So Claim 2 recites the image</p> <p>2 instances of the plurality of software applications,</p> <p>3 correct?</p> <p>4 A Yes.</p> <p>5 Q And that refers to the same image instances</p> <p>6 of the plurality of software applications from Claim</p> <p>7 1, correct?</p> <p>8 A Yes.</p> <p>9 Q Now, Claim 2 depends on Claim 1, right?</p> <p>10 A Yes.</p> <p>11 Q So therefore, if Claim 2 is satisfied,</p> <p>12 Claim 1 must also be satisfied, correct?</p> <p>13 A Yes, I suppose. I mean, Claim 2 is adding</p> <p>14 limitations to Claim 1. So yes, the limitations of</p> <p>15 Claim 1 need to be satisfied with the limitation of</p> <p>16 Claim 2 satisfied in addition.</p> <p>17 Q And something that falls within the scope</p> <p>18 of Claim 2, and thus satisfies Claim 2, would also</p> <p>19 satisfy -- would follow the scope of Claim 1, right?</p> <p>20 MR. YOUNG: Objection, form.</p> <p>21 THE WITNESS: To the extent of the -- you</p> <p>22 said something that falls within the scope of Claim</p> <p>23 2. I mean, if that something is the concern of the</p> <p>24 additional limitation of Claim 2, then it wouldn't</p> <p>25 necessarily fall within the scope of Claim 1, if I</p>	<p style="text-align: right;">Page 81</p> <p>1 made that clear. I mean, let's say Claim 1 has 10</p> <p>2 limitations. As a result of Claim 2, we now have 11</p> <p>3 limitations. It's possible for something to fall</p> <p>4 within the scope of that 11th limitation, but not</p> <p>5 within the scope of the first 10 limitations of Claim</p> <p>6 1.</p> <p>7 BY MR. LIANG:</p> <p>8 Q A virtual disk image file that satisfies</p> <p>9 Dependent Claim 2 would also satisfy the image</p> <p>10 instances of the plurality of software applications</p> <p>11 recited in Claim 1, correct?</p> <p>12 A It's one possible embodiment of those image</p> <p>13 instances of software applications recited in Claim</p> <p>14 1, but it doesn't -- the way I read it, it doesn't</p> <p>15 require that all such image instances be virtual disk</p> <p>16 image files.</p> <p>17 Q Correct. But the virtual disk image</p> <p>18 file -- withdrawn.</p> <p>19 A virtual disk image file that satisfies</p> <p>20 Claim 2 would also satisfy the limitation in Claim 1</p> <p>21 of the image instances of the plurality of software</p> <p>22 applications, correct?</p> <p>23 A Yes.</p> <p>24 Q Now, I want to look at -- if you go back</p> <p>25 to -- looking at Claim 1.</p>

<p style="text-align: right;">Page 82</p> <p>1 A Okay.</p> <p>2 Q Claim 1 has two paragraphs, right. So the</p> <p>3 first paragraph recites the software image repository</p> <p>4 and the second paragraph describes a control node; is</p> <p>5 that correct?</p> <p>6 A Yes.</p> <p>7 Q Now, just looking at the first paragraph of</p> <p>8 Claim 1, would you agree that the software image</p> <p>9 repository recited here in Claim 1 can contain the</p> <p>10 images described in Claim 1 even if there's no</p> <p>11 control node that provides additional functionality?</p> <p>12 A I guess -- I mean, you're describing a</p> <p>13 hypothetical. I mean, there's nothing -- I suppose a</p> <p>14 simple answer is yes. I mean, a software image</p> <p>15 repository can exist in the absence of a control node</p> <p>16 that does anything with that software image</p> <p>17 repository.</p> <p>18 Q Now, you reviewed a prior art reference</p> <p>19 called Khandekar, correct?</p> <p>20 A Yes.</p> <p>21 Q You agree that Khandekar -- withdrawn.</p> <p>22 MR. LIANG: Let's go off the record for a</p> <p>23 second.</p> <p>24 (Lunch recess)</p> <p>25 BY MR. LIANG:</p>	<p style="text-align: right;">Page 83</p> <p>1 Q Dr. Rosenblum, welcome back.</p> <p>2 Did you speak with your counsel at all</p> <p>3 during this lunch break we just had?</p> <p>4 A No.</p> <p>5 Q I'd like to turn to your declaration,</p> <p>6 paragraph 57 --</p> <p>7 A Okay.</p> <p>8 Q -- which is on stamped page 25 of your</p> <p>9 declaration, Exhibit 2001. Let me know when you get</p> <p>10 there.</p> <p>11 A I'm there.</p> <p>12 Q In paragraph 57, you describe a three-step</p> <p>13 deployment methodology of the 138 patent, correct?</p> <p>14 A Yes.</p> <p>15 Q And would you agree that in the first step,</p> <p>16 the -- a control server first deploys a virtual</p> <p>17 machine manager to an application node?</p> <p>18 A A control -- a control node deploys a</p> <p>19 virtual machine manager to an application mode.</p> <p>20 Q Okay. Yeah, I was reading that sentence</p> <p>21 where it says "control server," but you think it</p> <p>22 should say "control node"?</p> <p>23 A Yes, that's right. Control server -- I was</p> <p>24 using -- just now I was using the terminology in</p> <p>25 Claim 1 which refers to a control node. That's fine,</p>
<p style="text-align: right;">Page 84</p> <p>1 control server, yeah.</p> <p>2 Q And I guess in this context the server</p> <p>3 would be a node, right?</p> <p>4 A Yes.</p> <p>5 Q And you'd agree that the virtual machine</p> <p>6 manager is deployed from a virtual machine manager</p> <p>7 instance in step 1, correct?</p> <p>8 A Yes.</p> <p>9 Q And as we talked about earlier, the only</p> <p>10 VMM, the only virtual machine manager disclosed for</p> <p>11 the embodiment of the 138 patent is VMware ESX</p> <p>12 software, correct?</p> <p>13 MR. YOUNG: Objection, form.</p> <p>14 THE WITNESS: Again, I view that as being</p> <p>15 more of an example that doesn't, you know, restrict</p> <p>16 the generality of what's possible in terms of</p> <p>17 deploying an image instance of a virtual machine</p> <p>18 manager.</p> <p>19 BY MR. LIANG:</p> <p>20 Q The only example of a virtual machine</p> <p>21 manager disclosed in the embodiments of the 138</p> <p>22 patent is VMware ESX software, correct?</p> <p>23 A Yes. That appears to be the case, yes.</p> <p>24 Q For step 1, the image of virtual machine</p> <p>25 manager can be an image of VMware ESX software,</p>	<p style="text-align: right;">Page 85</p> <p>1 correct?</p> <p>2 MR. YOUNG: Objection.</p> <p>3 THE WITNESS: Yes.</p> <p>4 BY MR. LIANG:</p> <p>5 Q For step 2, your declaration says, "next,</p> <p>6 the virtual machine manager executes on the</p> <p>7 application node," correct?</p> <p>8 A Yes.</p> <p>9 Q The execution of the virtual machine</p> <p>10 manager creates or provides a virtual machine, which</p> <p>11 as noted above, is an emulated computer platform,</p> <p>12 correct?</p> <p>13 A Yes.</p> <p>14 Q The execution of VMware ESX software on the</p> <p>15 application node creates a virtual machine which is</p> <p>16 an emulated computer platform, correct?</p> <p>17 A Yes.</p> <p>18 Q You've used the term "bare metal" to</p> <p>19 describe virtual machines; is that right?</p> <p>20 MR. YOUNG: Objection, form.</p> <p>21 THE WITNESS: I believe I used it in one or</p> <p>22 two places and I've used it in some of my answers,</p> <p>23 yes.</p> <p>24 BY MR. LIANG:</p> <p>25 Q Okay. I'd like you to go to the -- that</p>

<p style="text-align: right;">Page 86</p> <p>1 share file site that we looked at earlier. And you</p> <p>2 should find there's a file in there, Exhibit 2004.</p> <p>3 Let me know when you have it up.</p> <p>4 A I'm still seeing an empty folder here.</p> <p>5 Q Yep. You may have to refresh it a little</p> <p>6 bit.</p> <p>7 A Yeah, I did. I've done that a couple of</p> <p>8 times. Let me see if I can open a new browser</p> <p>9 window, see if that makes a difference. Yes, I'm</p> <p>10 going to "folders" on the left-hand tab, clicking on</p> <p>11 "shared folders," "submitted folder," still says</p> <p>12 "empty."</p> <p>13 Q Okay. One moment, please.</p> <p>14 A Okay.</p> <p>15 Q I have -- one moment. Can you try it again</p> <p>16 now?</p> <p>17 A Still saying "this folder is empty."</p> <p>18 Q Let's see here.</p> <p>19 A It's working now.</p> <p>20 So you've got Exhibit 2004; is that</p> <p>21 correct?</p> <p>22 Q Yes.</p> <p>23 A That file. Okay. I'm bringing it up now.</p> <p>24 Q Let me know when you have it open.</p> <p>25 A Okay. So yes, so the file is open.</p>	<p style="text-align: right;">Page 87</p> <p>1 Q Okay. And you recognize Exhibit 2004,</p> <p>2 right?</p> <p>3 A Yes. This was an example reference I gave</p> <p>4 I believe for the notion of a bare metal machine as a</p> <p>5 term of art.</p> <p>6 Q All right. So starting on stamped page 1,</p> <p>7 just the first page of Exhibit 2004, it says "The</p> <p>8 MINIX Book."</p> <p>9 What is MINIX, which is, for the record,</p> <p>10 all caps, M-I-N-I-X?</p> <p>11 A So MINIX was a kind of a minimal operating</p> <p>12 system that was built by Andrew Tannenbaum, one of</p> <p>13 the authors of this textbook, as an educational tool,</p> <p>14 a way for teaching operating systems to students. So</p> <p>15 it didn't have all of the complexities and ugliness</p> <p>16 of, let's say, commercial-grade operating systems,</p> <p>17 but just enough of the attributes and characteristics</p> <p>18 of operating systems to allow students to learn the</p> <p>19 characteristics of operating systems, the concepts</p> <p>20 and that sort of thing, and also do coursework and</p> <p>21 small-scale experimentation with operating system</p> <p>22 implementations.</p> <p>23 Q So this is the textbook for undergraduate</p> <p>24 students to learn about operating systems?</p> <p>25 A Yes. It's a standard textbook. In fact, I</p>
<p style="text-align: right;">Page 88</p> <p>1 think MINIX was a play on the name Linux, if I'm not</p> <p>2 mistaken.</p> <p>3 Q Why are there raccoons on the cover?</p> <p>4 A No idea. There's probably some story</p> <p>5 behind that. It's probably explained in the forward</p> <p>6 of the book, but -- yeah, no idea.</p> <p>7 Q I'm flipping through the table of contents</p> <p>8 and it starts on page 8.</p> <p>9 A Okay.</p> <p>10 Q And I see a lot of concepts, kind of like</p> <p>11 you were describing, that remind me of the sort of</p> <p>12 things I learned about in undergraduate courses on</p> <p>13 operating systems.</p> <p>14 A Okay.</p> <p>15 Q So I don't actually see any mention of</p> <p>16 virtual machine in this table of contents.</p> <p>17 Does Exhibit 2004 discuss virtual machines?</p> <p>18 A Actually, if you look at section 1.5.3,</p> <p>19 there's a section on virtual machines.</p> <p>20 Q Okay. I see. And then when we look at</p> <p>21 page 10, the page you cited, there is a reference at</p> <p>22 the very end to virtual machine. It says -- do you</p> <p>23 see that, it's bolded?</p> <p>24 A Yes, I see at the bottom of textbook page</p> <p>25 1, stamped page 10, yes.</p>	<p style="text-align: right;">Page 89</p> <p>1 Q Okay. So -- is that a reference to the</p> <p>2 same types of virtual machines that we've been</p> <p>3 talking about with respect to the 138 patent?</p> <p>4 MR. YOUNG: Objection.</p> <p>5 THE WITNESS: To the particular kind that</p> <p>6 is deployed on bare hardware, yes.</p> <p>7 BY MR. LIANG:</p> <p>8 Q Okay. So it's a reference to like a</p> <p>9 virtual machine that's on a virtual machine manager?</p> <p>10 A Well --</p> <p>11 MR. YOUNG: Objection.</p> <p>12 THE WITNESS: I mean, if you read the full</p> <p>13 sentence, it says "the way that has evolved gradually</p> <p>14 is to put a layer of software on top of the bare</p> <p>15 hardware to manage parts of the system and present</p> <p>16 the user with an interface or virtual machine." So</p> <p>17 what we've been discussing as a virtual machine</p> <p>18 manager is the layer of software on top of the bare</p> <p>19 hardware. And it doesn't say this very felicitously,</p> <p>20 but it says, kind of, one would interpret this is</p> <p>21 saying that the layer of software presents the user</p> <p>22 with an interface or bold virtual machine that is</p> <p>23 easier to understand and program.</p> <p>24 So I wouldn't necessarily interpret that</p> <p>25 sentence as saying the virtual machine is deployed</p>

<p style="text-align: right;">Page 90</p> <p>1 directly on the bare hardware, if that makes sense.</p> <p>2 BY MR. LIANG:</p> <p>3 Q Okay. I see what you're saying.</p> <p>4 So you're saying that, yeah, there's</p> <p>5 implicitly in the sentence a virtual machine manager</p> <p>6 that's running the virtual machine?</p> <p>7 A Right. The layer of software presents the</p> <p>8 user with the virtual machine.</p> <p>9 Q Okay. And then that layer of software is</p> <p>10 the operating system stated in the next sentence,</p> <p>11 right?</p> <p>12 A Yes.</p> <p>13 Q Now, I want to ask you a little about</p> <p>14 Khandekar, if we put away Exhibit 2004.</p> <p>15 A Okay.</p> <p>16 Q Would you agree that Khandekar must be</p> <p>17 considered -- well, let me back up for a second.</p> <p>18 And I believe you actually have a copy of</p> <p>19 Khandekar in front of you which is Exhibit 1004,</p> <p>20 correct?</p> <p>21 A Yes, I've got a hard copy here.</p> <p>22 Q Okay. Would you agree that Khandekar must</p> <p>23 be considered for everything that it teaches, not</p> <p>24 simply the described invention or preferred</p> <p>25 embodiment?</p>	<p style="text-align: right;">Page 91</p> <p>1 MR. YOUNG: Objection, form.</p> <p>2 THE WITNESS: I'm sorry, I don't understand</p> <p>3 the question.</p> <p>4 BY MR. LIANG:</p> <p>5 Q Yeah.</p> <p>6 Would you agree that when analyzing</p> <p>7 Khandekar for purposes of obviousness, Khandekar must</p> <p>8 be considered for everything that it teaches, not</p> <p>9 simply the described invention or a preferred</p> <p>10 embodiment?</p> <p>11 MR. YOUNG: Objection, form.</p> <p>12 THE WITNESS: I agree with that to some</p> <p>13 extent as I believe I say in my declaration, though,</p> <p>14 there are, for instance, the concept of teaching away</p> <p>15 which is, as you know, an issue that I have with</p> <p>16 Khandekar. And that my understanding, at least to</p> <p>17 the limited extent that I understand the case law and</p> <p>18 patent litigation, teaching away also has to be</p> <p>19 considered in terms of what the aggregate teaching is</p> <p>20 of a patent.</p> <p>21 BY MR. LIANG:</p> <p>22 Q In forming your opinions for this</p> <p>23 proceeding, did you apply an understanding that the</p> <p>24 prior art reference must be considered for everything</p> <p>25 that it teaches, not simply the described invention</p>
<p style="text-align: right;">Page 92</p> <p>1 or preferred embodiment?</p> <p>2 A Yes.</p> <p>3 Q Okay. So you'd agree, then, that when</p> <p>4 analyzing Khandekar for obviousness, Khandekar must</p> <p>5 be considered for everything it teaches, not simply</p> <p>6 the described invention or preferred embodiments?</p> <p>7 MR. YOUNG: Objection, form.</p> <p>8 THE WITNESS: I agree with that. And maybe</p> <p>9 to give an example to convey a sense of what my</p> <p>10 thinking is, it might discuss things in there that</p> <p>11 are background IP to the disclosed invention. And</p> <p>12 one could take that description of background IP as</p> <p>13 part of the teachings of the patent.</p> <p>14 BY MR. LIANG:</p> <p>15 Q Are you aware that -- well, you obviously</p> <p>16 are aware that the patent owner in this case</p> <p>17 is Avago, right?</p> <p>18 A The patent owner of the 138 patent.</p> <p>19 Q Right. In this proceeding, it's Avago?</p> <p>20 A Right.</p> <p>21 Q Avago Technologies International Sales PTE,</p> <p>22 Limited, correct?</p> <p>23 A Right.</p> <p>24 Q Avago Technologies International Sales PTE,</p> <p>25 Limited, the patent owner, they're the ones that</p>	<p style="text-align: right;">Page 93</p> <p>1 retained you for this proceeding, right?</p> <p>2 A Yes.</p> <p>3 Q Are you aware that the patent owner, Avago,</p> <p>4 has filed claim construction briefing in district</p> <p>5 court relating to the 138 patent?</p> <p>6 A I'm aware of that. I believe that there's</p> <p>7 an exhibit, is it 2003 if I'm not mistaken, that has</p> <p>8 some sort of documentation about that claim</p> <p>9 construction proceeding. It covers several patents,</p> <p>10 I believe, if I remember correctly.</p> <p>11 Q All right. And you've reviewed Exhibit</p> <p>12 2003, correct?</p> <p>13 A I've looked through it, yes.</p> <p>14 Q It doesn't sound like you reviewed it in a</p> <p>15 high level of detail.</p> <p>16 A I didn't review it in depth enough to, you</p> <p>17 know, render any specific opinion in my declaration.</p> <p>18 Q Have you reviewed any other briefing</p> <p>19 regarding the claim construction of the 138 patent</p> <p>20 other than Exhibit 2003?</p> <p>21 A Only what's -- only what's asserted in the</p> <p>22 petition from the petitioners and what is discussed</p> <p>23 in the preliminary patent owner response and the</p> <p>24 final patent owner response. I believe those are the</p> <p>25 only briefings that I've looked at with respect to</p>

<div>Page 94</div> <div>1 claims in the 138 patent.</div> <div>2 Q Understood.</div> <div>3 So you haven't seen any other claim</div> <div>4 construction briefing from district court regarding</div> <div>5 the 138 patent other than Exhibit 2003, correct?</div> <div>6 A That's correct.</div> <div>7 Q We've taken several breaks today.</div> <div>8 During any of the breaks today, did you</div> <div>9 have any communications with anybody?</div> <div>10 A I exchanged a couple of e-mails with</div> <div>11 colleagues. I had colleagues asking if I was around</div> <div>12 for lunch and I had to say no, I'm tied up today.</div> <div>13 That was it really. I sent a text message to my wife</div> <div>14 just to let her know what's going on. That's about</div> <div>15 it.</div> <div>16 Q Did you discuss the substance of this</div> <div>17 deposition with any of the people that you</div> <div>18 communicated with today during our breaks?</div> <div>19 A No, not at all.</div> <div>20 Q Have you had any communications with your</div> <div>21 counsel today during any of the breaks we've taken</div> <div>22 since the deposition started?</div> <div>23 A No, I haven't.</div> <div>24 MR. LIANG: I'll pass the witness.</div> <div>25 MR. YOUNG: I don't have any questions for</div>	<div>Page 95</div> <div>1 Dr. Rosenblum.</div> <div>2 MR. LIANG: Well, I think we can end the</div> <div>3 deposition and go off the record then.</div> <div>4 Off the record, 11:31 a.m.</div> <div>5</div> <div>6</div> <div>7</div> <div>8</div> <div>9</div> <div>10</div> <div>11</div> <div>12</div> <div>13</div> <div>14</div> <div>15</div> <div>16</div> <div>17</div> <div>18</div> <div>19</div> <div>20</div> <div>21</div> <div>22</div> <div>23</div> <div>24</div> <div>25</div>
<div>Page 96</div> <div>1 I N D E X</div> <div>2</div> <div>3 WITNESS EXAMINATION PAGE</div> <div>4 David Rosenblum, Ph.D.</div> <div>5 By Mr. Liang 4</div> <div>6</div> <div>7</div> <div>8</div> <div>9 E X H I B I T S</div> <div>10 NO. PAGE DESCRIPTION</div> <div>11 (None)</div> <div>12</div> <div>13</div> <div>14</div> <div>15</div> <div>16</div> <div>17</div> <div>18</div> <div>19</div> <div>20</div> <div>21</div> <div>22</div> <div>23</div> <div>24</div> <div>25</div>	<div>Page 97</div> <div>1 STATE OF CALIFORNIA)</div> <div>2) ss</div> <div>3 COUNTY OF LOS ANGELES)</div> <div>4</div> <div>5</div> <div>6</div> <div>7 I, DAVID ROSENBLUM, PH.D.,</div> <div>8 hereby certify under penalty of perjury under the</div> <div>9 laws of the State of California that the foregoing is</div> <div>10 true and correct.</div> <div>11 Executed this day of ,2021</div> <div>12 at ,</div> <div>13 California.</div> <div>14</div> <div>15</div> <div>16</div> <div>17</div> <div>18</div> <div>19</div> <div>20 DAVID ROSENBLUM, PH.D.</div> <div>21</div> <div>22</div> <div>23</div> <div>24</div> <div>25</div>

<div>1 STATE OF CALIFORNIA)</div> <div>2) ss</div> <div>3 COUNTY OF LOS ANGELES)</div> <div>4 I, KATHERINE FERGUSON, Certified Shorthand</div> <div>5 Reporter, for the State of California, do hereby</div> <div>6 certify:</div> <div>7 That prior to being examined, the witness named</div> <div>8 in the foregoing deposition, was by me duly sworn to</div> <div>9 testify the truth, the whole truth and nothing but</div> <div>10 the truth;</div> <div>11 That the testimony of the witness and all</div> <div>12 objections made at the time of the examination were</div> <div>13 recorded stenographically by me;</div> <div>14 That the foregoing transcript is a true record</div> <div>15 of the testimony and all objections made at the time</div> <div>16 of the examination.</div> <div>17 I hereby certify that I am not interested in the</div> <div>18 event of the action.</div> <div>19 IN WITNESS WHEREOF, I have subscribed my name</div> <div>20 this 18th day of August, 2021.</div> <div>21</div> <div>22</div> <div>23 </div> <div>24 Katherine Ferguson</div> <div>25 CSR No. 12332</div>	<div>1 ERRATA SHEET</div> <div>2 Case Name:</div> <div>3 Deposition Date:</div> <div>4 Deponent:</div> <table><tr><th>5 Pg.</th><th>No.</th><th>Now Reads</th><th>Should Read</th><th>Reason</th></tr><tr><td>6</td><td>---</td><td>---</td><td>---</td><td>---</td></tr><tr><td>7</td><td>---</td><td>---</td><td>---</td><td>---</td></tr><tr><td>8</td><td>---</td><td>---</td><td>---</td><td>---</td></tr><tr><td>9</td><td>---</td><td>---</td><td>---</td><td>---</td></tr><tr><td>10</td><td>---</td><td>---</td><td>---</td><td>---</td></tr><tr><td>11</td><td>---</td><td>---</td><td>---</td><td>---</td></tr><tr><td>12</td><td>---</td><td>---</td><td>---</td><td>---</td></tr><tr><td>13</td><td>---</td><td>---</td><td>---</td><td>---</td></tr><tr><td>14</td><td>---</td><td>---</td><td>---</td><td>---</td></tr><tr><td>15</td><td>---</td><td>---</td><td>---</td><td>---</td></tr><tr><td>16</td><td>---</td><td>---</td><td>---</td><td>---</td></tr><tr><td>17</td><td>---</td><td>---</td><td>---</td><td>---</td></tr><tr><td>18</td><td>---</td><td>---</td><td>---</td><td>---</td></tr><tr><td>19</td><td>---</td><td>---</td><td>---</td><td>---</td></tr><tr><td>20</td><td></td><td></td><td></td><td></td></tr></table> <div>21</div> <div>22</div> <div>23</div> <div>24</div> <div>25</div>	5 Pg.	No.	Now Reads	Should Read	Reason	6	---	---	---	---	7	---	---	---	---	8	---	---	---	---	9	---	---	---	---	10	---	---	---	---	11	---	---	---	---	12	---	---	---	---	13	---	---	---	---	14	---	---	---	---	15	---	---	---	---	16	---	---	---	---	17	---	---	---	---	18	---	---	---	---	19	---	---	---	---	20				
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