

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

BMW OF NORTH AMERICA, LLC.,
Petitioner,

v.

FORAS TECHNOLOGIES LTD,
Patent Owner.

IPR2024-01346 (Patent 7,627,781 B2)
IPR2024-01347 (Patent 7,624,302 B2)

Record of Oral Hearing
Held: December 5, 2025

Before: WILLIAM V. SAINDON, STEVEN M. AMUNDSON, and
RUSSELL E. CASS, *Administrative Patent Judges*.

IPR2024-01346 (Patent 7,627,781 B2)

IPR2024-01347 (Patent 7,624,302 B2)

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1 P R O C E E D I N G S

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3 JUDGE SAINDON: Good afternoon. This is an oral hearing for
4 IPR2024-01346 and 01347, involving BMW of North America and Foras
5 Technologies. I am Judge Saindon. With me on the line today are Judges
6 Amundson and Cass. Since we are -- have a remote participation here,
7 please refer to the demonstrative page numbers when you are presenting.

8 Okay. So, we have 90 minutes per side. The order had mentioned
9 going one case and then the other, but I think given the overlap between the
10 issues, we'll just use one record for the whole thing. If there's something you
11 specifically want to say that only applies to one or the other case, just let us
12 know. I don't think that'll need to be anything that happens, but if it does,
13 just let us know. So, we'll have 90 minutes per side and let's do our
14 introductions for the parties. Let's start with Patent Owner.

15 MR. LINDNER: Good morning, Your Honors. This is Seth
16 Lindner with BC Law Group for Foras Technologies, Ltd. And with me
17 today is Robert Auchter, also from BC Law Group.

18 JUDGE SAINDON: Okay. Good afternoon.

19 MR. LINDNER: Good afternoon, Your Honor.

20 JUDGE SAINDON: And Petitioner?

21 MR. LAVENUE: Good morning, Your -- or afternoon, Your
22 Honor. Lionel Lavenue from Finnegan for BMW North America. And with
23 me also at Counsel's table is Xirui Zhang. I will just be observing her
24 excellent work today. She will be doing most of the argument. Thank you.

25 JUDGE SAINDON: Okay. All right, welcome. And Petitioner,

1 you may begin when you're ready. We have 90 minutes on the clock. If you
2 wish, I can let you know when a certain amount of time has expired, but
3 otherwise, you have your 90 minutes and we will do the alternating
4 presentations as described in the hearing order, except for it'll be one hearing
5 all together. Given that we do have 90 minutes a side, I'd like to take a
6 break at about the halfway point, depending on how that falls with the
7 different presentations. We'll kind of play that by ear as far as when, but
8 that is the plan. So, Petitioner, you may begin when ready.

9 MS. ZHANG: Good afternoon, Your Honors. May it please the
10 Board. This is Xirui Zhang on behalf of Petitioner, BMW. I'll be presenting
11 the argument today and we would like to reserve some time for rebuttal, and
12 please reserve 30 minutes for rebuttal. Thank you.

13 Going to Slide Number 1. Your Honors, the patents at issue here
14 today are two of a number of patent applications filed on the same day
15 related to tolerant multi-processor systems. They share similar
16 specifications and drawings and they are directed to switching boot
17 processor to a spare processor during system runtime. And these two IPRs
18 are straightforward. When the plain language of the claims arrived in light
19 of the specification and from the perspective of a person of ordinary skill.
20 Petitioner's prior art teaches a boot processor and switching the role of the
21 boot processor, as claimed.

22 Patent Owner's responses rely on magic words matching, looking
23 away from Petitioner's clear mapping and abundance of evidence in the
24 record. (INDISCERNIBLE) what a person of ordinary skill of the art would
25 have known and understood. I'll walk through how the petition shows the

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1 prior art meets the challenge of claims and then I'll focus on the main
2 disputed issues between the parties. Before that, I'd like to offer just a little
3 bit of context for these two IPR proceedings for the Board.

4 Slide Number 3. Slide Number 3 shows the common figure shared
5 by these patents. It shows a multiprocessor system and patents issued here
6 today are the '302 patent and the '781 patent directed to switching the role of
7 the boot processor to the spare processor during system runtime. There's
8 another patent subject to a prior IPR proceeding as a '958 patent, and that's
9 directed to lockstep recovery, and the Board has already issued a final recent
10 decision finding all challenged claims unpatentable.

11 Slide Number 4 shows the prior proceedings for the '958 patent
12 and the references used in those proceedings and combinations that differed
13 from the references and accommodations in this proceeding -- in these two
14 proceedings. Slide Number 5 shows that the '781 patent and the '302 patents
15 at issue here today are also subjected to prior ex parte re-examination
16 proceedings. The entire ex parte re-examination proceeding of the
17 references and combinations are different.

18 The next slides, number 6 and 7, we give you an overview of the
19 grounds of unpatentability presented in the petition. Slide 6 shows the
20 grounds of presenting the petition for the '981 patent, and as you can see
21 here, the main grounds of Ground 1 rely on Fox, Safford, and Arai, and
22 Ground 2 rely on Fox, Safford, Landry, and Arai. Petitioner has challenged
23 all claims of the '781 patent and Patent Owner's argument responding to the
24 Petitioner focuses on one limitation -- sorry -- focuses on limitation 1B and
25 1C, and two, a couple of dependent claim limitations directed to non-volatile

1 system memory and active spare.

2 Slide 7 shows a grounds for the '302 patent. Similarly, the main
3 grounds like Ground 1 rely on same combination references in Ground 2.
4 All the claims of the '302 patent are challenged and patent owner relies on
5 the same arguments made for limitation 1D, and made the same arguments
6 against a couple of limitations directed to act as spare and non-volatile data
7 storage. Patent Owner did not separately make any arguments against the
8 rest of the dependent claim limitations.

9 Now, I'd like to fast forward to Slide Number 11, going back to the
10 patents. This is the Figure 1 shared bed of the patents. As you can see, this
11 is a multiprocessor system described in these patents. It has multiple
12 components, and the claims we're looking at here today directed to the
13 components called out in the boxes, as shown on this slide. This processor
14 system has the boot processor, which is a green box, has a spare processor,
15 which is a red box. It also has an operating system marked by the purple
16 box, and for each of the boot processor and the spare processor, they each
17 have a pair of lockstep processors, and the associated logics for detecting
18 loss of lockstep between the pair of processors. And the system also
19 determines whether the processor that lost lockstep is boot processor. And if
20 so, the system is switching the role of the boot processor, to the spare
21 processor, and that's the orange box shown on this slide.

22 And going to the next slide, Slide 12, this slide shows that the main
23 dispute between the parties in these two proceedings focus on the two of
24 those boxes. The green box, that is what the prior art teaches the boot
25 processor, and the orange box, whether the prior art teaches switching the

1 role of the boot processor to the spare processor during system runtime.
2 That's what I will focus on for today's presentation -- discussing each of
3 those issues in the next part of my presentation.

4 And going to the grounds and moving on to Slide Number 16. We
5 will first talk about how the prior art teaches the boot processor. Ground 1
6 relies on Fox combined with Safford and Arai. Fox discloses an IA-32
7 multi-processor system, and that system performs system boot using the
8 BIOS by a boot processor. Fox also discloses switching a failing processor
9 with a spare processor. Fox does not expressly disclose the blue boxes that
10 we have shown earlier. The lockstep processors innately does not expressly
11 disclose the details for switching the fading processor with spare processor.

12 The petition shows that Fox combined with Safford teaches boot
13 processors, spare processors, a lockstep processor pairs, and Fox and Safford
14 and combined with Arai's teaching of switching the processor identifications
15 allows switching the processor role to the spare processor. That is our
16 combination for Ground 1, and Patent Owner has now disputed about the
17 teachings of Safford, about the combination of Fox combined with Safford,
18 or about the combination of Fox combined with Arai's teaching of how the
19 implementation details of switching the role of a fading processor to a spare
20 processor.

21 And for completeness, I would like to go through these
22 combinations a little bit more. Next slide. Slide 17 shows a combination of
23 Fox and Safford. As you can see, Safford teaches lockstep processors. It
24 shows a pair of lockstep processors and its error detection logics connected
25 each processor to the detected loss of lockstep between the pair of

1 processors. And then we have shown that, and Patent Owner hasn't disputed
2 that. It would be obvious to combine Fox's teaching with Safford to
3 implement those lockstep processors in Fox's system to improve the system
4 availability and reliability.

5 Slide 18 shows the combination of Fox and Arai. Fox teaches
6 switching the boot processor with the spare processor. It teaches other
7 components of the multi-processor system described in the patents, as well.
8 The operating system, the firmware, the system memory -- it doesn't disclose
9 the implementation detail about how those spare processors have switched
10 during system runtime, but Arai teaches it.

11 Arai teaches you can switch the system identifier of those
12 processors during system runtime and that implements the switching during
13 system runtime. And we have shown that Fox combined with Arai discloses
14 exactly what the claim says, switching the role of the boot processor with a
15 spare processor during system runtime. The Patent Owner has not disputed
16 about Arai's teaching of switching, the details of switching the processors, or
17 the motivation to combine or expectation of success of combining Fox as
18 modified by Safford, with Arai's teaching.

19 JUDGE SAINDON: Counsel, if I can jump in. This is Judge
20 Saindon. So, are you saying Fox teaches the boot processor, or that the
21 combination teaches the boot processor? Where does the boot processor
22 come from in your combination?

23 MS. ZHANG: Yes. Thank you, Your Honor. In our combination,
24 the boot processor comes from Fox's IA-32 multi-processor system. The
25 evidence in the record shows that Fox's IA-32 multi-processor system

1 (INDISCERNIBLE) when looking at Fox's disclosure, looking at -- it's an
2 Intel IA-32 multi-processor system -- and it has a BIOS boot, and has system
3 boot using BIOS (INDISCERNIBLE) we have understood that Fox
4 discloses a boot processor in its system. And I will get back to it as soon as
5 -- probably in a couple of slides, very quickly, after getting the main issues,
6 but that's the main dispute. If you look at Slide Number 19, that's the first
7 dispute that we will talk about extensively.

8 JUDGE SAINDON: Okay. Yes, let's get to that.

9 JUDGE AMUNDSON: This is Judge Amundson. I just want to
10 -- I had a follow-up question on that -- and correct me if I'm wrong, but as I
11 understand your position, BMW says that in Fox, one of -- it's one of the
12 processors, 120 -- one of those processors, 120, that executes the BIOS
13 instructions, that's the boot processor; is that it?

14 MS. ZHANG: That's correct. Our position is --

15 JUDGE AMUNDSON: Okay.

16 MS. ZHANG: -- one of the processors in Fox's system would be
17 the boot processor executing the BIOS to initialize the system.

18 JUDGE AMUNDSON: Okay, I got it. Thank you.

19 MS. ZHANG: Thank you, Your Honor. So, Slide 19 shows the
20 two issues that we talked about and we'll get to it right away, about how the
21 prior art teaches the boot processor. So, Slide 23 -- sorry, Slide 21 shows
22 Fox discloses the multi-processor system configured with IA-32 architecture
23 that is not disputed. And Dr. Brogioli, Petitioner's expert, have explained
24 that it is well understood -- a person of ordinary skill in the art -- that IA-32
25 system assigns the boot processor for system initialization. And with that

1 background knowledge, a person of ordinary skill in the art would have
2 understood that Fox discloses assigning a boot processor to initialize this
3 multi-processor system. Your Honors, I have three reasons to show you
4 how one of skill in the art would have understood Fox teaches a boot
5 processor.

6 JUDGE SAINDON: Counsel, before you jump into those, how
7 -- so, Fox doesn't say boot processor. It does talk about the IA-32, but that's
8 not incorporated by reference, right? So, what is the actual ground and
9 evidence, and how does the boot aspect from IA-32 make it into the ground?

10 MS. ZHANG: Your Honor, the ground is Fox combined with
11 Safford and Arai. That's our ground.

12 JUDGE SAINDON: Mm-hm.

13 MS. ZHANG: And then Fox teaches IA-32 system. And when a
14 person of -- the prior art needs to be read from the perspective of a person of
15 ordinary skill in the art. When the person of ordinary skill in the art, with
16 the background knowledge of what an IA-32 system is, would have
17 understood that's Fox's system, and Fox's system has a boot processor to
18 initialize. It uses BIOS boot, it has multiple processors. All the processors
19 are configured with the requirement of an IA-32 architecture.

20 So, the case law says the prior art should be understood in view of
21 the knowledge held by one of ordinary skill in the art. One of skill in the art
22 is not a automaton, right? So, in Shockwave case, the Federal Circuit said,
23 our case law has long recognized numerous permissible uses for general
24 background knowledge in IPR, such as, for example, finishing motivation to
25 combine or supplying missing claim limitations. Here, that's exactly

1 happening here. Our expert, Dr. Brogioli provided multiple pieces of
2 evidence -- And I walked through each of them -- to show you that one of
3 skill in the art would have understood an IA-32 Intel multi-processor system
4 has a boot processor.

5 JUDGE AMUNDSON: This is Judge Amundson. So, on this
6 point, what I'm trying to understand is, to show the knowledge of a person of
7 ordinary skill in the art, if you rely on documentary evidence to do that, does
8 that documentary evidence need to qualify as prior art under Section 102?

9 MS. ZHANG: Your Honor, no, because those references Dr.
10 Brogioli cited are references he's showing that that's the background check,
11 background knowledge. That's not a prior art I would've relied on in
12 grounds. And the IPRs -- in IPR proceedings, the Federal Circuit said
13 background knowledges are permissible to provide the motivation to
14 combine or supply a missing limitation, to show how a POSITA would have
15 understood the disclosure of a prior art reference.

16 JUDGE CASS: Counsel, this is --

17 JUDGE AMUNDSON: Well, did -- I mean --

18 JUDGE CASS: -- Judge Cass.

19 JUDGE AMUNDSON: Go ahead, go ahead. Sorry.

20 JUDGE CASS: Okay.

21 JUDGE AMUNDSON: No, go ahead.

22 JUDGE CASS: You do have to show, if you're relying on IA-32
23 as common knowledge in the art, you have to show that it was common
24 knowledge as of the critical date, right?

25 MS. ZHANG: Yes, and I will provide -- I will walk through the

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1 evidence that our expert, Dr. Brogioli, has cited to show you that it was
2 common knowledge by one of ordinary skill in the art. So, for example, if
3 you look at Slide Number 22, Dr. Brogioli cited the IA-32 Software
4 Developer's Manual, and he explained, based on, you know -- he explained
5 that manual shows that a POSITA would have understood. An IA-32 system
6 has a boot processor, it has a unique identification, and it has a unique
7 designation. That's the first piece of evidence that Dr. Brogioli has cited.
8 And he cited a second documentation from Intel.

9 JUDGE AMUNDSON: This is Judge Amundson. On that first
10 piece of evidence, the Exhibit 1008 -- the IA-32 Software Developer's
11 Manual -- as I understand the back and forth, Foras says that BMW has not
12 proven that Exhibit 1008 is prior art. What's BMW's response to that?

13 MS. ZHANG: Our response is -- our argument is in the reply.
14 That is not required to show a background knowledge as prior art. An expert
15 is allowed to rely on background knowledge and references to provide an
16 expert opinion.

17 JUDGE AMUNDSON: Well, here's my follow-up question. If
18 something is not prior art, then why would a person of ordinary skill in the
19 art know about it?

20 MS. ZHANG: Yes, and that's exactly -- he provided multiple
21 pieces of evidence to show you. That's what a person of ordinary skill in the
22 art would have known, and I can give you another example. The third
23 reference, the Schelling reference, which is a printed patent application. In
24 paragraph four -- and that is on Slide 23 -- it says, within some multi-
25 processor systems, such as, for example, Intel Corporation IA-32 based

1 system, selection of boot processor or boot strap processor is automatically
2 performed. That shows that -- that's the background knowledge of one of
3 ordinary skill in the art.

4 JUDGE AMUNDSON: I'm sorry, this is Judge Amundson. I have
5 sort of another follow-up question on that, and if you could go to Slide 24.

6 MS. ZHANG: Yes, Your Honor.

7 JUDGE AMUNDSON: Right. On there, I think you cite three
8 pieces of evidence about this background knowledge -- Exhibit 1008, the
9 IA-32 Software Developer's Manual -- showing -- and then Exhibit -- I think
10 it's 1028 -- the multi-processor specification, version 1.4. So, here's my
11 question. What if the Board said no, we think that to show background
12 knowledge, something has to qualify as prior art, and so okay, so we get rid
13 of Exhibit 1008, we get rid of Exhibit 1028. Do you still win, just based on
14 Schelling?

15 MS. ZHANG: Your Honor, I have two responses to that. First of
16 all, as I explained, an expert's opinion does not need to rely on -- the
17 background knowledge does not need to be shown as prior art. There's no
18 requirement to show that background knowledge is prior art. And second of
19 all, we have shown you the pieces of evidence, the Schelling reference,
20 there's clear in those dispute -- that is prior art and that teaches the IA-32
21 system has a boot processor. And I have a third response. In these two
22 proceedings, Patent Owner has not filed objections to these documents.
23 They have -- they waived their opportunity to file a motion to exclude.
24 These evidences are in the record and their expert, during deposition, he
25 acknowledged that one of a person of ordinary skill in the art, working on

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1 Intel processors, would look at Intel documentation. And during deposition,
2 their expert, when asked whether a person working on IA-32 system would
3 have looked at Intel documentation, and he said some people would have
4 looked at Intel documentation, but they just looked away from it -- from all
5 of the evidence in the record.

6 JUDGE AMUNDSON: All right. I think I understand your
7 position. Thank you.

8 MS. ZHANG: Thank you, Your Honor.

9 JUDGE CASS: This is Judge Cass. I have a few follow-up
10 questions. First, could you remind me what the critical date is here?

11 MS. ZHANG: Yes, it's October -- let me -- it's October 2004. And
12 I believe it's October 25th -- 25.

13 JUDGE CASS: Okay. So, could you -- I mean, you mention that
14 the -- that Dr. Brogioli walks through the evidence showing that Exhibit
15 1008 and Exhibit 1028, constitute information that was well known in the art
16 prior to the critical date. Where can I find that in the declaration?

17 MS. ZHANG: He did not say that in the declaration, but he used
18 those as evidence to show his background knowledge of what was known at
19 that time, and he's a qualified expert, and Patent Owner has not disputed his
20 credentials and qualifications under the definitions of the petition proposed,
21 and Patent Owner has agreed, too.

22 JUDGE CASS: But if we have to make a finding, which I think
23 maybe we do, that this evidence was well known in the art before the critical
24 date, what's the evidence to support that finding?

25 MS. ZHANG: So for the IA-32 software architecture document,

1 there's a copyright date on the document, and bear in mind -- so, Your
2 Honors, these are not prior art for basis of the grounds, so we are not
3 required to show their prior art. They are the documents cited by the expert
4 to evidence to support his testimony that one of skill in the art would have
5 that background knowledge.

6 So, for the Exhibit 1008, that's the AI-32 architecture software
7 manual, that document has a copyright date that shows Intel has been
8 providing that document since 2003. And also, the second document also
9 has a date that's contemporaneous to the priority date of this patent. And Dr.
10 Brogioli's testimony is also evidence in his deposition, that it shows he has
11 set up this document to show a person of ordinary skill in the art's
12 background knowledge of what an IA-32 system has.

13 JUDGE CASS: Does Dr. Brogioli -- I didn't see it, but maybe I
14 missed it -- does he ever say he has personal knowledge of Exhibit 1008 or
15 1028, and personal knowledge that those were well known prior to the
16 critical date?

17 MS. ZHANG: He did not provide a statement because an expert
18 can rely on the documents that he was provided under the Federal Circuit
19 -- under the Rules of Evidence. And he uses those documents to show what
20 he knows at a time before the priority date. And also, Dr. --

21 JUDGE CASS: Well, my understanding -- I'm sorry, I didn't mean
22 --

23 MS. ZHANG: Sorry.

24 JUDGE CASS: -- to interrupt you.

25 MS. ZHANG: Okay. And he also explained -- this is on page 24

1 -- on page 24 of our demonstrative. He also explained that one of skill in the
2 art would have found it obvious to designate Fox's multi-processor system as
3 a boot processor because that's what everybody knows after that time -- the
4 IA-32 system has a boot processor, even if Fox does not use exact words
5 "boot processor." It would be obvious for one of skill in the art to use a boot
6 processor to initialize Fox's multi-processor system.

7 JUDGE CASS: Now, you can correct me if I'm wrong, but my
8 understanding is that there are different ways to use references to show skill
9 in the art, and using a reference just to show, let's say a level of skill in the
10 art -- maybe there's a little bit less rigidity for showing that it was publicly
11 available -- but if you're trying to use evidence to show that particular
12 knowledge that you were relying on was well known in the art, it seems to
13 me that perhaps, you have an even higher burden than showing that it's just
14 merely prior art. You have to show not only that it was prior art, but also
15 that it was well known. And that's where I'm kind of struggling to see where
16 that evidence is in the record.

17 MS. ZHANG: Thank you, Your Honor. Thank you for the
18 explanation. We do retain our position that it was not unconventional to
19 have a boot processor in a multi-processor system, and Dr. Brogioli has
20 explained the common knowledge at that time, that IA-32 system, as
21 evidenced by the documentation he cited, including a printed publication.
22 But Your Honors, if that -- if Ground 1 is not persuasive for you to see that
23 Fox's system has a boot processor, we also have the alternative ground,
24 which is Ground 2, relying on Fox combined with Landry.

25 JUDGE CASS: So one thing else, it was a little unclear to me

1 from your papers whether you are also relying on the IA-32 documents,
2 Exhibit 1008 and 1028, in Ground 2, as well, or whether you were intending
3 Ground 2 not to encompass that -- those documents or that knowledge in the
4 art?

5 MS. ZHANG: Not in Ground 2.

6 JUDGE CASS: Can you clarify that?

7 MS. ZHANG: In Ground 2 -- yes, yeah. I can clarify that. In
8 Ground 2, we rely on Landry's teaching of a boot processor's selection
9 process, and this is -- I'd like to jump forward to Slide Number 51 -- sorry
10 31.

11 JUDGE SAINDON: Counsel, actually, if you don't mind, before
12 we go to Ground 2, there's one other question I have for Ground 1, and then
13 we can go back to Ground 2. For Ground 1, you mentioned that the IA-32
14 and all this knowledge is to demonstrate what a person of ordinary skill in
15 the art would know. I'm wondering if you can speak to the July 31st memo
16 that talks to kind of the -- on one side, what a person of ordinary skill in the
17 art would know, versus on the other side, not using experts to supply
18 missing limitations, and where your position is and how this use of the IA-
19 32 falls.

20 MS. ZHANG: Yes, I understand, Your Honor, and I understand
21 your concern, and we are aware of the memo. And also, the Shockwave
22 case that we just cited and talked about is directly cited in the memo, as well.
23 And the Shockwave case said that case law recognizes permissible use in a
24 general background knowledge. So, I think that's consistent with the memo.
25 We're not supplying a missing limitation in the -- we're not supplying a

1 -- we're not doing gap filling in the prior art. The prior art teaches an IA-32
2 multi-processor system, and everyone understands, at that time, IA-32
3 system has a boot processor. That's the only way to start initializing an IA-
4 32 boot -- multi-processor system Intel manufacturer at that time.

5 JUDGE SAINDON: So, is it your position that gap filling that is
6 impermissible means taking the expert's word versus using the expert to
7 address a limitation? Because here, a boot processor is a limitation, right?
8 So, you need to show boot processor specifically, and you're saying that's
9 not gap filling?

10 MS. ZHANG: It's not, Your Honor. And I understand your
11 concern, so what we are showing here is a person of ordinary skill in the art's
12 understanding of the disclosure of the prior art. When they disclosed an IA-
13 32 system, they would have understood that it doesn't use the word expressly
14 "boot processor", but it's implicit in that document. IA-32 system has a boot
15 processor. That was known. So, that meets the claim limitation. The prior
16 art teaches it. Not in the exact words, but it talks about boot, it talks about
17 the BIOS, it talks about the computer system that has a boot processor.

18 JUDGE SAINDON: Okay, thank you.

19 MS. ZHANG: Thank you, Your Honor. And going back to
20 Ground 2, we were just going into the alternative position that Petitioner
21 provided regarding how Fox's system has a boot processor. Even if Your
22 Honors don't think Fox teaches -- expressly teaches a boot processor, it at
23 least suggests you should have a boot processor to initialize the system, and
24 Landry provided a solution to initialize that Fox's system.

25 Landry teaches a multi-processor system that has a selection

1 process to make sure that one boot processor is selected, that is logical CPU
2 zero to initialize the system, to improve the system's availability. And we
3 have shown that Fox combined with Landry would have been obvious to one
4 of skill in the art because that would allow Fox's system to have a boot
5 processor to execute its BIOS program. And that's one of the ways that
6 Patent Owner's expert, Mr. Jones, even acknowledged that's one of the ways
7 to initialize a multi-processor system. And Patent Owner has not disputed
8 about that combination.

9 In fact, if I may move on to the next slide, Slide 32, you can see
10 here, Patent Owner said, Landry's boot processor selection happens during
11 system initialization before the operating system is running. That's exactly
12 the combination, why we are relying on Landry, is assigning a boot
13 processor in Fox's multi-processor system. We're now relying on Landry for
14 switching the role of the boot processor. That is through Fox, and Fox
15 combined with Landry teaches switching the role of the boot processor to
16 the spare processor during a system runtime.

17 Your Honors, I skipped ahead some of the slides, but slides -- I'm
18 showing some deposition testimony of Mr. Jones, Patent Owner's expert, on
19 Slide 28 and 29. And based on this testimony, you can see that, Your
20 Honors, Patent Owner's expert never seriously engaged with the claim
21 language. He said that one of skill in the art wouldn't have to know what a
22 boot processor is. Instead, he focused on searching the word "boot
23 processor" in Fox, but the law doesn't require the prior art to explicitly recite
24 the exact words in the claims. The question is whether a person of ordinary
25 skill in the art would have understand the prior art discloses the claim

1 limitation.

2 Patent Owner's expert, Mr. Jones, he did not grapple with the
3 evidence in the record. He did not dispute with Dr. Brogioli's testimony
4 regarding a person of ordinary skill in the art's background knowledge of
5 what an IA-32 system has. He took an (INDISCERNIBLE) approach onto
6 the record. He ignored the Intel IA-32 Software Manual that shows IA-32
7 system has a boot processor. He ignored the Intel multi-processor system
8 specification shows there's a boot processor to initialize the system and the
9 other application processors. He ignored a published U.S. Patent
10 application, specifically saying IA-32 system has a boot processor. He did
11 not refute those disclosures. He just buried his head in the sand and
12 pretended that no one would have to know all of this. He did cite that he did
13 not believe those references were prior art, but he could see that he's not
14 qualified to offer that legal opinion.

15 Your Honors, this is especially troublesome because he, himself,
16 during deposition, he said, he uses Intel processor, consulted Intel
17 documentation, of people working with Intel IA-32 systems with consulted
18 documentation. But when it came time for him to opine as one of ordinary
19 skill in the art, he just looked away. He looked away from the very materials
20 that such a person of ordinary skill in the art would have read. Your Honors,
21 credibility matters. An expert is free to disagree with us, but he's not free to
22 ignore the record. Mr. Jones' ostrich style testimony should be given little
23 weight, if any, and the Patent Owner's arguments should be rejected.

24 Now, we have talked about the main issues, whether the prior art
25 teaches the boot processor. We have two alternative grounds. We have

1 Ground 1 relying on Fox, Fox teaches a boot processor, and we have Round
2 2, that Fox combined with Landry also teaches assigning a boot processor.

3 JUDGE AMUNDSON: This is Judge Amundson. I just want to
4 go back to the -- this is something that's troubling me a little bit, and it's on
5 the documentary evidence that you can use to show the knowledge of a
6 person of ordinary skill in the art, and you said, okay, that documentary
7 evidence doesn't have to be prior art, per se. Okay, fine, but what I'm trying
8 to understand is then if it doesn't -- if that documentary evidence doesn't
9 have to be prior art per se, where is the dividing line? What kind of
10 documentary evidence could you not use? Would it have to be something
11 that's a trade secret or -- so, I'm just trying to -- I'm struggling with that
12 dividing line, if you could comment on that.

13 MS. ZHANG: Your Honor, Dr. Brogioli's testimony is also
14 evidence. He has a declaration and he has a deposition testimony. And
15 that's the purpose of having one of ordinary skill in the art, having someone
16 qualified to provide expert opinion about what was known in art at the time
17 -- at the relevant time. So, his testimony is self -- is also evidence to show
18 what was known at the time.

19 JUDGE AMUNDSON: Right, but he -- Dr. Brogioli relies, for his
20 testimony, on Exhibits -- the documentary evidence, Exhibit 1008, 1028.
21 But anyway, I'm still struggling with the dividing line question, if you're able
22 to comment on that. But if you're not, that's okay.

23 MS. ZHANG: Thank you, Your Honor. Yes, and then we think
24 that it also depends on what a POSITA would have used at that time to
25 initialize Fox's boot processor -- or sorry, initialize Fox's multi-processor

1 system. And he offered an opinion of one -- of what a POSITA would have
2 chose to use. That's his boot processor to start that multi-processor system.

3 JUDGE AMUNDSON: So, okay. So, is it like the -- so, Fox
4 refers to the IA-32, and if somebody wanted to know more information
5 about the IA-32, they go and get that; is that it?

6 MS. ZHANG: Sorry. Can you ask the question, again?

7 JUDGE AMUNDSON: Well, okay. As I understand your
8 position, the -- on the dividing line question, it's that -- it depends on the
9 circumstances, and here, the circumstances are there's a discussion of a
10 certain processor and based on that, in this circumstance, a person, if they
11 wanted -- of ordinary skill -- if they want to know more information about
12 that, they go to the Intel website and they look for documentation, such as
13 Exhibit 1008 and Exhibit 1028; is that it?

14 MS. ZHANG: Yes. That is correct.

15 JUDGE AMUNDSON: Okay, okay. Thank you.

16 MS. ZHANG: Thank you, Your Honor. Moving onto the next
17 issue -- this is Slide Number 33. We're looking at the first issue and now we
18 are looking at -- even if the prior art teaches a boot processor, whether the
19 prior art teaches switching the role of the boot processor to the spare
20 processor during system runtime. And Your Honors, Patent Owner's
21 arguments for this issue relies on the wrong claim interpretation. They're
22 asking you to take an implicit instruction to require switching the role of the
23 boot processor to the spare processor, so that a new boot processor would
24 persist the reboot or a reset. The new boot processor would initialize the
25 system after reboot or reset. That is not in the claims.

1 The claims simply recite switching the role or boot processor to the
2 spare processor during system runtime. That is when the operating system is
3 running. That is also not in the specification. Nowhere in the specification
4 can you find support to say the switching of the role or the boot processor
5 requires a new boot processor to persist through reboot and reset. And I'll
6 walk through that in a little bit more detail in the next couple of slides.

7 Slide 34. On this slide, this is Figure 4 of the '302 patent. It shows
8 the process of how to switch the role of the boot processor to the spare
9 processor. You can see when there is an error in the boot processor, the
10 system identifier of the boot processor is changed. It switches it to the spare
11 processor and the spare processor assumes the role of the boot processor.
12 And the operating system is running the whole time. This is during system
13 runtime. The operating system -- after the switching of the system
14 identifiers, the operating system recognized the spare processor as a new
15 boot processor. This process does not have reboot. This process does not
16 have reset. This process teaches expressly the spare processor is now the
17 new boot processor, and that's the role switching.

18 Next Slide, 35. You can see here on the timeline, the switching the
19 role of the boot processor to the spare processor during system runtime,
20 that's the purple box. That's when the switching happened. That's what the
21 patent describes. But what the Patent Owner is asking you to do is to
22 interpret this limitation to like what's shown on Slide Number 36. To have
23 the boot processor, to -- the new boot processor to persist, through a reboot
24 or a reset, to start a boot process next time. Again, Patent Owners derailed
25 from the claim language and derailed from the specification.

1 JUDGE SAINDON: Counsel, if I could jump in, I suppose,
2 though, there is some appeal in saying, well, the boot processor, it got its
3 name because it boots the system, so why would you say you're giving it the
4 role of a boot processor, even though it'll never boot? Yes, it's getting its
5 -- under your position, clearly it's getting the role that it is now playing, but
6 the role that it has as a whole includes the boot process. So, isn't -- it seems
7 like there is perhaps some implication that for it to have the role of a boot
8 processor, it must, in the future, at least be designated as what could boot the
9 computer the next time.

10 MS. ZHANG: I understand your concern, Your Honor. The boot
11 processor -- it's called the boot processor for that reason. It initializes the
12 system, and we agree with that, but that's not the only role of the boot
13 processor, and Patent Owner agrees with it. The boot processor does not
14 stop being a boot processor during the entire operation of a system. It also
15 has other functionalities. It needs to control the orderly shutdown of the
16 computer. It executes other firmware when it's needed during system
17 runtime, and that's why the patent itself describes switching the role of the
18 boot processor to the spare processor, so there's at least one boot processor
19 to be responsible for those functionalities. And the Patent Owner's argument
20 that the boot processor is only limited to the initial process, the patent did
21 not give a definition of boot processor. The boot processor needs to be
22 understood from the person of ordinary skill in the art's perspective. And
23 that is the boot processor initializes the system, and we agree with that. If it
24 also has other roles, then it needs to be taken place if the boot -- a range in
25 the boot processor is wrong or having a failure.

1 JUDGE SAINDON: So, I guess let's look at your Slide 36. You
2 have the three buckets and these things, the boot processor does -- boots the
3 runtime, it kind of takes point, and then it helps shut down the system. So, I
4 understand your point that the system runtime role of a boot processor is
5 what's happening in your combination. I agree that that is the role of a boot
6 processor there, but the role also, at least as I understand Patent Owner in the
7 argument, is it's all three of these, so it has to be able to do all three of them.
8 So, to be able to do the boot part of boot processor, the first bucket, it has to
9 somehow be marked in the system so that when the system shuts down and
10 that is turned back on, that's where we go to proceed with the boot process.
11 And you're saying that's --

12 MS. ZHANG: I understand --

13 JUDGE SAINDON: -- not required in that claim?

14 MS. ZHANG: -- your position. They wanted a new boot
15 processor to persist to initialize the system the next time, and that is not
16 anywhere described in the specification. If you look at a process we just
17 looked at, that is during system runtime. And when you look at how the
18 system recognized a new spare processor as a boot processor, that is when
19 the operating system is running. That is when the operating system knows,
20 oh, you switched the identifiers. Now I know this spare processor is the
21 boot processor. I know the old boot processor, which is having issues, now
22 will be the spare processor. That's how the patent described them. The
23 patent did not describe that the spare needs to perform re-initialization.

24 In fact, if I may, so we are looking at limitations in the independent
25 claim, right? But some dependent claims also recite the switching -- during

1 a switch, causing the operating system to recognize the spare processor as
2 the boot processor, the operating system is running. How would the
3 operating system run if the system goes all the way through the reboot. As
4 Patent Owner recognizes, if you reboot or reset, the operating system will
5 have to start again. It's not up and running yet, so it's inherently inconsistent
6 with the claim languages and there's no disclosure in the specification for
7 that made up construction.

8 JUDGE SAINDON: I guess I don't understand that to be Patent
9 Owner's position. They'll be able to fix my understanding if I'm wrong, but I
10 thought what they're saying is we have now designated this processor as the
11 boot processor during runtime. It'll serve that role, and then we mark in the
12 system so that when it resets, that is where it goes. So, we don't need to shut
13 down the system during runtime. We just proceed and then when the
14 computer is shut down normally and it turns back on, we have changed
15 something. In assigning the role, we have changed something in be it a
16 BIOS setting or whatever, to identify, where does the computer look to have
17 a processor to go to all the boot procedures. So, I don't understand their
18 thing to be that you have to shut it down. I think you just proceed, but then
19 you've marked which processor is now going to be the boot processor. But
20 you don't agree with that?

21 MS. ZHANG: I think their argument, Your Honor -- that's part of
22 it, but their argument, they argue that APIC IDs or some processor
23 identifications cannot persistent the reboot or reset, so they're -- in their
24 argument, they are asking the new boot processor's identification to
25 persistent through reboot or reset, and that is requiring the new boot

1 processor to perform a system initialization the next time. Otherwise, why
2 wouldn't you require the identification to persist? Because every time the
3 system reboots or reset, a boot processor would be selected to initialize the
4 system. Why would you need that identifier to persist? They're adding
5 this extra limitation to the claim language. That's the issue we are taking
6 with, like there is no language in the claims or in the specification to require
7 the processor identification to persist.

8 JUDGE SAINDON: Okay.

9 MS. ZHANG: Thank you.

10 JUDGE CASS: Counsel, I just want to make sure I understand.
11 This is Judge Cass. So, what's shown on Slide 36, that the boot processor
12 includes all these different -- these three different buckets of tasks -- you're
13 saying that's Patent Owner's position or is that your position, or that the
14 parties agree on that? You know, what's the state of the arguments in
15 evidence?

16 MS. ZHANG: The black box is Patent Owner's argument, that
17 they require the new boot processor to persist with the reboot or reset.
18 That's our understanding of their position because they require the new boot
19 processor's identification to persist through a reboot or a reset.

20 JUDGE CASS: I understand that. I'm referring to the pink part.

21 MS. ZHANG: No, the pink part is -- well, Dr. Brogioli explained
22 what the boot processor's role is, it has responsibilities for a boot process. It
23 also has other responsibilities during a runtime and also during system
24 shutdown. That's Petitioner's --

25 JUDGE CASS: So, I guess --

1 MS. ZHANG: -- position --

2 JUDGE CASS: -- your position is that as long as at some point,
3 another processor is assigned and performs, let's say, the system runtime
4 functions, then that's switched to the role of a boot processor, even if that
5 processor or the processor it switched to is never involved in the booting
6 process.

7 MS. ZHANG: Yes, because the designated assignment of the boot
8 processor doesn't change. After the initialization process, the boot processor
9 remains as a boot processor, and is still the boot processor during runtime
10 because it also performs the other functionalities. The designation of boot
11 processor, as the patent describes, is in a table. It's called a device tree and
12 this particular flag indicates is this a boot processor, yes. And I have the
13 device tree showing in our slides.

14 JUDGE AMUNDSON: This is Judge Amundson. Are you
15 looking for Slide 27? It's in the --

16 MS. ZHANG: Oh, 44, Your Honor.

17 JUDGE AMUNDSON: Oh, okay.

18 MS. ZHANG: If you are there, Your Honor, Slide 44 shows what
19 the patent describes, how you identify the boot processor. This is a device
20 tree, as shown in Table 1. The device tree stored into the multi-processor
21 system has a formation, identifies a processor, that is the boot processor, and
22 also has information, identifies the processor as a spare processor. In the
23 table, we can see we marked with a purple box here which one is a boot
24 processor, which one is a spare processor. It's indicated there after system
25 initialization. It's not changed until during system runtime. The switch to

1 that limitation is updated. Now, the spare processor will be the boot
2 processor, the boot processor will be the spare processor.

3 JUDGE SAINDON: I understand this is a run time construct used
4 by the OS to identify these things, but I guess the question and perhaps
5 distinction is that there is some type of storage prior to initialization to
6 identify which processor is going to boot the system prior to that OS being
7 loaded. And that would need not this table, but some identification of who
8 is the boot processor. Am I incorrect in that? And that would be separate
9 from this.

10 MS. ZHANG: Your Honor, as we understand, that's the
11 information assigning the boot assigning the boot processor and spare
12 processor because not only -- the independent claims does now to specify,
13 what's the information, but some dependent claims does, and I can give you
14 the claim number later, after looking at my notes, but some dependent claim
15 says the information identifies the boot processor, the information identifies
16 the spare processor, and you store that information in a data storage. That's
17 what we understand the specification says. This is the information that you
18 need to store.

19 JUDGE SAINDON: So, you're saying the information described
20 in the patent is the runtime information. This is not some sort of -- when the
21 machine is off, it's stored somewhere type of information?

22 MS. ZHANG: Correct.

23 JUDGE SAINDON: Okay.

24 MS. ZHANG: Yes. And I'll get you to the claim number so you
25 can check later. That claim specifically said the information identifies the

1 boot processor and spare processor.

2 JUDGE CASS: So Counsel, this is Judge Cass. Would it be
3 correct to say, you know, one of the purposes of the patent here is that if
4 there's an error in the boot processor, you want to take that out of service,
5 and you want to take it out of service in a permanent way so that if that
6 processor is still sitting in the computer and the system shuts down -- it has
7 power failure, and something happens and the system shuts down and has to
8 reboot -- it's not going to go back and use the erroneous boot processor
9 again. It's going to use the newly assigned processor that is operating
10 properly.

11 MS. ZHANG: Thank you, Your Honor. I don't understand it that
12 way because the patent also describes the boot processors, the lockstep
13 processors, and the errors that occur during the operating system -- while the
14 operating system is running is loss of lockstep, and the patent describes that
15 you can recover loss of lockstep. I know when -- after the switch happens,
16 the patent describes you can recover the lockstep and the boot processor
17 -- the old boot processor becomes the spare processor. So, it's not
18 permanently taken off -- away from the system. It can be still used by the
19 system after recovery.

20 JUDGE CASS: I see. So, the invention can be used where let's
21 say there was an error in lockstep -- not because of the hardware is defective,
22 but because something happens -- radiation or, you know -- something
23 happens that interrupts the processing activity of the processor that when it
24 shuts down and reboots, it will no longer be there.

25 MS. ZHANG: Exactly, Your Honor. There's some random errors

1 that cause loss of lockstep, and that concept was known in the art. The
2 Safford reference already teaches it, and Patent Owner has not disputed
3 about that. The loss of lockstep, and recovering the loss of lockstep, and
4 detection of loss of lockstep. So, when you notice that error, you replace
5 that processor and recover that processor.

6 JUDGE LEE: I see, thank you.

7 MS. ZHANG: Thank you. And now we have covered the first
8 issue and second issue, and there are two additional cite issues that we
9 would like to cover. And those cite issues are only for some of the
10 dependent claims. I'm going to Slide 40. Your Honor, there are two cite
11 issues regarding to some of the dependent claims of these two patents.
12 There's an issue of whether the prior art teaches a non-volatile data storage
13 for storing information, assigning a boot processor. And there's another
14 question of whether the prior art teaches an active spare.

15 Slide 42 shows the Fox system, again. As we have shown, Fox
16 system teaches a multi-processor system that has a system memory. And
17 you can see, as indicated by the red box here, that system memory stores the
18 BIOS. That system memory stores the operating system, and that system
19 memory stores the applications. And Fox teaches that you would store the
20 register or table storing the processor identifications in the system memory
21 -- or sorry -- you would store the information assigned in the boot processor
22 in a register or table. Fox does not expressly teach us storing that register or
23 table in the system memory. Arai does.

24 Arai also teaches a fail non-volatile system that switches a failing
25 processor with a spare processor. And Arai teaches using the main memory

1 of the system to store processor table in the main memory. So, in the
2 petition, we have shown that one with skill in the art would have found it
3 routine and ordinary to store that processor or table, including information
4 identified in the boot processor, identified in the spare processor, in Fox's
5 system memory.

6 JUDGE AMUNDSON: Now, this is Judge Amundson. I had a
7 question on your Slides 41 and 43, and I thought -- at least to me -- they
8 contained what I thought was inconsistent information. Maybe you can
9 clarify that. But on Slide 41 where you have an arrow pointing to system
10 memory 110, you say that Fox discloses system memory that is a non-
11 volatile data storage and then if we go to Slide 43, you've got the same
12 figure and you've got another arrow pointing to system memory 110, and
13 you say that Fox's system memory is not read only. I thought that those two
14 were inconsistent. Could you clarify that?

15 MS. ZHANG: Yes, I'm happy to. So, Slide Number 41 shows
16 Fox's memory is non-volatile. That's in the claim language. The claim
17 recites the data storage is non-volatile data storage. Non-volatile means the
18 memory -- I'm sorry, Your Honor. Are you speaking? I cannot hear you.

19 JUDGE SAINDON: There's a lag in the video.

20 JUDGE AMUNDSON: Go ahead.

21 JUDGE SAINDON: A pretty substantial one it looks like.

22 MS. ZHANG: Okay. Your Honor, the claim recites non-volatile
23 data storage, and we have an explanation from Dr. Brogioli why Fox's
24 system memory is non-volatile. Non-volatile is not equivalent to read only.
25 Non-volatile means information stored in the memory is not removed or

1 deleted when the system shuts down for reboot. That's what Fox's system
2 memory is, because it stores the BIOS. The BIOS needs to boot the system.
3 It cannot be deleted. It stores the operating system, it stores the applications.
4 That means the system memory is non-volatile. The claim -- that's what the
5 claim recites. It's not reciting read only, and Patent Owner is characterizing
6 Fox's system memory as read only, and that's not our position, and we are
7 -- we haven't shown what the claim limitation -- what the -- how the prior art
8 teaches the claim limitation.

9 JUDGE SAINDON: Counsel, the memory 110 in Fox, I mean, I'm
10 looking at this and I see a very large box containing a lot of different
11 components. This could be as far as all things that qualify as memory,
12 ROM, RAM, hard drives, so forth. So, I don't know if this is a very useful
13 teaching, and since you're relying on Arai, is that a more useful teaching for
14 you, and if so, my question would be, you know, it says that the part that you
15 have underlined here on Slide 41 is the BIOS creates a table in the main
16 memory, RAM, which is -- the RAM obviously is not non-volatile. So,
17 where is the non-volatile storage of the processor identification come
18 between all of these different disclosures?

19 MS. ZHANG: Thank you, Your Honor. I have two responses.
20 First of all, the combination is storing the processor table or register in Fox's
21 system memory, and that is non-volatile, because it stores the information
22 that cannot be removed. And -- but Dr. Brogioli has explained why that is
23 non-volatile. And he gave different examples of a non-volatile memory. So,
24 non-volatile memory is a category of memories that stores information that
25 cannot be removed. It can be read only, but it can be RAM. That's my

1 second response to your statement. RAM can also be volatile and non-
2 volatile. Arai didn't say whether that RAM is volatile and non-volatile, and
3 we are not saying that the combination is storing information in Arai -- I'm
4 sorry -- information in RAM. That's not the claim language. We're not
5 relying -- saying the combination only stores information using RAM. It
6 stores in a non-volatile memory in Fox's system memory -- Fox's non-
7 volatile system memory. I hope that answers your question, but please let
8 me know if you have followed that.

9 JUDGE SAINDON: So, I mean, if RAM and ROM -- what I
10 understood and maybe I misunderstood is that Claim 2 just requires you to
11 store it. I'm not sure I understood what was the non-volatile aspect of it -- of
12 the combination.

13 MS. ZHANG: It's Fox's system memory, because Fox's system
14 memory from the person of ordinary skill in the art's perspective. That
15 system memory is storing operating system, it's storing the BIOS. It cannot
16 be -- those information cannot be removed, and when one of skill in the art
17 is looking at Fox's system, would have understood that system memory is
18 non-volatile, because it doesn't make sense to make it volatile, so all of their
19 information is removed. All the information stored in that system memory is
20 removed.

21 JUDGE SAINDON: Sure. I certainly understand that some parts
22 of Fox are non-volatile, but why are we storing this -- what is this specific
23 -- the data storage storing information, that in non-volatile is pushed to
24 volatile memory.

25 MS. ZHANG: Sure. And I would like to point you to Slide 42.

1 This is from Dr. Brogioli's declaration explaining a POSITA would have
2 found it suitable and routine in all areas to store that register or table.
3 Having information identify the boot processor and spare processor in Fox's
4 non-volatile system memory, because the prior art already teaches. You
5 have processor register. You have tables. You store that in the main
6 memory. That is one of the known and conventional ways to store
7 information. You store that in the system memory in Fox's system. That is
8 a well known and conventional way to do it, and Patent Owner has not
9 disputed that you would not have expectation of success to do that.

10 JUDGE SAINDON: Well, I'm looking at Slide 42, and this is
11 paragraph 198 of the expert, and it says, storing -- stores information,
12 assigns the roles of the boot and spare processors in its system memory. No
13 qualifiers there. And then would've understood that Fox's system memory
14 would be non-volatile because blah, blah, blah, and then it talks about ROM
15 and EEPROM -- programmable ROM. So -- but that is different than
16 system memory -- ROM and EEPROM is not system memory.

17 MS. ZHANG: They are -- Dr. Brogioli is giving you examples of
18 what a non-volatile memory is. He's giving examples in the parenthetical,
19 yes. These are non-volatile memories, and he said et cetera. They are also
20 non-volatile memories, and Patent Owner recognized that. They recognized
21 there are non-volatile RAMs, even in the patent themselves. So, he's just
22 giving examples, but his opinion is the system memory in Fox is non-
23 volatile. He's not giving an opinion of whether that is ROM, that is RAM.
24 He's not providing that opinion. His opinion is based on the claim language
25 that is non-volatile and it needs to store information that stays there after the

1 system shutdown.

2 JUDGE SAINDON: Okay. No further questions on that.

3 MS. ZHANG: Thank you, Your Honor.

4 JUDGE CASS: Counsel, this is Judge Cass. Could you just point
5 me quickly to where Fox discloses storing the roles of the -- the new roles of
6 the processors and system memory?

7 MS. ZHANG: So, Your Honor, Fox teaches registers and tables,
8 and a POSITA would -- the registers and tables would have --

9 JUDGE CASS: Wait. Where is that in Fox?

10 MS. ZHANG: Thank you, Your Honor. Let me get to the slide
11 that has Fox's disclosure. Your Honor, maybe I'll get back to you after I take
12 a look at the record and look through my slide and have a paper copy of the
13 slide.

14 JUDGE CASS: That's fine.

15 MS. ZHANG: Thank you.

16 JUDGE CASS: That's fine. I just want to make sure I know where
17 in the record that is.

18 MS. ZHANG: Yes. And Your Honors, if you have no further
19 questions for the third issue -- the non-volatile data storage -- I'd like to
20 reserve the remaining time for my rebuttal, and it'll come back to the two
21 issues I'm looking into -- the Fox disclosure of the processor register and
22 table, storing process information, and claims reciting -- causing the
23 operating system to recognize the spare processor and boot processor.
24 Thank you, Your Honor.

25 JUDGE SAINDON: Okay, thank you.

1 MS. ZHANG: Sorry, Your Honor. Just one note. I have fourth
2 issue, but I will come back to it, if that's dispute, regarding active spare.
3 Thank you.

4 MR. LINDNER: Your Honors, could I take a short bathroom
5 break before I begin?

6 JUDGE SAINDON: we've been going for about an hour, so let's
7 do -- I had mentioned a break. Let's just do that now. What time do we
8 have? It's 2:20 on my clock local. So, maybe let's restart at 2:30. Okay.
9 So, we are in recess.--

10 (Whereupon, the above-entitled matter went off the record at 2:20
11 p.m. and resumed at 2:30 p.m.)

12 JUDGE SAINDON: Okay, it looks like we're back. Let's see. We
13 have a 90 minute clock. If you'd like to reserve some time, you can just stop
14 and reserve your main time, or if you want a warning, you can let me know.

15 MR. LINDNER: Thank you. Good afternoon, Your Honors, and
16 may it please the Board. Again, I'm Seth Lindner for Patent Owner, Foras.
17 So, I'd like to begin with one of the issues that was discussed already today
18 relating to the references -- Exhibit 1008, 1028, that Petitioner and Dr.
19 Brogioli rely on. So, on Slide 23 -- Petitioner's Slide 23 -- so, Petitioner
20 pointed to this slide when asked about what was the evidence that those two
21 documents, Exhibits 1008 and 1028, are prior art. She said -- she identified
22 the Shelling reference, Exhibit 1014.

23 So, one point I'd like to make there is that whatever is in Exhibit
24 1014 has no bearing on whether or not Exhibits 1008 and 1028 are prior art,
25 whether they were available to a person of skill, whether a person of skill

1 would've known what was in those documents. Exhibit 1014 is just its own
2 document. The other thing I'll point out is that although Exhibit 1014 is
3 listed as an exhibit in the list of exhibits, it was not relied upon in the
4 petition ever. It was not cited in the petition, so to the extent that Petitioner
5 is trying to say now that this is somehow evidence that brings in all these
6 other documents, I think that's just not -- that's not a correct position to take.

7 The other point that I wanted to make here is that, you know, Your
8 Honors were asking, how can you use a document that's not demonstrated in
9 prior art. You know, where's the line there? And Petitioner's position was
10 that they're not using the Exhibit 1008 and 1028 to supply a missing claim
11 limitation. They're simply using it to show how someone would've
12 understood Fox, and I would disagree with that position -- both how they're
13 using it, and that they can use it at all.

14 So for example, if we look at Patent Owner's Slide 5 -- well, let's
15 go to Slide 6. Okay. So, this relates a limitation that -- for the '781 patent
16 -- I'm just going to use that wording for now, but it's similar in the other
17 patent, but for the '781, it discloses information that assigns a role of boot
18 processor. And in the petition, we can see that Petitioner took the position
19 that a POSITA would've understood that Fox's IA-32 system would have set
20 the BSP flag of the designated boot processors to one, and then they have a
21 parentheses and it says, assigns a role a boot processor. So, what we can see
22 here is not just that they're saying the BSP flag, which comes from Exhibit
23 1008 -- it's not in Fox -- we can see here that they're using that particular
24 implementation described in the IA-32 reference for the limitation itself, for
25 the assigns a role a boot processor limitation.

1 So, it's not just the sort of general existence of a boot processor,
2 but it's how is the boot processor, which IA-32 calls BSP for boot strap
3 processor, how is that actually implemented. And you know, they're
4 pointing to a particular flag that is set that allegedly indicates which
5 processor is going to play this role of the boot strap process, so they're
6 looking at IA-32 for that limitation. They're saying it came from the assigns
7 a role a boot processor comes from the IA-32 reference. And regardless of
8 where the dividing line is between what's allowable as to non-prior art, the
9 providing a missing limitation in a reference that hasn't been proven to prior
10 art is far on the side of it that's not allowable. So, I -- we think that's an
11 improper way to use those references.

12 Okay. So, I wanted to also go back up a little bit and just look at
13 our claim language for a moment because I wanted to kind of set the stage
14 for the following discussion. So, I've got the -- actually, let me do this. Let
15 me -- let's go to Slide 4 of Patent Owner's demonstratives, and I think a
16 similar -- I'm looking at Figure 1 of the patent. It's easier to zoom in on your
17 patent -- '781 patent through -- to share Figure 1. So, what I wanted to point
18 out there was that -- so, when I first read this patent, it was always confusing
19 to me because there was an idea of there being a -- like a master processor
20 and a slave processor that are in lockstep, and then there's a spare processor
21 and it also has a master and a slave.

22 So, I just wanted to give a quick overview of that so everybody is
23 on the same page. The boot processor in Figure 1, it sort of combines into
24 one boot processor -- this master and this slave that are in lockstep. So,
25 these are just two processors that are both executing the same function and

1 same instructions all the time, and that allows for error detection to happen
2 because if one spits out one value and the other one spits out a different
3 value, you know that one of those two is wrong. So, that's what's within the
4 boot processor. The spare processor has the same thing, so they each kind of
5 have this built in back-up, if you will, right? And that allows you to detect
6 errors more rapidly.

7 So, the one thing I wanted to point out was that after the boot
8 processor, you know, provides its result, you see there's an error detect block
9 labeled 13C. It's sort of in the center left of that figure. And then there's a
10 -- if there's an error, you see that there's a triangular box -- or sorry, a
11 diamond shaped box that says, lockstep recoverable. So, if it's non-
12 recoverable, then the system would crash. If it is recoverable, there's
13 another decision step which says, is master processor 12A the system boot
14 processor, right?

15 So, it's considering whether when we got an error, right, did that
16 error come from the boot processor or not? If yes, then we go downward in
17 that Figure 2D, switch the hot spare, and so on. If it's a no, meaning it
18 wasn't the boot processor that crashed, then you go to a different step, which
19 is idle the master processor 12A in step 104. And so, I'm bringing this up
20 because the patent does describe that a boot processor and a non-boot
21 processor, which is what this figure is showing, those are treated differently.
22 So, there's a separate path for what do we do when we get an error in a boot
23 processor. We're doing something special. It's different than what happens
24 if you get an error in an application processor anything that's not a boot
25 processor, right?

1 So, it has these two different paths, and this is unique because in
2 the prior art, the systems that are described there are -- the idea behind those,
3 and I'm generalizing a bit -- but the idea behind those is that it's just trying to
4 come up with a way to recover when you have an error in a processor. Not
5 saying, oh, well what kind of processor was it and are we going to treat them
6 differently if it's a boot versus an applications processor. The prior art
7 doesn't do that. That's what's unique and why the prior art from a broad
8 perspective doesn't fit with the challenged claims of either of the two patents
9 at issue today. Okay. So now, I want to go to the claim language. I've got

10 --

11 JUDGE CASS: Counsel, this is Judge Cass. Can I just ask you to
12 elaborate a bit? So, how is -- why are there different paths depending on
13 whether it's a boot processor or not?

14 MR. LINDNER: So, the patent describes that the boot processor
15 wouldn't be a processor, that you'd want to -- I don't -- it also describes that
16 the role of the boot processor and booting the system, and how -- you know,
17 goes into a lot of detail about all the things that are involved when you, you
18 know -- that the boot processor does, basically. It's the starting position and
19 it's a more important processor. It also describes that if you -- you can see
20 that in the description about how if it would be a waste of resources or
21 maybe -- didn't say waste -- inefficient use of resources to have a spare for
22 every processor in the system, right? It says it would be burdensome -- I
23 don't remember the exact language -- but it would be a burden to have a
24 spare for every processor in the system, so the boot processor is the one that
25 is, you know -- in this disclosure, they describe that as the one having the

1 spare and the others wouldn't necessarily have one.

2 JUDGE CASS: I see, thank you.

3 MR. LINDNER: Okay. So, I want to talk about the claim
4 language for a moment, and I've got that on Slide 3. Okay. So, we've
5 -- Your Honors are, you know, certainly familiar with sort of the main issues
6 here, but I wanted to focus on the limitation 1C, and just particular, the
7 wording of that limitation. So, you can see that 1C describes -- and I'll read
8 a portion of it -- but the relevant part that we're talking about here is that
9 there's logic that's operable for transferring during system runtime the role of
10 boot processor to said spare processor. And I'm sure you all have been
11 doing this long enough to know that the words in the claim matter and the
12 way that it's written, the grammar of the claim matters. And in this case, I
13 think it's actually pretty relevant to examine that a little bit closely.

14 So, I'll give a short example. I have an eight year old daughter
15 who's wonderful. If she ever reads this transcript, she'll be thrilled to know
16 that I mentioned her here. She's brilliant and wonderful, and she's very
17 literal. So, if I said to my eight year old daughter, we need to talk about
18 what you did after school, she would have an interpretation of what I meant
19 by that. And it could mean that I want to know, you did something bad after
20 school and we're going to have to talk about that. Now, if I said to her, we
21 need to talk after school about what you did, that's a different meaning. It
22 means, when are we going to talk, we're going to talk after school, and what
23 are we going to talk about, we're going to talk about what you did.

24 So, the same words, but I just changed the order and put the
25 commas in, and it means something very different. So, when we look at the

1 claims, they are helpful. It doesn't always happen in patent claims. These
2 claims are helpful because they actually tell us what is being talked about.
3 So, it says transferring during system runtime the role of boot processor. So,
4 when are transferring? During system runtime. What are we transferring?
5 The role of system boot processor. That is -- that's clear.

6 Just plain rules of grammar, ordinary rules of grammar, tell us how
7 those things are applying to each other with the commas and everything that
8 are in that limitation. That is a different meaning than if the claim said,
9 transferring the system runtime role of the boot processor or as Petitioner's
10 slides had repeatedly switching the role of the boot processor during the
11 system runtime. So, is the -- are we switching the system runtime role? The
12 language of the claims, the plain language of the claim says no. The claim
13 language says you are transferring the role of boot processor during system
14 runtime, not that you're transferring whatever it was doing during system
15 runtime to a different processor.

16 JUDGE CASS: Well, Counsel, I mean, I think in light of
17 Petitioner's position, it sort of begs the question of, you know, what does it
18 mean to transfer the role of boot processor. So, I hope you address that next.

19 MR. LINDNER: Yes, thank you. That's where I was going to go
20 next. So, I think the best place to start that is to look at what is a boot
21 processor, and I think Your Honors asked a couple of questions about this
22 already, and you won't be surprised by my position. And I think Counsel
23 said this earlier, as well, that a boot processor is a boot processor because it
24 boots the system. I think that was how Your Honor phrased it.

25 I think I would agree with that, that that's what it does, and I think

1 both of the experts have taken that position that what makes it a boot
2 processor -- the defining feature of the boot processor -- is that it is going to
3 initialize the system, boot the operating system. That's what makes it a boot
4 processor. That's how you recognize that it is one. That's the evidence that
5 they point to in the IA-32 document to say, hey, we've got a boot processor
6 because look what it does. It initializes and loads the operating system. So,
7 that's what a boot processor is, and so when we talk about the role of boot
8 processor, the role of boot processor is to do those things.

9 And it's, again -- I don't meant to nitpick on the words, but in
10 Petitioner's presentation, they often said, you're switching the role of the
11 boot processor, meaning okay, we've got a boot processor, we've got it in the
12 system, we know which one it is physically, and now we're going to assign
13 tasks from that one to a different processor. But the claim doesn't say
14 switching the role of the boot processor. It says that you're transferring the
15 role of boot processor. So, which processor is now going to play the role of
16 boot processor. That's what the claims are talking about, and so the critical
17 piece there is that if you are going to play the role of boot processor, then
18 part of your job description is going to be to perform those boot functions.
19 And that's important here because that is what the prior art doesn't do.
20 There's --

21 JUDGE CASS: Counsel, this is Judge Cass. Does the boot
22 processor have other roles other than booting?

23 MR. LINDNER: So, this is a great question, and let me take you
24 to Petitioner's Slide 35. Thirty-five and 36 show pretty similar information.
25 And I think this came up a little bit here earlier today where Petitioner was

1 saying, okay, this is -- what's shown in pink -- I think one of Your Honors
2 was asking about what's shown in pink on Slide 35 and 36 of Petitioner's
3 demonstratives. So, the question was, well, is this -- you know, where does
4 the pink part come from. And Petitioner said that what the pink part is, is
5 how a person of skill would understand what a boot processor is.

6 Now, there's immediately some tension there because earlier,
7 Petitioner took the correct position that a boot processor is a boot processor
8 because it boots. Now, in this slide, they've added some things. So, if we
9 look at the left part of the slide where it says "boot process" in pink, or
10 maybe that's purple, we see the familiar phrase that we've acknowledged is
11 sort of the fundamental part. It initializes the system, boots the operating
12 system, and then you see these other two pieces. And the implication on this
13 slide, and as I recall how Petitioner described it is that okay, these other two
14 pieces in the patent, these things are happening, as well, and that is not
15 correct.

16 So, if we looked -- if the goal here is to understand what is a boot
17 processor, what does it mean to transfer the role of boot processor, we have
18 to look at what does the term mean and where we look for that is in the
19 specification of the '781 or the '302 patents. What Petitioner has done here,
20 they've not -- if you look at the citations on the Slide 35, you'll see that it's
21 Brogioli declaration, and you'll see that it's the NP specification. I'm not
22 going to pull up all of those documents and make you go through them now,
23 but I'll just note for you that in those places when you look, what you won't
24 find is a citation back to the '781 or the '302 patents, because those two other
25 portions of the figure in Slide 35, those descriptions do not come from the

1 '781 or '302 patents. Those are not extra things that happened -- that the
2 boot processor in the patents are doing.

3 Those descriptions come entirely from the prior art -- or the
4 alleged -- the documents relied on. I don't even want to call them prior art,
5 but it's the MP specification, Exhibit 1028. That's where Dr. Brogioli got all
6 of that from. So, from a perspective of, okay, what does the claim mean,
7 what does it mean to be a boot processor, they've got it completely
8 backwards. They're saying, well, here's what everybody agrees a boot
9 processor is, and now here's a couple of other things that what we point to as
10 a boot processor, the BSP in IA-32 and the MP specification. Here's what
11 those do. That's not the way that a claim is supposed to be interpreted using
12 the prior art as a road map for what the claim means and --

13 JUDGE AMUNDSON: This is Judge Amundson. If I could -- if I
14 could ask a question here. It seems like what we've got here is a claim
15 construction issue. We have to interpret the phrase "role of a boot
16 processor" or "boot processor", and it's Foras' position that, as I understand
17 it, at least based on the patent specification, the role of a boot processor is to
18 initialize the system. And then -- do I have that right?

19 MR. LINDNER: Yes, Your Honor. And I think, you know, we
20 could phrase it a slightly different way of is it going to load the OS, is it
21 going to initialize the system? I don't want to say it's stuck in that little tiny
22 box, but yes, the boot processor is doing the booting.

23 JUDGE AMUNDSON: Right. And so, okay -- and then your
24 argument now is that BMW is relying on extrinsic evidence to say, well,
25 okay, the boot processor does other things and that's improper. And the

1 Board in interpreting the phrase or the term should just rely upon the
2 intrinsic evidence?

3 MR. LINDNER: Yes, Your Honor. The Board should rely on the
4 intrinsic record. It's an oddity in this case, I think, that in the end, this is
5 coming down to a claim construction, but in the way that the briefing is
6 written, you won't find a section called claim construction from in the
7 petition, and therefore, you won't find one in the POR. But in my view, as
8 the Patent Owner, that's kind of what's at issue here is how do we -- at least
9 for this issue, what does it mean to be a boot processor, what's the role.

10 And the strange thing is, you know, the record reflects that both
11 experts -- and as I said, both parties kind of agree on what the role of the
12 boot processor is. How do we know that we found one? It does the booting,
13 and so that's -- it's a strange position that, I think, the Petitioner has
14 presented, that they agree on what a boot processor is, but then they point to
15 things that are not that defining characteristic as being relevant to
16 transferring the role of boot processor during --

17 JUDGE CASS: This is Judge Cass. I guess I see it a little
18 differently. It seems to me -- and they can correct us if I'm wrong -- but
19 they're interpreting -- maybe broadly is the wrong word, but they're -- you
20 both agree that the boot processor boots, if that's something the boot
21 processor does, but you say that's that and associated functions are kind of
22 all the boot processor does, at least the defining characteristic of the boot
23 processor, and they say, well it does other things, too, and those other things
24 are the two things to the middle and the right on Slide 35. Does that sound
25 right?

1 MR. LINDNER: Yes, I would say they're pointing to the other
2 things, and I -- just to make it clear, I wouldn't say that Patent Owner's
3 position is that somehow, having these other things that are happening in the
4 -- I'll call them the Intel documents because I don't want to call them prior
5 art, which they are not -- but in the Intel documents, the fact that there is a
6 processor that during runtime, switches roles, and it turns into an
7 applications processor, which is -- that was, I believe, paragraph 46 of Dr.
8 Brogioli's declaration. He says that BSP becomes an application processor
9 after the initialization is finished. So, it's done doing the boot role and then
10 it switches into an applications processor and it's going to just become, you
11 know, one of the processors that's running applications during runtime.

12 So, Patent Owner's position is not that, oh, if you have a processor
13 that is changed roles, that it's just disqualified, it cannot be a part of this
14 claim. The point is that -- so, you could have a processor, and Patent Owner
15 is -- but you could have a processor that starts out performing the boot
16 functions, and then during runtime, is assigned some other functions, and it
17 doesn't really matter what those are, and that then there's a moment where
18 there's a problem with that processor, and now you're going to transfer the
19 role of boot processor to a spare. It's okay that the processor, at that point,
20 happened to be doing something else. We're not saying that it's disqualified
21 because it had other tasks.

22 We're saying that when you -- when the claim says transfer the role
23 of boot processor, it means that -- that you have to transfer that role. The
24 other roles can come along for the ride, if it's going to -- if that spare
25 processor is, you know, now going to take on all of these other tasks, as

1 well, that are unrelated to boot, that's -- in our view, that doesn't disqualify,
2 like I said. But fundamentally, it has to take on to -- to be transferred the
3 role of boot processor, means that it has to be marked or flagged or
4 dedicated to play the role of boot processor, which is to boot the system,
5 load the operating system, initialize things, you know, at some point.

6 Now, the claim doesn't go through and say no, on restart here's
7 what happens. It stops at, you're transferring the role, you can do that
8 -- you've been that claim, you know, in the method claims. You met it when
9 you transferred it in the system claims, you met it when you got, you know,
10 the logic, as the claim says, logic for doing this.

11 So, that's what the claims require, and that critical piece of, you
12 know, what defines it as a boot processor is the piece that's just missing from
13 the prior art. And so, that's where it's, in our view, a very clear distinction
14 between the prior art, which is -- because it wasn't directed to how to handle
15 a boot processor, it's just simply looking at processors with errors, what are
16 we going to do. And it came -- and the prior art discloses some solution for
17 swapping it, a spare processor, but not directed to a boot processor. And so,
18 Your Honor, does that answer your question?

19 JUDGE CASS: I think it does. I was also looking at paragraph 47
20 of Dr. Brogioli's declaration, which I think is what you may have been
21 referring to. And it says, once the operating system is up and running, the
22 BSP function of AP, which I think is what you referred to, but it also says
23 the BSP also controls all system hardware, including AP startup and
24 shutdown. So, I mean, it does seem that at least Dr. Brogioli is pointing to
25 some other functions, other than just booting.

1 MR. LINDNER: Right. He is pointing to those other functions,
2 and like I said, we're not saying that the fact that there are other functions
3 being performed by the BSP means that it doesn't qualify as a boot
4 processor. The presence of other functions is not a disqualification for the
5 claims. It's just that if you're going to transfer the role of boot processor,
6 then you've got to have a processor that's going to perform those defining
7 roles of booting the system.

8 JUDGE CASS: So, if I could say, maybe rephrase your position
9 and tell me if this is right, that the ability to reboot is a necessary condition
10 of being a boot processor?

11 MR. LINDNER: Yes, I would say that's fair. Yes.

12 JUDGE CASS: And don't you --

13 MR. LINDNER: Yes.

14 JUDGE SAINDON: And Counsel -- oh, finish your statement,
15 then I have a question.

16 MR. LINDNER: I feel like your question is going to be relevant to
17 my statement, so --

18 JUDGE SAINDON: To be a boot processor, you need to have
19 some indication in the system so that when it is turned on, it knows to look
20 for you, right?

21 MR. LINDNER: Yes.

22 JUDGE SAINDON: And so that's really what it is, is a flag or
23 some sort of stored value that says, this is the one that -- of all your options
24 -- all your processors, which are otherwise fairly fungible, I believe, that's
25 the one that you're going to use for the boot. So, it's identified somehow as

1 the boot processor?

2 MR. LINDNER: That's right. That's right. And so, yeah,
3 fundamentally, the system comes up and you've got to have a processor
4 that's doing these first few steps of loading things. And so before you get
5 there, there's got to be some kind of -- a stored value, a flag -- I don't want to
6 say -- it could be a lot of other things, but it's got to be there before the
7 system loads, so that the boot processor is the one that's, you know -- which
8 of these processors are going to take on those roles, you know which one it
9 is.

10 And so Your Honors talked with Counsel for Petitioner earlier
11 today about, you know, how they're using the Arai reference, and one of the
12 points that Counsel made was that, you know, we looked at how you're
13 combining Fox with Arai, and Arai discloses this process of how you sort of
14 swap in one processor for another. And Counsel said that they're not saying
15 that in Fox, when you combine them -- and I'll call it the combined system,
16 which is how it is referred to in the papers -- but in that combined system,
17 Counsel said that they're not only putting the information about the role of
18 processors in RAM, and to me, that's directly in conflict with the papers and
19 with the record. So, I would point the Board to Slide 18 of Patent Owner's
20 demonstratives, and in the petition and in Dr. Brogioli's declaration, they
21 describe that they're going to be storing this information, and the petition
22 and the declaration, use the words as in -- or I'm sorry -- yeah, as in Arai.

23 So, I think Your Honors talked earlier with Petitioner's Counsel
24 about what Arai says about this, and Arai describes that it's -- Arai is going
25 to store the information about the role of the processors in RAM. So, during

1 his deposition, Dr. Brogioli was asked that question -- what does it mean
2 -- I'm not quoting the question, but effectively, what does it mean when you
3 say, like in Arai? And this is Dr. Brogioli's answer -- it's here on Slide 18,
4 and he said, that's what's happening in the combination is just as Arai says in
5 paragraph 21, that the BIOS goes and creates a table, and that main memory
6 during the startup in the RAM. So, the BIOS is coming out of this read only
7 memory, running, and creating the table in the RAM here.

8 So, it's clear that regardless of whether the BIOS is in volatile
9 memory or non-volatile memory. The location of where the relevant table is
10 that indicates which processor has which functionality, that table is created
11 in RAM. That's what Arai does, and that is what, you know, Dr. Brogioli
12 clarified when he's combining these two, and he says, you know, Fox doesn't
13 say how to do this, we're doing it like Arai does it. Arai puts those values
14 into RAM. Now, as we see from the testimony of Mr. Jones, when you look
15 at that in total, the fact that those values are put into RAM means that they
16 will not persist on the next restart. That's what's happening in Arai. It is a
17 temporary assignment of those responsibilities put into RAM. Now,
18 Petitioner took the position -- and I think it came up again today -- that
19 Patent Owner has not shown that RAM necessarily means volatile memory.

20 So, I think first of all, I'll point out that it is Petitioner's job to show
21 that it is non-volatile memory, if they're going to take the position that these
22 values persist, which is, you know, expressly in Claim 2 of the '781 and in a
23 couple of the claims of '302 that it has to be non-volatile memory. But even
24 setting those limitations aside, the overall position that the implication -- I'll
25 say that what happens when you combine Fox with Arai, is that you end up

1 with a system that can then use the spare processor as the boot processor the
2 next time because these values are written to RAM, which could be non-
3 volatile RAM, I think is unsupported by the record.

4 And Petitioner hasn't pointed to any place where anyone has taken
5 the position that when Arai said we're going to write these values into RAM,
6 there's nobody that took a position that said, oh, that means non-volatile
7 memory. That's a frankly ridiculous position, and the only evidence we have
8 about it, other than the words itself, is that Mr. Jones opined on this and said,
9 it was -- if you do that, those values, they don't persist on the next reset.

10 Had Patent Owner -- or pardon me -- had Petitioner wanted to
11 disagree with that, the mechanism for it is not to say, well you haven't shown
12 that it isn't non-volatile, but they've got to come forward with evidence to
13 say that it is volatile, and they could've done so through a declaration of their
14 expert with their reply brief, but there wasn't one. So, they got the burden
15 wrong, and also, the evidence all goes in the other direction.

16 JUDGE AMUNDSON: This is Judge Amundson. I probably
17 should've asked this a little earlier, but with regard to Fox and BMW's
18 position that initially, whatever processor 120 executes the BIOS
19 instructions that's your boot processor, are you saying that, okay, assuming
20 that's correct, BMW hasn't shown that the role of that processor is
21 transferred to another processor? Or where does their argument break
22 down?

23 MR. LINDNER: I apologize, Your Honor. Can you run that by
24 me one more time? The video --

25 JUDGE AMUNDSON: Well --

1 MR. LINDNER: -- and the voice are un-synced, and it made it
2 difficult for me to follow along. I apologize.

3 JUDGE AMUNDSON: All right. Let's -- okay, let me try it again.
4 Okay. So, I asked BMW's Counsel about what would be the boot processor
5 in Fox, and I think she said or agreed with me that whatever processor 120 is
6 selected initially to execute the BIOS, that's going to be the boot processor.
7 That's what I thought I understood. And so now, assuming that's correct, I'm
8 trying to understand Foras' position about where BMW's mapping breaks
9 down. Is it in the transferring step or do they have the identification of the
10 boot processor wrong?

11 MR. LINDNER: Okay. So, there's a couple of problems there.
12 The first of them is that Fox doesn't disclose that there is a boot processor.
13 The demonstratives from Petitioner have, you know, done this a bunch of
14 times where they take Figure 1 from Fox and they put a blue box around a
15 processor and say, this is the IA-32 boot processor. That's not disclosed in
16 Fox. Fox doesn't say anything about it being a boot processor, so that's
17 -- the first problem is just that there's not a disclosure in Fox that tells you
18 that one of these processors is the boot processor and they've got to rely on
19 non-prior art to get there.

20 JUDGE AMUNDSON: This is Judge Amundson. But let's
21 assume the Board agrees with BMW that the processor -- whatever
22 processor 120 is selected initially to run the BIOS, that that's going to be the
23 boot processor, all right? What's the other problem with BMW's position?

24 MR. LINDNER: Yeah. So, I mean, fundamentally, it's kind of
25 what I've been going through here, which is the -- when Petitioner combines

1 the Fox and Arai references and attempts to show what is -- which
2 responsibilities of the processor -- the alleged boot processor in Fox -- are
3 then taken over by the spare -- the alleged spare processor. That's done
4 using these things that are called APIC IDs -- A-P-I-C IDs -- and it swaps
5 the numbers essentially.

6 So, the -- there's a couple of problems. The fundamental one at the
7 very, you know, highest level is that, when you do that, when you swap
8 those IDs, that doesn't show anything about how the new processor that just
9 got the former boot processor's ID, how that new one is going to play any
10 role in booting or have any responsibility, or designate at all to the system
11 that hey, this is going to be a boot processor at some point in the future. In
12 fact, those IDs that are used in Arai and in the Intel document, those IDs are
13 assigned by the BIOS, which is running on the BSP. That's the alleged boot
14 processor. So, the boot processor comes up and it starts giving out IDs. So,
15 as we pointed out in the papers, that process of giving out the IDs, that can't
16 be assigning the role because the boot processor is already running. It can't
17 assign the role when a boot processor is already doing its job. It's sort of
18 like a circular -- or a chicken and egg thing. The boot processor has already
19 been assigned because that's how it knows it's the boot processor, and that's
20 why it is giving out these identifications.

21 So, that's one of the problems is there. The other problem, Your
22 Honor, is that those -- switching those identifications doesn't do anything
23 other than what are relevant for that particular cycle of the system -- that
24 particular power cycle. So, you don't ever have any indication that, oh, this
25 is going to persist, this is going to be something that now, there's another

1 boot processing function that's ever performed by that spare processor that
2 got swapped in. So, it's simply not -- it simply hasn't been transferred the
3 -- during runtime, the role of boot processor.

4 JUDGE AMUNDSON: This is Judge Amundson. I think one of
5 the things you're saying is that when the APIC ID is switched during
6 runtime, okay, that's fine, but that doesn't change -- that doesn't transfer the
7 role of the boot processor because that switching occurs in RAM and does
8 not persist?

9 MR. LINDNER: Yes. Because it's in RAM, we know that it, sort
10 of by definition, can't persist when there's a restart of the system. And
11 beyond that, Petitioner hasn't even argued that it would. I mean, they haven't
12 even taken a position to say, hey, this could be the processor that boots the
13 next time. I mean, that isn't anywhere in the record. That's not an argument
14 that they've made, so we've sort of disproved it, but really, they haven't even
15 taken the first step of trying to show that that is what happens.

16 They're simply relying on the fact that it's going to -- that processor
17 will, you know -- some of the saved memories, is I think the wording that
18 Arai uses -- that that saved memory state is going to be transferred from one
19 processor to the other, which just effectively means that whatever things
20 happen to be going on in that processor are now going to be moved over to
21 another processor. So, it doesn't have anything to do with boot
22 responsibilities at all. And like I said, I think that Petitioner would agree
23 that there isn't any evidence in the record, nor have they argued that any of
24 these processors are actually going to do the boot functionality that
25 everybody agrees is what defines a boot processor. Did I answer your

1 question?

2 JUDGE AMUNDSON: Yes, thank you.

3 MR. LINDNER: Okay. All right.

4 JUDGE SAINDON: Counsel, before we move off this, and
5 hopefully, we're not beating a dead horse because I think this is important
6 -- this whole boot processor and what the role is. So, we had -- at the very
7 beginning, we looked at Figure 1, and you were pointing out how we needed
8 to check, is this the boot processor, and if so, we switch to the spare, as
9 opposed to just I -- wait, and so forth. And with that in mind then also,
10 maybe there was somewhere else in there. Is there any more affirmative
11 statements in the spec for this claim construction idea that the role of boot
12 processor is that of booting, as opposed to, you know, it boots, and then
13 whatever that processor happens to later do is the role of boot processor?

14 MR. LINDNER: Yes. So, let me direct you to Slide 12 of Patent
15 Owner's demonstratives.

16 JUDGE SAINDON: Okay.

17 MR. LINDNER: And I apologize for me leaning over. It's too
18 small on my screen otherwise. So, we cited there a couple of different
19 portions of the specification that describe the concept that the system -- the
20 concept that the system recognizes that the role of the boot processor would
21 sort of persist across a reset. And like in the second bullet point here, we
22 talk about the changes to processor roles -- or sorry -- change to processor
23 roles can change settings in NVRAM that are honored on the next reset.
24 That's from column 14, lines 4 through 31 of the '781 patent.

25 So, in that instance, it specifies NVRAM, which means non-

1 volatile random access memory -- non-volatile RAM. Not the typical RAM.
2 It's kind of a special case, but it says you're doing that. You're putting
3 information about the boot processor into NVRAM so that it can be honored
4 on the next reset. And then there's also a description -- I don't know if I have
5 a -- I may not have a slide for it here, but there's a -- there's in -- or in Mr.
6 Jones' declaration and in the '781 patent, there's a pretty detailed discussion
7 of exactly what the boot processor does and sort of from when the -- do you
8 have a copy of the patent? I'll find it as I talk.

9 JUDGE SAINDON: Okay. Otherwise, we can do it in your next
10 session.

11 MR. LINDNER: Okay. So -- no, sorry, this isn't going to -- we'll
12 look at it the next time, but yeah, there's a pretty detailed disclosure of sort
13 of step by step how the boot processor works, how does it bring up the
14 system, who is handing off to whom, and all of that -- I mean, that's what we
15 know about the boot processor -- all of that is part of initializing the system.
16 It's the boot stuff, and there isn't really a dispute between the parties that
17 what's described there is the boot operation. What we don't see, and this
18 kind of gets to your question -- what we don't see if any disclosure in the
19 spec of the boot processor doing something else. We know that it's there
20 and it's running, otherwise you wouldn't be able to get an error from the boot
21 processor. So, we know that it's there and that it's running, but we don't
22 have any detail in the spec about what operations might be doing after it
23 finishes the booting. So, to me, that absence, you know -- if you look at,
24 well, how do we know what is the role of a boot processor, couldn't it be one
25 of all these things. Well, from the spec, no.

1 The role is what it says is done and the part I was thinking of is the
2 bottom of column 11. So, 11, line 60 through to much of column 12,
3 probably through to 12, line 35. And I'm not going to bore you with all the
4 details there, but it talks about sort of the traditional role of boot processor
5 and what they call a traditional IPF system, and it also describes that, you
6 know, you could have different architectures. It's not limiting to one
7 particular one, but these are just the sort of standard things that a boot
8 processor would do, and it goes through them in detail here about what it is,
9 and all of them are related to this booting operation.

10 I haven't seen -- and Petitioners haven't pointed out any other roles
11 that are there, so it's not like we've -- we're trying to say, hey, we're limiting
12 the meaning to this certain embodiment. It's that this is, first of all, just plain
13 language of the word boot processor. A person of skill would understand
14 that to mean that it has this role, and secondly, there's not some disclosure in
15 the spec that says, oh, well there's also all these other roles and, well, which
16 of the roles is being transferred. It's the role of boot processor. So, in our
17 view, that's pretty clear.

18 JUDGE SAINDON: Okay. And we've been talking about this
19 issue a whole lot, and I want to make sure that I haven't missed anything, so
20 I guess is this issue -- I don't want to say dispositive -- it would be
21 dispositive if we rule for you, but if we ruled against you, is it dispositive for
22 Patent -- or for Petitioner. What are some other arguments that maybe we're
23 overlooking that we haven't --

24 MR. LINDNER: Right.

25 JUDGE SAINDON: -- talked about?

1 MR. LINDNER: So, there's always the issue of their inclusion of
2 those two exhibits that are prior art. So, that -- regardless of what role is
3 being played, those are certainly a factor. The other one is that when we
4 look at Claim 2 of the '781 patent and a couple of the claims of the '302
5 -- and I don't remember their claim numbers off the top of my head -- those
6 expressly recite non-volatile memory, that you're putting the information
7 that assigns the role into non-volatile memory. And the closest that
8 Petitioner has to that -- even if we set aside the assigning the role concept
9 -- is they point to the Arai reference, which puts it into RAM, and they said
10 that Patent Owner hasn't shown that that RAM is necessarily volatile. So,
11 that's another problem for those claims. And --

12 JUDGE SAINDON: And it's not a memory test, like --

13 MR. LINDNER: Yeah.

14 JUDGE SAINDON: -- I'm reading, but --

15 MR. LINDNER: I'm just like, whoa, gosh, I don't want to leave
16 anything out. There probably are more and they'll probably come to me as I
17 go here.

18 JUDGE SAINDON: Because I just thought of something else.

19 MR. LINDNER: Oh, yeah.

20 JUDGE SAINDON: The Landry reference was added to talk
21 about boot, but I think -- and I'm wondering if your characterization -- if
22 you'd agree -- that that's really to address whether this IA-32, if we really
23 need to go into that, if Landry cures that issue, then it just turns into what the
24 role of the boot processor and that could be dispositive for both of those
25 grounds.

1 MR. LINDNER: I think as to Landry, I want to make sure it's
2 clear because I think what Petitioner said was that when they do the Landry
3 combination, that Petitioner is no longer relying on Fox for IA-32 or the
4 Exhibit 1028 MP specification for the idea of there being a boot processor.
5 And if that's the position, today's the first time that I've heard of it. I would
6 direct Your Honors to page 33 of the petition where it's clearer there that
7 they're still relying on Fox -- the boot processor in Fox. And they say that
8 Landry is a suitable option for selecting a boot processor, meaning how do
9 we choose which one of these is going to be the boot processor, but to me,
10 the plain reading of the petition -- let me get the wording for the --

11 JUDGE AMUNDSON: This is Judge Amundson. If you could
12 just indicate the case number for the petition you're talking about --

13 MR. LINDNER: Yes.

14 JUDGE AMUNDSON: -- because we've got two cases --

15 MR. LINDNER: Thank you.

16 JUDGE AMUNDSON: -- so the record is clear.

17 MR. LINDNER: Good point. This is the IPR2024-01436. So,
18 this is for the '781 patent. And you can see at the top of the section that's
19 titled "A POSITA Would've Found it Obvious to Identify Fox's Boot
20 Processor as Logical CPU Zero." Well, I mean, even from the title, we
21 know they're talking about the boot processor that they say is in Fox and
22 you're identifying it. And we read the first sentence and it says, again, a
23 POSITA would've understood that Fox's system would have designated a
24 boot processor. See Section 7B.2. That's referring back to Ground 1, where
25 they used Fox and they used the IA-32, and they used the MP specification

1 to show that Fox had a boot processor.

2 So, unless I've missed something, it, you know -- it's pretty clear
3 that what Petitioner is doing with Landry is not to say, hey, Landry has got a
4 boot processor, so let's use its boot processor instead of the one we said was
5 in Fox. They're relying still on the Fox boot processor. They're using
6 Landry as a technique for how do you choose which processor is going to be
7 the boot processor, not for the idea that there isn't a boot processor, that you
8 need to choose one in the first place. The other thing --

9 JUDGE AMUNDSON: What page was that, Counsel?

10 MR. LINDNER: Pardon me?

11 JUDGE AMUNDSON: Point me again to the page of the petition
12 you're looking at.

13 MR. LINDNER: I was reading from the bottom of page 33 of the
14 petition for the '781 patent, the 1346 petition. Bottom of page 33, top of
15 page 34. The other thing that's important here --

16 JUDGE AMUNDSON: Yes, Counsel. So, I'm taking -- I'm
17 looking at this and I said -- I asked a question to Petitioner's Counsel, and I
18 guess it's not that clear to me whether this section is -- I mean, it's clearly
19 relying on Fox, no doubt about that, but whether it's also relying on the IA-
20 32 documents or not.

21 MR. LINDNER: So --

22 JUDGE AMUNDSON: Maybe you could help clarify your
23 position as to why it is relying on the IA-32 documents.

24 MR. LINDNER: Well, the sentence that I read about -- or I didn't
25 read it into the record -- but the second sentence in -- at the bottom of page

1 33, it says, Fox's multi-processor system configured with IA-32 architecture,
2 follows the MP initialization protocol that dynamically designates one of its
3 processors as the boot processor. Citing to Fox at paragraph 14, citing to
4 IA-32 -- that's Exhibit 1008 that we've demonstrated as not prior art at page
5 238, and then it also cites to Brogioli, paragraphs 45 and 46, where in those
6 paragraphs, he relies on the MP specification, and if I remember correctly,
7 also, the IA-32 document. So, to me, that's -- it's pretty clear that they're
8 pointing back to what they said in Ground 1 about Fox in combination with
9 those other two documents.

10 JUDGE AMUNDSON: I guess the thing that is making me
11 unclear is the last sentence in that paragraph that says, a POSITA would've
12 understood Landry's process as a suitable option for selecting a boot
13 processor in Fox, consistent with the initialization protocol of IA-32 multi-
14 processor system. So, it's not clear to me whether they're saying any
15 additional alternative to Fox or the boot processor, or whether they're still
16 relying on Fox for the boot processor.

17 MR. LINDNER: Yeah, I see that sentence and I do think that, to
18 me, it's clear that they're actually relying on the IA-32 system because it says
19 it's consistent with the initialization protocol of an IA-32 multi-processor
20 system. The initialization protocol of an IA-32 multi-processor system only
21 comes into this case because of the -- those two documents.

22 So, if you're saying you're going to do something that's consistent
23 with that protocol, it means that you're following that protocol and then
24 you're going to maybe add something to it that doesn't, you know, destroy it
25 or break it. You're going to be consistent with it. So, I think it's relying on

1 those documents. I think that's a reasonable interpretation of that and pretty
2 clear from the wording here. The other thing that I'll point out, and this is
3 important when you look at Landry, is that what's happening in Landry is
4 not -- and we pointed this out in the papers, as well -- but what's happening
5 in Landry is not that you got some system that's going to do a on the fly
6 designation of a boot processor, and we sort of saved the day on all these
7 claims.

8 Landry is a very old reference and essentially, all that Landry does
9 is it's looking at -- it says you have a bunch of processors in physical slots
10 and you're literally going to look at the left-most slot, which they call
11 physical CPU zero, which is physically the left-most slot. And Landry says
12 start there, and if that processor is not functioning, then we can't boot from
13 it, so let's move on to the next one. And whenever we find one that is
14 working, we're going to call that the logical CPU zero. So, it's the physical
15 versus logical. It doesn't happen to be the zero slot, but we're calling it
16 logical CPU zero because that's going to be the one that we boot from. So,
17 all of this though is happening in Landry. This is not during the system
18 runtime.

19 Landry is -- my apologies to Mr. Landry -- but it's kind of a dumb
20 system in that it's not very sophisticated. It's a fine idea for whenever
21 -- 1988 or whenever this was written, but it's not a sophisticated system. It's
22 just simply looking at slots during the initialization before you've started to
23 boot, and it's picking one. So, from that perspective, again, the -- when we
24 get into the concept of transferring roles during runtime, right, now Landry
25 has sort of this other problem that it doesn't transfer roles during runtime.

1 It's doing it before anything starts, and as Dr. Brogioli acknowledged during
2 his deposition, every time Landry restarts, you're going back to the drawing
3 board. He didn't use those words, but that's effectively what happens.
4 Landry is going to always just say, okay, let's go back and check CPU zero,
5 physical slot zero, the left-most slot. And it's just plugging along until it
6 finds a processor that's working and then says, okay, that'll be the boot
7 processor.

8 So, that combination with Landry with Fox, it's kind of an odd
9 pairing because it doesn't get to what the claim says, the during runtime,
10 which is why Petitioner -- the way they phrased it, and I've -- they've -- the
11 way they phrased how they're using Landry never really made a lot of sense
12 because they're sort of saying, look, we're just -- we've got the Fox/Arai
13 combination, which has these -- this concept of an APIC ID, and now we've
14 got a Landry reference that says, CPU zero or logical CPU zero can be the
15 boot processor, and somehow, those are supposed to come together and help
16 to satisfy the claims.

17 And frankly, I just don't see it. I don't see how that helps, given
18 that, Like I said, Landry is never -- the concept of Landry is that you've
19 picked the boot processor every time, start from scratch, just plug along and
20 find one that's working. It's not any kind of dynamic assignment of roles of
21 the processor, which is, you know -- certainly, the claims are expressed
22 about that, that you have to do it without shutting down the operating
23 system, you have to switch the role as the '302 says. The '781 patent says
24 you have to transfer the role during runtime, and those two things are just
25 incompatible with the way that Landry works.

1 JUDGE AMUNDSON: Thank you, Counsel.

2 MR. LINDNER: The other difference we haven't talked about yet,
3 and it's -- the papers do a very good job of laying this out, and me repeating
4 it all here wouldn't be helpful, but just for the context, the active spare and
5 the hot spare issue in the '302 patent, that is laid out well in the appears, and
6 that is a separate distinction -- totally separate from whether the -- what the
7 role of boot processor is and that whole discussion, so I think you're asking
8 about what other issues are there. That one certainly stands alone.

9 The other point, Petitioner's demonstratives spent quite a bit of
10 time on the testimony of Mr. Jones, which they said was -- he was burying
11 his head in the sand or something like that. And I think if you look at that
12 testimony and look at the broader context, I think that's really a
13 mischaracterization of what was happening there. The first thing, and I'll
14 direct you to the slide so you can see the testimony. So, this is on Slide 28
15 of Petitioner's demonstratives. So, they made the point today that Mr. Jones
16 didn't consider an Intel multi-processor system from before 2004.
17 Therefore, he was sort of ignoring the evidence in the record. And I think
18 that's just totally incorrect. First of all, this is an IPR where we're looking at
19 patents and printed publications, and some other documents that may or may
20 not be prior art.

21 The idea of saying to the expert, did you consider Intel's multi-
22 processor systems from before 2004, that's -- a system is like a piece of
23 equipment, and to say that he considered that or not is just totally irrelevant,
24 and the fact that he said he didn't consider is probably the right answer. He
25 didn't tear apart an Intel 2004 multi-processor system and look at it and

1 figure out what it does. He looked at the documents and as he says here, he
2 looked at the documents that he's cited in his declaration, and that includes
3 both of the documents that Petitioner says he ignored. Petitioner made the
4 point that he didn't read the entirety of one of the documents and as you can
5 see from his response on Slide 29, Petitioner's Slide 29, when he was asked
6 if he read it in its entirety, he said that it was 798 pages long, and he didn't
7 read it in its entirety.

8 He looked at the portions that Dr. Brogioli referenced in his
9 opinion, which is absolutely what he should've been looking at, and it also,
10 you know, sort of emphasizes the point of, look, if this document wasn't
11 even shown as being a piece of prior art, how is it appropriate to pick one
12 page out of 798 and say, that's the background knowledge of a person of
13 skill, and then criticize the expert for not looking at the uncited pages of that
14 document that wasn't even prior art. So, I think that position -- the criticism
15 of Mr. Jones -- is quite inappropriate. Let me see. Oh, the other point I'll
16 make -- so this relates to only the '302 patent, but that patent has quite a
17 number of challenged claims, and included in those claims is 11, 12, 17, and
18 24. So, on Patent Owner's Slide 24, I've laid out just an excerpt from the
19 papers -- from Patent Owner's surreply that sort of lays out the position, and
20 here's what it is.

21 In the petition, the Petitioner never went through any of those
22 limitations -- those claims -- 11, 12, 17, or 24, and mapped those claims, or
23 mapped the prior art to those claims. It doesn't appear in the petition, and
24 Patent Owner pointed that out in the POR and said, you can't meet your
25 burden if you don't analyze the claims and show that it all maps. And what

1 Petitioner did in reply was what's on Slide 25 of Patent Owner's
2 demonstratives. They replied with this chart, and this chart proports to show
3 where they say, oh, the -- yes, we didn't map those claims, but if you look at
4 the limitations that are in those claims, you can find a discussion of those
5 limitations elsewhere in the petition for a different claim.

6 And that is sort of fundamentally not what the Petitioner is
7 supposed to do, where they have to point out, with particularity, where
8 -- how the prior art teaches each of the claims. So, this chart on a reply is
9 totally inappropriate. I'm not even sure if that chart would be good enough
10 if you were -- included it in the petition just to say, go look elsewhere, unless
11 the wording of those claims in the, you know, missing claim language was
12 actually verbatim in the other claims, or they made some statement to that
13 effect of, oh, you know, there's a minor reporting difference, but it doesn't
14 make a difference here. They haven't done any of that.

15 They just simply left it out of the petition and that should be the
16 end of the story. Now that they've tried to clean it up in reply, it just
17 illustrates what they're saying is for the Board, and for Patent Owners,
18 they're saying, you need to have gone -- in order for Patent Owner to have
19 responded, Patent Owner would've needed to have gone through and found
20 all these different sections that were never explained in the petition as to
21 how -- go look at Claim 1C, go look at Claim 13B, 13E, and 21E, and you'll
22 find all the missing -- all the pieces that fit together. So, I think that's totally
23 inappropriate that they have them at their burden there.

24 The other thing that I would point out, and I put this on a couple of
25 the slides here, beginning with Patent Owner's Slide 26 -- and this isn't

1 exhausted because -- but I want to show a couple of examples. If you look
2 at the claim that they say was -- you can find the limitations elsewhere, they
3 pointed for Claim 11, they pointed to 1A, 13B, and 13C. And I won't read
4 all of this into the record, but we can see on this slide that in the portions that
5 are underlined, that the language is different, and we can spend lots of time
6 figuring out whether that language is -- well, is it close enough or not, but
7 the bottom line is, it wasn't in here.

8 So, when there's this mismatch in the language and when they have
9 never said until the reply, here's where you're supposed to look, it just
10 compounds the error and really also that that was deficient. So, from Patent
11 Owner's perspective, those claims -- 11, 12, 17, 24 -- regardless of whether,
12 you know, the Board disagrees with everything else that I've said, those
13 claims are just missing from the petition and I can't think of, you know, a
14 more clear example of where Petitioner hasn't met its burden to show with
15 particularly, how the prior art maps to the claims.

16 JUDGE SAINDON: You have a little more than 15 minutes.

17 MR. LINDNER: Okay. I will stop here and reserve the rest of my
18 time for rebuttal. Thank you.

19 JUDGE SAINDON: Thank you.

20 MS. ZHANG: May it please the board.

21 JUDGE SAINDON: Sure, go ahead. Please.

22 MS. ZHANG: Your Honors, Patent Owner didn't invent boot
23 processors. I hear a lot of discussion about the role of boot processors and
24 there's fundamental agreement here. Boot processor and that system
25 initialization. And Patent Owner, I didn't hear them dispute that boot

1 processor also performed other responsibilities during the operation of the
2 system. Their expert didn't dispute any of the testimony Dr. Brogioli gave
3 about other functionalities of boot processor during system operations.
4 Their expert just simply choose not to look at it, not to address it. And their
5 recent new claim construction, Your Honors, is not in their response.
6 They're requiring that (INDISCERNIBLE) is the new boot processor to
7 perform system initialization. And I've already pointed out, that's
8 inconsistent with the specification describing the process, describing the
9 information for switching the role of the boot processor. And I won't repeat
10 that, but I have other examples, too. And for example --

11 JUDGE AMUNDSON: This is Judge Amundson. Which portions
12 of the specification -- I mean, pick the patent, but if you pick one of the
13 patents and direct us specifically to what portions of the specification you're
14 referring to, I think that will help.

15 MS. ZHANG: Thank you, Your Honor. What evidence I'm
16 talking about is the Figure 4 that we have shown -- Figure 4 of Patent '302
17 -- and its associated description in its specification about how you switch the
18 role of the boot processor to the spare processor. And the citations are -- this
19 is our slide -- page 37, where we also show that figure in Slide 34 of our
20 exhibit -- demonstrative exhibit, and the citations below that figure are
21 citations to the record discussing that portions of the specification describing
22 switching the role or the boot processor during system runtime.

23 JUDGE AMUNDSON: All right, thank you.

24 MS. ZHANG: Thank you, Your Honor. And their argument about
25 a boot processor needs to perform system initialization is inconsistent with

1 their claim language. In Patent Owner's response for the '302 IPR, they
2 argue that claim limitation 21E, causing the operating system to recognize
3 the spare processor as the boot processor, is equivalent to switching the role
4 of the boot processor to the spare processor. If that's equivalent, that means
5 the operating system is already running. That is consistent with Figure 4 of
6 the specification. That's when the role has been switched. That's when the
7 role is being switched.

8 And Your Honor, Patent Owner's argument regarding the new
9 construction that they have made in the Patent Owner's response, they have
10 waived that argument. And what is telling about Patent Owner's argument is
11 they say, don't look at those specifications about Intel processors, they have
12 not been shown as prior art, but when they make their arguments, they
13 started to pour in information from those specifications. Their expert did not
14 even disclose about any of the discussions in those documents. And they're
15 saying -- they're relying on Exhibit 108 and talking about the APIC ID.
16 They're relying on multi-processor specifications to talk about the boot
17 processor becomes the application processor, according to Dr. Brogioli.

18 But as Your Honor correctly pointed out, the same paragraph also
19 talks about during operation when boot processor finishes the initialization,
20 it can operate as an application processor so the system can utilize its
21 resource. It's not just sitting there performing only a handful of functions.
22 And then when it needs to be called upon to shut down a system and perform
23 other functionalities, it keeps performing its boot processor responsibilities.
24 These are now -- these are the known knowledge of boot processors, and
25 Patent Owner did not reinvent them. In fact, in the Patent Owner surreply,

1 they recognize the primary function of a boot process is to initialize the
2 system. They recognize there are other functions and responsibilities of a
3 boot processor.

4 JUDGE SAINDON: So, Counsel, as I understand it, let's say a
5 boot processor does -- at least functions A, B, and C. So, you're saying if we
6 have a transfer and this new processor does any of A, B, or C, it's been
7 assigned the role of a boot processor and you're saying, well, Patent Owner
8 is requiring maybe all of them or specifically only A or something like that.

9 MS. ZHANG: Yes, Your Honor. That is correct. Patent Owner is
10 asking to find that switching a role, the new processor has to perform the
11 system initialization after the reboot, but that's contrary to the claim they're
12 saying the operating system is still running, the operating system
13 recognizing the new -- the spare processor as a new processor. We think
14 that's consistent with the specification.

15 JUDGE SAINDON: I suppose I don't see anything inconsistent
16 with saying -- let's say the tasks are A, B, or C, and Patent Owner says it has
17 to do all of them, or at least A, which is the boot. And you're saying, okay,
18 now I'm doing B, so therefore, I have the role of the boot processor. I don't
19 think Patent Owner is saying you can't do B. It's just that you -- whatever
20 you do, you at least have to do A, and you don't have to do it now. You just
21 have to be transferred the responsibility of when task A comes up, you will
22 do it.

23 MS. ZHANG: I don't --

24 JUDGE SAINDON: Do you understand what I'm trying to say?
25 Who's assigned the task as opposed to who's doing it? Yes, if you're

1 assigned the task, you will do it, but it's the assignment of the task that is
2 what the claim is asking for.

3 MS. ZHANG: Your Honor, yes, and I think the assignment of the
4 task -- the assignment of a boot processor occurs during system
5 initialization. When a system starts to run, it identifies the boot processor,
6 and then the boot processor is performing its responsibility in the
7 initialization throughout the operation of the system. And I don't think the
8 Patent Owner had a dispute about that. I think there are many arguments
9 about the limitation and switching the role, and you've heard the argument
10 that identification needs to persist the reboot, and that is not in the claim
11 language. And that is not what the patent describes switching the role
12 during runtime. I think they are trying to say, you need to add this limitation
13 here to the claim language. You need to have the new boot processor to
14 perform system initialization. That's the switching the role.

15 JUDGE SAINDON: Mm-hm.

16 MS. ZHANG: And then just a couple words on the Landry
17 Ground. Patent Owner admitted that a boot processor could be identified as
18 logical CPU zero. In our combination of Fox and Landry, and that we have
19 explained that in the petition, is you incorporate Landry's boot processor
20 selection process to Fox's multi-processor system, because as we have
21 discussed this excessively, if Fox does not expressly teach -- expressly say
22 the words boot processor, and at least to suggest using a boot processor.

23 So, just a way to use a processor to execute its files to initialize the
24 system. And our combination is it would be obvious to use Landry's boot
25 processor selection process to initialize its system. I think that's been

1 consistent -- that's consistent with our petition that we are relying on Landry
2 for the assignment of the boot processor. We now rely on Landry for
3 switching the role of the boot process during runtime. And then Patent
4 Owner's argument for the second part is mostly addressing attacking the
5 combination -- for switching the role of during system runtime, and that's
6 still from Fox's disclosure.

7 Your Honors, during argument, you asked which claims gave more
8 meaning to the information, assigning the boot -- the role -- the boot
9 processor and spare processor, and I found the claim numbers. This is Claim
10 6 of the '302 patent that says, excess information stored in non-volatile data
11 storage that identifies one of the processors inside multi-processor system
12 that assigned the role of the boot processor. That corresponds to the table
13 that -- the table shown as the device tree. And also, for the '781 patent, there
14 is Claim 10 that says assigning a role boot processors comprises storing
15 information to non-volatile data storage that identifies said as one of said
16 plurality of processors as boot processors. The information identified in the
17 boot processor is the software pack, as we have seen. It's the table, the
18 software pack, saying yes, this processor is boot processor. No other
19 processors are not boot processors.

20 And Patent Owner has made arguments about its data storage.
21 This is related to a non-volatile data storage and limitation. To hear them
22 say the saying RAM is volatile is ridiculous, but that's what their patent says
23 in the device tree. When they talk about the device tree, the device tree is
24 stored in RAM. And Patent Owner pointed to Dr. Brogioli's deposition
25 testimony saying the combination is storing information in RAM. What it

1 didn't say is that -- they didn't follow-up with that question to say, oh, Dr.
2 Brogioli -- looking at the claim language, the claim says it's non-volatile. Is
3 RAM volatile or non-volatile? They didn't even ask that question.

4 They recognized RAM can be non-volatile. They gave you an
5 example already. The NVRAM, that is non-volatile. They recognized just
6 now. What Dr. Brogioli is explaining and what the prior art teaches is based
7 on claim language that is non-volatile data storage, and he just explained
8 why Fox's system memory is now volatile, why it would be ordinary and
9 conventional to store information in that non-volatile memory. And now, I'd
10 like to make one last point about the claims in the '302 IPR that Patent
11 Owner argued that weren't specifically addressed. Those are claims 11, 12,
12 17, and 24. We disagree.

13 In our petition, we have a grounds section expressly listing those
14 grounds -- listing those claims, and there are specific grounds challenging
15 each of those claims. And the institution decision also acknowledged those
16 claims were challenged. And the limitations recited in the claims are
17 expressly mapped in a discussion on our grounds. What Patent Owner is
18 arguing is that those claim numbers were not specifically listed in our
19 headings in the petitions. Is the Petitioner perfect? No, it's not, but are those
20 limitations addressed and discussed, and mapped in the petition? Yes. And
21 now I'd like to walk through those limitations.

22 So, Patent Owner picked a first example, Claim 11. Patent
23 Owner's Slide 26. It underlined a phrase -- the processor for which said loss
24 of lockstep is detected includes a lockstep pair of processors. You can see
25 that they are focusing on the loss of lockstep is detected, including a

1 lockstep pair of processors. And we have expressly addressed that
2 limitation.

3 In our discussion of the overall combination of Fox, Safford, and
4 Arai, in a petition from starting on page 9, we said Safford discloses pairs of
5 lockstep processors with error detection logics and switching a pair of
6 lockstep processors, detected to have loss of lockstep, to a spare pair of
7 processors. A POSITA would've found it obvious to implement Fox's
8 processors as lockstep processor pairs, with error detection logics, as taught
9 in Safford to improve reliability and ability.

10 And the petition kept going. And the petition says, a POSITA
11 would have understood in the Fox and Safford system, detecting fatal error
12 in the processor would increase, detecting loss of lockstep between the pair
13 of lockstep processors. We have discussed that limitation clearly and
14 expressly in the petition.

15 And with respect to Claim 12, so what Patent Owner underlined in
16 their Slide Number 27, is to copy -- the state of determining one lockstep
17 processor that is not the cause of a loss lockstep to each of said lockstep pair
18 of processors, of said spare processor. As Your Honors have seen, we have
19 established the combination -- in the prior art combination, Fox's processes
20 have processor repairs -- lockstep processor repairs -- and when it comes to
21 detecting a loss of lockstep and recovering that processor, you copy the state
22 of the -- you copy the state of the good processor to the spare processor pair.
23 We expressly and clearly explained that.

24 So, this is in our petition, page 41. We went through the Safford
25 reference. Safford disclosed copying the state of the good processor to a

1 spare processor. Safford disclosed saving the architecture state of the good
2 processor and copying the architecture state of the lockstep process or pair,
3 experiencing loss of lockstep to the (INDISCERNIBLE) by a process or
4 repair. It's copying to the pair of processors that we have already
5 established. In --

6 JUDGE SAINDON: Counsel --

7 MS. ZHANG: Yes, Your Honor.

8 JUDGE SAINDON: -- if I can interrupt. So, if we scroll down a
9 few more pages to 43 of the petition, we have identified element 13D and
10 13E, and it says for 13D -- 13D is similar to 1C, and you know, we see this
11 all the time. I don't think there's really any problem with it. It says, this
12 limitation is basically the same as this other one, go look over there. Here,
13 we don't have that. I understand what you're saying, that you can possibly
14 put that together, but are you aware of any Board decisions, or more
15 importantly, Federal Circuit decisions where this situation has happened and
16 we have some sort of answer for what to do with it?

17 MS. ZHANG: Yes, Your Honor. You do not need to decode the
18 petition to find the mappings for that limitation. As we just laid out for
19 those limitations, we have expressly and clearly mapped what is a lockstep
20 here and how you copy that state of the good processor to that pair. And
21 there is -- Patent Owner cited some case laws, but none of them support their
22 position. So, the case law that's relevant to respond to your question, Your
23 Honor, this is the *Wasica* -- *Wasica v.* -- sorry, I don't have the full name
24 here, but that's the *Wasica* case that Patent Owner said he needed a Patent
25 Owner response. In that case, the Court said, while the Board should not

1 take an overly mechanist type view of that petition, it declined to address an
2 argument because Petitioner did not present it with ideal vigor and clarity.

3 With the knowledge that those claims are not particularly,
4 specifically added in the headings, but the mappings of the prior art, how the
5 prior art teaches these limitations, are already shown in the petition. It's in
6 the overall combination section and it's in the other ground summary section,
7 and it's discussing about -- it's discussed in detail under the similar
8 limitations in the petition.

9 And Patent Owner also cited other cases. The *Netflix* case, the
10 *Oren Techs.* case, and the *Intelligent* case. Those cases addressed new
11 arguments, new unvalidated theories, as Petitioner's raised in the reply or on
12 appeal. We're not doing their -- we are not arguing any new piece of prior
13 art. We're pointing to any new ability theory. We're just pointing to what's
14 already described and stayed in the petition.

15 And Your Honors, in the institution decision, and you already find
16 the reference that teaches a lockstep pair of processors, and the institution
17 decision page 8 -- this is in Fox and Safford -- your response to determining
18 a loss of lockstep is detecting the boot processor and implementing a rise to
19 identification limitation switching and contact transfer, we have reassigned
20 the processor logical and implications responsibilities of the fading boot
21 processor to the spare processor pair without interrupting the operating
22 system. You have made similar findings in page 32 in the institution
23 decision that a POSITA would have understood, switched the system and
24 entire of lockstep processor pair of the boot processor detected you have loss
25 of lockstep. You can't have loss of lockstep without the pair, so we have

1 shown those limitations in our petition.

2 If there's anyone who did not make the argument for those
3 limitations, it is Patent Owner here. Patent Owner had a full and fair
4 opportunity to argue those prior art teachings against those limitations,
5 whether there's a process or pair. They have not made this argument. They
6 chose to ignore the discussions in the petition and evidence, and therefore,
7 they have waived arguments for those limitations expressly discussed in the
8 petition. Nevertheless, Petitioner has filed also an ex parte re-examination,
9 based on the prior art reference for those claims. I think the Board has the
10 authority to consolidate those proceedings if you agree.

11 Your Honors, you can see the pattern of Patent Owner's arguments
12 and Mr. Jones' testimony. They have him willfully blind, ignoring the plain
13 claim language, the specification in the prior art, and the clear arguments in
14 the petition. We respectfully ask the Board to reject Patent Owner's willful
15 blindness theory credit, Dr. Brogioli's recent analysis, as well supported by
16 the evidence in the record, and finally, challenge the claims unpatentable.
17 Thank you.

18 JUDGE SAINDON: Thank you. Any questions from the panel?
19 No? Okay, thank you.

20 MS. ZHANG: Thank you, Your Honors.

21 MR. LINDNER: May it please the Board. I'm going to do my
22 best not to use the full 16 minutes here, but I've been known to exhaust my
23 full scope, if my voice holds up on me. So, I wanted to just talk about a few
24 things. I'll go in kind of reverse order. So, what Petitioner just mentioned
25 now was that the petition was adequate as to those missing limitations and

1 Petitioner walked through where in the petition the limitations were being
2 discussed. And that's exactly what the petition should've included already,
3 not to have Petitioner say where to find them today, but to have them in the
4 petition. So, the case law is clear that they have to use -- with particularity,
5 you have to describe where the prior art maps to the claims. And that's just
6 not done.

7 The reference to the institution decision can't fix the problem. The
8 petition was flawed when it was written, when it was filed, and whatever
9 came after that can't fix what was in the petition. And I've looked for cases
10 in the PTAB or in the Federal Circuit that had this glaring of an omission
11 and didn't find an example where that had come up, where someone had just
12 left a claim out and then said, well, yeah, that's okay, and the Board found
13 that and the Federal Circuit found that. I don't think there is such a case, and
14 it sounded like when you asked Petitioner for that, they pointed back to the
15 cases that we had cited, which yet the general principles of how you have to
16 be particular and, you know, those were obviously brought up in instances
17 where there was a sort of somewhat different kind of flaw, but I think the
18 principle is really clear and it applies. So, if the Board were to find that that
19 level of particularity in the petition is adequate, it would be breaking new
20 ground, for certain.

21 The other point I wanted to address is the combination involving
22 the Landry reference. So, Petitioner clarified today that what they're using
23 Landry for is for its selection process of a boot processor, which happens
24 before you are booting, before the system is running, and as I mentioned
25 earlier, happens every time the system were to restart. So, it sounds like

1 they're saying, you take Landry to fill in the problems with Fox where it may
2 not have a boot processor, and you select one there, which is the first part of
3 the limitation where it says you're assigning a role.

4 So, they're saying, okay, use Landry, and that's what assigns the
5 role, and then we leave Landry aside and then we just proceed with the rest
6 of the Fox/Arai combination. So, the problem there is that we come back to
7 the same place, which is now you're transferring the role, just as you had
8 previously with Fox and Arai. That doesn't -- or allegedly transferred the
9 role, as you did in Fox and Arai. That doesn't actually accomplish
10 transferring the role because you won't -- in how Fox and Arai do it, you're
11 not ever achieving a processor that's going to take over that role. And it gets
12 worse now when you add Landry, because as I mentioned, Landry is what is
13 assigning the role.

14 So, you've got a system where when it starts, it's going to assign
15 the role based on this formula of checking each processor from left to right
16 in the hardware stack. That's still what they're using. So, now, if you
17 -- regardless of what the Fox/Arai combination did for trying to transfer the
18 role processor, Landry, on the next reset, will come in, it'll say, forget about
19 anything you did. It doesn't matter if you wrote it to non-volatile memory,
20 even if you had a non-volatile indicator of it. Landry is going to reset all of
21 that because it's just looking at those physical slots, so that -- I think that
22 compounds the problem.

23 The other point that I wanted to address was it sounded like
24 Petitioner was saying that Patent Owner was today, for the first time, raising
25 a claim construction argument that should've been -- that was waived, that

1 should've been brought up in the POR, and that is incorrect. If you look at
2 the POR on pages 9 through 11, you'll see that Patent Owner discusses the
3 particular flaws of the combination that was presented. And on the bottom
4 of page 9, it says, but Petitioner has not shown that switching the logical
5 APIC IDs between processors has any impact on which processor performs
6 any boot processor role. And then on the next page --

7 JUDGE SAINDON: I think Judge Amundson is saying something.

8 MR. LINDNER: Oh, I apologize, Judge. I --

9 JUDGE AMUNDSON: Oh, I had myself on mute. Sorry. Sorry.
10 Sorry to confuse everybody. If you could just clarify the record as to which
11 case you're talking about for the respondents.

12 MR. LINDNER: Yes, thank you. I should've remembered to do
13 that. This is for the 01346 POR, for the '718 patent. So, on page 9, we also
14 see that there's a citation to -- right after the sentence that I read, it cites to
15 Jones, paragraph 34. This is the bottom of page 9 in the '781 Patent Owner
16 response.

17 And in Jones, paragraph 34, we see some more detail and it says
18 on page 11, this is within paragraph 34, Exhibit 2004. So, top of page 11, it
19 says, even if correct, this does not demonstrate the role a boot processor has
20 been transferred to a spare processor. For example, Petitioner provides no
21 evidence that change in the logical APIC ID of the processor in error to the
22 logical APIC ID of the reserve processor has any impact on which processor
23 performs any boot processing role, including, for example, the functions of
24 initializing the system, for booting the operating system.

25 So, that's the -- I think that's exactly the phrase that Petitioner used

1 in their slides when they said, this is the boot operation, initializes the
2 system or booting the operating system. It's the same phrase that appears in
3 the cited testimony of Mr. Jones. So, this concept that Patent Owner is
4 springing a claim construction on them for the first time and never
5 mentioned this before is not right. It's in the papers. Like I said, there's not
6 an expressed claim construction argument made by either party.

7 I think Petitioner is the one that's sort of supposed to bring that, but
8 it's clear from the papers, certainly, that what Patent Owner is saying is that
9 you have to perform boot processor functions, and because the prior art
10 doesn't do that, Petitioner is trying to sort of get out of that now by saying,
11 well, you didn't ever give us a precise claim construction for that term. And
12 as I said today, you know, the concept of what a boot processor is, is agreed
13 upon by the parties. And what roles that it -- what boot processing roles it
14 plays is agreed upon by the parties, and it's pretty consistent throughout the
15 papers.

16 So, I think it's certainly not a surprise. This has been our position
17 throughout the case, that these references don't disclose performing the boot
18 processing functionality. And it includes explicitly, the wording that
19 Petitioner said was new or previously undisclosed. This is also page -- in the
20 '302 IPR, this is on page 26. That's the 01347, page 26 of the Patent Owner's
21 response. We have a similar argument that was made to raise, again, the
22 same issue in that IPR that was raised here. So, I've got six minutes left. I
23 could talk to you more about my kids, but I think it's been a long day, so are
24 there any other questions from the Board?

25 JUDGE SAINDON: None from me. Do you have a point of

1 order, Petitioner?

2 MS. ZHANG: Your Honor, sorry. I remembered that Judge Cass
3 asked me a question about the citation of Fox that I haven't provided. May I
4 use the remaining two minutes, or is -- to give that citation?

5 JUDGE SAINDON: Yes, but let's make sure that we're done here.
6 Any other questions for Patent Owner from the panel? Seeing none. Okay.
7 All right, thank you.

8 MR. LINDNER: Could I -- if --

9 JUDGE SAINDON: You can hear it and if --

10 MR. LINDNER: -- I'd like to respond --

11 JUDGE SAINDON: -- there's something you have to say, yes.

12 MS. ZHANG: Sorry, Your Honor. The citation you asked for,
13 Fox's teaching of register and table is in Fox paragraphs 33, 34, 38, and 41.
14 Thank you. Sorry about that.

15 JUDGE SAINDON: And you can have a moment to think about
16 it, or if you want to send an email, if you think of something later, you heard
17 the cite. Just let us know if you need to make a statement.

18 MS. LINDNER: I don't have anything now.

19 JUDGE SAINDON: Okay. Thank you very much for your
20 presentations today. This was very helpful to us. With that, we are
21 adjourned. Thank you for your time.

22 (Whereupon, the above-entitled matter went off the record at 2:59
23 p.m.)

IPR2024-01346 (Patent 7,627,781 B2)

IPR2024-01347 (Patent 7,624,302 B2)

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