

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG ELECTRONICS CO., LTD.,
Petitioner,

v.

HEADWATER RESEARCH LLC.,
Patent Owner.

IPR2023-01360
Patent 9,609,544 B2

Before ROBERT J. WEINSCHENK, GARTH D. BAER, and
RUSSELL E. CASS, *Administrative Patent Judges*.

CASS, *Administrative Patent Judge*.

DECISION
Granting Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

A. Background

Samsung Electronics Co., LTD. (“Petitioner”) filed a Petition requesting an *inter partes* review of claims 1–23 (the “challenged claims”) of U.S. Patent No. 9,609,544 B2 (Ex. 1001, “the ’544 patent”). Paper 2, 1 (“Pet.”). Headwater Research LLC (“Patent Owner”) filed a Preliminary Response. Paper 6 (“Prelim. Resp.”).

An *inter partes* review may not be instituted unless it is determined that “the information presented in the petition filed under section 311 and any response filed under section 313 shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314 (2018); *see also* 37 C.F.R. § 42.4(a) (2021) (“The Board institutes the trial on behalf of the Director.”). The reasonable likelihood standard is “a higher standard than mere notice pleading,” but “lower than the ‘preponderance’ standard to prevail in a final written decision.” *Hulu, LLC v. Sound View Innovations, LLC*, IPR2018-01039, Paper 29 at 13 (PTAB Dec. 20, 2019) (precedential).

For the reasons provided below and based on the record before us, we determine that Petitioner has demonstrated a reasonable likelihood that it would prevail in showing the unpatentability of at least one of the challenged claims. Accordingly, we institute an *inter partes* review on all grounds set forth in the Petition.

B. Real Parties in Interest

Petitioner states that the real parties in interest are Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc. Pet. 85.

Patent Owner states that Headwater Research LLC is the real party in interest. Paper 4, 1.

C. Related Proceedings

The parties indicate that the '544 patent is the subject of the following district court case: *Headwater Research LLC v. Samsung Electronics Co., Ltd.*, No. 2:22-cv-00422 (E.D. Tex.). Pet. 85; Paper 4, 2.

D. The '544 Patent (Ex. 1001)

The '544 patent relates to “device-assisted services for protecting network capacity.” Ex. 1001, code (56). More specifically, the '544 patent explains, the device can manage capacity increases by “apply[ing] a service usage control policy for the network service usage activities to protect network capacity (e.g., reduce network capacity demand).” *Id.* at 13:66–14:2. The device can “assign[] a priority to a network service usage activity and control[] traffic associated with the network services usage activity based on the assigned priority” and provide a “differentiated and dynamic background services classification . . . as a function of network availability state and/or network busy state.” *Id.* at 14:25–32. The service usage control policy assists “in network access control of network service usage activities (e.g., deferring some or all of the network capacity demand from these source activities).” *Id.*

The device associates “the network service usage activity with a network service usage control policy” based on factors such as “a network busy state,” “a time of day,” “application behavior,” “a power state of device, a device usage state, a time based criteria, availability of alternative networks, and a set of policy rules.” Ex. 1001, 89:15–23. When a policy

applies to an access request, the device can apply various “well known traffic control techniques.” *Id.* at 15:48–50.

E. Illustrative Claims

Of challenged claims 1–23, claim 1 is independent. For purposes of the issues raised at this stage of the proceeding, claim 1 is illustrative and is reproduced below.

- [1.1] A wireless end-user device, comprising:
- [1.2] a wireless modem to communicate data for network service usage activities between the device and a wireless network;
- [1.3] a processor that executes instructions to associate network service usage activity, on behalf of a first device application, and that occurs when the first device application is not in the foreground of user interaction, with a network service usage control policy,
- [1.4] set an application state indicating whether the first device application, associated with a particular network service usage activity, is in the foreground of user interaction, and
- [1.5] dynamically determine whether to apply the network service usage control policy to the particular network service usage activity, based on the application state and based on a power control state; and
- [1.6] a memory coupled to the processor to provide the processor with instructions.

Ex. 1001, 108:19–37 (indents and bracketed paragraph identifiers added).

F. Applied References

Petitioner relies upon the following references:

Rao, US 2006/0039354 A1, published Feb. 23, 2006
(Ex. 1005, “Rao”);

Araujo, US 2009/0217065 A1, published Aug. 27, 2009 (Ex. 1006, “Araujo”);

Freund, US 5,987,611, issued Nov. 16, 1999 (Ex. 1007, “Freund”);

Singh, US 8,381,127 B2, issued Feb. 19, 2013 (Ex. 1008, “Singh”);

Montemurro, US 2009/0207817 A1, published Aug. 20, 2009 (Ex. 1009, “Montemurro”);

Wright, US 2006/0039364 A1, published Feb. 23, 2006 (Ex. 1010, “Wright”).

Pet. i, 2. Petitioner also submits the Declaration of Dr. Kevin Butler (Ex. 1003).

G. Asserted Grounds of Unpatentability

Petitioner challenges the patentability of claims 1–23 of the ’544 patent based on the following grounds:

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1, 2, 4–8, 12–16, 18, 20, 22, 23	103	Rao, Araujo
2, 17, 19–21	103	Rao, Araujo, Freund
3	103	Rao, Araujo, Singh
11	103	Rao, Araujo, Montemurro
9, 10, 13, 18	103	Rao, Araujo, Wright

Pet. 1.

II. DISCUSSION

A. Claim Construction

A claim “shall be construed using the same claim construction standard that would be used to construe the claim in a civil action under

35 U.S.C. § 282(b).” 37 C.F.R. § 42.100(b). At this stage of the proceeding, neither party presents any claim terms for construction. Pet. 2–3; Prelim. Resp. 3. Based on the present record, we determine that it is not necessary to provide an express interpretation of any claim terms at this time. *See Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1374 (Fed. Cir. 2019) (“The Board is required to construe ‘only those terms . . . that are in controversy, and only to the extent necessary to resolve the controversy.’”) (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)).

B. Principles of Law

A claim is unpatentable under 35 U.S.C. § 103 if “the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) where in evidence, objective evidence of non-obviousness.¹ *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17–18 (1966). When evaluating a combination of teachings, we must also “determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue.” *KSR*, 550 U.S. at 418 (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)). Whether a

¹ At this stage of the proceeding, Patent Owner has not presented objective evidence of non-obviousness.

combination of prior art elements would have produced a predictable result weighs in the ultimate determination of obviousness. *Id.* at 416–417.

In an *inter partes* review, the petitioner must show with particularity why each challenged claim is unpatentable. *Harmonic, Inc. v. Avid Technology, Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016); 37 C.F.R. § 42.104(b) (2020). The burden of persuasion never shifts to Patent Owner. *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015).

We analyze the challenges presented in the Petition in accordance with the above-stated principles.

C. Level of Ordinary Skill in the Art

Petitioner introduces the testimony of Dr. Butler that a person of ordinary skill in the art would have had “(1) at least a bachelor’s degree in computer science, electrical engineering, or a related field, and (2) three to five years of experience with networking, power consumption of networked computing devices, and/or wireless communication systems.” Pet. 5, n.1; Ex. 1003 ¶ 17. Dr. Butler further states that “[m]ore education, e.g., a doctorate in an academic area emphasizing electrical engineering, computer engineering, computer science, or a related technical field, would compensate for fewer years of work experience.” *Id.* Patent Owner states that “[f]or the purposes of this preliminary response,” it “does not challenge that definition.” Prelim. Resp. 3.

For purposes of this Decision, we adopt the assessment of the level of ordinary skill in the art proposed by Petitioner and Dr. Butler and not disputed by Patent Owner as reasonable and consistent with the prior art.

See Okajima v Bourdeau, 261 F.3d 1350, 1355 (Fed. Cir 2001) (the prior art may reflect an appropriate level of skill in the art).

D. Ground 1A:² Asserted Obviousness of Claims 1, 2, 4–10, 12–16, 18, 20, 22, and 23 Based on Rao in view of Araujo

Petitioner contends that claims 1, 2, 4–10, 12–16, 18, 20, 22, and 23 would have been obvious over Rao in view of Araujo. Pet. 6–50. Patent Owner disagrees, arguing that Petitioner has failed to establish that these claims would have been obvious based on Rao and Araujo. Prelim. Resp. 3–12.

1. Overview of Rao (Ex. 1005)

Rao is directed to “a remote access architecture for providing peer-to-peer communications and remote access connectivity.” Ex. 1005, code (57). The system is shown in Rao’s Figure 1A, reproduced below.

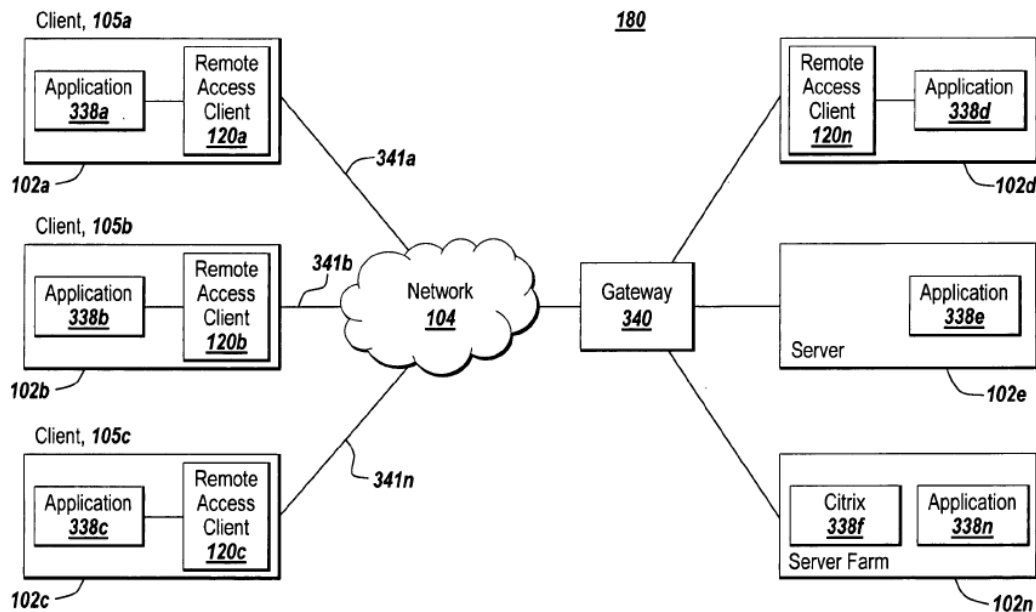


Fig. 1A

² Here, and elsewhere in the Decision, the identification of the grounds using designations such as “Ground 1A” and “Ground 1B” refers to the designation of the grounds as presented in the Petition.

Rao's Figure 1A is a block diagram of an embodiment of Rao's system operating via a gateway in a network environment. Ex. 1005 ¶ 60, Fig. 1A. As shown in Figure 1A, Rao's system includes clients 105 (e.g., computing devices 102a–102c) that communicate over network 104 to other devices, such as servers, server farms, and peer computing devices. *Id.* ¶¶ 86–96.

Rao addresses inefficient use of network resources when network communications between devices are “processed in the order generated by the activity of a user and applications of the client.” Ex. 1005 ¶ 3. According to Rao, this is not “always desirable” because, for example, network packets for background applications may be processed ahead of network packets for foreground applications, resulting in applications suffering from increased latency and reduced quality of voice communication. *Id.* Rao addresses these inefficiencies by using a prioritization scheme that “provide[s] application-aware, client-specific prioritization of packet traffic.” *Id.* As Rao explains, this scheme is achieved by augmenting client 105 as shown in Rao's Figure 1C, reproduced below.

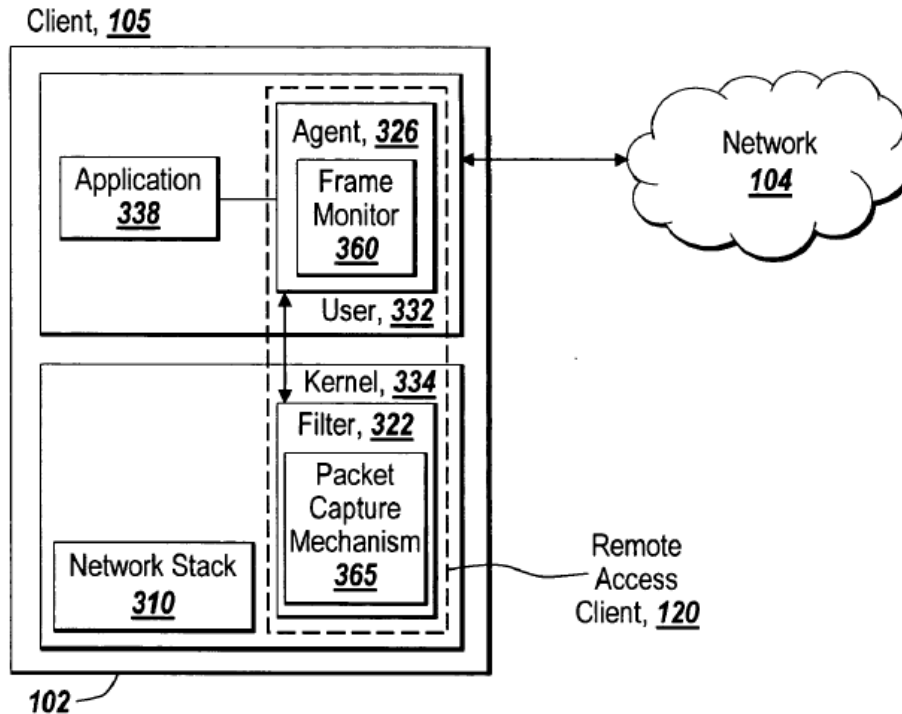


Fig. 1C

Rao's Figure 1C is a block diagram depicting an embodiment of client 105 that has been augmented with remote access client 120 for network communications.

As shown in Figure 1C, Rao's client 105 includes remote access client (RAC) 120 that interacts with application 338 and network stack 310.

Ex. 1005 ¶¶ 89, 98–101. RAC 120 includes filter 322 that uses a “filtering table . . . to determine what action to take against packets,” including “ensur[ing] that unwanted packets are discarded,” “deny[ing] access to particular protocols,” and/or “preventing unauthorized access from remote computers by discarding packets to specified destination addresses.” *Id.*

¶ 102. RAC 120 can also include agent 326 with frame monitor 360 that “include[s] policies and logic for applying a policy to a received packet,”

and “transmit[s] a packet to a gateway 340 responsive to a policy-based determination made by the frame monitor 360.” *Id.* ¶ 108.

Rao also explains that its RAC “provides for the intelligent and client-centric prioritization of application network communications on a client based on the type and/or priority of an application.” Ex. 1005 ¶ 179. To perform prioritization, Rao’s system may “apply a policy to determine a condition of the client 105, or endpoint, at the time of transmission of the packet,” and “frame monitor 360 may identify an application 338 that generated the packet” and “make a policy-based determination to transmit the packet to the gateway 340 responsive to the identified application 338.” *Id.* ¶ 109. Additionally, Rao discloses that policies can be specified, for example, by “type of application,” type of “protocols used by the applications,” or “whether an application is running in the foreground or the background of the client 105.” *Id.* ¶ 182. Rao explains that “[o]ne ordinarily skilled in the art will recognize and appreciate the multitude of ways to define client-side application priorities.” *Id.*

2. Overview of Araujo (Ex. 1006)

Araujo is directed to the management of a machine’s power by using a power-management policy. Ex. 1006, code (57). When a program “makes a request that involves use of one of the machine’s power-consuming devices, the policy may take into account factors such as the program’s status” indicating “the program’s relative level of justification to consume power.” *Id.* For example, “some programs may have a ‘VIP’ status that allows them to consume power in situations where other programs would not be permitted to consume power.” *Id.* ¶ 27. Araujo’s system includes a power manager 110 that controls the respective power states of devices and “may

cause devices to be turned off, or into a lower power state, based on factors such as timers, the amount of battery power remaining, or any other factor.” *Id.* ¶ 22. Such factors are evaluated by Araujo’s power management runtime 120 that “may implement policies that determine when, and under what circumstances”, power manager 110 is to turn devices 104–108 on or off, or is to place those devices in a different power state.” *Id.*

In addition, “[a] component may intercept a request to use a device before the request reaches the driver, and may deflect requests that, if carried out, are not consistent with [the] power usage policy.” Ex. 1005, code (57). This may be carried out using “[r]equest deflector component 602” interposed “between program 112 and driver 116.” *Id.* ¶ 50. “When request deflector component 602 detects that a request . . . has been made, it interacts with power management runtime 120 to determine what the ambient policy (e.g., power use policy 266) says about whether the request may be carried out at the expense of power use.” *Id.* If the request may be carried out under the power policy, “request deflector component 602 passes the request along to driver 116;” otherwise request deflector component 602 “may permanently or temporarily deflect the request from reaching driver 116.” *Id.*

3. *Analysis of Independent Claim 1*

a) [1.1]: “[a] wireless end-user device, comprising:”

Petitioner argues that, to the extent the preamble is limiting, Rao renders it obvious. Pet. 19. Petitioner asserts that Rao teaches a client that is a wireless end-user device such as a “mobile telephone” or “other form of computing or telecommunications device that is capable of communication.” *Id.* at 19–20 (citing Ex. 1005 ¶¶ 86, 130; Ex. 1003 ¶ 85). According to

Petitioner, one of ordinary skill “would have known that a wireless telephone is a wireless end-user device.” *Id.* at 20 (citing Ex. 1003 ¶ 85).

Patent Owner does not present arguments regarding the preamble.
See Prelim. Resp. 3–12.

We determine that, on the record before us, Petitioner’s cited evidence sufficiently supports its contentions regarding the preamble.³

b) [1.2]: “a wireless modem to communicate data for network service usage activities between the device and a wireless network;”

Petitioner argues that Rao teaches a computing device with a network interface that can include a “wireless network adapter,” “modem,” or “any other device suitable for interfacing the computing device 102 to any type of network capable of communication.” Pet. 21 (emphasis omitted) (citing Ex. 1005 ¶ 125). Petitioner also asserts that Rao “teaches that the network interface of its device ‘interface[s] to . . . wireless connections.’” *Id.* “Moreover,” according to Petitioner, “Rao’s device may be implemented as a ‘smart phone,’” which one of ordinary skill “would have understood and found obvious includes a wireless modem.” *Id.* (citing Ex. 1005 ¶ 198; Ex. 1003 ¶ 87).

Patent Owner does not present arguments directed to this limitation.
See Prelim. Resp. 3–12.

We determine that, on the record before us, Petitioner’s cited evidence sufficiently supports its contentions regarding this limitation.

³ Because we are persuaded that Petitioner has sufficiently shown that Rao teaches the subject matter recited in the preamble, we need not decide whether the preamble is limiting for purposes of this Decision.

- c) [1.3]: “a processor that executes instructions to associate network service usage activity, on behalf of a first device application, and that occurs when the first device application is not in the foreground of user interaction, with a network service usage control policy,”

Petitioner argues that Figure 1D of Rao shows a processor (CPU 121) that executes instructions, and discloses that each computing device 102 includes a central processing unit 102 and main memory 104. Pet. 21–22 (citing Ex. 1005 ¶ 118, Fig. 1D). According to Petitioner, one of ordinary skill would have understood that the processor executes instructions. *Id.* at 22 (citing Ex. 1005 ¶ 119; Ex. 1003 ¶ 91).

Petitioner argues that Rao also teaches applying policies when network service usage activity of a first device application occurs when the first device application is not in the foreground of user interaction. Pet. 22 (citing Ex. 1005 ¶ 182; Ex. 1003 ¶ 92). Petitioner points to Rao’s disclosure that “policies 520 define prioritization based on whether an application is running in the foreground or the background of the client 105,” and argues that one of ordinary skill “would have understood and found obvious that reference to applications ‘not in the foreground’ includes, for example, applications in the background and thereby are subject to policies 520.” *Id.* at 22–23 (citing Ex. 1005 ¶ 182; Ex. 1003 ¶ 92).

Petitioner further argues that Rao “teaches associating network service usage activity of an application with a network service usage control policy.” Pet. 23 (citing Ex. 1005 ¶¶ 182–187; Ex. 1003 ¶ 93). For example, Petitioner asserts, “Rao teaches policies ‘for specifying client-side prioritization of network communication related to **applications**,” and that the remote access client “‘determines the association of network packets with applications’ to ‘determine priorities and apply any priority based

policies’ and ‘can associate network traffic with applications’ by any suitable mechanisms.” *Id.* (citing Ex. 1005 ¶ 187). According to Petitioner, one of ordinary skill “would have known that, since Rao’s policies can define prioritization based on whether an application is running in the foreground or background of the client, the RAC determines the association of network packets with applications to determine priorities, then applies priority-based policies.” *Id.* (citing Ex. 1003 ¶ 94). Thus, Petitioner contends, the combination “renders obvious associating network service usage activity, on behalf of a first application, and that occurs when the first application is not in the foreground of user interaction, with a network service usage control policy.” *Id.* at 23–24 (citing Ex. 1005 ¶¶ 182, 187; Ex. 1003 ¶ 94).

Patent Owner does not present arguments directed to this limitation. *See* Prelim. Resp. 3–12.

We determine that, on the record before us, Petitioner’s cited evidence sufficiently supports its contentions regarding this limitation.

d) [1.4]: “set an application state indicating whether the first device application, associated with a particular network service usage activity, is in the foreground of user interaction, and”

Petitioner argues that Rao teaches applying policies, which one of ordinary skill would have understood to involve or make obvious setting an application state. Pet. 24 (citing Ex. 1003 ¶ 96). For example, Petitioner asserts, “Rao explains that policies ‘define prioritization based on **whether an application is running in the foreground or the background** of the client 105’” and that characteristics of the application, such as whether it runs in the foreground or background, can “indicate priority for a network

packet of the application.” *Id.* (citing Ex. 1005 ¶¶ 182, 189). In this example, according to Petitioner, one of ordinary skill “would have understood and found obvious that applying a policy to prioritize network packets for [an] application involves setting an application’s state (e.g., foreground, background) to permit the evaluation of policies that rely on the application state.” *Id.* (citing Ex. 1003 ¶ 96). Additionally, Petitioner contends, “Rao’s policies ‘may be specified conditionally’ based on application state,” and one of ordinary skill “would have similarly understood and found obvious that policy depends on application state (‘is running’), and thus, use of the policy includes setting an application state so the policy may be applied.” *Id.* at 24–25 (citing Ex. 1003 ¶ 96).

Furthermore, Petitioner argues, Rao teaches “packet interception techniques,” which one of ordinary skill “would have understood and found obvious to include associating applications with network service activities.” Pet. 25 (citing Ex. 1003 ¶ 97). According to Petitioner, “Rao’s client intercepts packets ‘associated with an application’ and ‘a priority for the intercepted and queued network packet is determined based on the type and/or priority of the application.’” *Id.* (citing Ex. 1005 ¶ 184). One of ordinary skill, Petitioner contends, would have recognized that, in the proposed combination, “intercepted packets are examples of network service activities, and thus, the interception of packets that are then prioritized based on application state indicates that applications (which have application states, e.g., foreground, background) are associated with network service activities.” *Id.* (citing Ex. 1003 ¶ 97).

Patent Owner does not present arguments directed to this limitation. *See* Prelim. Resp. 3–12.

We determine that, on the record before us, Petitioner’s cited evidence sufficiently supports its contentions regarding this limitation.

- e) [1.5]: “*dynamically determine whether to apply the network service usage control policy to the particular network service usage activity, based on the application state and based on a power control state; and*

Petitioner argues that the combination of Rao and Araujo renders this limitation obvious. Pet. 25. More specifically, Petitioner asserts, “Rao teaches policy evaluation based on application state, such that prioritization [is] based on whether an application is running in the foreground or the background.” *Id.* (citing Ex. 1005 ¶ 182). According to Petitioner, one of ordinary skill “would have recognized ‘foreground’ and ‘background’ as examples of application states.” *Id.* at 25–26 (citing Ex. 1003 ¶ 182).

Petitioner also contends that “Araujo teaches that ‘devices may have various power states’ such as on, off and a processor’s clock speed and ‘a justification to change a device from one power state to another may be based on at least one other factor other than the mere fact that a request to use the device has been made.’” *Id.* at 26 (citing Ex. 1006 ¶¶ 4, 25). And, Petitioner argues, “Araujo further teaches that the ‘current power state of a device may be a factor in determining whether the power state will be changed.’” *Id.* (citing Ex. 1006 ¶ 28). According to Petitioner, one of ordinary skill “would have recognized that Araujo’s disclosure that the ‘power state of a device’ is a power control state and a ‘factor in determining whether the power state will be changed’ renders obvious that the power control state is used to determine whether to apply a policy regulating network service usage.” *Id.* (citing Ex. 1003 ¶ 100).

Turning to motivation to combine, Petitioner argues that one of ordinary skill would have found it obvious to combine Rao's remote access client (RAC) with Araujo's power manager and power management runtime (collectively referred to as a "power policy manager" or "PPM") and request deflector component in order "to provide a client that better uses energy and 'strikes a balance between providing functionality and maintaining longevity of the charge.'" Pet. 14 (citing Ex. 1006 ¶ 1; Ex. 1003 ¶ 75). Specifically, Petitioner asserts that one of ordinary skill would have perceived opportunities for improving Rao's policy management capabilities "to impart additional advantages, such as optimizing power use," and "would have recognized the importance of power management at least because, in mobile devices, applications cannot execute without sufficient power." *Id.* at 15 (citing Ex. 1003 ¶ 77; Ex. 1006 ¶ 1). Consequently, according to Petitioner, one of ordinary skill "would have looked to policy-based power management, such as taught in Araujo, to serve as one of Rao's 'multitude of ways to define client-side application priorities.'" *Id.* (citing Ex. 1005 ¶ 182; Ex. 1003 ¶ 78). The resulting Rao-Araujo combination, Petitioner explains, "would both manage power according to the PPM techniques of Araujo and manage network use according to both Rao's and Araujo's techniques." *Id.* (citing Ex. 1003 ¶ 78).

As to the proposed combination itself, Petitioner argues that one of ordinary skill "would have incorporated Araujo's PPM and reflector components in Rao's RAC," such that "[t]he enhanced RAC" would "evaluate power-management policies (per Araujo) and network prioritization policies (per Rao and Araujo)." Pet. 15 (citing Ex. 1003 ¶ 79). "For example," Petitioner asserts, the Rao-Araujo combination "would have

determined whether an application has a ‘relative level of justification to consume power,’ which includes determining whether the application is running in the foreground or background.” *Id.* at 15–16 (citing Ex. 1005 ¶ 182; Ex. 1006, code (57); Ex. 1003 ¶ 79). Additionally, according to Petitioner, one of ordinary skill “would have understood and found obvious that policy enforcement” in the proposed combination “may be based on application state (foreground/background) and power state (battery/plugged-in).” *Id.* at 16 (Ex. 1005 ¶ 182; Ex. 1006 ¶¶ 4, 11).

Petitioner also argues that, because Araujo’s request is “interposed between the program and the device driver” and Rao’s filter “may include a packet capturing mechanism 365, and the filter 322 and/or packet capturing mechanism 365 may comprise a network driver,” the Rao-Araujo device’s request deflector “would reside in the filter interposed between the other packet capture components and network device driver that provides traffic to the network stack.” Pet. 18. Additionally, Petitioner contends that one of ordinary skill would have had a reasonable expectation of success in making the combination because doing would “would have required only routine programming knowledge well within the skill” of a person of ordinary skill in the art at the relevant time. *Id.* at 16–18 (citing Ex. 1003 ¶¶ 81, 83).

Petitioner also provides four examples of how the combined Rao-Araujo device would operate. These examples are as follows.

Example 1: When the application transmitting packets is in the foreground, giving it VIP status, and the power state indicates the battery is above a threshold level, the device would permit transmission and place the packets in a high-priority queue.

Example 2: When the application transmitting packets is in the background (not having VIP status) and the battery is above a threshold level, the device would permit the transmission and place the packets in a lower-priority queue.

Example 3: When the application transmitting packets is in the foreground and the battery is below a threshold level, the device would place the packets in a high-priority queue but hold the transmission until a more favorable power state existed.

Example 4: When the application transmitting packets is in the background and the power level is low, the request deflector prevents the request from being passed to the device driver, not queuing the packet and further conserving power.

Pet. 16–17 (citing Ex. 1006 ¶ 22; Ex. 1003 ¶ 80). Petitioner explains that these are examples of the “multitude of ways to define client-side application priorities” referred to by Rao. *Id.* at 17 (citing Ex. 1005 ¶ 182; Ex. 1003 ¶ 80).

Patent Owner responds that the Petition “fails to establish the obviousness of the combination” of Rao and Araujo. Prelim. Resp. 5. In doing so, Patent Owner focuses on Petitioner’s Example 3, arguing that “[t]he Petition identifies no plausible benefit or other motivation to place packets ‘in a high priority queue . . . until a more favorable power state existed’ at some indeterminate future time period, even though the Petition acknowledges that this proposed queuing has the disadvantage of passing the transmission request to the device driver and consuming additional power (during a period of time when the battery power of the device is *already* low).” *Id.* at 5–7 (citing Pet. 17). For example, Patent Owner argues, “in a mobile device with a low battery, the system will not know *when* the device will be plugged in such that ‘a more favorable power state’ will exist,” and thus “the amount of time packets would need to be queued would be entirely indeterminate and would often be on the order of hours.” *Id.* at 7.

According to Patent Owner, “queuing packets would require consumption by the network driver, which would need to (i) convert data for transmission by the application into packets suitable for transmission over the network

and (ii) remain powered on to preserve and store the network packets in the high-priority queue.” *Id.* at 7–8 (citing Pet. 17).

Patent Owner provides a couple of additional arguments as to why Petitioner’s proposed combination would be undesirable. First, Patent Owner offers up the example of a trusted application on a smartphone that starts uploading HDR videos, and then is moved to the background. Prelim. Resp. 8. According to Patent Owner, those videos would be processed into tens or hundreds of thousands of network packets, which would be queued until some future point in time, thus consuming CPU and memory battery power and capacity. *Id.* at 8–9. Furthermore, Patent Owner contends, if the user deletes the videos or turns off the device, or the device runs out of battery power before the conditions are met for transmitting the stored network packets, all of the stored packets would be lost. *Id.* at 9.

Patent Owner also argues that queuing but not transmitting packets would interfere with application flow because the application would not be informed that its data for transmission was not actually transmitted over the network, causing the application to continue attempting to transmit data over the network, wasting CPU, memory, and battery resources. Prelim. Resp. 9–10. According to Patent Owner, the application would also need to keep track of what data had been queued and re-request transmission of any packets that ultimately timed out. *Id.* at 10. Patent Owner also contends that the Petition admits that queuing the packet is less power efficient than simply not queuing the packet at all. *Id.* at 11 (citing Pet. 17). These inefficiencies, Patent Owner argues, could be avoided “by simply **not** taking the application state into account” and “not queuing any network packets for transmission when the battery is low.” *Id.*

Based on the present record, we determine that Petitioner has made a sufficient showing as to this limitation for purposes of institution. In this regard, Petitioner has introduced sufficient evidence at this stage of the proceeding that one of ordinary skill would have been motivated to combine Rao and Araujo as Petitioner proposes. This evidence includes the testimony of Dr. Butler that one of ordinary skill “would have found it obvious to combine a Remote Access Client as taught by Rao with a PPM and request deflector as taught by Araujo to provide a client that better ‘use[s] the energy in a way that strikes a balance between providing functionality and maintaining longevity of the charge.’” Ex. 1003 ¶ 75. It also includes Dr. Butler’s testimony that, in implementing Rao’s filtering, prioritization, and queuing functionality, one of ordinary skill “would have perceived opportunities for improving the policy management capabilities already present in Rao to impart additional advantages, such as optimizing power use,” and would have known that “mobile devices use techniques for optimizing the use of constrained resources, including network bandwidth and battery power.” *Id.* ¶ 77. Dr. Butler further explains that one of ordinary skill “would have recognized the importance of power management at least because, in mobile devices, applications cannot execute without sufficient power.” *Id.* Additionally, Dr. Butler testifies that, for these reasons, one of ordinary skill “would have looked to policy-based power management such as taught in Araujo to serve as one of Rao’s ‘multitude of ways to define client-side application priorities,’” to create a device that “would both manage power according to the PPM techniques of Araujo and manage network use according to the techniques of both Rao and Araujo.” *Id.* ¶ 78. And, Dr. Butler explains, based on Rao and Araujo, one of

ordinary skill “would have understood and found obvious that policy enforcement” in the Rao-Araujo combination “may be based on application state (foreground, background) and power state (battery/plugged-in). *Id.*

¶ 80. We determine that this testimony is reasonable and credible based on the record presently before us, and is unrebutted by countervailing evidence from Patent Owner.

We also determine that Petitioner has introduced sufficient evidence that one of ordinary skill would have had a reasonable expectation of success in achieving the proposed Rao-Araujo combination. This evidence includes the testimony of Dr. Butler that one of ordinary skill “would have expected success integrating a PPM and deflector components as taught by Araujo into a remote access client as taught by Rao,” that “the request deflector (Araujo) and packet capture mechanism (Rao) serve similar functions,” and that “[c]ombining such functions would have required only routine programming skill well within the skill set of” a person of ordinary skill. Ex. 1003 ¶¶ 81, 83.

We do not agree with Patent Owner’s arguments against institution. First, we do not agree with Patent Owner that deficiencies in Petitioner’s Example 3 of the Rao-Araujo device’s operation warrant denial of institution. Even if Patent Owner were correct that one of ordinary skill would not have been motivated to include the operation of Example 3 within the programming of the proposed combination, Petitioner has provided sufficient evidence that one of ordinary skill would have been motivated to program the proposed combination in accordance with Examples 1 and 4. Based on the present record, such programming would be sufficient to meet the relevant language of claim 1, which broadly recites that the processor

dynamically determine whether to apply the network service usage control policy “based on the application state and based on a power control state,” without specifying particular details of how the application state and power control state are used. The parties may further address the other examples during the trial.

Based on the present record, we also do not agree with Patent Owner’s argument that one of ordinary skill would not have been motivated to make the proposed combination based on its example of a smartphone app that starts uploading HDR videos and then is moved to the background. Prelim. Resp. 8. Patent Owner does not introduce evidence that this example would necessarily require queuing “tens of thousands to hundreds of thousands of network packets” until some future point in time, as Patent Owner contends, but rather relies only on attorney argument. *Id.* at 8–9. Moreover, even if the combined device was not ideal for uploading videos in a background app, Petitioner has sufficiently shown on this record that it would have been suitable for other uses, such as prioritizing real time data communications from a foreground application over non-real-time data communication applications in background applications, as Rao explains. Ex. 1005 ¶ 184 (“The client 105, using the techniques of the present invention, may prioritize the real-time data communications of application 338a ahead of other applications, such as non-real-time data communication applications.”).

We also do not agree with Patent Owner’s argument that a motivation to combine is lacking because queuing but not transmitting packets would interfere with application flow. Prelim. Resp. 9–10. More specifically, Patent Owner argues that application flow would be impeded because (1) the

application would not be informed that its data for transmission was not actually transmitted over the network, causing the application to continue attempting to transmit data over the network, wasting CPU, memory, and battery resources, and (2) the application would also need to keep track of what data had been queued and re-request transmission of any packets that ultimately timed out. *Id.* Based on the present record, it is not clear to us that the proposed combination would be implemented in the manner that Patent Owner contends, particularly because Patent Owner does not support its assertions with expert testimony, but instead relies only on attorney argument. Specifically, Patent Owner has not sufficiently shown why the application could not be informed that its data for transmission was not actually transmitted over the network (so that it would not need to continue to attempt to transmit the same data), or why keeping track of what data had been queued would be a significant problem in the combination.

Consequently, Petitioner has made a sufficient showing that the prior art teaches this limitation for purposes of institution.

f) [1.6]: “a memory coupled to the processor to provide the processor with the instructions.

Petitioner argues that Rao renders this limitation obvious. Pet. 27. For example, Petitioner asserts, Rao’s Figure 1D shows a main memory 122, and “further teaches that the processor (CPU) ‘is any logic circuitry that responds to and processes instructions fetched from the main memory unit 104’ and ‘the processor 100 communicates with main memory 104 via a system bus.’” Pet. 27–28 (citing Ex. 1005 ¶¶ 119–120, Fig. 1D). According to Petitioner, one of ordinary skill “would have recognized that Rao’s system bus couples the processor to the memory, and the memory provides instructions fetched by the processor.” *Id.* at 28 (citing Ex. 1003 ¶ 105).

Patent Owner does not present arguments directed to this limitation.
See Prelim. Resp. 3–12.

We determine that, on the record before us, Petitioner’s cited evidence sufficiently supports its contentions regarding this limitation.

g) Summary for Claim 1

For the foregoing reasons, Petitioner’s cited evidence and reasoning demonstrates a reasonable likelihood that Petitioner would prevail in its contentions regarding claim 1.

4. Claims 2, 4–8, 12–16, 18, 20, 22, and 23

Petitioner contends that dependent claims 2, 4–8, 12–16, 18, 20, 22, and 23 are unpatentable over Rao in view of Araujo. Pet. 28–50. Patent Owner relies on its arguments concerning claim 1 for these claims. *See* Prelim. Resp. 3–12. Based on the evidence of record, we determine that Petitioner has demonstrated a reasonable likelihood that claims 2, 4–8, 12–16, 18, 20, 22, and 23 are unpatentable over Rao in view of Araujo.

E. Grounds 1B–1E

In Grounds 1B–1E Petitioner contends that dependent claims 2, 3, 9–11, 13, and 17–21 would have been obvious over various combinations of Rao, Araujo, Freund, Singh, Montemurro, and Wright. Pet. 1, 50–82. Patent Owner relies on its arguments concerning claim 1 for these claims. *See* Prelim. Resp. 3–12. Based on the evidence of record, we determine that Petitioner has demonstrated a reasonable likelihood that claims are unpatentable over the cited prior art.

III. CONCLUSION

After considering the evidence and arguments presented in the current record, we determine that Petitioner has demonstrated a reasonable

likelihood of success in proving that at least one of the challenged claims of the '544 patent is unpatentable. We therefore institute trial on all challenged claims and grounds raised in the Petition.

At this stage of the proceeding, we have not made a final determination as to the patentability of any challenged claim or as to the construction of any claim term. Any final determination will be based on the record developed during trial. We place Patent Owner on express notice that any argument not asserted in a timely-filed Response to the Petition, or in another manner permitted during trial, shall be deemed waived, even if that argument was presented in the Preliminary Response.

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review of claims 1–23 of the '544 patent is instituted with respect to all grounds set forth in the Petition; and

FURTHER ORDERED that, pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4(b), *inter partes* review of the '544 patent shall commence on the entry date of this Order, and notice is hereby given of the institution of a trial.

For PETITIONER:

W. Karl Renner
Jeremy J. Monaldo
Ryan Chowdhury
Jennifer J. Huang
FISH & RICHARDSON PC.
axf-ptab@fr.com
jjm@fr.com
rchowdhury@fr.com
jjh@fr.com

For PATENT OWNER:

Reza Mirzaie
Dale Chang
Amy E. Hayden
James A. Milkey
Neil A. Rubin
Philip X. Wang
RUSS AUGUST & KABAT
rmirzaie@raklaw.com
dchang@raklaw.com
ahayden@raklaw.com
jmilkey@raklaw.com
nrubin@raklaw.com
pwang@raklaw.com