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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG ELECTRONICS CO., LTD.,
SAMSUNG ELECTRONICS AMERICA, INC., and APPLE INC.,
Petitioner,

v.

IXI IP, LLC,
Patent Owner.

Case IPR2015-01444
Patent 7,039,033 B2

Before KRISTINA M. KALAN, ROBERT J. WEINSCHENK, and JOHN A. HUDALLA, *Administrative Patent Judges*.

HUDALLA, *Administrative Patent Judge*.

FINAL WRITTEN DECISION
35 U.S.C. § 318(a) and 37 C.F.R. § 42.73

Samsung Electronics Co., Ltd., Samsung Electronics America, Inc., and Apple Inc. (collectively "Petitioner") filed a Petition ("Pet.") (Paper 2) to institute an *inter partes* review of claims 1, 4–7, 12, 14, 15, 22, 23, 25, 28, 34, 39, 40, 42, and 46 of U.S. Patent No. 7,039,033 B2 ("the '033 patent")

(Ex. 1001) pursuant to 35 U.S.C. §§ 311–319. Patent Owner, IXI IP, LLC ("IXI"), filed a Preliminary Response ("Prelim. Resp.") (Paper 6) to the Petition. Taking into account the arguments presented in IXI's Preliminary Response, we determined that the information presented in the Petition established that there is a reasonable likelihood that Petitioner would prevail in challenging claims 1, 4–7, 12, 14, 15, 22, 23, 25, 28, 34, 39, 40, 42, and 46 of the '033 patent under 35 U.S.C. § 103(a). Pursuant to 35 U.S.C. § 314, we instituted this proceeding on December 30, 2015, as to these claims of the '033 patent. Paper 7 ("Dec. on Inst.").

During the course of trial, IXI filed a Patent Owner Response (Paper 14, "PO Resp."), and Petitioner filed a Reply to the Patent Owner Response (Paper 18, "Pet. Reply"). An oral hearing was held on September 15, 2016, and a transcript of the hearing is included in the record. Paper 26 ("Tr.").

Petitioner proffered a Declaration of Dr. Sayfe Kiaei (Ex. 1003) with its Petition, and IXI proffered a Declaration of Dr. Narayan Mandayam (Ex. 2301) with its Response. The parties also filed transcripts of the depositions of Dr. Kiaei (Exs. 2303–2305) and Dr. Mandayam (Exs. 1018, 1019).

IXI filed a Motion to Exclude (Paper 21) certain exhibits submitted by Petitioner. Petitioner filed an Opposition (Paper 24) and IXI filed a Reply (Paper 25).

We have jurisdiction under 35 U.S.C. § 6. This decision is a Final Written Decision under 35 U.S.C. § 318(a) as to the patentability of claims 1, 4–7, 12, 14, 15, 22, 23, 25, 28, 34, 39, 40, 42, and 46 of the '033 patent. For the reasons discussed below, Petitioner has demonstrated by a preponderance of the evidence that these claims are unpatentable under § 103(a).

I. BACKGROUND

A. Related Proceedings

The parties identify the following proceedings related to the '033 patent: *IXI Mobile (R&D) Ltd. v. Samsung Electronics Co.*, Case No. 3:15-cv-03752-HSG (N.D. Cal.); *IXI Mobile (R&D) Ltd. v. Apple, Inc.*, Case No. 4:15-cv-03755-PJH (N.D. Cal.); and *IXI Mobile (R&D) Ltd. v. Blackberry Ltd.*, Case No. 3:15-cv-03754-RS (N.D. Cal.). Pet. 1–2; Paper 5, 1–2; Paper 7, 1–2.

B. The '033 Patent

The '033 patent issued from an application filed on May 7, 2001. Ex. 1001, at [22]. The '033 patent is directed to "a system that accesses information from a wide area network ('WAN'), such as the Internet, and local wireless devices in response to short-range radio signals." *Id.* at 4:8–11. Figure 1 of the '033 patent is reproduced below:

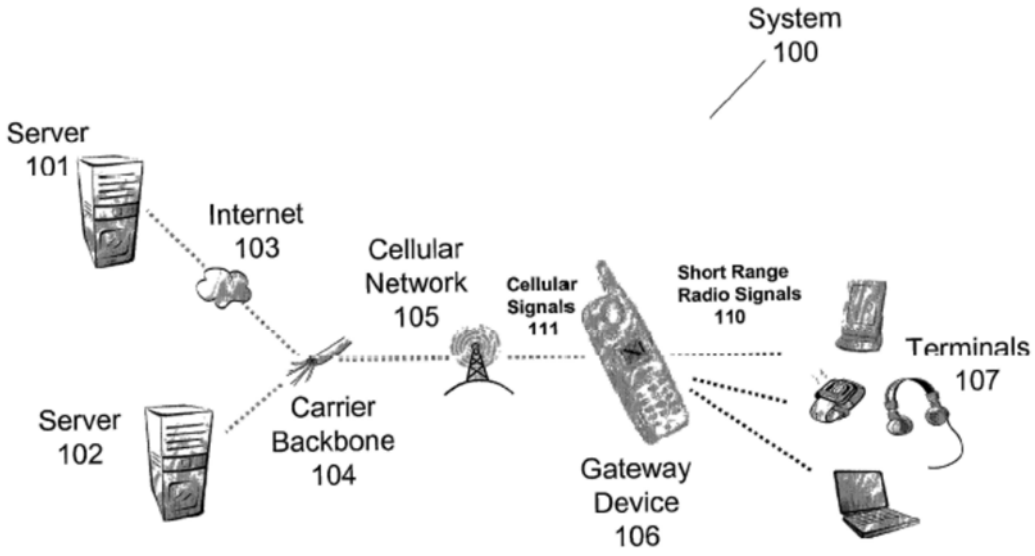


Fig. 1

Figure 1 illustrates an exemplary system 100 having a personal area network (PAN) and a wide area network. *Id.* at 4:8–19. The PAN is made up of gateway device 106 and one or more terminals 107, such as, for example, a laptop computer, a personal digital assistant (PDA), or a printer. *Id.* at 4:17–25. Gateway device 106 is coupled to cellular network 105, which in turn connects to Internet 103 through carrier backbone 104. *Id.* at 4:36–39, 49–55.

Software architecture 400 for gateway device 106 may include network management software 404 including, *inter alia*, PAN application server 404a. *Id.* at 5:61–6:5, 6:36–42; 6:58–63, Figs. 4, 5a. In turn, PAN application server 404a includes service repository software component 704, which "allows applications 406, which run on a gateway device 106 or terminals 107, to discover what services are offered by a PAN, and to determine the characteristics of the available services." *Id.* at 10:1–9, 12:9–14, Fig. 7; *see also id.* at 12:33–67 (enumerating the many functions of service repository software component 704).

C. Illustrative Claim

Claims 1, 25, 34, and 42 of the '033 patent are independent. Claims 4–7, 12, 14, 15, 22, and 23 depend from claim 1; claim 28 depends from claim 25; claims 39 and 40 depend from claim 34; and claim 46 depends from claim 42. Independent claim 1 is illustrative of the challenged claims and is reproduced below:

> 1. A system for providing access to the Internet, comprising:
>
> a first wireless device, in a short distance wireless network, having a software component to access information from the Internet by communicating with a cellular network in response to a first short-range radio signal, wherein the first

wireless device communicates with the cellular network and receives the first short-range radio signal; and,

a second wireless device, in the short distance wireless network, to provide the first short-range radio signal,

wherein the software component includes a network address translator software component to translate between a first Internet Protocol ("IP") address provided to the first wireless device from the cellular network and a second address for the second wireless device provided by the first wireless device,

wherein the software component includes a service repository software component to identify a service provided by the second wireless device.

Ex. 1001, 15:40–59.

D. The Prior Art

Petitioner relies on the following prior art:

PCT Publication No. WO 01/76154 A2 to Marchand, published Oct. 11, 2001 (Ex. 1005, "Marchand"), which claims priority to U.S. Application No. 09/541,529, filed Apr. 3, 2000 (Ex. 1006, "Marchand Priority");

Handley et al., *Request For Comments 2543 SIP: Session Initiation Protocol*, THE INTERNET SOCIETY, March 1999 (Ex. 1007, "RFC 2543");

U.S. Patent No. 6,836,474 B1 to Larsson, filed Aug. 31, 2000, issued Dec. 28, 2004 (Ex. 1008, "Larsson");

K. Arnold et al., *The Jini™ Specification*, Addison-Wesley, June 1, 1999 (Ex. 1009, "JINI Spec.");

U.S. Patent No. 6,560,642 B1 to Nurmann, filed Oct. 23, 1999, issued May 6, 2003 (Ex. 1010, "Nurmann"); and

U.S. Patent No. 6,771,635 B1 to Vilander, filed Mar. 27, 2000, issued Aug. 3, 2004 (Ex. 1011, "Vilander").

E. The Asserted Grounds

We instituted this proceeding on the following grounds of unpatentability (Dec. on Inst. 26):

References	Basis	Claim(s) Challenged
Marchand, Nurmann, and Vilander	35 U.S.C. § 103(a)	1, 4, 7, 14
Marchand, Nurmann, Vilander, and RFC 2543	35 U.S.C. § 103(a)	5
Marchand, Nurmann, Vilander, and Larsson	35 U.S.C. § 103(a)	6, 23
Marchand, Nurmann, Vilander, and JINI Spec.	35 U.S.C. § 103(a)	12, 15, 22, 34, 39, 40, 42, 46
Marchand, Larsson, and JINI Spec.	35 U.S.C. § 103(a)	25, 28

F. Claim Interpretation

In an *inter partes* review, we construe claims by applying the broadest reasonable interpretation in light of the specification. 37 C.F.R. § 42.100(b); *see Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2144–46 (2016). Under the broadest reasonable interpretation standard, and absent any special definitions, claim terms are given their ordinary and customary meaning, as would be understood by one of ordinary skill in the art in the context of the entire disclosure. *See In re Translogic Tech. Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). Any special definitions for claim terms or phrases must be set forth "with reasonable clarity, deliberateness, and precision." *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994). Only those terms which are in controversy need be construed, and only to the extent

necessary to resolve the controversy. *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999).

In our Decision on Institution, we determined that no claim terms required construction. Dec. on Inst. 6–7. Based on our review of the complete record, we maintain our determination that no constructions are necessary, with the exception of the term "thin terminal" in claims 7 and 46.

The parties' arguments require us to consider whether a printer is commensurate with the broadest reasonable interpretation of "thin terminal." *See* Pet. 30–31; PO Resp. 42–43; Pet. Reply 18–20. The '033 patent describes "thin terminals" as having "a relatively low power central processor and operating system" and as being "mainly used as peripherals to an Application server in a PAN." Ex. 1001, 5:2–5. The main tasks of a thin terminal are described as "user interaction, rendering output for a user and providing an Application server with a user's input." *Id.* at 5:5–7. Examples of thin terminals provided in the '033 patent include a watch and a messaging terminal. *Id.* at 5:5–7. Furthermore, the '033 patent contrasts thin terminals with smart terminals having "a relatively powerful central processor, operating system and applications," such as "a computer notebook and PDA." *Id.* at 4:62–5:2. In describing a messaging terminal in one embodiment, the '033 patent states that the terminal "has no embedded application code or data." *Id.* at 10:18–21.

Petitioner contends a printer is a thin terminal because, at least, a printer "has a low power central processor and operating system relative to a laptop computer or PDA." Pet. 31 (citing Ex. 1003 ¶ 25) (internal quotation omitted). We agree with Petitioner, and we additionally observe that a printer is a peripheral utilized for rendering user output, which is consistent with the Specification's description of a thin terminal. We also agree with

Petitioner that the Specification's reference to "no embedded application code or data" (Ex. 1001, 10:18–21) does not preclude a printer with application code and/or data from being a thin terminal, because the '033 patent also describes the thin terminal locating, downloading, and executing software. Pet. 19 (citing Ex. 1001, 10:13–25). As such, we determine the "thin terminal" recited in claims 7 and 46 encompasses a printer.[1]

II. ANALYSIS

A. Obviousness Ground Based on Marchand, Nurmann, and Vilander

Petitioner contends claims 1, 4, 7, and 14 would have been obvious over the combination of Marchand, Nurmann, and Vilander. Pet. 11–29. IXI disputes Petitioner's contention. PO Resp. 16–43.

1. Principles of Law

A claim is unpatentable under 35 U.S.C. § 103(a)[2] if the differences between the claimed subject matter 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

[1] Although we acknowledge the different standards for claim interpretation before us and before the district courts, IXI's infringement contentions in the co-pending litigation provide additional extrinsic support for our determination. *See* Pet. 31 (citing Ex. 1012, 20, 45; Ex. 1013, 35, 70). In particular, IXI contends that a printer is a type of "thin terminal" in its infringement case. *See id.*

[2] The Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) ("AIA"), amended 35 U.S.C. §§ 102 and 103. Because the '033 patent has an effective filing date before the effective date of the applicable AIA amendments, throughout this Decision we refer to the pre-AIA versions of 35 U.S.C. §§ 102 and 103.

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, so-called secondary considerations. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). We also recognize that prior art references must be "considered together with the knowledge of one of ordinary skill in the pertinent art." *Paulsen*, 30 F.3d at 1480 (citing *In re Samour*, 571 F.2d 559, 562 (CCPA 1978)). We analyze Petitioner's obviousness grounds with the principles identified above in mind.

2. Level of Ordinary Skill in the Art

In determining the level of ordinary skill in the art, various factors may be considered, including the "type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the technology; and educational level of active workers in the field." *In re GPAC, Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995) (citing *Custom Accessories, Inc. v. Jeffrey-Allan Indus., Inc.*, 807 F.2d 955, 962 (Fed. Cir. 1986)). In addition, the prior art of record in this proceeding—namely, Marchand, Nurmann, Vilander, RFC 2543, Larsson, and JINI Spec.—is indicative of the level of ordinary skill in the art. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001); *GPAC*, 57 F.3d at 1579; *In re Oelrich*, 579 F.2d 86, 91 (CCPA 1978).

> Petitioner contends a person of ordinary skill in the art
>
> would have had a Master[] of Science Degree (or a similar technical Master's Degree, or higher degree) in an academic

> area emphasizing electrical engineering, computer engineering, or computer science with a concentration in communication and networking systems or, alternatively, a Bachelor's Degree (or higher degree) in an academic area emphasizing electrical or computer engineering and having two or more years of experience in communication and networking systems.

Pet. 7–8. Petitioner's contention is supported by the testimony of Dr. Kiaei, who bases his testimony on his "experience working in industry and academia, with undergraduate and postgraduate students, with colleagues from academia, and with engineers practicing in industry." Ex. 1003 ¶¶ 15–16. IXI does not dispute Petitioner's definition of the level of ordinary skill in the art, and, in fact, IXI applies it in IXI's Patent Owner Response. PO Resp. 8; *see also* Ex. 2301 ¶ 16 (IXI's declarant, Dr. Mandayam, applying same definition). Accordingly, we apply Petitioner's definition of the level of ordinary skill in the art for purposes of this Decision. We further observe that Petitioner's proposed definition comports with the qualifications a person would need to understand and implement the teachings of the '033 patent and the prior art of record.

3. Marchand

Marchand is a published international patent application, and Petitioner asserts Marchand's priority date under 35 U.S.C. § 102(e) is April 3, 2000, the date of filing for a prior national application (i.e., Marchand Priority) in the United States. *See* Pet. 4–5. IXI does not contest Petitioner's priority date assertion. Therefore, for purposes of this decision, we find Marchand qualifies as prior art to the '033 patent under 35 U.S.C. § 102(e) because April 3, 2000, predates the May 7, 2001, filing date of the '033 patent.

Marchand relates to "an ad-hoc network and a gateway that provides an interface between external wireless IP networks and devices in the ad-hoc network." Ex. 1005, 1:5–7. Figure 3 of Marchand is reproduced below:

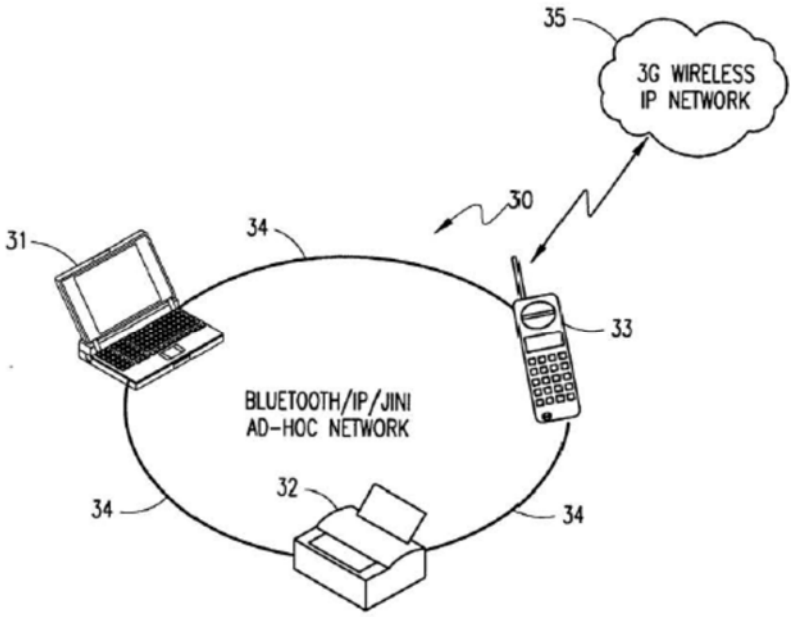


FIG. 3

Figure 3 illustrates "an ad-hoc network 30 utilizing Bluetooth, IP [Internet Protocol], and JINI technologies . . . to enable the use of a gateway mobile phone." *Id.* at 7:7–9. Ad-hoc network 30 (also called "Bluetooth Piconet (30)") includes laptop computer 31, printer 32, and mobile phone 33, which can communicate via Bluetooth radio link 34. *Id.* at Abstract, 7:9–11. Mobile phone 33 acts "as a gateway between the ad-hoc network and a 3G wireless IP network 35 such as the General Packet Radio Service (GPRS) network." *Id.* at 7:12–14. Regarding IP address translation, IP packets from the GPRS are received at mobile phone 33 through its public IP address, and then are forwarded to the private IP address of the device on ad-hoc network 30. *Id.* at 7:14–16. Address translation in the opposite direction is handled similarly. *Id.* at 7:16–17.

"JINI (Java) technology is utilized to publish and share services between the devices" in network 30, and this technology "provid[es] the capability for an application 21 to discover, join, and download services 22 from a JINI LUS [Lookup Service]." *Id.* at 6:3–4, 6:21–22. "The LUS contains a list of available services provided by other devices on the network." *Id.* at 3:11–12. Devices in the network "announce not only value-added services, but also their attributes and capabilities to the network," whereupon these services are published through the LUS. *Id.* at 3:12–15, 10:17–18. The LUS also provides interfaces for services that are available to the devices in the network. *Id.* at 3:13–14, 8:12–15.

Figure 4 of Marchand is reproduced below.

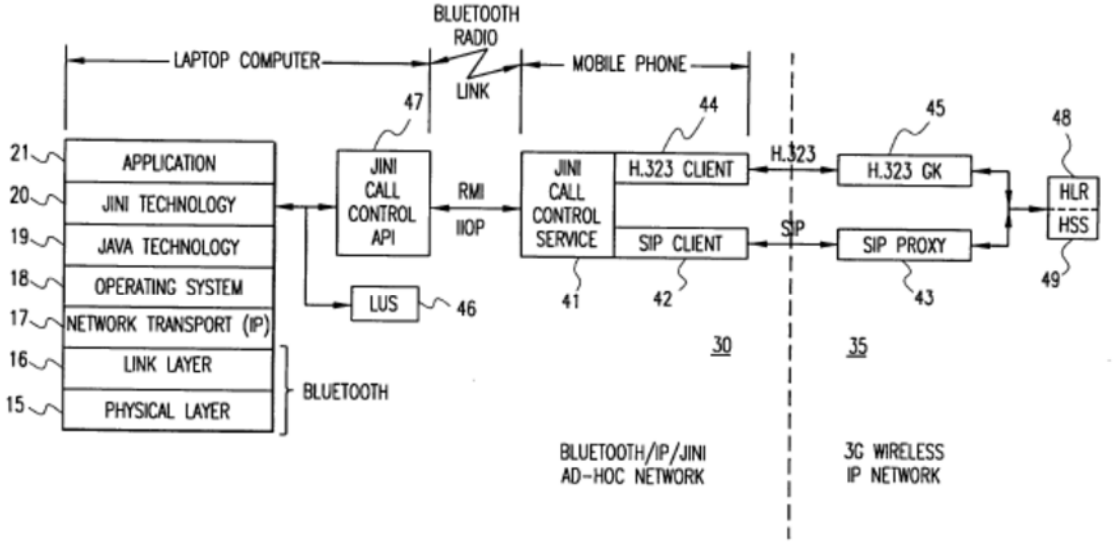


FIG. 4

Figure 4 depicts "a simplified functional block diagram of a connection between two devices such as the laptop computer 31 and the mobile phone 33 utilizing the ad-hoc network 30 of FIG. 3." *Id.* at 7:26–28. Gateway mobile phone 33 publishes in the Bluetooth piconet the call control services that it offers utilizing JINI LUS 46.

4. Nurmann

Nurmann relates to establishing an "Internet Protocol ('IP') network with several IP hosts and with an IP gateway for connecting the IP network to the [I]nternet." Ex. 1010, 1:9–12. Acting as a Dynamic Host Configuration Protocol (DHCP) client, the IP gateway determines whether a DHCP server is present in the IP network. *Id.* at 2:62–67. If a DHCP server is present, "[t]he allocation of the IP addresses to the IP hosts functioning as DHCP clients takes place from the DHCP server." *Id.* at 2:6–27. "If there is no DHCP server[,] the IP gateway is activated automatically as [a] DHCP server," which "allocates IP addresses and IP network masks to the IP hosts in a standard manner." *Id.* at 2:50–57.

5. Vilander

Vilander relates to "the allocation of IP addresses to mobile terminals and in particular to the allocation of a host part of an IP address to a mobile terminal." Ex. 1011, 1:6–8. Vilander teaches that, when a mobile terminal requests Internet access, the request is directed to a Gateway General Packet Radio Service (GPRS) Switching Node (GGSN), which may act as an Internet Access Server. *Id.* at 1:48–52.

6. Claim 1

Petitioner argues Marchand teaches a "first wireless device, in a short distance wireless network, having a software component to access information from the Internet by communicating with a cellular network in response to a first short-range radio signal," as recited in claim 1. Pet. 21–23. Petitioner maps Marchand's mobile phone 33 to the recited "first wireless device," and Marchand's ad-hoc Bluetooth piconet to the recited

"short distance wireless network." *Id.* at 21–22 (citing Ex. 1005, 1:29–31, 6:23–25, 7:12–14). Regarding the recited "second wireless device," Petitioner maps "[t]he devices in the ad-hoc Bluetooth Piconet network 30 [that] send signals to the mobile phone 33 over short-range radio links." *Id.* at 23–24 (citing Ex. 1003 ¶¶ 19, 25–27; Ex. 1005, 7:9–11, 7:18–21). As such, Petitioner maps Marchand's laptop computer 31 and/or printer 32 to the "second wireless device." *Id.*; Ex. 1005, 7:9–11, Fig. 3.

Regarding "access[ing] information from the Internet by communicating with a cellular network in response to a first short-range radio signal," Petitioner contends the IP packets sent among devices in Marchand's Bluetooth piconet over a short-range radio link correspond to the "first short-range radio signal." Pet. 22–23. Petitioner further contends Marchand's disclosure of connecting devices "to an IP-based network such as the Internet" and of "data going out of the Piconet to the GPRS network" teaches the recited Internet access. *Id.* at 22–24 (citing Ex. 1003 ¶ 27; Ex. 1005, 7:14–17, 13:12–14).

According to Petitioner, "Marchand discloses a network address translator to translate between a first IP address and a second IP address" based on Marchand's description of translating and forwarding between public and private IP addresses. *Id.* at 24 (citing Ex. 1003 ¶ 27; Ex. 1005, 7:14–17, 10:31–11:2). Petitioner contends an ordinarily skilled artisan would have modified Marchand in view of Vilander "such that the public IP address of the mobile phone gateway 33 was provided by the cellular network 35." *Id.* at 18 (citing Ex. 1003 ¶ 46). In particular, Petitioner cites Vilander's implementation of a device on the cellular network, such as a GGSN, to allocate the public IP address to the gateway. *Id.* (citing Ex. 1011 at 1:48–52, 1:57–59). Petitioner further contends an ordinarily skilled

artisan would have modified Marchand in view of Nurmann "such that the mobile gateway provides the private IP addresses to the devices on the network 30." *Id.* (citing Ex. 1003 ¶ 47). Specifically, Petitioner proposes implementing Nurmann's DHCP server on Marchand's mobile phone 33 to accomplish IP addressing in Marchand's local network 30. *Id.* (citing Ex. 1010, 4:51–56). Petitioner associates these citations from Vilander and Nurmann with the recited "network address translator software component" of claim 1. *See id.* at 24–25.

Petitioner maps Marchand's JINI Lookup Service (LUS) to the recited "service repository software component [that] identif[ies] a service provided by the second wireless device" of claim 1. Pet. 25–26 (citing Ex. 1003 ¶ 28; Ex. 1005, 3:11–12, 5:13–14). Claim 1 requires this "service repository software component" to be part of the "software component," which is itself part of the "first wireless device." Ex. 1001, 15:42–43, 15:57–59. Dr. Kiaei acknowledges "Marchand does not expressly state that the JINI LUS is located on mobile phone 33." Ex. 1003 ¶ 37. Petitioner nonetheless contends an ordinarily skilled artisan "would appreciate that Marchand implicitly teaches an implementation in which the JINI LUS is located in the mobile phone 33." Pet. 26 (citing Ex. 1003 ¶¶ 37–41). In particular, Petitioner cites Marchand's description of the mobile phone having "an interface/Application Programming Interface (API) . . . [that] is downloaded to the Bluetooth device involved in an external wireless call in order to have the device behave as a slave device toward the mobile phone which is the master." Ex. 1005, 6:27–31; *see also* Pet. 26–27 (citing same). Relying on testimony from Dr. Kiaei, Petitioner contends an ordinarily skilled artisan "would [have] underst[ood] that Marchand's API corresponds to a JINI

proxy object" and that such "proxy objects are downloaded from a LUS" in JINI. Pet. 27 (citing Ex. 1003 ¶ 38).

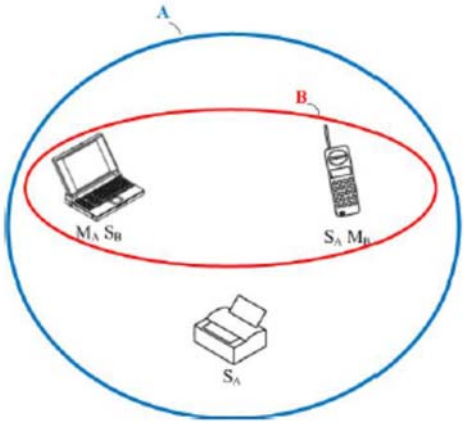
Petitioner also highlights Marchand's description "that all the devices in the ad-hoc Bluetooth Piconet network 30 publish their services when the mobile phone 33 connects to the ad-hoc Bluetooth Piconet network 30 and cellular network 35." *Id.* (citing Ex. 1003 ¶ 39; Ex. 1005, 10:12–18). Because a LUS "identifies services provided by devices on the network 30," Petitioner contends an ordinarily skilled artisan would have concluded from this description that Marchand teaches a JINI LUS located on mobile phone 33. *Id.* at 27–28 (citing Ex. 1003 ¶ 39). Petitioner additionally contends an ordinarily skilled artisan would have recognized that implementing Marchand's LUS in mobile phone 33—the gateway device to the cellular network—would best allow for the other devices in the ad-hoc Bluetooth piconet to join or leave without loss of connectivity between the piconet and the cellular network. Pet. 28 (citing Ex. 1003 ¶ 40).

Thus, Petitioner has established that Marchand, Vilander, and Nurmann teach every limitation of claim 1. Petitioner, as supported by Dr. Kiaei's testimony, also has established that a person of ordinary skill in the art would have had reason to combine the teachings of Marchand, Vilander, and Nurmann to achieve the system recited in claim 1. *See* Pet. 17–20; Ex. 1003 ¶¶ 46–51. We now consider IXI's arguments in opposition to Petitioner's obviousness analysis.

a. How an Ordinarily Skilled Artisan Would Have Interpreted Marchand's Teachings Related to the LUS

IXI disputes that Marchand teaches a LUS located on mobile phone 33, because IXI contends an ordinarily skilled artisan "would not understand

Marchand to disclose that its JINI LUS is on Marchand's cellular-enabled mobile phone 33, and . . . would have no motivation to modify Marchand to place the JINI LUS on the mobile phone in contradistinction to Marchand's explicit teachings to the contrary." PO Resp. 26–27. In particular, IXI contends Petitioner and its declarant wrongly analyzed Marchand's Bluetooth piconet. *See id.* at 12–15, 27–36. IXI's contention is based on Dr. Mandayam's testimony regarding a Bluetooth scatternet, which is formed when a Bluetooth device participates concurrently in two or more piconets. *See* Ex. 2301 ¶¶ 28–30. Figure 4 from Dr. Mandayam's Declaration is reproduced below



Id. ¶ 30. Figure 4 depicts separate piconets A (in blue) and B (in red) applied to the devices in Marchand's ad-hoc network. *Id.* ¶ 31. Dr. Mandayam explains:

> [T]he laptop computer is the master (M_A) of piconet A, with the mobile phone (S_A) and the printer (S_A) as slave devices in piconet A. The mobile phone is the master of piconet B (M_B), with only the laptop (S_B) as its slave device. Both the laptop and the mobile phone simultaneously act as master and slave devices on independent piconets, with piconet B, being a "sub-piconet" within piconet A.

Id.

Applying Dr. Mandayam's explanation to Marchand, IXI contends an ordinarily skilled artisan "would [have] appreciate[d] that the JINI LUS 46 must be located on the master device of the Bluetooth piconet, which Marchand discloses is a laptop as clearly shown on Marchand's Figure 4." PO Resp. 28 (citing Ex. 2301 ¶¶ 54–55). IXI further contends "the gateway mobile phone is the master of a sub-piconet within Marchand's Bluetooth piconet." *Id.* at 27. This purported sub-piconet, in which "the gateway mobile phone acts as the master device with the requesting device as its slave," is formed "[w]hen a device, such as a laptop, seeks to use the call control service offered by Marchand's gateway mobile phone." *Id.* at 30 (citing Ex. 2301 ¶¶ 54–55). In this case, "the gateway mobile phone sends the requesting device an API which allows the gateway mobile phone to establish its own, independent Bluetooth piconet . . . within the main Bluetooth piconet that connects all of the devices in the network." *Id.* (citing Ex. 1005, 10:25–29; Ex. 2301 ¶ 54). As such, IXI seeks to distinguish Marchand's teachings on publishing this call control API from Marchand's other teachings on publishing services to a JINI LUS upon entry of the mobile phone into the piconet. *Id.* at 32 (citing Ex. 2301 ¶ 56).

IXI's arguments rely heavily on Marchand's Figure 4, which appears to dispose a LUS within the laptop computer. *Id.* at 28 (presenting annotated version of Marchand's Fig. 4). Based on this drawing figure, and in consideration of IXI's sub-piconet theory, IXI argues that an ordinarily skilled artisan would not have had a reason to dispose a LUS within Marchand's gateway mobile phone. *See id.* at 26–37. We do not agree Marchand's disclosure should be read so narrowly, however, particularly because obviousness is determined from the perspective of "a person having ordinary skill in the art to which said subject matter pertains." 35 U.S.C.

§ 103(a); *see also Dann v. Johnston*, 425 U.S. 219, 230 (1976) ("[T]he mere existence of differences between the prior art and an invention does not establish the invention's nonobviousness.").

Petitioner presents evidence showing that an ordinarily skilled artisan would have considered Marchand's call control API to be a JINI proxy object. *See* Pet. 26–27 (citing Ex. 1003 ¶ 38; Ex. 1005, 6:27–7:2). In turn, Petitioner and Dr. Kiaei cite the JINI Spec. as teaching that such proxy objects are stored in a LUS for use when a client wants access to a service.[3] *See id.* (citing Ex. 1003 ¶ 38; Ex. 1009, 5–12). Finally, Petitioner cites Marchand's claim 6 as explicitly reciting "a JINI call control API that is downloaded from the gateway to the other devices on the ad-hoc network." *See id.* at 27 (citing Ex. 1005, 15:25–27). Petitioner concludes an ordinarily skilled artisan would have would have understood Marchand "as implicitly describing an implementation in which the JINI LUS, which identifies services provided by devices on the network 30, is located on the mobile phone gateway 33." *Id.* (citing Ex. 1003 ¶ 38). We are persuaded by this rationale, which establishes how an ordinarily skilled artisan would have read Marchand.

In addition, Marchand does not expressly prevent the LUS from being disposed on the gateway mobile phone. We agree with Petitioner's

[3] We may consider record evidence outside of the asserted ground, such as the JINI Spec., that demonstrates the knowledge and perspective of one of ordinary skill in the art, particularly when it explains why an ordinarily skilled artisan would have been motivated to combine or modify the cited references to arrive at the claimed invention. *See Ariosa Diagnostics v. Verinata Health, Inc.*, 805 F.3d 1359, 1365 (Fed. Cir. 2015); *Randall Mfg. v. Rea*, 733 F.3d 1355, 1362 (Fed. Cir. 2013).

assessment that Marchand's Figure 4 is merely exemplary and that nothing in Marchand limits or precludes the inclusion of a LUS in the gateway mobile phone. *See* Pet. Reply 11–12. Furthermore, one of ordinary skill in the art would have known, at least, that it was possible to have multiple LUSs in a network. *See* Ex. 1009, 5 ("Each Jini system is built around *one or more* lookup services." (original emphasis omitted and emphasis added)).[4] If multiple LUSs are possible, and if a LUS must be disposed on a master device, as IXI contends (*see, e.g.*, PO Resp. 28 (citing Ex. 2301 ¶¶ 54–55)), then Marchand's teaching that a gateway mobile phone is a master (*see* Pet. 13–14 (citing Ex. 1005, 8:2–2); Pet. Reply 3 (citing Ex. 1005, 3:22–27, 7:26–31, 8:1–3)) supports Petitioner's contention that Marchand suggests disposing a LUS in the gateway mobile phone. We also are not persuaded by Dr. Mandayam's testimony and IXI's arguments that the LUS must be disposed on a device that is "intrinsic to the Piconet" and that is "not the gateway." Ex. 1019, 16:10–14; Tr. 81:1–86:2. The notion of an "intrinsic" device is not apt in Marchand, which is expressly directed to ad-hoc networks. *See, e.g.*, Ex. 1005, 7:7–11, Fig. 3 (including gateway mobile phone in discussion of described "ad-hoc network").

Accordingly, based on the arguments before us, we determine that an ordinarily skilled artisan's understanding of Marchand would not have been limited by IXI's sub-piconet theory in the way suggested by IXI. Therefore, we determine that Marchand would have informed an ordinarily skilled artisan that the "service repository software component" may be disposed in the "first wireless device."

[4] Petitioner makes this point citing a reference that is subject to IXI's motion to exclude, *see* Pet. Reply 11–12 (citing Ex. 1016), but the same point is supported by the JINI Spec.

b. Marchand's Teachings on a Network Address Translator

IXI also disputes that Marchand teaches a "network address translator software component" located on mobile phone 33, as required by claim 1. PO Resp. 37. In particular, IXI contends that "Marchand discloses that an API should be used to translate between a public IP address and a private IP address." *Id.* (citing Ex. 1005, 11:17–12:3; 15:29–31). IXI cites Marchand's claim 7, which recites the "JINI call control API includes means for deconflicting public and private IP addresses when devices in the ad-hoc network are utilizing real-time applications over the wireless IP network." *Id.* (quoting Ex. 1005, 15:29–31). Dr. Mandayam testifies that an ordinarily skilled artisan "would have understood that the use of an API to translate between public and private addresses is significantly different than using a NAT [network address translator]."[5] Ex. 2301 ¶ 64. IXI further contends Marchand discourages utilizing a NAT in the gateway mobile phone and encourages using an API translator to avoid the problem of IP address mismatch "for real-time applications such as VoIP [Voice over Internet Protocol]." PO Resp. 39 (quoting Ex. 1005, 11:26–12:2; citing Ex. 2301 ¶ 66).

We do not agree with IXI's characterization of Marchand's teachings on address translation, however. As noted by Petitioner, Marchand describes forwarding IP packets received at the gateway mobile phone through a public IP address to a destination device in the piconet having a

[5] Even though both parties reference a network address translator, Marchand actually uses the acronym "NAT" to refer to a "National Access Translator." *See* Ex. 1005, 11:23. Given an opportunity at the oral hearing to explain if there were any meaningful differences in this terminology, IXI's counsel did not offer any. *See* Tr. 36:11–37:8.

private IP address, and vice versa. Pet. 24 (citing Ex. 1003 ¶ 27; Ex. 1005, 7:14–17, 10:31–11:2). In addition, Dr. Mandayam testifies that address translation is done at the gateway in Marchand. Pet. Reply 13 (citing Ex. 1018, 147:5–7, 152:25–153:1). Accordingly, and regardless of whether this address translation is performed by a NAT or an API translator, Marchand teaches a network address translator software component located on the gateway mobile phone. *See* Pet. Reply 14–15. Furthermore, we agree with Petitioner that the use of an API translator for certain real-time applications would have been viewed as "as a supplement to NAT [and] not a substitute for NAT." Pet. Reply 14 (citing Ex. 1003 ¶ 27). For these reasons, Petitioner has established that Marchand teaches a "network address translator software component."

c. Rationale for Modifying Marchand in View of Vilander and Nurmann

IXI disputes Petitioner's contention that, in view of Vilander, an ordinarily skilled artisan "would have modified Marchand's system such that the public IP address of the mobile phone gateway 33 was provided by the cellular network 35." PO Resp. 40 (quoting Pet. 17–18). IXI argues that Marchand and Vilander do not indicate a need for the cellular network to provide a public IP address for the gateway mobile phone. *Id.* (citing Ex. 2301 ¶ 70). Nevertheless, we agree with Petitioner that "using Vilander's address allocation in Marchand would have amounted to nothing more than the use of a known technique to improve similar devices in the same way or the combination of prior art elements according to known methods to yield predictable results." Pet. Reply 15 (citing, *inter alia*, *KSR v. Teleflex*, 550 U.S. 398, 417 (2007)); *see also* Pet. 19 (citing same).

Although Marchand describes gateway mobile phone as having "a public IP address recognized in the wireless IP network," Marchand does not explicitly describe how the public IP address is assigned. Pet. Reply 16 (quoting Ex. 1005, 4:23–30). In light of this, Petitioner identifies evidence that Vilander's GGSN would have improved Marchand by allocating the public IP address to Marchand's gateway mobile phone 33. Pet. 18 (citing Ex. 1003 ¶ 46; Ex. 1011, 1:48–52, 1:57–59).

IXI likewise disputes Petitioner's contention that, in view of Nurmann, an ordinarily skilled artisan "would have modified [Marchand's] mobile gateway 33 such that the mobile gateway provides the private IP addresses to the devices on the network 30." PO Resp. 40 (quoting Pet. 18). According to IXI, a person of ordinary skill in the art "would have understood that the master device, containing the JINI LUS, . . . provide[s] the private IP addresses," so that person "would not have been motivated to require a slave device [i.e., the mobile gateway] in the network to assign private IP addresses." PO Resp. 40 (citing Ex. 2201 [sic, 2301] ¶ 71). For the same reasons expressed above, however, we determine that an ordinarily skilled artisan would not have read Marchand to preclude the gateway from being a master device with a LUS. *See supra* § II.A.4.a.

d. Secondary Considerations of Nonobviousness

IXI did not put forth any evidence of secondary considerations of nonobviousness.

e. Conclusion Regarding Claim 1

Based on all of the evidence of record, we determine, by a preponderance of the evidence, that the subject matter of claim 1 would have

been obvious over the combination of Marchand, Vilander, and Nurmann under 35 U.S.C. § 103(a).

7. Claims 4, 7, and 14

Claim 4 depends from claim 1 and recites "the service repository software component identifies whether the service is available at a particular time." Ex. 1001, 16:4–6. Building on Petitioner's analysis for claim 1, in which Marchand's LUS corresponds to the recited "service repository software component," Petitioner contends "Marchand teaches that '[t]he LUS contains a list of *available* services provided by other devices on the network.'" Pet. 29 (quoting Ex. 1005, 3:11–12) (emphasis added by Petitioner).

Claim 7 depends from claim 1 and recites "the second wireless device is a thin terminal." Ex. 1001, 16:14–15. Mirroring its unpatentability contentions for claim 1, Petitioner maps Marchand's printer 32 to the recited "second wireless device" that is a "thin terminal." Pet. 30–31 (citing, *inter alia*, Ex. 1005, 7:9–11). As stated above, we determine a printer is a type of "thin terminal." *See supra* § I.F.

Claim 14 depends from claim 1 and recites "the second wireless device includes an application software component that registers an availability of the service with the service repository software component." Ex. 1001, 16:34–36. Petitioner cites Marchand for teaching that "[o]ther devices (e.g., printer 32) on [Marchand's] ad-hoc Bluetooth Piconet network 30 may use their respective Java and JINI layers 19 and 20 to discover, join, and download services 22 from [the] JINI LUS." Pet. 31–32 (citing Ex. 1005, 6:19–22, 7:23–25, 8:11–28) (internal quotation omitted). Petitioner contends an ordinarily skilled artisan "would [have] underst[ood]

that one or more software elements, such as Marchand's Java technology layer 19, JINI technology layer 20, and any other application (e.g., application 21) in a network 30 device . . . help [to] implement registration of an availability of a service with the LUS." *Id.* at 32; Ex. 1003 ¶¶ 28, 32.

Therefore, having considered Petitioner's unpatentability contentions and supporting evidence, we are persuaded that Petitioner presents sufficient evidence to support a finding that these prior art references teach the claimed subject matter recited in claims 4, 7, and 14. For the same reasons as above with respect to claim 1, we also are satisfied that Petitioner has presented sufficient reasons for the combination, as supported by Dr. Kiaei's testimony. *See* Pet. 17–20; Ex. 1003 ¶¶ 46–51. Furthermore, regarding claims 4 and 14, IXI relies on its same arguments from claim 1 (*see* PO Resp. 41), which we do not find persuasive for the reasons mentioned above. For claim 7, IXI's arguments pertain to claim interpretation of the term "thin terminal," (*see id.* at 42–43), and we already have considered those arguments above. *See supra* § I.F. Therefore, based on the entire record before us, we conclude Petitioner has demonstrated by a preponderance of the evidence that the subject matter of claims 4, 7, and 14 would have been obvious over the combination of Marchand, Vilander, and Nurmann.

B. Obviousness Ground Based on Marchand, Nurmann, Vilander, and RFC 2543

Petitioner contends claim 5 would have been obvious over the combination of Marchand, Nurmann, Vilander, and RFC 2543. Pet. 32–35. IXI disputes Petitioner's contention. PO Resp. 43–45.

1. RFC 2543

RFC 2543 is an Internet standards document related to Session Initiation Protocol (SIP), which is "an application-layer control (signaling) protocol for creating, modifying and terminating sessions with one or more participants." Ex. 1007, 1. An SIP-capable "client queries the DNS [Domain Naming Service] server for address records for the host portion of the Request-URI [Uniform Resource Identifier]." *Id.* at 13. Such a client "MAY cache a successful DNS query result." *Id.*

2. Claim 5

Claim 5 depends from claim 1 and recites "the software component includes a domain naming service ('DNS') software component to translate between a human readable name and a second Internet Protocol ('IP') address." Ex. 1001, 16:7–10. Petitioner cites RFC 2543's teachings regarding a client querying a DNS server to obtain and cache an IP address corresponding to a human-readable name, such as "company.com." Pet. 33 (citing Ex. 1003 ¶¶ 54–55; Ex. 1007, 13, 146). Petitioner proposes adding "RFC 2543's disclosure of DNS query and response . . . with Marchand's SIP client in the combination of Marchand, Nurmann, and Vilander to implement full SIP capabilities (e.g., DNS) in Marchand's SIP client and comply with SIP standards." *Id.* at 34 (citing Ex. 1003 ¶ 57). According to Petitioner, this would be useful when a device in Marchand's piconet requests "access to the Internet (e.g., a web page, online call)." *Id.* at 33–34 (citing Ex. 1003 ¶ 56).

Supported by Dr. Mandayam's testimony, IXI argues that devices on Marchand's piconet access the cellular network through a call control client, and Marchand does not teach that the client provides access to a webpage.

Id. at 44–45; Ex. 2301 ¶¶ 74–75.[6] IXI further notes that "Marchand does not teach that the devices in the Bluetooth piconet have human-readable names." *Id.* at 45 (drawing a contrast with Ex. 1001, 8:25–29). IXI also argues an ordinarily skilled artisan would not have been motivated to add such unnecessary functions. *Id.*

As noted by Petitioner, however, Marchand's gateway mobile phone includes a second interface/API, depicted as SIP client 42 in Figure 4, which enables the use of the full SIP client capabilities. Pet. 33; Pet. Reply 20 (both citing Ex. 1003 ¶ 54; Ex. 1005, 8:5–7, 9:20–30). In light of this teaching, we are persuaded that an ordinarily skilled artisan would have known to implement RFC 2543's disclosure of DNS query, response, and caching in Marchand's SIP client 42. *See* Ex. 1003 ¶¶ 54, 57. We further agree with Petitioner that this amounts to using a known technique to improve similar devices in the same way to yield predictable results. *See* Pet. 34; Pet. Reply 21 (both citing *KSR*, 550 U.S. at 417).

For these reasons, we are satisfied that Petitioner has presented sufficient reasons for the combination of Marchand, Nurmann, Vilander, and RFC 2543. We also are persuaded that Petitioner presents sufficient evidence to support a finding that RFC 2543 teaches the additional limitation recited in claim 5. Finally, to the extent IXI again relies on its arguments for claim 1 (*see* PO Resp. 44), we do not find them persuasive for the same reasons mentioned above. Accordingly, based on the complete trial record, we conclude Petitioner has demonstrated by a preponderance of the evidence

[6] Although IXI cites paragraphs 75–76 of Dr. Mandayam's declaration, the context makes clear that IXI intended to cite paragraphs 74–75.

that the subject matter of claim 5 would have been obvious over the combination of Marchand, Vilander, Nurmann, and RFC 2543.

C. Obviousness Ground Based on Marchand, Nurmann, Vilander, and Larsson

Petitioner contends claims 6 and 23 would have been obvious over the combination of Marchand, Nurmann, Vilander, and Larsson. Pet. 35–39. IXI disputes Petitioner's contention. PO Resp. 46–48.

1. Larsson

Larsson "relates to WAP [Wireless Application Protocol] sessions between a mobile terminal and a WAP gateway, and more particularly, to the organization of protocol layers in a WAP gateway." Ex. 1008, 1:25–27. Figure 1 of Larsson is reproduced below:

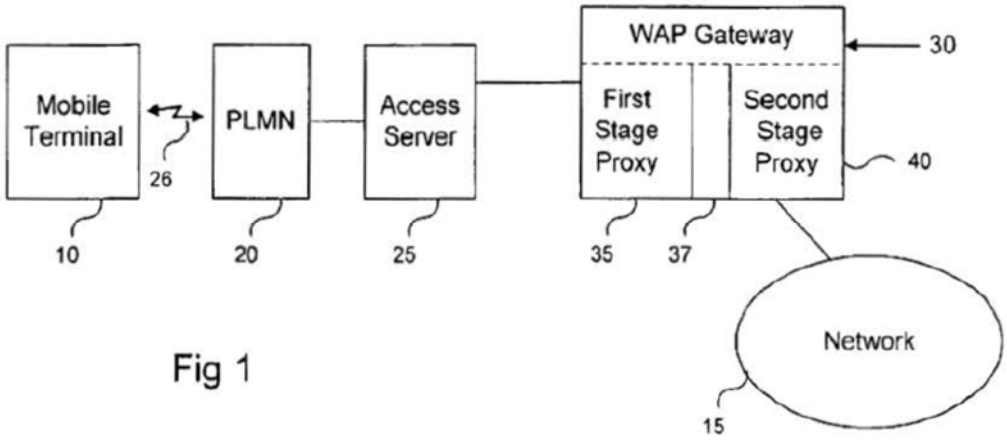


Fig 1

Figure 1 illustrates mobile terminal 10, i.e., "a portable laptop computer, personal digital assistant (PDA), mobile telephone, pager, etc.," accessing private network 15 via WAP gateway 30. *Id.* at 2:31–46. Private network 15 may be a corporate network or a virtual private network (VPN). *Id.* at 2:47–55. The mobile terminal 10 obtains access to access server 25 via wireless link 26 to Public Land Mobile Network (PLMN) 20. *Id.* at 2:40–

44. The WAP gateway 30 includes first stage proxy 35 and second stage proxy 40, which are "functionally separated" by firewall 37. *Id.* at 2:62–64, 3:1–7.

2. Claims 6 and 23

Claim 6 depends from claim 1 and recites "the software component includes a security software component to control access between the cellular network and the first wireless device." Ex. 1001, 16:11–13. Petitioner proposes adding Larsson to the combination of Marchand, Nurmann, and Vilander for teaching the security software component. Pet. 37. Petitioner contends an ordinarily skilled artisan would have "include[d] security software components such as Larsson's firewall 37, first stage proxy 35, and second stage proxy 40 in Marchand's mobile phone gateway 33 which is situated between two networks (e.g., Marchand's cellular network 35 and ad-hoc Bluetooth Piconet network 30)." *Id.* (citing Ex. 1003 ¶ 61). Petitioner also contends an ordinarily skilled artisan would have been motivated to add Larsson's firewall 37, first stage proxy 35, and second stage proxy 40 in Marchand's gateway 33 to provide secure access to Marchand's piconet from the cellular network. *Id.* (citing Ex. 1003 ¶ 62). According to Petitioner, this would result in more efficient authentication because such authentication need only be performed once at the time of the first network access request. *Id.* at 37–38 (citing Ex. 1003 ¶ 62; Ex. 1008, 2:8–15).

IXI contends Larsson does not teach "that the WAP gateway can be incorporated in the mobile terminal 10 or even that the WAP gateway is on a local area network with mobile terminal 10." PO Resp. 48 (citing Ex. 2201 ¶ 78). We agree with Petitioner, however, that Petitioner's proposed

combination seeks to add Larsson's security components to Marchand's gateway mobile phone, not Larsson's own mobile terminal 10. *See* Pet. Reply 22. As such, IXI misapprehends the proposed combination. Furthermore, we are persuaded by Petitioner's showing that Larsson and Marchand both involve a gateway situated between two networks such that an ordinarily skilled artisan would have known to apply Larsson's security features to Marchand's similar topology. *See* Pet. 37 (citing Ex. 1003 ¶ 61); Pet. Reply 23 (citing Ex. 1003 ¶¶ 58–61; Ex. 1008, 1:8, 1:67–2:1, 2:30–54, Fig. 1). We are further persuaded by Petitioner's contention that an ordinarily skilled artisan would have been motivated by the efficiency gained through performing authentication only once at the time of the first request for network access. *See* Pet. 37–38 (citing Ex. 1003 ¶ 62; Ex. 1008, 2:8–15).

Claim 23 depends from claim 1 and recites "the first wireless device further includes a virtual private network ('VPN') software component." Ex. 1001, 16:59–61. Regarding the recited VPN, Petitioner contends the asserted 4-way obviousness combination "discloses a second stage proxy that resides within the VPN side of a firewall in a gateway cellular phone, and authenticates access requests from users." Pet. 39 (citing Ex. 1003 ¶ 59; Ex. 1008, 3:1–7; 4:13–22. This is supported by Larsson's teachings on private network 15 potentially being a VPN; because the second stage proxy interacts with the VPN, the second stage proxy acts as the recited "virtual private network . . . software component." *See* 1003 ¶¶ 58–59; Ex. 1008, 2:47–55, Fig. 1.

Finally, to the extent IXI relies on the same arguments from claim 1 relative to claims 6 and 23 (PO Resp. 46), we find them unpersuasive for the same reasons mentioned above.

Accordingly, we are persuaded that Petitioner presents sufficient evidence to support a finding that the combination of Marchand, Nurmann, Vilander, and Larsson teaches the subject matter recited in claims 6 and 23 (*see* Pet. 38–39), and that there are sufficient reasons for the combination (*see id.* at 37–38). Therefore, based on the entire record before us, we conclude Petitioner has demonstrated by a preponderance of the evidence that the subject matter of claims 6 and 23 would have been obvious over the combination of Marchand, Nurmann, Vilander, and Larsson.

D. Obviousness Ground Based on Marchand, Nurmann, Vilander, and JINI Spec.

Petitioner contends claims 12, 15, 22, 34, 39, 40, 42, and 46 would have been obvious over the combination of Marchand, Nurmann, Vilander, and JINI Spec. Pet. 39–55. IXI disputes Petitioner's contention. PO Resp. 48–56

1. JINI Spec.

The JINI Spec. is a textbook directed to the Jini architecture, which is "designed for deploying and using services in a network." Ex. 1009, xix. The JINI Spec. teaches a process by which a Lookup Service (LUS) is used to register proxy objects associated with available services. *Id.* at 5–12. A client wishing to use a service loads an appropriate proxy object from the LUS and executes the proxy object to access the service. *Id.* at 72–75; *see also* Ex. 1003 ¶¶ 63, 69 (explaining the use of proxy objects in the JINI Spec.).

2. Claim 22, 34, and 39

Independent claims 1 and 34 include some limitations that are similar in scope, so the parties' positions relative to claim 34 are similar to those in claim 1. Therefore, we focus on certain differences in the analyses between claims 1 and 34.

Petitioner maps Marchand's gateway mobile phone 33 to the recited "handheld device" of claim 34, and Petitioner maps Marchand's Bluetooth piconet to the recited "short distance wireless network." Pet. 44 (citing Ex. 1003 ¶¶ 24–26; Ex. 1005, 4:21–23, 6:16–29, 7:18–23, 8:11). For the recited "storage device," Petitioner cites Marchand's description of programming interfaces and protocol stack layers and contends that an ordinarily skilled artisan would have understood that a storage device would have been necessary to store software associated with these features in Marchand's gateway mobile phone. *Id.* at 45 (citing Ex. 1003 ¶¶ 33–36; Ex. 1005, 6:16–29). Petitioner likewise contends an ordinarily skilled artisan would have appreciated that software in the gateway, including software for "implement[ing] routing and communication over the cellular and local wireless networks," would require execution by a processor coupled to the storage device. *Id.* at 45–46 (citing Ex. 1003 ¶¶ 34–36; Ex. 1005, 2:14–16, 2:27–31, 6:18–20, 6:27–30).

Regarding claim 34's recitations on providing an IP data packet to a terminal and translating between first and second IP addresses, Petitioner cites Marchand's description of receiving IP data packets from a public IP network at the gateway and forwarding them to other devices in the Bluetooth piconet. *Id.* at 24–25, 46–48 (citing Ex. 1003 ¶ 27; Ex. 1005, 7:14–17, 10:31–11:2). For "control[ling] access" between the networks, Petitioner cites this same teaching on IP data packets and also cites

Marchand's description of the gateway functioning as "a call-control server for client devices in the ad-hoc network, and . . . as a call-control client for a server in the wireless IP network." *Id.* (citing Ex. 1003 ¶¶ 24, 25, 58–62; Ex. 1005, 4:23–27, 7:12–14). For enumerating and searching a list of services, Petitioner cites Marchand's teachings on listing services in a JINI LUS and on allowing devices to discover, join, and download services from the LUS. *Id.* at 48–49 (citing Ex. 1003 ¶¶ 28, 32; Ex. 1005, 6:19–22, 7:9–25, 8:11–28, 11:12–14). Petitioner also cites the JINI Spec. for teaching that the LUS can provide a proxy object to a requesting device so that the device may access the requested service. *Id.* (citing, *inter alia*, Ex. 1003 ¶¶ 38, 63, 68; Ex. 1009, 4–11, 72–75). Thus, Petitioner has established that Marchand, Vilander, Nurmann, and JINI Spec. teach every limitation of claim 34.

Claim 39 depends from claim 34 and recites "the search includes searching the list of services by class, attribute or instance." Ex. 1001, 18:3–4. Citing the JINI Spec., Petitioner contends "a JINI LUS stores information about a service's ID, its class or type, and its attributes," all of which can be searched. Pet. 50 (citing Ex. 1003 ¶ 64; Ex. 1009, 9–11, 16–20, 73, 77–79, 217–230). Claim 22 depends from claim 1 and contains a similar limitation; Petitioner's analysis is nearly identical to that of claim 39. *See id.* at 43–44. Petitioner, therefore, has established that the combination of Marchand, Nurmann, Vilander, and JINI Spec. teaches the additional limitations in claims 22 and 39.

Building on its reasons for combining Marchand, Nurmann, and Vilander, Petitioner contends an ordinarily skilled artisan would have combined the JINI Spec. with these references "to fully implement and realize JINI technology in Marchand's ad-hoc Bluetooth Piconet network 30." *Id.* at 42 (citing Ex. 1003 ¶ 70). According to Petitioner, this would

allow each device in Marchand's piconet "to register, search for, and execute services in the [piconet] according to the JINI Spec." *Id.* (citing Ex. 1003 ¶ 70). We agree with Petitioner that this amounts to nothing more than the use of a known technique to improve similar devices in the same way or the combination of prior art elements according to known methods to yield predictable results. *Id.* (citing *KSR*, 550 U.S. at 417). As such, Petitioner has established that a person of ordinary skill in the art would have had reason to combine the teachings of Marchand, Vilander, Nurmann, and JINI Spec. to achieve the system recited in claim 34.

With respect to claims 34 and 39, IXI argues Marchand cannot teach the recited enumerated list of services operative in the software component of the handheld device's processor because Marchand's LUS cannot be in gateway mobile phone 33. PO Resp. 53–54. IXI's reasoning behind this argument is the same as for the argument it made for claim 1. *See id.* Therefore, for the same reasons mentioned above with respect to claim 1, we are not persuaded by this argument. We also are unpersuaded by IXI's arguments for claim 22, which recapitulate arguments it made for claim 1. *See id.* at 52.

Accordingly, based on the entire trial record, we conclude Petitioner has demonstrated by a preponderance of the evidence that the subject matter of claims 22, 34, and 39 would have been obvious over the combination of Marchand, Nurmann, Vilander, and JINI Spec.

3. Claims 42 and 46

Claim 42 is an independent claim that shares many similar limitations to those in independent claim 34. *See* Ex. 1001, 18:14–40. Petitioner's mapping of prior art elements to claim 42 is nearly identical to that of claim

34. *See* Pet. 50–55. In contrast, however, claim 42 recites that the processor of a first handheld device provides short-range radio signals to second and third wireless handheld devices. *See* Ex. 1001, 18:14–40. Petitioner maps Marchand's network devices, such as a laptop computer, a printer, or a PDA, to the second and third wireless handheld devices. Pet. 52 (citing Ex. 1003 ¶¶ 25, 26; Ex. 1005, 6:23–27, 7:9–11, 10:18–21). In support of its mapping, Petitioner notes that non-asserted claim 45 from the '033 patent indicates that "a laptop computer [and] a personal digital assistant" are wireless handheld devices. *Id.* (citing Ex. 1001, 18:50-54). Petitioner also references the '033 patent's description of a "hand-held" device 350 in Figure 3b, which, in one embodiment, "is one of the terminals 107"; in turn, Petitioner references that a printer is one of the enumerated terminals 107 in the '033 patent. *Id.* at 52 (citing Ex. 1001, 4:17–25, 5:43–46). In light of this, Petitioner contends an ordinarily skilled artisan "would [have] consider[ed] any of Marchand's network 30 devices, such as the laptop computer, printer, or PDA, as corresponding to the second and third wireless handheld devices." Pet. 52 (citing Ex. 1001, 4:17–25; 5:43–46; Ex. 1003 ¶ 26). Petitioner additionally notes that IXI mapped a printer to the "second wireless handheld device" limitation in its infringement contentions from the related district court litigation. *Id.* at 52–53 (citing Ex. 1012, 45; Ex. 1013, 70).

IXI does not dispute Petitioner's evidence showing that an ordinarily skilled artisan would have understood Marchand's laptop computer, printer, and PDA as corresponding to the recited second and third wireless handheld devices. Nor does IXI dispute that Marchand's laptop computer, printer, and PDA are "handheld device[s]" commensurate with claim 42; indeed, IXI does not propose a construction of "handheld." IXI's only argument against

Petitioner's analysis for claim 42 recapitulates its argument from claim 34, namely, that Marchand cannot teach a wireless handheld device that enumerates a list of services because Marchand's LUS cannot be in the gateway mobile phone. PO Resp. 53–55. As stated above, we do not agree that Marchand's teachings on the LUS are so limited. *See supra* § II.A.6.a. Accordingly, we determine that Marchand teaches the recited second and third "wireless handheld device[s]" of claim 42.

Claim 46 depends from claim 42 and further recites "the second wireless handheld device is a thin terminal." Ex. 1001, 18:55–57. As stated above, we determine a printer is a type of "thin terminal" (*see supra* § I.F.), and Petitioner maps Marchand's printer 32 to the second wireless handheld device. Pet. 55. IXI's arguments disputing Petitioner's analysis relate to claim interpretation (*see* PO Resp. 42–43, 56), which we have addressed above.

Therefore, having reviewed Petitioner's unpatentability contentions for claims 42 and 46 (*see id.* at 50–55), we determine Petitioner has established that Marchand, Vilander, Nurmann, and JINI Spec. teach every limitation of these claims. Petitioner's rationale for combining these references is also sufficient for the reasons stated above. Based on the entire trial record, we conclude Petitioner has demonstrated by a preponderance of the evidence that the subject matter of claims 42 and 46 would have been obvious over the combination of Marchand, Nurmann, Vilander, and JINI Spec.

4. Claims 12, 15, and 40

Claim 12 recites "the software component includes a plug and play software component to load and execute software for the second wireless

device." Ex. 1001, 16:27–29. Claim 40 recites "the software component includes a plug and play software component to identify the terminal in the short distance wireless network and obtain the application software component for the terminal." *Id.* at 18:5–9. Petitioner relies on Marchand and JINI Spec., as supported by Dr. Kiaei's testimony, for teaching these limitations. *See* Pet. 39–43, 50. Specifically, Petitioner contends "a network 30 device (e.g., printer 32) registers a service (e.g., printing service) with the JINI LUS in gateway mobile phone 33 by loading a proxy object corresponding to its service onto the JINI LUS." *Id.* at 39–42 (citing Ex. 1003 ¶¶ 63, 67; Ex. 1009, 4–11, 72–73, 217–230). According to Petitioner, when a request for a service is received, the proxy object is loaded and executed to allow access to the service. *Id.* at 41–43 (citing Ex. 1003 ¶¶ 38, 63, 68–69; Ex. 1009, 4–11, 16–20, 73–74, 77–79, 217–230).

As supported by Dr. Mandayam's testimony, IXI contends an ordinarily skilled artisan would not have understood JINI Spec's proxy object that is published to a LUS upon joining a network as constituting a "plug and play software component." PO Resp. 50 (citing Ex. 2301 ¶ 84). Specifically, IXI contends "there is no disclosure of a software component that functions in a 'plug and play' manner." *Id.* IXI explains "the LUS does not ***determine***, ***find***, or otherwise ***resolve*** the software necessary to support the joining terminal, consistent with the plain and ordinary meaning of the term 'plug and play' and the specification of the -033 Patent." *Id.* at 50–51 (citing Ex. 2301 ¶ 84).

Yet the JINI Spec. describes the concept of "[n]etwork plug-and-work" as being a goal of the JINI architecture: "You should be able to plug a service into the network and have it be visible and available to those who want to use it. Plugging something into a network should be all or almost all

you need to do to deploy the service." Ex. 1009, 4. This is commensurate with the recited "plug and play" concept recited in claims 12 and 40. The JINI Spec. also describes downloading of code for a proxy object and "invoking methods on the proxy object" in response to a request for a service. *Id.* at 5–7, 9–10. This is commensurate with the recited "load[ing] and execut[ing]" of software in claim 12 and "obtain[ing] the application software component" in claim 40. We additionally agree with Petitioner (Pet. Reply 23–24) that certain of IXI's arguments turn on features not appearing in the claims, such as "determin[ing], find[ing], or otherwise resolv[ing] the software." *See* PO Resp. 50–51. These arguments are not persuasive.

Petitioner's obviousness analysis for claim 15 is similar to that for claim 12, and it likewise establishes that the asserted obviousness combination teaches the additional limitation in claim 15. *See* Pet. 43 (citing Ex. 1003 ¶¶ 38, 63, 67). Regarding claim 15, IXI again relies on its arguments for claim 1 (*see* PO Resp. 52), which are not persuasive for the same reasons mentioned above.

Based on all of the evidence of record, we determine, by a preponderance of the evidence, that the subject matter of claims 12, 15, and 40 would have been obvious over the combination of Marchand, Vilander, Nurmann, and JINI Spec. under 35 U.S.C. § 103(a).

E. Obviousness Ground Based on Marchand, Larsson, and JINI Spec.

Petitioner contends claims 25 and 28 would have been obvious over the combination of Marchand, Larsson, and JINI Spec. Pet. 55–60. IXI disputes Petitioner's contention. PO Resp. 56–57.

Petitioner's analysis for independent claim 25 incorporates elements of the analysis above for independent claim 34 and for dependent claim 6. In particular, Petitioner cites Marchand for teaching the basic Bluetooth system architecture, the transfer of IP data packets, and the use of a JINI LUS. Pet. 56–59. Petitioner cites Larsson for teaching the recited "security software component." *Id.* at 58–59. Petitioner cites the JINI Spec. for teaching details on registering and listing services with a LUS and using proxy objects to implement services. *Id.* at 59.

For claim 28, which depends from claim 25, Petitioner relies on the same analysis for claim 23, in which Petitioner cites Larsson for teaching staged proxies that are used with a VPN. *See id.* at 39, 60; *supra* § II.C.2.

Thus, for the same reasons discussed above, Petitioner establishes that the combination of Marchand, Larsson, and JINI Spec. teaches the subject matter recited in claims 25 and 28. Petitioner also presents sufficient reasons for combining Marchand, Larsson, and JINI Spec. that mirror those given with respect to other grounds discussed above. Pet. 56; *see supra* §§ II.C.2., II.D.2.

IXI again contends Marchand does not teach or suggest locating the JINI LUS and its service searching capabilities (i.e., the "service repository software component") on mobile phone 33, which corresponds to the recited "second wireless device" in claim 25. PO Resp. 57. For the same reasons discussed above, however, we are not persuaded by this argument.

Accordingly, based on the entire trial record, we conclude Petitioner has demonstrated by a preponderance of the evidence that the subject matter of claims 25 and 28 would have been obvious over the combination of Marchand, Larsson, and JINI Spec.

F. Testimony of Dr. Kiaei

IXI argues that "Dr. Kiaei's opinions are unreliable because they misunderstand and mischaracterize the inner workings of Marchand's network and devices." PO Resp. 12. Dr. Kiaei's "opinions regarding Bluetooth, the proposed modifications of Marchand, and the purported motivations for modifying Marchand should be entitled to little weight, if any," IXI argues, because of "Dr. Kiaei's lack of understanding Bluetooth and failure to consider the implications of Marchand's reliance on Bluetooth with respect to the proposed combinations." *Id.* at 15. IXI's arguments are rooted in IXI's sub-piconet theory discussed above. *See supra* § II.A.6.a.

Petitioner replies that the "portion of Marchand relied upon in the Petition does not rely on a device being connected in more than one piconet." Pet. Reply 25. Thus, IXI's sub-piconet theory is supported by hypothetical drawings and testimony of Dr. Mandayam, not by Marchand, according to Petitioner. *Id.* Moreover, Dr. Kiaei testified that the question of whether a device could be connected in more than one piconet was a hypothetical question that he could not answer without more information because it was outside of the scope of what he considered. *See id.* at 24–25 (quoting Ex. 2302, 98:2–3, 98:22–99:9). In sum, Petitioner argues that IXI's "attack on Dr. Kiaei's credibility is misguided and [is] not germane to any substantive issues involved in this proceeding." *Id.* at 25.

We have the discretion to determine the appropriate weight to be accorded to the evidence presented, including opinion testimony, based on the disclosure of the underlying facts or data upon which the opinion is based. *See, e.g.*, *Yorkey v. Diab*, 601 F.3d 1279, 1284 (Fed. Cir. 2010) (holding the Board has discretion to credit one witness's testimony over another "unless no reasonable trier of fact could have done so"). In this

instance, we are not persuaded by IXI's arguments that Dr. Kiaei's testimony as a whole should be given "little weight, if any." Specifically, we have considered IXI's and Dr. Mandayam's sub-piconet theory in detail, and we determine that it would not have limited an ordinarily skilled artisan's understanding of Marchand. *See supra* § II.A.6.a. Thus, we accord an appropriate weight to Dr. Kiaei's testimony as indicated in this Decision.

G. Motion to Exclude

IXI moves to exclude Exhibits 1002, 1014, and 1015 on the basis of relevance "because they are not referenced or explained at all in the Petition or the Reply." Paper 21, 10–11. In its Opposition, Petitioner contends Dr. Kiaei referenced these exhibits in his declaration. Paper 24, 2–3 (citing Ex. 1003 ¶¶ 35, 36, 42, 60). Because Dr. Kiaei relies on these exhibits in support of his testimony in this case, IXI has not shown that they are irrelevant under FRE 401 and 402. Accordingly, we deny IXI's motion to exclude Exhibits 1002, 1014, and 1015.

IXI also moves to exclude Exhibits 1016 and 1017 on the basis of relevance, hearsay, and authenticity. Paper 21, 5–9. IXI further contends Exhibits 1016 and 1017 constitute improper supplemental information that was submitted without authorization pursuant to 37 C.F.R. § 42.123. *Id.* at 2–5. Because we do not rely upon Exhibits 1016 and 1017 in rendering this Decision, we dismiss as moot IXI's motion to exclude these exhibits.

III. CONCLUSION

Petitioner has demonstrated, by a preponderance of the evidence, that

(a) claims 1, 4, 7, and 14 are unpatentable over Marchand, Nurmann, and Vilander under 35 U.S.C. § 103(a);

(b) claim 5 is unpatentable over Marchand, Nurmann, Vilander, and RFC 2543 under 35 U.S.C. § 103(a);

(c) claims 6 and 23 are unpatentable over Marchand, Nurmann, Vilander, and Larsson under 35 U.S.C. § 103(a);

(d) claims 12, 15, 22, 34, 39, 40, 42, and 46 are unpatentable over Marchand, Nurmann, Vilander, and JINI Spec. under 35 U.S.C. § 103(a); and

(e) claims 25 and 28 are unpatentable over Marchand, Larsson, and JINI Spec. under 35 U.S.C. § 103(a).

IV. ORDER

In consideration of the foregoing, it is

ORDERED that claims 1, 4–7, 12, 14, 15, 22, 23, 25, 28, 34, 39, 40, 42, and 46 of the ’033 patent are held unpatentable;

FURTHER ORDERED that IXI’s motion to exclude Exhibits 1002, 1014, and 1015 is *denied*;

FURTHER ORDERED that IXI’s motion to exclude Exhibits 1016 and 1017 is *dismissed as moot*; and

FURTHER ORDERED that because this is a Final Written Decision, parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

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