

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MICROSOFT CORPORATION

Petitioner,

v.

EDGE NETWORKING SYSTEMS, LLC,

Patent Owner.

Case No. IPR2025-00618
U.S. Patent No. 11,695,823

PATENT OWNER'S PRELIMINARY RESPONSE

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PATENT OWNER'S EXHIBIT LIST

Ex. 2001	U.S. Patent Publ. 2013/0054763 (Van der Merwe)
Ex. 2002	<i>Ruckus Wireless, Inc. v. Hera Wireless SA et al.</i> , IPR2018-01739, Petition for Inter Partes Review, Paper 1,

I. INTRODUCTION

Institution should be denied. The Petition fails to establish that any of the challenged claims of U.S. Patent No. 11,695,823 (the “‘823 Patent”) would have been obvious under 35 U.S.C. § 103. The Petition relies primarily on Vasell (Ex. 1004), together with its incorporated provisional applications (Exs. 1015 and 1016), as the lead reference in both proposed grounds. However, the Petition fails to explain how Vasell is different from the Van der Merwe reference considered during prosecution, or how Vasell discloses or suggests the key limitation that distinguishes the claims of the ‘823 Patent: “unified capabilities enabling a plurality of upper layer application programming interfaces (APIs) to program the plurality of network device applications and plurality of cloud applications independent of network device hardware and cloud device hardware.” This limitation was the express basis for allowance, and Petitioner has failed to demonstrate that Vasell or any other cited reference supplies it.

Critically, none of the other cited references (i.e., Alves (Ex. 1008), Hall (Ex. 1009), and Rellermeier (Ex. 1011)) are even alleged to disclose this missing limitation. These references are directed to standard software modularity or OSGi-based service management within a single runtime environment. The Petition does not contend, let alone prove, that any of them teach “unified capabilities enabling a plurality of upper layer application programming interfaces (APIs) to program the

plurality of network device applications and plurality of cloud applications independent of network device hardware and cloud device hardware,” as claimed. Instead, Petitioner relies on conclusory expert assertions and mischaracterizations of the cited art, including the repeated use of a doctored figure from Vasell that was materially altered without disclosure to the Board.

The record here reflects a classic attempt at hindsight-driven reconstruction. Petitioner attempts to stitch together generalized teachings about Java modularity, communication protocols, and lifecycle management, and repurpose them to meet the highly specific and architecturally distinct limitations of the ‘823 claims. But these elements are not interchangeable. The ‘823 Patent claims a particular technical solution to a known problem in the art, namely, the lack of unified development and deployment capabilities across heterogeneous network and cloud systems. The Petition fails to demonstrate that the claimed solution is disclosed or suggested in the cited references.

As explained further below, Petitioner’s asserted combinations fail to address the actual claim language, fail to confront the reasons for allowance, and fail to supply the missing teachings. Accordingly, institution should be denied under 35 U.S.C. § 314(a).

II. THE '823 PATENT

The specification of the '823 Patent discloses a distributed application that is formed from network and cloud applications running on different devices that communicate with each other, together with “tools to facilitate development, testing, debugging and verifications” of such applications. *Id.*, 10:25-31 and 16:39-42. The tools allow “the developer to develop the components *together* to simplify the development and testing.” *Id.*, 16:43-47 (emphasis added). In keeping with this, the Applicant presented claims during prosecution reciting “unified capabilities enabling a plurality of upper layer application programming interfaces (APIs) to program the plurality of network device applications and plurality of cloud applications.” As explained more fully below, the prosecution history demonstrates that, in the Examiner’s view, this limitation specifying such “unified capabilities” is what distinguished the claims over the prior art applied by the Examiner.

In the prosecution of the '823 Patent, following a Final Rejection of all the original claims (1-18), the Applicant cancelled all of the pending claims and added new claims 19-38 (of which claims 19, 37 and 38 were independent). Ex. 1002, 124-129 and 133-137. New independent claim 19 included a final wherein clause substantially reciting the “unified capabilities” limitation described, while new independent claims 37 and 38 recited no such limitation. *Id.* In the next Office Action, the Examiner rejected independent claims 37 and 38 as anticipated by U.S.

Patent Publ. 2013/0054763 (Van der Merwe) (Ex. 2001) but found independent claim 19 allowable over the same reference. *Id.*, 94-100. While the Examiner understood that Van der Merwe disclosed distributed applications and APIs for developing such applications, the Examiner found that Van der Merwe *failed* to disclose or suggest the “unified capabilities” that enable APIs to perform programming as recited in the final wherein clause of claim 19. *Id.*, 10-11 and 100. Following claim amendments relating to 35 U.S.C. ¶112, the Examiner allowed the application, and claim 19 from the Application became claim 1 in the ‘823 Patent. *Id.*, 10-14 and 41-48.

With respect to the “unified capabilities” limitation recited in claim 1 of the ‘823 Patent, the Petition relies on provisional application no. 60/123,971 (the ‘971 Provisional Application) (Ex. 1016) which the Vasell Patent (Ex. 1004) purports to have incorporated by reference. Ex. 1004, 1:8-10. Consistent with the Examiner’s understanding that Van der Merwe disclosed the claimed “distributed application” and APIs for developing such applications, the ‘971 Provisional Application provides for the implementation of services as “distributed applications” that execute “over several infrastructure nodes,” and describes the use of APIs for developing such distributed applications. Ex. 1016, 4, 8. However, the Petition fails to explain how the ‘971 Provisional Application (or any other disclosure in Vasell) is any different from Van der Merwe, or how the ‘971 Provisional Application (or

anything else in the Vasell Patent) discloses any “*unified capabilities*” that enable APIs to program a distributed application, as claimed.

Thus, with respect to the “unified capabilities” recited in claim 1 of the ‘823 Patent that formed the basis of patentability during prosecution, the Petition fails to explain how the disclosure from Vasell relied on in the Petition is anything other than cumulative of the Van der Merwe reference that was applied during prosecution and found wanting. In this regard, the Petition fails to even allege that the Office erred in allowing the application over Van der Merwe during prosecution.

A. Distributed Application Development Environment Disclosed In ‘823 Patent

The ‘823 Patent disclosed a Distributed Software Defined Network (dSDN) that simplifies the programmability of an application distributed across multiple hardware elements in the network. Ex. 1001, 2:32-38. “A high-level overview of a dSDN system 300 is depicted in FIG. 3,” which is reproduced with colored annotations added by Patent Owner. *Id.*, 10:8-9. The dSDN system 300 includes, *inter alia*, “a flexible network device (fxDevice) 302 [red box]” and “a flexible cloud platform (fxCloud) 304 [green box].” *Id.*, 10:9-11.

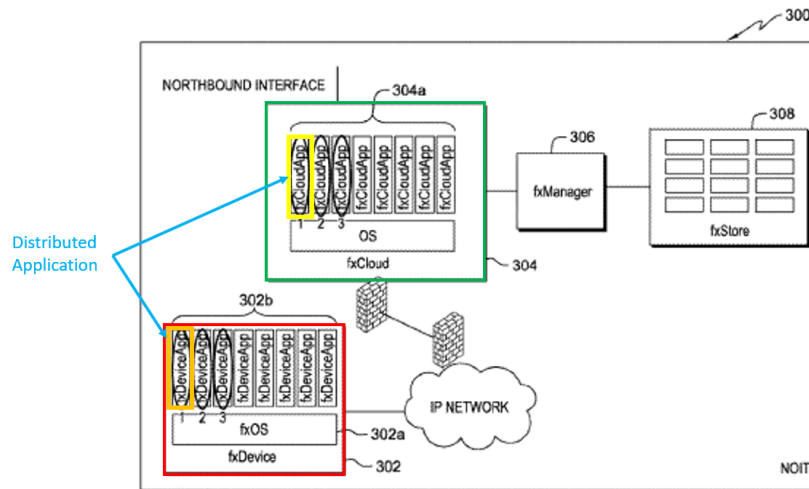


FIG. 3

In the dSDN system shown above, a FxDeviceApp 302b [orange box] can communicate with a fxCloudApp 304a [yellow box] to form a distributed application [identified with blue arrows and text]. As explained in the ‘823 Patent, an “fxDeviceApp 302 may have a sister app in the backend cloud infrastructure (i.e., flexible cloud platform 304) referenced here as fxCloudApp 304a. The fxCloudApp 304a in the cloud is paired with its fxDevice-App 302b in the fxDevice 302. The fxCloudApp 304a and the fxDeviceApp 302b collectively form a distributed application (dApp or fxApp).” *Id.*, 10:25-31.

The ‘823 Patent discloses a “flexible Software Development Kit (fxSDK)” that includes “tools to facilitate development, testing, debugging and verifications” of distributed applications. *Id.*, 16:39-42. As the ‘823 Patent explains, “since the dSDN applications may have a device component (fxDevice 302) and cloud component (fxCloud 304), the fxSDK allows the developer to develop the

components together to simplify the development and testing.” *Id.*, 16:43-47

(emphasis added).

B. Prosecution History Of ‘823 Patent

Following a Final Rejection of all claims (1-18) based on a nonstatutory double patenting rejection, the Applicant cancelled all of the previous claims and added new claims 19-38 (of which claims 19, 37 and 38 were independent). Ex. 1002, 124-129 and 133-137. Independent 19 recited as follows:

19. (New) A system comprising a plurality of network elements, said network elements comprising:

 a programmable network device adapted to host a plurality of first network applications;

 a programmable cloud device adapted to host a plurality of second network applications, wherein the plurality of first network applications in the programmable network device and the plurality of second network applications in the programmable cloud device are in secure communication with each other to form distributed applications; and

 wherein the programmable network device and programmable cloud device form unified capabilities enabling a plurality of upper layer application programming interfaces (APIs) that allow for simultaneous programming of the programmable network device and programmable cloud device independent of network device hardware and cloud device hardware. *Id.*, 125.

Three aspects of claim 19 are worthy of note.

First, claim 19 specifies that a “plurality of first network applications in the programmable network device and the plurality of second network applications in

the programmable cloud device are in secure communication with each other to form distributed applications.”

Second, claim 19 recites that “the programmable network device and programmable cloud device form unified capabilities enabling a plurality of upper layer application programming interfaces (APIs)” that allow” for “programming of the programmable network device and programmable cloud device independent of network device hardware and cloud device hardware.”

In contrast to new independent claim 19, new independent claims 37 and 38 lacked the limitations in the final wherein clause of claim 19 relating to the unified capabilities and the APIs described in the paragraph immediately above. More specifically, new independent claims 37 and 38 recited:

37. (New) A system comprising a plurality of network elements, said network elements comprising:

a programmable cloud device having a plurality of virtual machines, wherein of the virtual machines has at least one of a plurality of first network applications; and

a programmable network device adapted to process data flows having at least one of a plurality of second network applications, wherein the first and second network applications are in secure communication to form a distributed application.

38. (New) A system comprising a plurality of network elements, said network elements comprising:

a programmable cloud device having a plurality of zones, wherein of the plurality of zones has at least one of a plurality of first network applications; and

a programmable network device adapted to process data flows having at least one of a plurality of second network applications,

wherein the first and second network applications are in secure communication to form a distributed application. Ex. 1002, 128-129.

In the next Office Action, the Examiner rejected independent claims 37 and 38 as anticipated by U.S. Patent Publ. 2013/0054763 (Van der Merwe) but found independent claim 19 allowable over the same reference. Ex. 1002, 94-100. The Examiner found that *Van der Merwe disclosed* first and second network applications on different hardware where “*the first and second network applications* are in secure communication *to form a distributed application*” -- a requirement *common to each of independent claims 19, 37 and 38*.¹ Ex. 1002, 98-99. However, while the Examiner found that Van der Merwe disclosed such distributed applications, the Examiner found that Van der Merwe *failed* to disclose or suggest the “*unified capabilities*” that enable APIs to program a distributed application recited in the final wherein clause of claim 19 which, as explained in the specification, provide a *unified* development environment in which *multiple components* (deployed on different hardware) of the distributed application are developed and tested *together*. Ex. 1001, 16:43-47 (emphasis added). In this regard, the Examiner explained that the prior art (which included Van der Merwe) failed to teach or render obvious the recitation of such “unified capabilities” in the final wherein clause in claim 19:

¹ Patent Owner does not concede that the Examiner’s findings as set forth herein are correct.

Claims 19-36 are allowed over the prior art.

The following is an examiner's statement of reasons for allowance:

The prior art does not teach or render obvious to one of ordinary skill in the art, before the earliest effective filing date of the claimed invention, in the specific combinations and manner recited within the claims, the features of:

“...wherein the programmable network device and programmable cloud device form unified capabilities enabling a plurality of upper layer application programming interfaces (APIs) that allow for simultaneous programming of the programmable network device and programmable cloud device independent of network device hardware and cloud device hardware.” Id., 100.

In the next response, the Applicant deleted claims 37-38 from the Application. *Id.*, 100. Following claim amendments relating to 35 U.S.C. ¶112, the Examiner allowed the application. *Id.*, 41-48 and 10-14. Claim 19 from the Application became claim 1 in the '823 Patent.

By way of summary, during the prosecution history, the Examiner applied the Van der Merwe reference to the pending claims and found that, while claims 37 and 38 were anticipated by the reference, the final wherein clause in claim 19 distinguished that claim from the reference. Thus, the prosecution history demonstrates that, in the Examiner's view, while the Van der Merwe reference disclosed first and second network applications on different hardware devices that communicated to form a distributed application, the reference failed to teach or render obvious the final wherein clause of claim 19 specifying that “the

programmable network device and programmable cloud device form unified capabilities enabling a plurality of upper layer application programming interfaces (APIs)” to perform their stated programming function.

C. Differences Between The Disclosure Of Van der Merwe And The Unified Capabilities Recited In The Final Wherein Clause Of Claim 1 Of The ‘823 Patent

As explained above, the Examiner found that Van der Merwe disclosed the “distributed applications” recited in the claims of the application. In addition, Van der Merwe provided API functionality for developing, creating or deploying its applications. For example, Van der Merwe disclosed the following:

To enable client administrators to provide coupling information and/or create, modify, and/or deploy enterprise applications, the example client coupler 130 includes an API interface 708. The example API interface 708 includes a web-based interface that enables client administrators to specify which VPMNs are to be coupled to which client VPNs and/or virtual machines. ...

The example API interface 708 of FIG. 7 also enables client administrators to develop, deploy, and/or modify enterprise applications through a MPaaS. This enables clients to utilize virtual machines within the cloud computing data center 134 to deploy their own services (e.g., a service deployment platform configured for mobility and cloud computing environments) and use the security of the virtual routes coupling these virtual machines to VPMNs and VPNs to provide custom control capabilities. In some examples, the client administrators have third parties develop and/or deploy the applications within the virtual machines. Ex. 2001, ¶¶[0119]-[0120].

Thus, while the Examiner found that Van der Merwe disclosed the claimed “distributed application” (i.e., first and second network applications on different

hardware that communicated to *form a distributed application*), and Van der Merwe disclosed APIs for creating such an application, the Examiner found that Van der Merwe lacked the “*unified capabilities*” that *enable APIs* to program multiple devices as recited in the final wherein clause of claim 19. In the context of the prosecution history as a whole, the Examiner’s reasons for allowance demonstrate that, in the Examiner’s view, the absence of any disclosure of such “*unified capabilities*” that *enable APIs* to perform their stated programming function in Van der Merwe distinguished claim 19 from the reference. Ex. 1002, 100.

The Petition has failed to explain how the disclosures relied on in the Petition for the “unified capabilities” recited in the claims of the ‘823 Patent are any better than, or anything other than cumulative of, the Van der Merwe reference that was applied during prosecution.

III. MATERIALS RELIED UPON IN THE PETITION

A. Declaration of Petitioner’s Expert Dr. Erez Zadok (EX1003)

The Petition relies extensively on the testimony of Petitioner’s expert for the assertion that Vasell discloses the “*unified capabilities enabling a plurality of upper layer application programming interfaces (APIs) to program* the programmable network device and programmable cloud device ...” Ex. 1003, ¶¶453-463. Without alerting the PTAB that it had made substantive changes to the diagram, the Petition attempts to pass off a fabricated version of Figure 2 of Vasell for the actual figure

from the reference. The Petition performs this sleight of hand not once, not twice or three times - but *four times*. Pet., 5, 17, 24 and 44.

Set forth below is the actual version of Figure 2 from Vasell (without any changes or annotations):

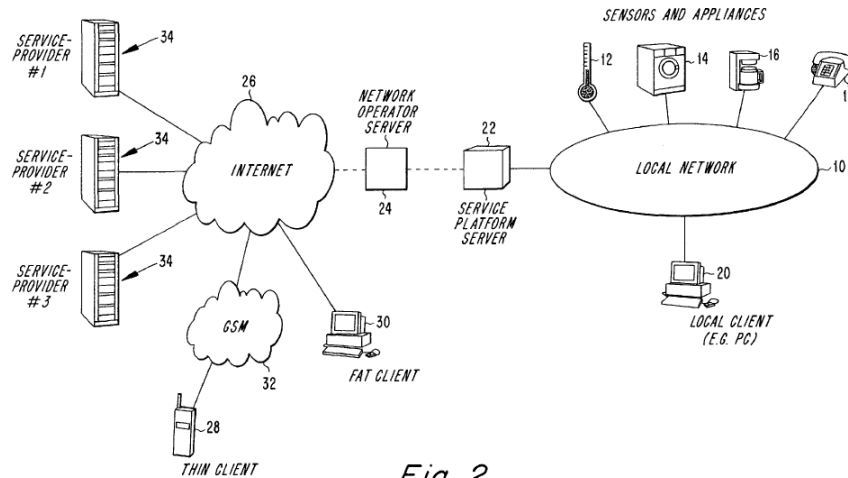


Fig. 2

As shown above, the space above Internet 26 is completely blank.

Set forth below is the fabricated version of Figure 2 of Vasell that the Petition (at page 5) attempts to pass off as the real thing:

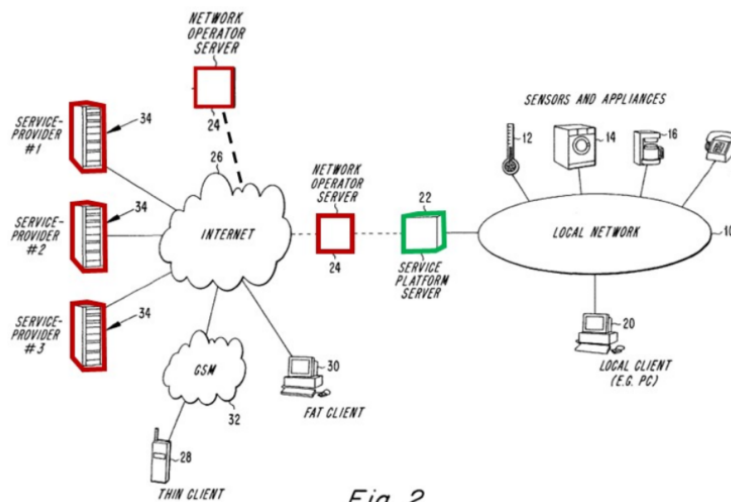


Fig. 2

Pet., 5. As shown above, in the Petition, the space above Internet 26 is *no longer blank*. Instead, the Petition has inserted a *fabricated* “Network Operator Server” 24 into the previously blank space above Internet 26. The Petition never alerts the Board to this issue, essentially passing off the Petition’s fabricated version of Figure 2 of Vasell for the real one. The Petition repeats its fabricated version of Figure 2 of Vasell again on pages 17, 24 and 44.

Procedurally, it is improper for Petitioner to use expert testimony to rewrite a reference rather than interpret what it actually says. The Federal Circuit has made clear, “conclusory statements and unspecific expert testimony do not qualify as substantial evidence that could support the Board’s conclusions regarding obviousness.” *TQ Delta, LLC v. Cisco Sys.*, 942 F.3d 1352, 1360–61 (Fed. Cir. 2019). Likewise, the USPTO has recognized that expert declarations “merely offer[ing] conclusory assertions without underlying factual support” are entitled to little, if any, weight. *Xerox Corp. v. Bytemark, Inc.*, IPR2022-00624, Paper 9 at 15–17 (PTAB Aug. 24, 2022) (precedential). Here, Petitioner literally rewrote the reference, therefore, the expert’s testimony should be afforded little weight.

B. U.S. Patent No. 6,496,575 to Vasell (EX1004)

Vasell is directed to a connectivity-based service platform architecture in which a service gateway device (also referred to as a “service platform server”) executes modular software components, known as “boxlets,” to implement localized

service applications. These applications are intended to monitor and control devices on a local area network (LAN), such as thermostats, appliances, or utility meters, and are implemented in Java. The system architecture is built around a centralized service gateway that operates as a boundary node between remote service provider infrastructure and local user environment.

C. U.S. Provisional Patent Application No. 60/088,437 (EX1015)

Exhibit 1015 is a provisional patent filing that Vasell purportedly incorporates. The language of Ex. 1015 closely tracks that of Vasell with Vasell adding an additional embodiment depicted and described with respect to Figure 6.

D. U.S. Provisional Patent Application No. 60/123,971 (EX1016)

Exhibit 1016 is a provisional patent filing that Vasell purportedly incorporates, which includes a paper that describes Ericsson's e-box system.

E. "OSGi in Depth" by Alves (EX1008)

Alves is directed to the Open Service Gateway Initiative (OSGi), and discloses how "OSGi technology can be used to write better software, and in particular, how OSGi can be used to write better platforms for the development of better software." Ex. 1008, xviii.

F. "OSGi in Action - Creating Modular Applications in Java" by Hall (EX1009)

Hall is also directed to OSGi, and discusses the most common concepts,

features, and mechanisms needed to work with OSGi technology.

G. “Dependability as a cloud service - a modular approach” by Rellermeyer (EX1011)

Rellermeyer is directed to “replication of services on distributed cloud platforms.” Ex. 1011, 1.

IV. APPLICABLE LEGAL STANDARDS

The Board may only grant a petition for IPR where “the information presented in the petition ... 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(a); 37 C.F.R. § 42.108(c). Accordingly, the Petitioner bears the burden of showing this statutory threshold has been met. *See* Office Patent Trial Practice Guide, 77 Fed. Reg. 48,756, 48,756 (Aug. 14, 2012) (“The Board ... may institute a trial where the petitioner establishes that the standards for instituting the requested trial are met...”).

V. A PERSON HAVING ORDINARY SKILL IN THE ART

The Petition alleges that “POSITAs as of June 2013 would have had a bachelor’s degree in computer science, computer engineering, or equivalent degree, and approximately three years of experience working in the computer science or engineering field. Additional experience might substitute for less education and vice versa. To that end, POSITAs in June 2013 would have been knowledgeable about

the design and management of networked systems and virtualization technologies, and familiar with operating/distributed systems and security and privacy techniques.” Petition, 14. For purposes of this Patent Owner Preliminary Response only, Patent Owner does not contest Petitioner’s proposed definition of a POSITA. However, Patent Owner reserves the right to contest Petitioner’s proposed definition of a POSITA should this challenge be instituted.

VI. Petitioner Has Failed to Meet Its Burden Under Either Ground 1 or Ground 2 to Establish That the Challenged Claims Would Have Been Obvious

The Petition challenges various claims of the ‘823 Patent under 35 U.S.C. § 103 based on two proposed combinations. In Ground 1, the Petition alleges that claims 1–2, 12, 15, and 19 would have been obvious over Vasell (Exs. 1004, 1015, and 1016) in view of Alves (Ex. 1008) and Rellermeyer (Ex. 1011). In Ground 2, the Petition alleges that claims 3–5, 7–8, and 18 would have been obvious over Vasell in view of Alves, Rellermeyer, and Hall (Ex. 1009). Central to both grounds is Petitioner’s assertion that Vasell discloses or suggests the claim limitation requiring “unified capabilities that enable a plurality of upper layer application programming interfaces (APIs) to program the plurality of network device applications and plurality of cloud applications independent of network device hardware and cloud device hardware.” This assertion fails on multiple levels.

The Petition has failed to explain how the disclosures from Vasell—including its provisional application (Ex. 1016)—are anything other than cumulative of the Van der Merwe reference already considered and rejected during prosecution. The cited passages either fail to mention APIs altogether or refer only to local interfaces within a gateway device, not to APIs that program distributed applications.

The arguments in the Petition fail to explain how standard Java programming tools equate to the claimed unified programming capabilities. For example, the Petition fails to explain how modularity, use of Java, or adherence to “write once, run everywhere” principles equate to the claimed invention: a “programmable network device and programmable cloud device” that “form unified capabilities enabling a plurality of upper layer application programming interfaces (APIs) to program the plurality of network device applications and plurality of cloud applications independent of network device hardware and cloud device hardware.” As detailed in the following sections, Petitioner’s reliance on Vasell is legally insufficient and factually unsupported, and both Grounds 1 and 2 should be rejected.

A. Petitioner Has Failed to Show How Vasell is Different Than Van der Merwe

The disclosures from Vasell cited in the Petition (i.e. Ex. 1016, 4, 6, 8-9; Ex. 1004, 2:60-3:1, 5:15-35, 22:35-37, 20:52-53, 16:59-60, FIG. 6) are no more effective than those in Van der Merwe, which the Examiner previously considered during

prosecution and found lacking with respect to the “unified capabilities” limitation. First, Vasell’s statement that “the development environment must follow the ‘write-once, run-everywhere’ maxim” merely reflects a general attribute of the software produced. The Petition fails to explain how this aspect of Vasell is a disclosure of capabilities enabling a plurality of upper layer APIs to program distributed applications, as claimed.

Second, the reference to new applications interacting with the e-service infrastructure through Java APIs that comply with mainstream Java development similarly addresses only the characteristics of the resulting applications, rather than capabilities enabling a plurality of upper layer APIs to program distributed applications, as claimed. The Petition fails to explain how Vasell discloses “unified capabilities” that enable APIs to program network and cloud applications independently of device hardware, as claimed.

Third, the fact that Vasell’s “Boxlets are created using a standard Java development environment” does not indicate that the environment contains the type of unified capabilities required by the claims. A standard Java environment—like the “API interface 708” disclosed in Van der Merwe—merely supports application development using common APIs. The Petition fails to explain how such a disclosure equates to “unified capabilities” that enable APIs to program network and cloud applications independently of device hardware, as claimed. Thus, both Vasell

and Van der Merwe describe familiar API-based development techniques without teaching or suggesting the claimed “unified capabilities.”

Accordingly, Vasell offers no new or materially different disclosure and fails to cure the deficiencies already identified in Van der Merwe. The Petition therefore, does not establish that Vasell teaches or renders obvious the “unified capabilities” limitation, and this ground of challenge should be rejected.

Further, the Petition does not meaningfully engage with the Examiner’s explicit statement of reasons for allowance, which focused on the claimed “unified capabilities” enabling APIs to program distributed applications independent of hardware. Petitioner identifies no portion of the prior art that discloses this limitation and does not explain why the Examiner’s interpretation of the claims or distinction over Van der Merwe was incorrect. The Board has repeatedly declined institution where the petition ignores the Examiner’s articulated basis for allowance. (See *Advanced Bionics* IPR2019-01469, Paper 6 and *Becton, Dickinson*, IPR2017-01586, Paper 8). Petitioner’s silence regarding the Examiner’s “unified capabilities” finding here warrants the same result.

B. The Petition Fails to Cite Any Portion of Vasell Teaching or Suggesting Unified Upper-Layer APIs Across Network and Cloud Devices

Claim 1 of the ‘823 Patent recites “a plurality of upper layer application programming interfaces to program the plurality of network device applications and

plurality of cloud applications....” The Petition fails to cite any portion of Vasell² (Exs. 1004, 1015 and 1016) detailing an upper layer API programming applications.

Independent claims 1 and 19 of ‘823 Patent each recite:

“enabling a plurality of upper layer application programming interfaces (APIs) to program the plurality of network device applications and plurality of cloud applications independent of network device hardware and cloud device hardware.”

The Petition alleges the above API can be found within nine (9) different passages of Vasell Ex. 1004. Paper 2, 55-57. But none of the cited passages mention an upper layer APIs for programming applications.

The first passage cited (Ex. 1004, 2:60-3:1) discusses the distribution of applications among equipment. Nowhere does the passage mention an API – let alone an API to program a plurality of applications.

“The service gateway system according to the present invention facilitates the development, implementation, operation and maintenance of services in an integrated manner So that the interface between different services providers and the end user is transparent to both. Each service may comprise a set of functionalities and logic which are implemented as software service applications. The service application may be distributed among various pieces of equipment which are geographically separated.” Ex. 1004, 2:60-3:1.

² The Petition refers to EX1004, EX1015, EX1016 collectively as Vasell and independently as Vasell. For consistency, Patent Owner will do the same.

The next passage of Vasell Ex. 1004 cited details programming service gateways with “standard communication protocols and programming languages.”

Nothing is said about programming with an API, nor is an API even mentioned.

“Service gateways according to the present invention are preferably open platforms to allow for the development of Service applications by third party developers. Moreover, standard communication protocols and programming languages may be used in order to facilitate Such Software Service applications development. In addition to being open platforms, Service gateways according to the present invention are intended to be horizontal in nature So that a plurality of Service providers can share the same platform infrastructure.” Ex. 1004, 3:10-19.

The Petition goes on to cite a passage detailing “the remote management” of hardware and the desirability of “established communications standards, protocols, interface specifications and technologies.” Again, nowhere is an API mentioned.

“The need for remote service gateway management arises due to the logistics of managing an extensive network of geographically dispersed service gateways. The service gateway network may potentially range from several hundred thousand to millions of service gateway units. At least some of the many service gateways will be installed in places not easily accessible. It would be logistically difficult to physically access all service gateways in order to, for instance, upgrade software, supervise operations, and detect errors. Therefore, the ability for a service gateway to be managed remotely in as many ways as possible is desirable.

Another desirable characteristic of the service gateway design is that it be compatible to established communications standards, protocols, interface specifications and technologies. In addition to enhancing communication and interfacing among

various systems, service gateway compatibility potentially opens third-party markets for service gateway hardware and services. However, specialized portions of the service gateway system may be specifically designed and developed.” Ex. 1004, 5:15-35.

Then the Petition cites a passage detailing the efficiencies associated with using the same communication and information processing infrastructure. Yet again no API is mentioned.

“For example, as conceptually illustrated in FIG. 3, open service gateways according to the present invention may be used to integrate many independent service providers to further exploit efficiencies associated with using this same communication and information processing infrastructure.” Ex. 1004, 10:18-23.

The next passages cited discuss class libraries, rather than APIs, to develop boxlets.

“The development of the boxlets 64-69 is not restricted to any particular software language or operating System. According to this exemplary embodiment, the only code specific to development of the boxlets 64–69 is in class libraries 95 which contain the service application 70-72 program interfaces for the main services layer 100 and the system services layer 110.” Ex 1004, 13:37-43.

The next passage of Vasell Ex. 1004 cited by the Petition details an API for managing “crashed” cells by either disabling or reenabling the cell. The passage, however, does not detail the API used to program the cells. Accordingly, though an

API is disclosed, the cited passage fails to disclose an API for programming applications.

“If one of the cells 90-92 crashes too many times within a given predetermined time period, the cell manager 93 may disable it. The cell 90-92 remains disabled until it is either replaced as a result of loading a new cell table 94 or reenabled by the cell manager 93 or by the system management application program interface (API).” Ex. 1004, 16:55-60.

The above is the only cited passage of Vasell Ex. 1004 disclosing an API. The next cited passage merely discloses design aspects in general without providing any details as to how they are achieved. Accordingly, no API is mentioned.

“These and other design aspects of the service gateway system ensure the security, isolation and robustness of the service applications 70-72, facilitate management of service applications 70-72 lifetimes, and allow resource management for cells 90-92.” Ex. 1004, 20:49-54.

The final passage of Vasell Ex. 1004 cited by the Petition discloses a “management system service” without detailing an API as the external interface for accessing the service. This passage also fails to disclose an API for programming applications.

“The management system service 76 provides an external interface through which the service applications 70-72 may be downloaded, installed, removed, executed, and controlled.” Ex. 1004, 22:35-38

The last portion of Vasell Ex. 1004 the Petition cites to in support of the API for programming applications is Fig. 6 (reproduced below). “FIG. 6 depicts an exemplary organization of a software system for providing a connectivity based Service gateway according to the present invention.” Ex. 1004, 4:16-18. Notably absent from the depicted software system is an API. Accordingly, like every other portion of Vasell 1004 cited by the Petition, Fig. 6 fails to disclose an API for programming applications.

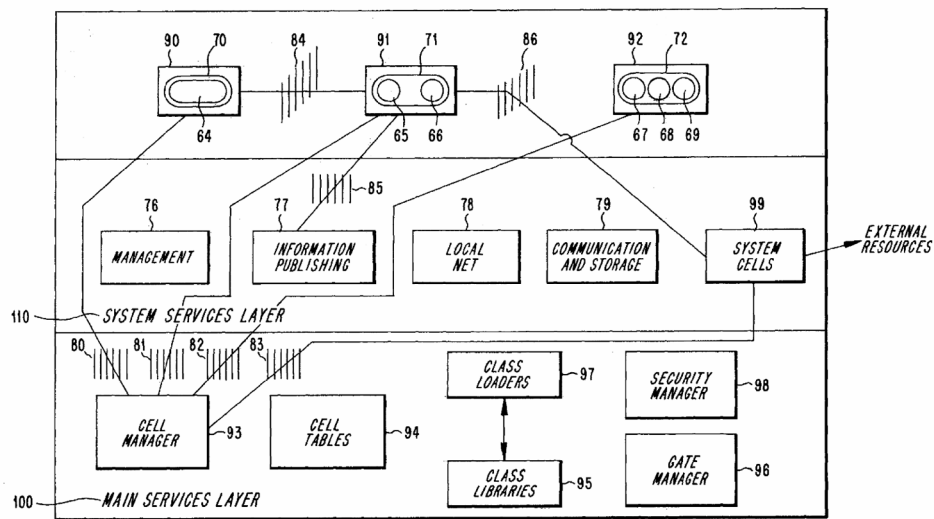


FIG. 6

The Petition also asserts that Vasell Ex. 1016 discloses an API for programming applications. However, it fails to cite to any portion of Vasell Ex. 1016 making such a disclosure. Vasell Ex. 1016 mentions APIs only twice and not once for programming applications.

The first mention of API in Vasell Ex. 1016 is one that permits new applications to “interact with the e-service infrastructure.” Thus, the API is not disclosed as being used to program the applications, but provides developed applications a means of interacting with the e-service infrastructure.

“The development environment must follow the “write-once, run-everywhere” maxim and should be based on Java standards. New applications will interact with the e-service infrastructure through Java application program interfaces (API) that comply with mainstream Java development. By leveraging the Java development, the application software environment can be taken to a higher level of abstraction, allowing non specialists to develop service applications more easily.” Ex. 1016, at 4.

The second mention of API is for “main services and system layers” and not for programming applications. Rather, it is explicitly stated that “[b]oxlets are created using a standard Java development environment.” Thus, Vasell Ex. 1016 discloses using a standard development environment - not an API – for the development of boxlets.

“Boxlets are created using a standard Java development environment. For instance, the Java development kit (ODK) from Sun Microsystems can be used as well as other development environments. The only parts that are specific to boxier development are the libraries that contain APIs for the main services and system services layers.” Ex. 1016, at 8.

Furthermore, Vasell Ex. 1016 describes a service gateway, referred to as the “e-box,” that executes localized service logic in the form of Java-based “boxlets.” While the e-box may interact with external service platforms or cloud infrastructure,

there is no suggestion that those remote systems are programmed through the same upper-layer APIs, nor that the remote and local software components form a distributed application. Instead, the cloud-side functionality is implemented as a set of external services that communicate with the e-box using conventional network protocols. This falls far short of the unified API model disclosed and claimed in the '823 Patent.

Moreover, Vasell Ex. 1016's architecture is tightly bound to conventional PC-class hardware and does not abstract away device-specific interfaces. As such, the programming environment disclosed in Vasell Ex. 1016 remains closely coupled to the physical characteristics of the hardware. Any hardware change (e.g., a new driver, interface card, or chipset) would necessitate custom integration or adaptation.

The APIs in Vasell Ex. 1016 are confined to the gateway device and do not support programming of both edge and cloud components as part of a unified, distributed application.

The Petition fails to cite any portion of Vasell Exs. 1004 and 1016 disclosing an API for programming applications. Accordingly, the Petition has not demonstrated that Vasell discloses or suggests an API for programming applications as recited in claims 1 and 19.

Accordingly, the cited limitation, “enabling a plurality of upper layer APIs ... independent of hardware,” is neither taught nor suggested by Vasell, whether alone or in combination with other references.

C. Petitioner’s Assertions Regarding Vasell Fail to Disclose the Claimed Unified, Hardware-Independent API Architecture

Petitioner contends that Vasell satisfies the limitation in Claims 1 and 19 of the ‘823 Patent requiring “enabling a plurality of upper layer application programming interfaces (APIs) to program the plurality of network device applications and plurality of cloud applications independent of network device hardware and cloud device hardware.” Petition, 56. Petitioner cites five supposed reasons, none of which withstand scrutiny.

Petitioner first asserts that because Vasell discloses “distributed Java service applications [that] are naturally modular,” it must therefore disclose the claimed unified API surface. Petition, 56. But modularity alone is neither sufficient nor relevant to the claimed invention. Vasell’s “boxlets” may be modular Java software components, but they execute solely within the confines of a single gateway runtime environment. Nothing in Vasell suggests that these modules are programmed by an API set that spans across edge and cloud domains. Merely organizing code into modular units does not disclose or inherently imply the existence of a domain-spanning, hardware-agnostic programming interface.

Further, as the Federal Circuit explains, the use of inherency, “a doctrine originally rooted in anticipation, must be carefully circumscribed in the context of obviousness” and “[t]he mere fact that a certain thing may result from a given set of circumstances is not sufficient to establish inherency.” *Par Pharm., Inc. v. TWi Pharm., Inc.*, 773 F.3d 1186, 1194-95 (Fed. Cir. 2014) (internal markings and citations omitted). The Court has “emphasized that the limitation at issue necessarily must be present in order to be inherently disclosed by the reference.” *Southwire Co. v. Cerro Wire LLC*, 870 F.3d 1306, 1310-11 (Fed. Cir. 2017) (internal citation omitted). Accordingly, “[a] party must...meet a high standard in order to rely on inherency to establish the existence of a claim limitation in the prior art in an obviousness analysis.” *Millennium Pharms., Inc. v. Sandoz, Inc.*, 862 F.3d 1356, 1367 (Fed. Cir. 2017). Therefore, obviousness cannot be established by the mere fact that something may happen. Instead, to teach the high standard of inherency, the alleged feature must necessarily be present in the cited reference.

Here, Petitioner has offered no evidence that Vasell’s disclosure of modular Java components must necessarily include the recited API “to program the plurality of network device applications and plurality of cloud applications independent of network device hardware and cloud device hardware”. Instead, modularity, by itself, neither requires nor implies the presence of a programming interface that spans both edge and cloud environments, let alone one that is expressly hardware-independent

as required by the '823 claims. Moreover, any attempt to rely on inherency to fill this gap is legally improper. Because Vasell does not disclose an API to program applications independent of network device hardware and cloud device hardware, either explicitly or inherently, its teaching falls well short of the claimed invention.

Petitioner next asserts that “standardized communication protocols” between Java components in Vasell satisfy the API limitation. Petition, 56. But Petitioner has not explained how communication protocols equate to an API to program applications.

Petitioner’s third rationale, that standard Java APIs are used in Vasell, misses the point entirely. Petition, 56. The fact that Vasell’s developers may use Java standard libraries such as `java.util` or `java.lang` to implement boxlets has no bearing on whether the system exposes domain-specific APIs capable of programming both network device and cloud applications. Claim 1 is not concerned with general-purpose programming language constructs. It requires upper-layer APIs that enable control over distributed network and cloud functionality in a hardware-neutral fashion. Vasell lacks any such disclosure. Its only referenced APIs are gateway-internal class libraries confined to the local execution environment of the e-box.

Petitioner’s fourth assertion, that Vasell supports “flexible,” “transparent,” and “standards-compatible” interfaces for lifecycle management, is again inapposite. Petition, 56. The operations and management (O&M) interface in Vasell

merely allows a local administrator to download, start, or stop software running within the gateway. That is not the same as programming both edge and cloud components of a distributed application through a unified API surface.

Finally, Petitioner’s reliance on the alleged use of “standard development and management APIs ... regardless of ... hardware” is nothing but conclusory. Petition, 56. Petitioner fails to cite any reference that discloses an API to program applications. Rather, Petitioner just merely asserts that APIs are just “standard.” If that were the case, then Petitioner could have cited at least one instance of such an API.

In sum, each of Petitioner’s five arguments relies on mischaracterizing or diluting the claim language. The ‘823 Patent requires more than modularity, messaging protocols, or local O&M tools. It claims a unified, programmable system in which upper-layer APIs transparently span programmable network and cloud devices, irrespective of underlying hardware. Neither Vasell 1004 nor Ex. 1016 discloses such an architecture.

D. Petitioner’s Reliance on Java’s “Write Once, Run Everywhere” Slogan Is Misplaced and Irrelevant to the Claimed Invention

Petitioner attempts to conflate Java’s well-known language-level portability with the ‘823 Patent’s much more specific and technical requirement of upper-layer application programming interfaces (APIs) that can program both network device

and cloud applications independently of the underlying hardware. This argument is both technically incorrect and legally irrelevant for at least the following reasons.

The statement in Vasell that “[t]he development environment must follow the ‘write once, run everywhere’ maxim and should be based on Java standards” simply reflects the commonplace notion that Java bytecode can execute on any Java Virtual Machine (JVM). This principle, however, has no bearing on whether the system exposes an API surface capable of programming distributed edge and cloud applications in a unified, hardware-independent fashion. Java’s standard libraries is a collection of prewritten code that developers can incorporate into their own code. Thus, the standard libraries are, as their name implies, libraries and not an API.

Thus, Vasell fails to disclose or suggest a system that enables a plurality of upper layer APIs to program both network devices and cloud applications independently of network device hardware and cloud device hardware, as expressly required by the claims.

E. Petitioner Does Not Allege That Alves, Hall, or Rellermeyer Disclose the Missing Unified Capabilities Limitation

As shown above, the Petition has failed to show that Vasell discloses the claimed “unified capabilities enabling a plurality of upper layer application programming interfaces (APIs) to program the plurality of network device applications and plurality of cloud applications independent of network device

hardware and cloud device hardware.” This limitation was the distinguishing feature that overcame the Van der Merwe reference during prosecution and, with respect to such limitation, the Petition has failed to explain how Vasell is anything but cumulative of Van der Merwe.

The Petition also fails to articulate how the additional references—Alves (Ex. 1008), Hall (Ex. 1009), and Rellermeyer (Ex. 1011)—supply the missing limitation. Nowhere does the Petition even allege that any of these references disclose a “programmable network device and programmable cloud device” that “form *unified capabilities enabling a plurality of upper layer application programming interfaces (APIs)* to program the plurality of network device applications and plurality of cloud applications *independent of network device hardware and cloud device hardware.*” Nor does Petitioner explain how these references might supplement Vasell to provide the claimed “unified capabilities.”

Instead, the Petition primarily discusses Alves, Hall, and Rellermeyer in connection with secondary limitations such as modularity, service lifecycle management, or fault tolerance in OSGi-based environments. But the Petition never asserts—much less demonstrates—that any of these references disclose the “unified capabilities” feature absent from Vasell. Critically, the Petition does not argue that any of Alves, Hall, or Rellermeyer disclose APIs that extend across execution domains or abstract away hardware-specific differences using the claimed “unified

capabilities,” nor does it cite any API in those references that performs programming as claimed.

Even assuming *arguendo* that the individual references disclosed modularity, lifecycle management, or service redundancy, Petitioner fails to offer any meaningful motivation to combine them in the manner required to arrive at the claimed unified API architecture. Petitioner does not explain why or how a POSITA would have modified Vasell’s localized gateway design using Alves, Hall, or Rellermeyer to create a distributed, hardware-independent programming surface. The absence of such rationale is itself a fatal defect in the asserted obviousness grounds.

Because the Petition fails to explain how the relied on references include, in any reference or combination, the specific limitation that the Examiner found distinguished the claims over Van der Merwe and upon which the Examiner based allowance, it necessarily fails to meet the threshold showing required for institution under 35 U.S.C. § 314(a). Petitioner cannot rely on a combination of references to remedy the deficiencies of Vasell where it has not even alleged that the additional references teach the missing elements. As such, both Grounds 1 and 2 should be rejected.

VII. CONCLUSION

Petitioner has not met its burden under 35 U.S.C. § 314(a) to show that there is a reasonable likelihood that it would prevail with respect to at least one challenged claim. Both asserted grounds of unpatentability rely on a foundational assumption that Vasell (Ex. 1004), together with its incorporated provisionals (Ex. 1015 and Ex. 1016), teaches or suggests the key claim limitation of “unified capabilities enabling a plurality of upper layer application programming interfaces (APIs) to program the plurality of network device applications and plurality of cloud applications independent of network device hardware and cloud device hardware.” The Petition has failed to demonstrate that this assumption is correct.

As shown in the prosecution history, this very limitation was what, in the Examiner’s view, distinguished the allowed claims over Van der Merwe, a reference that the Examiner found disclosed distributed applications and standard APIs but lacked the “unified capabilities” enabling their coordinated programming across heterogeneous devices. The Petition fails to explain why Vasell, which the Petition now asserts as the primary reference, does not suffer from the same deficiency. Indeed, Petitioner fails to identify a single passage in Vasell (or its provisionals) that discloses a unified programming interface capable of abstracting both network device and cloud hardware platforms under a common API surface. The cited references merely describe local APIs confined to gateway components or standard

Java development tools unrelated to distributed control. The Petition has failed to demonstrate that anything in Vasell, Ex. 1015 or Ex. 1016, discloses, suggests, or inherently requires “unified capabilities enabling a plurality of upper layer application programming interfaces (APIs) to program the plurality of network device applications and plurality of cloud applications independent of network device hardware and cloud device hardware” as claimed in the ‘823 Patent.

Moreover, Petitioner does not even allege that the secondary references relied upon in Grounds 1 and 2 (i.e., Alves, Hall, and Rellermeier) remedy this deficiency. Critically, the Petition fails to argue, much less prove, that any of these secondary references supply the “unified capabilities” the Examiner deemed essential to patentability.

The Petition fails to explain how modular software design, standard Java programming constructs, or lifecycle management protocols equate to the far more “unified capabilities” actually claimed. At best, Petitioner relies on conclusory expert opinion, speculation and fabricated figures to bridge this gap—opinion that is not supported by the references themselves and that attempts to rewrite Vasell through reinterpretation and altered figures. Such tactics are not a substitute for substantial evidence.

The Petition’s failure to identify, in any asserted combination, the core claim limitation that served as the basis for allowance renders both Grounds 1 and 2 fatally

defective. The Board has repeatedly declined to institute inter partes review where the petitioner fails to address the specific reasons for allowance or fails to supply missing limitations with particularity. That is precisely the case here.

For these reasons, and for all those set forth more fully above, institution of trial should be denied.

Respectfully submitted,

Dated: July 15, 2025

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CERTIFICATE OF COMPLIANCE WITH WORD COUNT

Pursuant to 37 C.F.R. § 42.24(d), I certify that this **PATENT OWNER'S PRELIMINARY RESPONSE** complies with the type-volume limits set forth in the Memorandum and 37 C.F.R. § 42.24 because it contains 7,729 words, excluding the parts of the Brief that are exempted by 37 C.F.R. § 42.24(a), according to the word processing system used to prepare this Brief.

Respectfully submitted,

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CERTIFICATE OF SERVICE

The undersigned certifies that pursuant to 37 C.F.R. § 42.6(e), a copy of the foregoing **PATENT OWNER'S PRELIMINARY RESPONSE** was served via email (as consented to by counsel) on July 15, 2025 to lead and backup counsel of record for Petitioner as follows:

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