

Qualcomm Incorporated
v.
Network System Technologies, LLC

IPR2024-00338
U.S. Patent No. 7,373,449

Patent Owner's Demonstrative Exhibit

'449 Patent Overview – Apparatus and Method for Communicating in an Integrated Circuit

'449 Patent Overview


 US007373449B2

(12) **United States Patent**
Radulescu et al.

(10) Patent No.: **US 7,373,449 B2**
 (45) Date of Patent: **May 13, 2008**

(54) **APPARATUS AND METHOD FOR COMMUNICATING IN AN INTEGRATED CIRCUIT**

(75) Inventors: **Andrei Radulescu, Eindhoven (NL); Kees Gerard Willem Goossens, Eindhoven (NL)**

(73) Assignee: **Koninklijke Philips Electronics N.V., Eindhoven (NL)**

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 270 days.

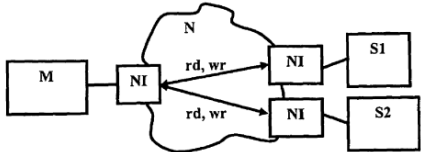
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 PCT Pub. Date: **Apr. 22, 2004**
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G06F 15/00 (2006.01)
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 (58) **Field of Classification Search** 710/300-317; 710/319-356-61; 104-110; 709/201-203; 709/310-317; 227-229
 See application file for complete search history.

(56) **References**
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 5,317,568 A * 5/1994 H
 6,539,650 B1 * 3/2003 J
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 Los Alamitos, CA, pp. 117-124, XP002503346, unknown dates.
 * cited by examiner
 Primary Examiner—Raymond N. Pham

ABSTRACT
 An integrated circuit comprising a plurality of processing modules (M; I; S; T) and a network (N; RN) arranged for providing at least one connection between a first and at least one second module is provided. Said connection comprises a set of communication channels each having a set of connection properties. Said connection supports transactions comprising outgoing messages from the first module to the second module and return messages from the second module to the first module. The connection properties of the different communication channels of said connection can be adjusted independently. Therefore, the utilization of the resources of a network on chip is more efficient, since the connection between modules can be efficiently adapted to their actual requirement, such that the connection is not over dimensioned and unused network resources can be assigned to other connections.

18 Claims, 1 Drawing Sheet



Qualcomm Ex. 1001
Page 1

Ex.1001, cover

(12) United States Patent Radulescu et al.

(10) Patent No.: **US 7,373,449 B2**
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(54) APPARATUS AND METHOD FOR COMMUNICATING IN AN INTEGRATED CIRCUIT

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'449 Patent Overview

'449 Patent:

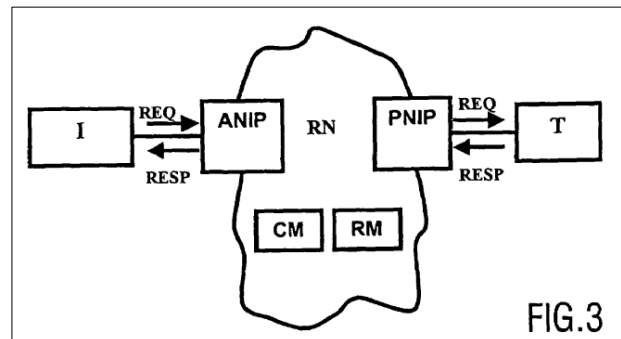
conventional processing systems the systems modules usually communicate to each other via a bus. As the number of modules increases however, this way of communication is no longer practical for the following reasons. On the one hand the large number of modules forms a too high bus load. On the other hand the bus forms a communication bottleneck as it enables only one device to send data to the bus. A communication network forms an effective way to overcome these disadvantages.

Networks on chip (NoC) have received considerable attention recently as a solution to the interconnect problem

Ex.1001, 1:27-37

NoCs also decouple computation from communication, which is essential in managing the design of billion-transistor chips. NoCs achieve this decoupling because they are

Ex.1001, 1:44-46



Ex.1001, Fig. 3

Introducing networks as on-chip interconnects radically changes the communication when compared to direct interconnects, such as buses or switches. This is because of the

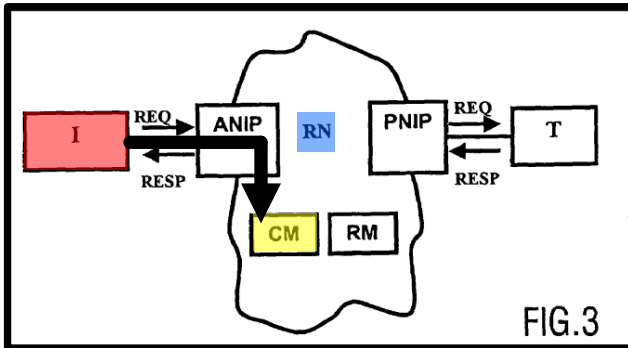
Ex.1001, 3:47-49

also applicable on chip. However, NoC's premises are different from off-chip networks, and, therefore, most of the network design choices must be reevaluated. On-chip networks have different properties (e.g., tighter link synchronization) and constraints (e.g., higher memory cost) leading to different design choices, which ultimately affect the network services.

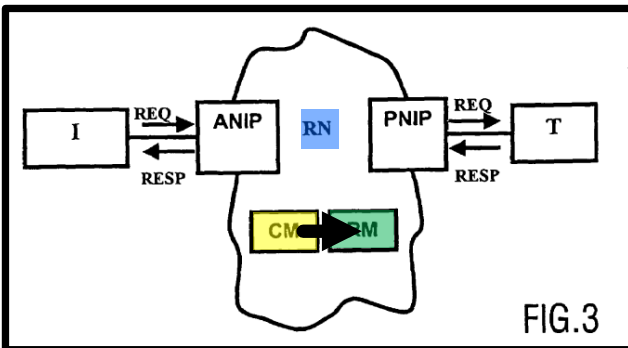
Ex.1001, 1:66-2:5

'449 Patent Overview

Limitation 10[a] / 6[a]



Limitation 10[b] / 6[b]



Ex.1001, Fig. 3

10. Method for exchanging messages in an integrated circuit comprising a plurality of modules, the messages between the modules being exchanged over connections via a network, wherein said connections comprises a set of communication channels each having a set of connection properties, any communication channel being independently configurable, wherein said connection through the network supports transactions comprising at least one of outgoing messages from the first module to the second module and return messages from the second module to the first module and further comprising the steps of:

the first module issuing a request for a connection with the second module to a communication manager, wherein the request comprises desired connection properties associated with the sets of communication channels;

the communication manager forwarding the request to a resource manager;

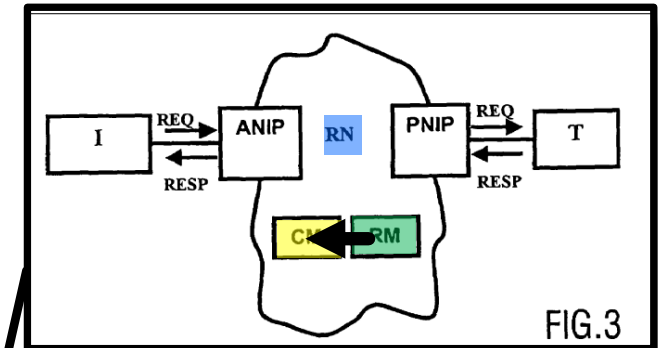
the resource manager determining whether a target connection with the desired connection properties is available;

the resource manager responding with the availability of the target connection to the communication manager;

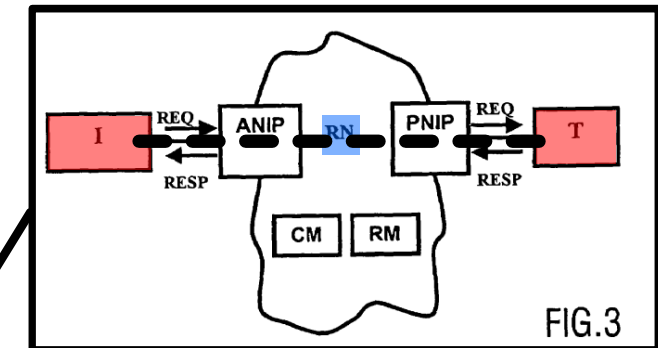
and
the target connection between the first and second module being established based on the available properties of said communication channels of said connection.

Ex.1001, claim 10

Limitation 10[d] / 6[c]



Limitation 10[e] / 6[d]



POR, 3-6, 39, 41-42, 45

'449 Patent Overview

6

10. Method for exchanging messages in an integrated circuit comprising a plurality of modules, the messages between the modules being exchanged over connections via a network, wherein said connections comprises a set of communication channels each having a set of connection properties, any communication channel being independently configurable, wherein said connection through the network supports transactions comprising at least one of outgoing messages from the first module to the second module and return messages from the second module to the first module and further comprising the steps of:

- the first module issuing a request for a connection with the second module to a communication manager, wherein the request comprises desired connection properties associated with the sets of communication channels;
- the communication manager forwarding the request to a resource manager;
- the resource manager determining whether a target connection with the desired connection properties is available;

the resource manager responding with the availability of the target connection to the communication manager; and

the target connection between the first and second module being established based on the available properties of said communication channels of said connection.

Ex.1001, claims 1-2, 6, 10

1. Integrated circuit comprising a plurality of processing modules (M; I; S; T), network (N; RN), and at least one resource manager (RM) for managing resources of the network (N), wherein the modules, network and resource manager are disposed on a chip and arranged for providing at least one connection between a first and at least one second module, wherein the at least one connection comprises a set of communication channels each having a set of connection properties, the connection properties of the different communication channels of said connection being adjustable independently, wherein said connection supports transactions comprising at least one of outgoing messages from the first module to the second module and return messages from the second module to the first module, wherein the resource manager determines whether the at least one connection with said communication channels is available based on the connection properties being available.

2. Integrated circuit according to claim 1, further comprising: at least one communication manager (CM) for managing the communication between different modules.

6. Integrated circuit according to claim 2, wherein said first module (M; I) is adapted to issue a request (REQ) for a connection with at least one of said second modules to said communication manager (CM), said communication manager (CM) is adapted to forward said request (REQ) for a connection with communication channels each having a specific set of connection properties to said resource manager (RM), said resource manager (RM) responding with the availability of the requested connection to said communication manager (CM), wherein a connection between the first and second module is established based on the available properties of said communication channels of said connection.

**The Alleged Combinations of
Goossens200X and Drake Are
Insufficiently Explained and
Lack Motivation to Combine**

Roadmap for Lack of Motivation to Combine

- The Petition fails to sufficiently explain the combinations and motivation regarding the claimed “[CM],” “[RM],” and “first module”
 - The Board decided the “first module” issue, and Dr. Mowry’s 1st deposition was then inconsistent
- POR explained:
 - The references teach away from implementing Drake’s QoS-12 (alleged “[CM]”) anywhere in Goossens200X
 - Implementing Drake’s QoS-12 in Goossens200X would be redundant
 - Under either option 1 or 2 for the “first module,” the combination does not meet the claimed “[CM],” 6[a]/10[a], and 6[d]/10[e]
- The Reply argued “first module” and “network interface” (“NI”) theories that are new, inconsistent, and nonetheless fail
- Petitioner’s alleged combinations are based on hindsight

Petition fails to sufficiently explain the combinations and motivation regarding the claimed “[CM]” and “[RM]”

Primary References: Goossens200X

Goossens2002:

Abstract

We advocate a **network on silicon (NOS)** as a hardware architecture to implement communication between IP cores in future technologies, and as a software model in the form of a protocol stack to structure the programming of NOSs. We claim guaranteed services are essential. In the **ÆTHEREAL NOS** they pervade the NOS as a requirement for hardware design, and as foundation for software programming.

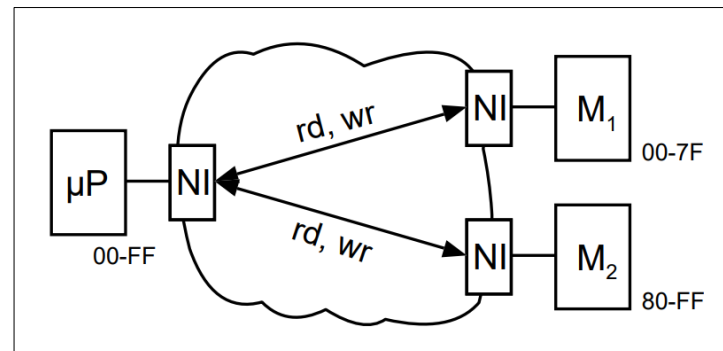
Ex.1005, 1

Goossens2003:

Abstract

Users expect a *predictable quality of service (QoS)* of embedded systems, even for future, more dynamic, applications. System-on-chip designers use **networks on chip (NOC)** to solve deep submicron problems, and to divide global problems into local, decoupled problems. NOCs provide services through protocol stacks, and introducing *guaranteed* services enables **IP re-use** and platform-based design. It also provides globally predictable behaviour, as required by the user, when combining local, decoupled solutions. There are several levels of QoS commitment (correctness, completion, completion bounds), with increasing cost. A combination of guaranteed and best-effort (no commitment) services combines their respective attractive features: predictable behaviour, and good average resource utilization. The **ÆTHEREAL NOC** is an example of this on

Ex.1007, 61



Ex.1007, 72

Primary References: Goossens200X

Petition:

Regarding Goossens2002

Goossens2002 discloses “a network on silicon (NOS)” to implement communications between intellectual property blocks (IPs) in a system on silicon

Goossens2002 recognizes that managing network resources is critical to the provision of guaranteed services and describes a “quality-of-service [QoS] manager” that plays a beneficial role in that process, but does not provide specific details for that management. *Id.*, 3.

Pet., 16-17

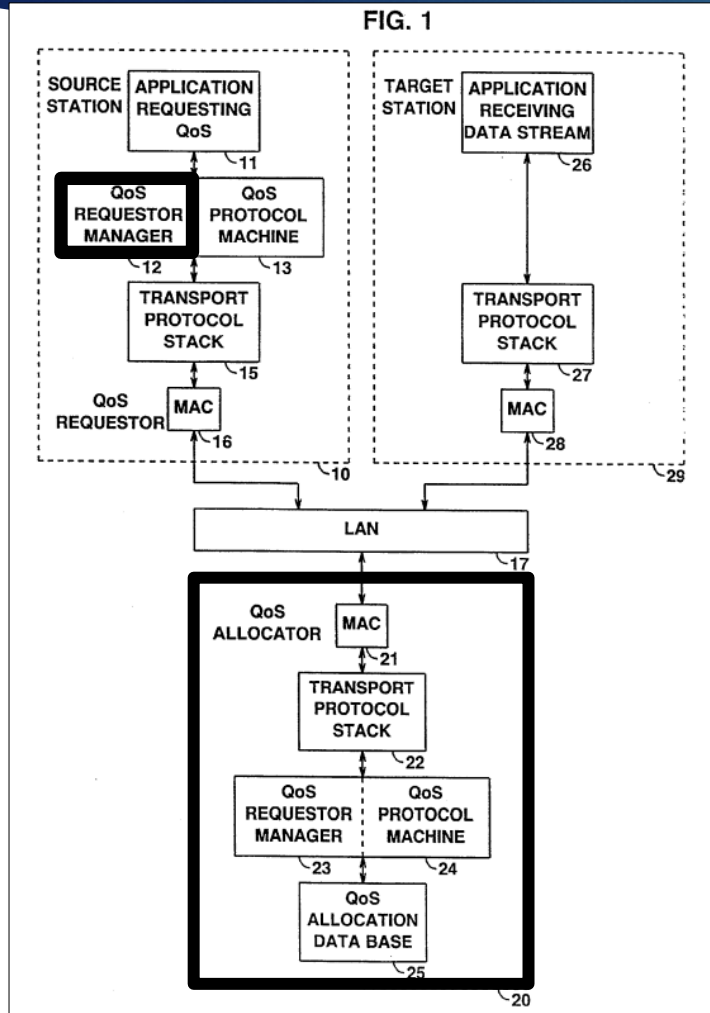
Regarding Goossens2003

Goossens2003 describes a network on chip (NOC) for use in providing communications between “intellectual property blocks (IP)” in a system-on-chip.

shared and managed.” Ex-1007, 65; *see also id.*, 67. Goossens2003, however, does not describe a component or mechanism for managing resource usage within the NOC or for determining the availability of the resources required for a requested connection. Ex-1003 ¶¶157–159.

Pet., 51

Secondary Reference: Drake



Ex.1006, Fig. 1 ("Drake")

**QoS allocator 20
(alleged "[RM]"):**

**QoS Requestor
Manager 12
("QoS-12")
(alleged "[CM]"):**

DETAILED DESCRIPTION

Referring more particularly to FIG. 1, there is shown a detailed block diagram of a quality of service management system for local area networks comprising a prior art local area network (LAN) 17 comprising a plurality of stations 10, 29, . . . , attached thereto. LAN 17 may, for example, be a Token Ring network. In accordance with the present invention, also attached to LAN 17 is a quality of service (QoS) allocator 20 which implements a quality of service management process for LAN 17.

Ex.1006,
4:18-26

stream transmitted from application 11 in station. 10. The overall function of allocator 20 is to receive the QoS request from station 10, examine the resources of LAN 17, and determine if a path exists in LAN 17 between station 10 and station 29 which satisfies the requested level of QoS. If the

Ex.1006,
4:50-54

transport protocol stack, 15 to the target station 29. Source station 10 also includes a QoS requestor manager 12 and a QoS protocol machine 13. Together, components 12 and 13 assemble a request to reserve a QoS connection for a multi-media data stream on that path through the LAN 17 between source station 10 and target station 29. Using a

Ex.1006,
4:32-37

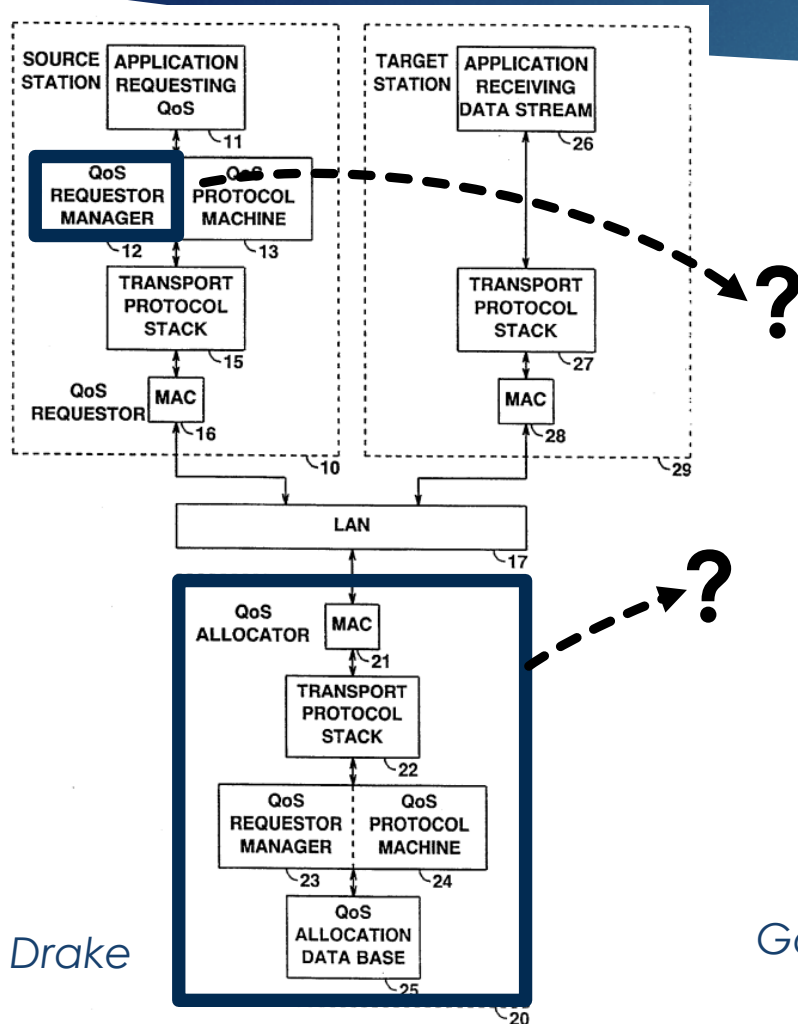
program described in IBM Manual S04G-1046. The QoS requestor manager 12 interacts with application 11 using internal messages as is well known in the art and utilizes QoS protocol machine 13 to format the QoS request.

Ex.1006,
4:62-65

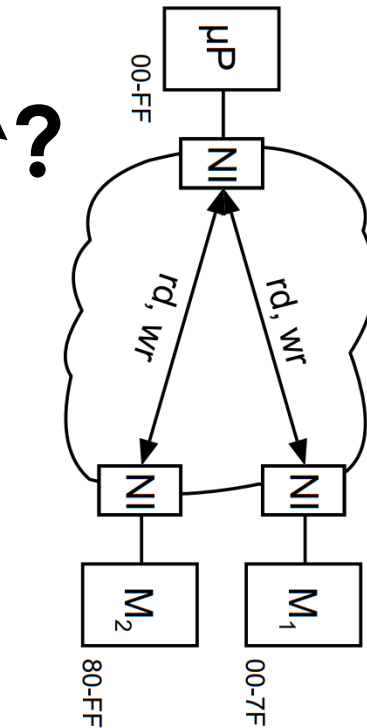
POR, 10-11,
20-21, 28-29,
45-46

Petition Failed to Explain the Combination / Motivation for Drake's QoS-12 & QoS allocator in Goossens200X

13



Drake



Goossens200X

Petition's "Motivation to Combine" sections fail to explain how Drake's components would work in Goossens200X:

Ex-1006, Abstract; Ex-1003 ¶¶77-79. A POSITA would have looked to Drake's disclosure to implement a "QoS requestor manager" to formulate requests for guaranteed services with particular properties and a "QoS allocator" to determine whether the required network resources are available for the requested services.

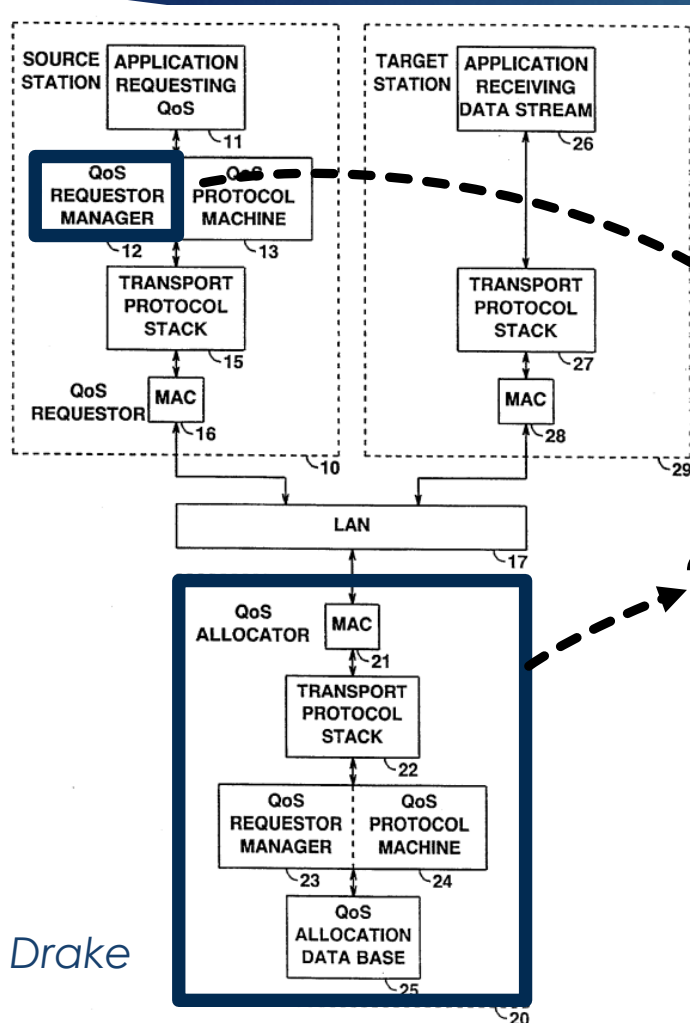
Pet., 17 (Ground 1)

Ex-1003 ¶160. A POSITA would have looked to Drake's disclosure of a "QoS requestor manager" to formulate requests for guaranteed services with particular properties and a "QoS allocator" to determine whether the network resources required for the requested services are available. Ex-1006, 4:17-56; *see also id.*,

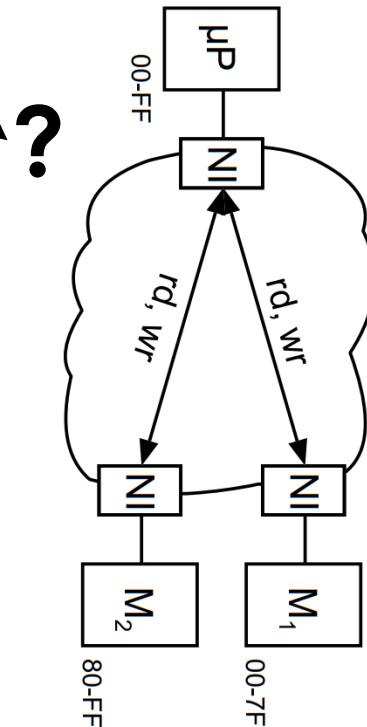
Pet., 52 (Ground 2)

Petition Failed to Explain the Combination / Motivation for Drake's QoS-12 & QoS allocator in Goossens200X

14



Drake



Goossens200X

Petition relies on generic motivation not specific to Drake's components:

Drake is directed to the same goal of managing network resources in order to “ensure[] selected levels of quality of services,” and a POSITA would have been motivated to combine Goossens2002’s disclosures with Drake’s disclosures regarding a system for QoS management to obtain the benefits of Drake’s known solution to ensuring the availability of network resources for guaranteed services.

Pet., 17 (Ground 1); see also Pet., 51-52 (similar for Ground 2)

A POSITA would have understood that using Drake’s QoS management process would improve the performance and efficiency of Goossens2002’s NOS by ensuring that connections established to provide guaranteed services are, in fact, able to provide the required services. Ex-1003 ¶79. As Drake explains, the

Pet., 18 (Ground 1); see also Pet., 52 (similar for Ground 2)

Petition Failed to Explain the Combination / Motivation for Drake's QoS-12 & QoS allocator in Goossens200X

15

POR identified the Petition's insufficiencies regarding combining Drake's QoS-12 with Goossens200X, for example:

manager 12. Pet., 35-38, 17.⁶ However, Petitioner's only alleged motivation for incorporating Drake's QoS requestor manager 12 into Goossens2002 is that "a POSITA would have looked to Drake's disclosures regarding a QoS requestor manager to obtain the benefits of Drake's known solution to ensuring the availability of network resources for guaranteed services." Pet., 35-38 (citing Petition Section VII.A.1). But neither this statement nor Petition Section VII.A.1 explains *why* a POSITA would implement Drake's QoS requestor manager in Goossens2002 or *how* it would work with Goossens2002. See Pet., 35-38, 16-20. Petitioner's expert fares

POR, 26 (Ground 1, claim 2); see also POR, 49 (similar for Ground 2)

and Drake to meet claim 6. The Petition's analysis for claim 6 contains no references to Petition Section VII.A.1, and only two cites to Goossens2002, neither of which explains why or how Goossens2002 would be modified or work with Drake's teachings. See Pet., 39-44.

POR, 33-34 (Ground 1, claim 6); see also POR, 55 (similar for Ground 2)

manager 12 as the claimed "communication manager." Pet., 40-41. The Petition, however, contains no discussion for why or how Goossens2002 and Drake would be combined to meet limitation 6[a]. See Pet., 40-41. Petitioner's expert declaration is

POR, 34 (Ground 1, limitation 6[a]); see also POR, 56 (similar for Ground 2)

Moreover, because limitation 6[a] recites that the "first module" issues a "request" to the "communication manager," this implicates the issues discussed above for claim 2 regarding where and how Drake's QoS requestor manager is purportedly implemented in Goossens2002. *Supra*, §VI.B.2.b. Petitioner failed to sufficiently explain how Drake's QoS requestor manager is implemented in Goossens2002 (e.g., in Goossens2002's IP, NOS, or elsewhere). *Id.* As discussed

POR, 35 (Ground 1, limitation 6[a]); see also POR, 57 (similar for Ground 2)

The Petition, however, fails to establish the requisite motivation for limitations 6[b]-[d], as Petitioner's analysis of limitations 6[b]-[d] contains no discussion or citation of Goossens2002, much less an explanation for why and how Goossens2002 would be modified to include the relied-upon teachings of Drake.

POR, 36 (Ground 1, limitations 6[b]-[d]); see also POR, 58 (similar for Ground 2)

POR, 26, 33-36, 49, 55-58

Petition Failed to Explain the Combination / Motivation for Drake's QoS-12 & QoS allocator in Goossens200X

16

POR identified the Petition's insufficiencies regarding combining Drake's QoS allocator with Goossens200X:

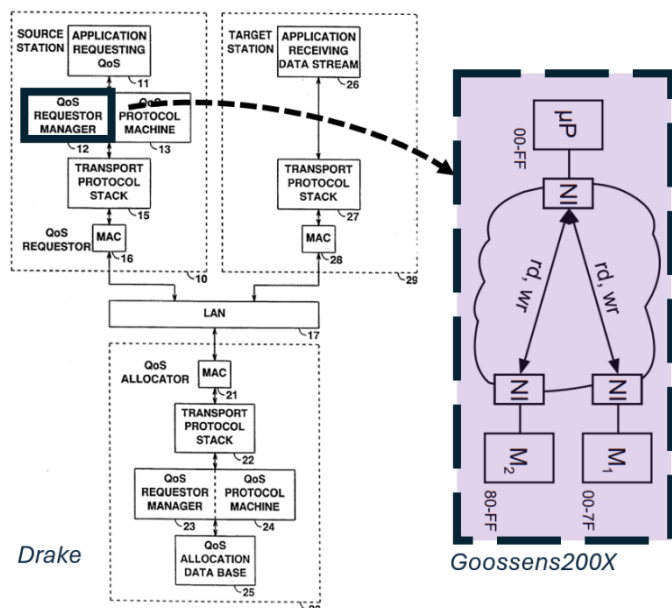
Resource Manager—Limitations 1[c] and 1[g] relate to the claimed “resource manager.” Petitioner’s analysis contains no discussion whatsoever as to *why or how* a POSITA would modify Goossens2002 to meet these limitations. Pet., 26 (1[c]), 32-34 (1[g]). For example, Petitioner does not explain where Drake’s QoS allocator would purportedly receive requests from in the alleged combination with Goossens2002 (e.g., from Goossens2002’s IP or somewhere else). Pet., 32-34. Petitioner’s expert fares no better. EX1003, ¶¶90-94, 113-16.

POR, 32 (Ground 1, claim 1); see also POR, 54 (same for Ground 2, claim 1)

Dr. Mowry (1st Deposition): Drake's QoS-12 Can Go Anywhere in Goossens200X

17

(during redirect)



Q. All right. So I'm going to ask you the same question we walked through with Goossens2002.

You don't explicitly state anywhere here between paragraphs 155 and paragraph 166 where Drake's QoS requestor manager would be implemented on the Goossens2003 chip, correct?

A. Okay. I think maybe -- maybe I'm possibly understanding your question, or how to answer your question, rather.

So the answer is, it can go anywhere on the chip as long as it has access to the -- as long as it's attached to the NOC, because the only requirement is that the source -- the IP block that's the source of communication just has to be able to talk to it. So physically it can go anywhere on the chip provided that it has a connection to the NOC. And that would be true of essentially the whole chip. So you have flexibility, really, to put it anywhere. You just have to attach it to the NOC. And the same is true for Goossens2002 as well. It can go anywhere on the chip. The only requirement is it just has to be connected to the network on chip.

BY MR. KOHLHEPP:

Q. You were also asked some -- some questions, excuse me, about specifically where the Drake QoS requestor manager would be implemented within the chip in Goossens2002 and Goossens2003. Do you recall those questions?

A. Yes, I do.

Q. Is deciding where specifically to implement the QoS requestor manager within the chip of Goossens2002 -- would that have been something that was within the ordinary skill of a POSA in early 2002?

MR. CHRISTOPHER: Objection to form.

THE WITNESS: Well, absolutely. It would be something that a POSA in that time frame would be very comfortable doing, because, as I mentioned, it would be clear -- obvious that it could go anywhere on the chip as long as it had a connection to the interconnect, because the only requirement, similar to figure 1 in Drake, is that it just has to be -- have connectivity with the -- with the IPs through the interconnect.

BY MR. KOHLHEPP:

Q. Would the answer you just gave change at all if the relevant time frame was early 2003?

A. No, it would not.

Ex.2078, 211:4-25

Ex.2078, 233:3-234:1

POR, 31-32, 53-54; POSR, 6-8

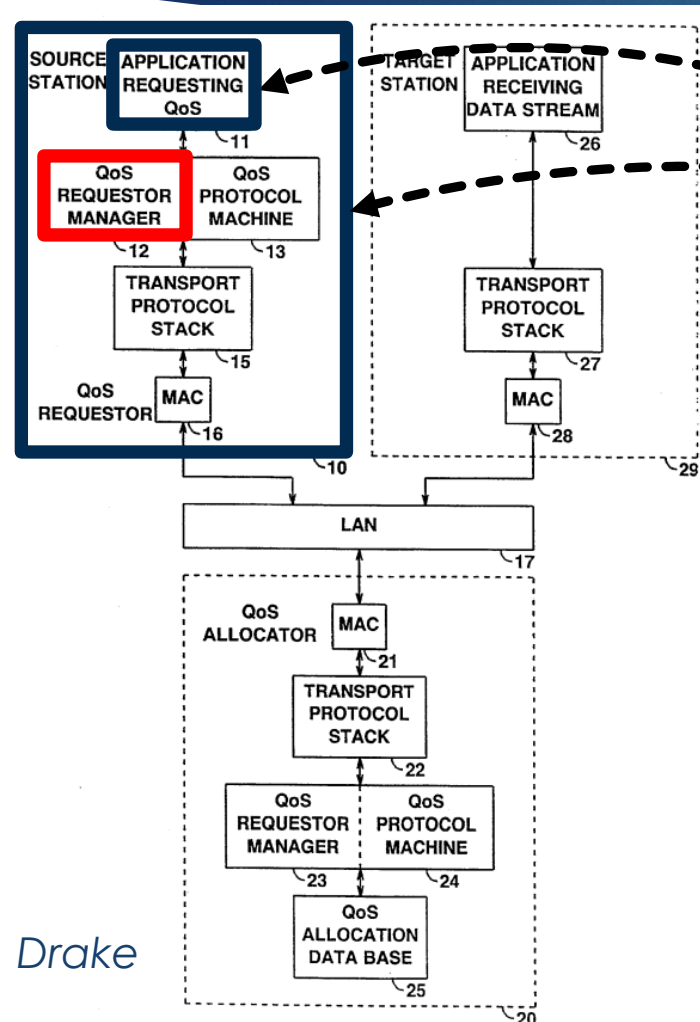
Petition's Explanation of the Alleged Combination / Motivation Is Insufficient 18

Legal Standard

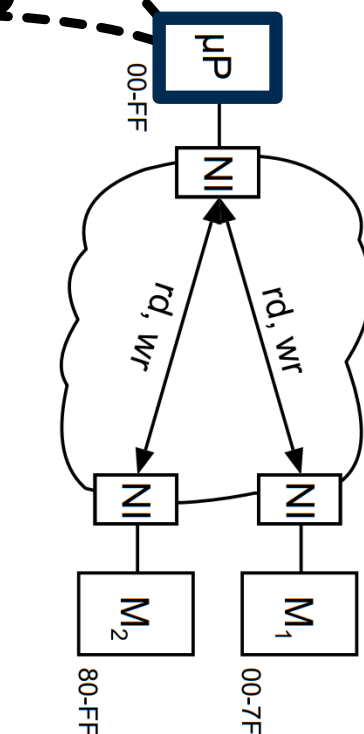
- Obviousness analysis is insufficient where it does not explain specifically how the references would be combined or explain motivation specific to the claim limitations.
 - *ActiveVideo Networks, Inc. v. Verizon Commc'ns, Inc.*, 694 F.3d 1312, 1327-28 (Fed. Cir. 2012) (emphasis in original)
- “[Party] failed to prove ... why the prior art references would have worked together.”
 - *Braintree Labs., Inc. v. Novel Labs., Inc.*, 749 F.3d 1349, 1359 (Fed. Cir. 2014) (cleaned up)
- Vacating obviousness based on failure to explain “how the combination of the two references was supposed to work.”
 - *PersonalWeb Techs., LLC v. Apple, Inc.*, 848 F.3d 987, 993-94 (Fed. Cir. 2017) (emphasis in original)
- “[Petitioner did] not adequately explain[] how [one reference] would be modified to incorporate teachings from [another reference].”
 - *Juniper Networks, Inc. v. Smart Path Connections, LLC*, IPR2021-01356, Paper 27 at 48-50 (PTAB Jan. 19, 2023)
- “[N]eed for specificity pervades our authority on the PTAB’s findings on motivation to combine.”
 - *In re NuVasive, Inc.*, 842 F.3d 1376, 1381-82 (Fed. Cir. 2016) (cleaned up)

The Petition and Dr. Mowry's 1st deposition were ambiguous and inconsistent regarding the claimed "first module"

“first module” in Drake: Why It Matters



Petition:



Goossens200X

POR:

3. Claim 2: “Integrated circuit according to claim 1, further comprising: at least one communication manager (CM) for managing the communication between different modules”

Claim 1 is obvious. See VII.A.2. In addition, Goossens2002 in view of

Drake renders this limitation obvious. Ex-1003 ¶117. Drake discloses a

“communication manager”⁶ in the form of a “QoS requestor manager.” Ex-1006,

- b. Claim 6[a]: “wherein said first module (M; I) is adapted to issue a request (REQ) for a connection with at least one of said second modules to said communication manager (CM)”

Goossens2002 in view of Drake renders this limitation obvious. Ex-1003

- e. Claim 6[d]: “wherein a connection between the first and second module is established based on the available properties of said communication channels of said connection”

Goossens2002 in view of Drake renders this limitation obvious. Ex-1003

Pet., 35, 40, 43 (Ground 1); see also Pet., 62-63, 65-67 (similar for Ground 2)

- A. The “First Module” and “Communication Manager” Are Separate and Distinct

POR, 12

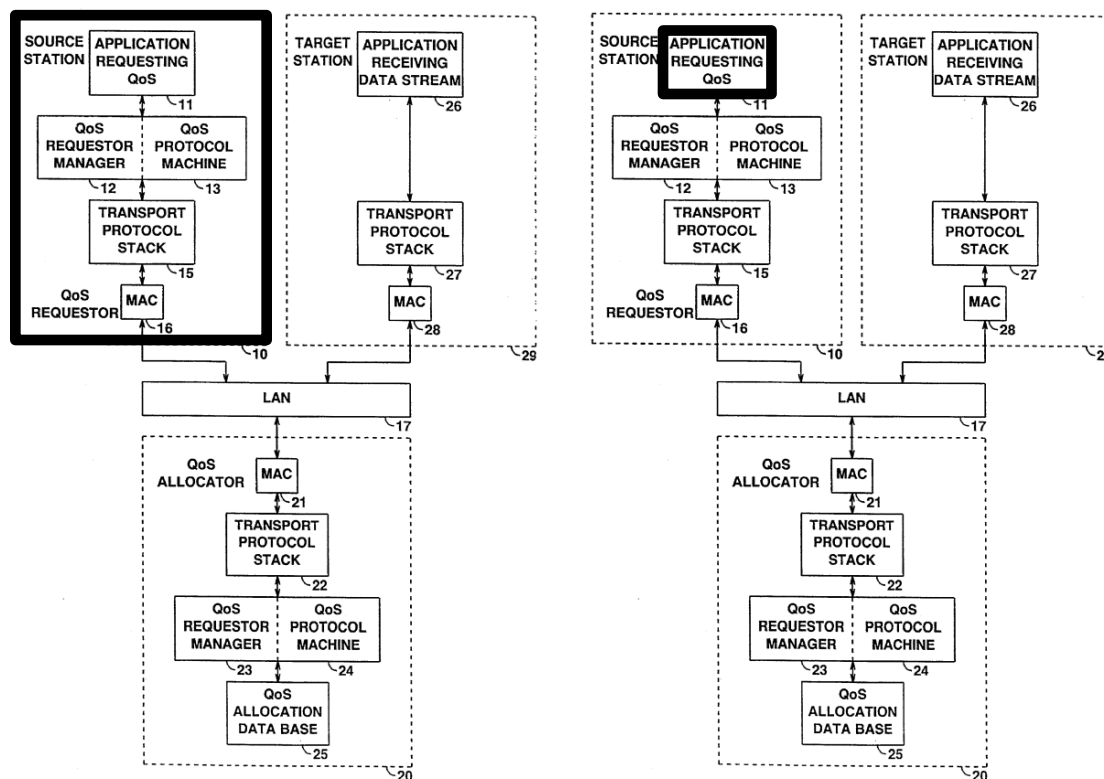
Petition's Ambiguity as to "first module" in Drake: source station 10 (option 1) or application 11 (option 2)?

21

"first module"?

Option 1:

Option 2:



Petition, for example:

"second module." Ex-1003 ¶128. Similarly, Drake describes that an application in a source station (i.e., first module) "requests a QoS connection to the destination or

¶131. Drake describes that, having received a request for a connection from an application in the source station (i.e., first module), the QoS requestor manager

Pet., 40-41

POPR:

Petitioner's argument and Dr. Mowry's opinion with respect to the first module and the communication manager are faulty. Petition, 40-41; EX1003, ¶ 128-130. Petitioner and Dr. Mowry take inconsistent positions with respect to Drake's alleged disclosure of the first module. On one hand, Petitioner and Dr. Mowry allege

..."). Thus, Petitioner has failed to identify with specificity which disclosure in Drake is the claimed first module. This is reason alone to deny institution. *Dropbox*,

IPR2024-01081, Paper 9 (POPR), 29

POPR, 29; POR, 17-18; Paper 53, 1

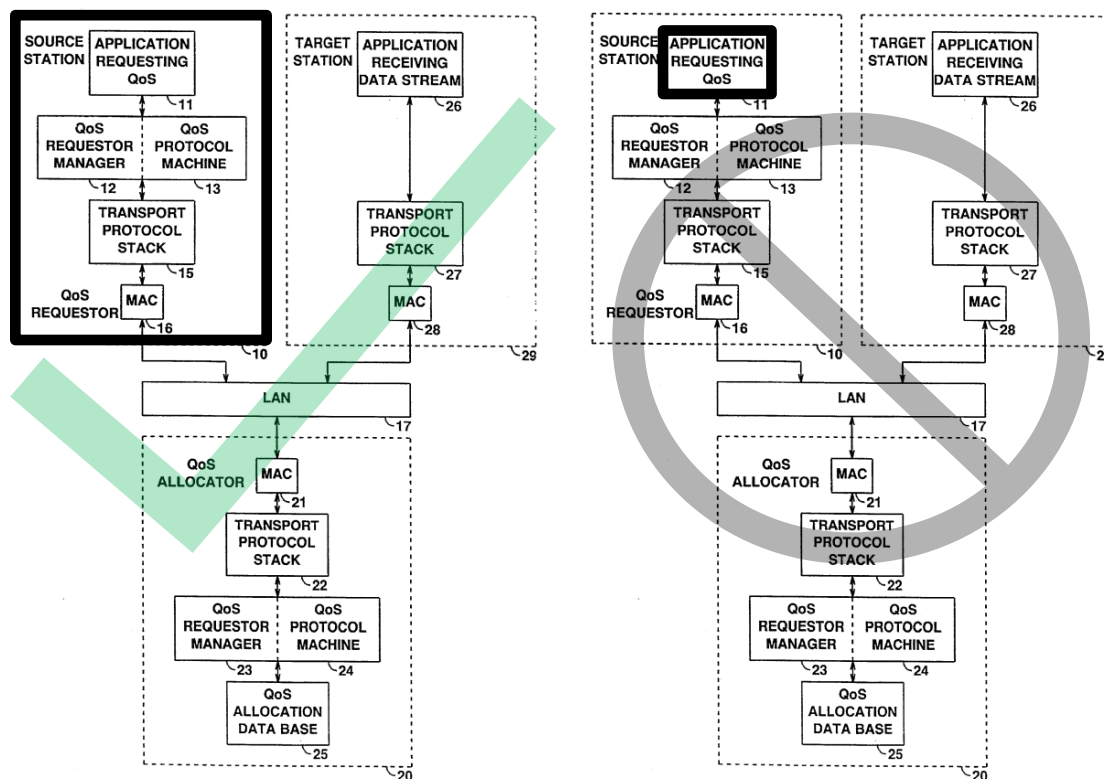
Institution Decision found: Petition Identifies “first module” as Drake’s source station 10 (option 1)

22

“first module”?

Option 1:

Option 2:



Qualcomm Institution Decision

module.” See Prelim. Resp. 29. Petitioner consistently identifies Drake’s source station 10 as the claimed “first module.” See Pet. 27, 32, 40–41, 59.

Also, we disagree with Patent Owner that Petitioner identifies application 11 in source station 10 as the claimed “first module” for limitation 6.a. See Prelim. Resp. 28–29. Limitation 6.a reads as follows:

allocator.” Pet. 41 (emphases omitted). Petitioner’s explanation indicates that Petitioner identifies source station 10 as the claimed “first module” for limitation 6.a and identifies application 11 as a component in the claimed “first module” involved in “issu[ing] a request.” *Id.*; see *id.* at 27, 32,

IPR2024-01081, Paper 14 at 23-24

Indeed, Petition Clearly Identifies “first module” as Drake’s source station 10 (option 1)

23

3. Claim 2: “Integrated circuit according to claim 1, further comprising: at least one communication manager (CM) for managing the communication between different modules”

Claim 1 is obvious. See VII.A.2. In addition, Goossens2002 in view of Drake renders this limitation obvious. Ex-1003 ¶117. Drake discloses a “communication manager”⁶ in the form of a “QoS requestor manager.” Ex-1006, 4:32–37; see also *id.*, 4:62–65, 5:5–8, Fig. 1. Drake explains that there are QoS requestor managers associated with source stations, and that the QoS requestor managers manage communications between modules by “assembl[ing] a request to reserve a QoS connection for a multi-media data stream ... between source station 10 and target station 29,” which request is sent to the QoS allocator (i.e., resource

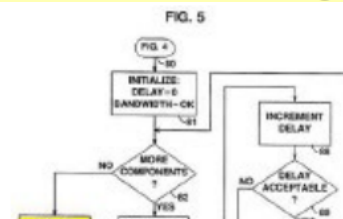
Pet., 35 (claim 2; only discusses Drake); see also Pet., 63 (Ground 2 relying on Ground 1 for claim 2)

second modules. Drake likewise describes “connections” between source and target stations (i.e., first and second processing modules), which it also refers to as

Pet., 27 (1[d])

e. Claim 6[d]: “wherein a connection between the first and second module is established based on the available properties of said communication channels of said connection”

Goossens2002 in view of Drake renders this limitation obvious. Ex-1003 ¶134. Drake describes that, if the QoS allocator determines that the requested QoS properties are available, the requested connection between the source and target stations is established along a designated path through the network and required resources are reserved. See Ex-1006, Abstract (“An allocator



Pet., 43 (6[d]; only discusses Drake); see also Pet., 47 (relying on 6[d] for 10[e]), 67 (Ground 2 relying on Ground 1 for 6[d]), 70 (relying on 6[d] for 10[e])

and return messages from the second to the first IP. Ex-1003 ¶112. Further, as shown above, Drake likewise describes communications in the “forward direction” (i.e., outgoing messages) and in the “backward direction” (i.e., return messages) between source and target stations (i.e., first and second modules). See VII.A.2.f.

Pet., 32 (1[f]); see also Pet., 61 (Ground 2 relying on Ground 1 for 1[f])

Dr. Mowry's 1st Deposition's Inconsistent Testimony for the "first module" in Drake Is Improper 24

Mowry 1st Deposition regarding the "first module" was inconsistent—internally and compared to the Institution Decision and Petition

Option 1

Q. Paragraph 129, you wrote, "Similarly, Drake describes that an application in a source station (i.e., first module)." Do you see that?

A. Yes.

Q. So in your declaration, you've mapped Drake's source station to the first module in the claims, correct?

A. Yes.

Ex.2078, 173:4-14

Option 2

Q. Can you tell me which of the components in figure 1 of Drake correspond to the claimed first module?

A. Well, in this scenario it's box 11, which is inside the source station.

Ex.2078, 174:23-175:2

Legal Standards

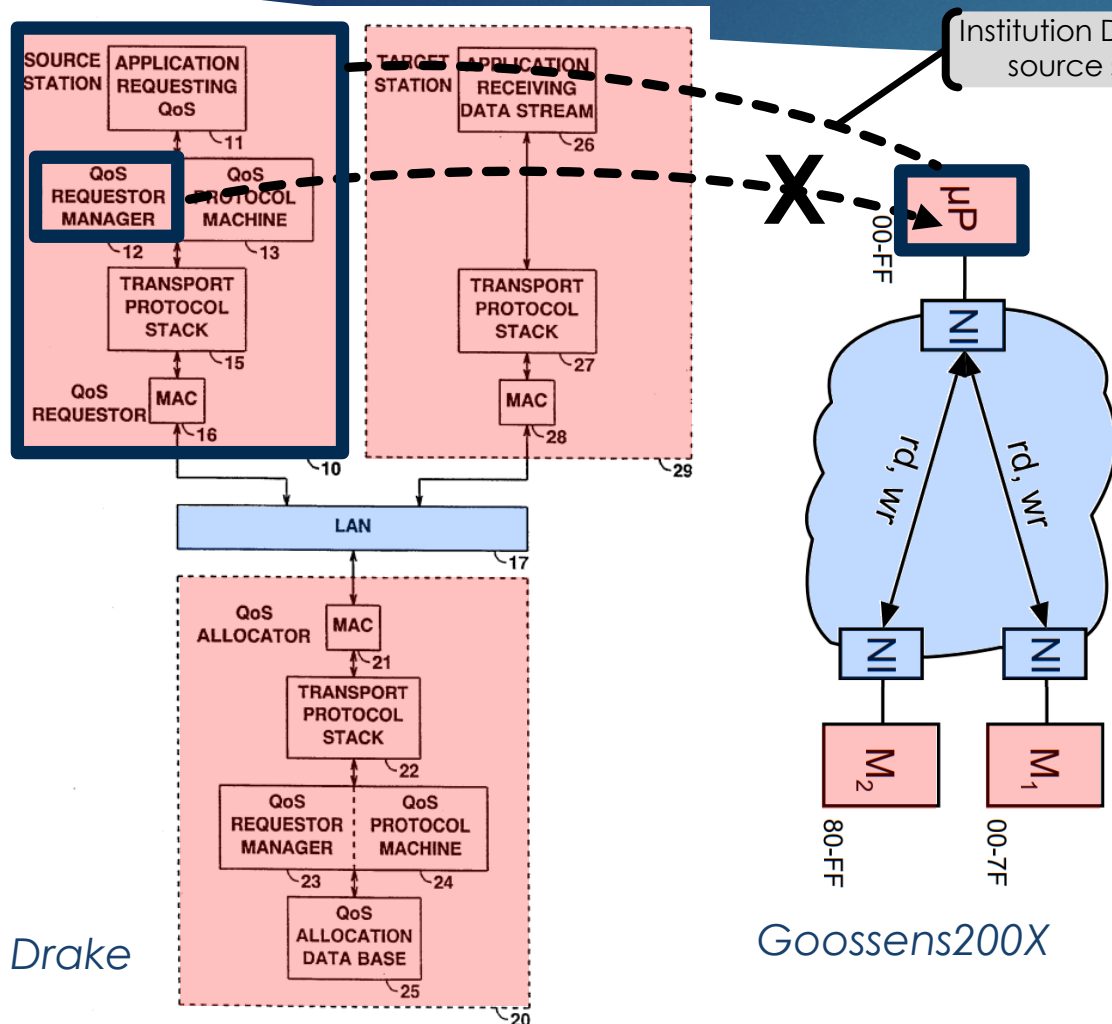
- "The petition must specify where each element of the claim is found in the prior art"
 - 37 C.F.R. § 42.104(b)(4)
- "Petitioner's inconsistent identification of the claimed [element] runs afoul of [37 C.F.R. § 42.104(b)(4)]"
 - *Power Integrations, Inc. v. Semiconductor Components Indus., LLC*, IPR2017-01907, Paper 31 at 22-24 (PTAB Mar. 11, 2019)
- Striking new theory argued in deposition but not included in the petition or original declaration
 - *Arista Networks, Inc. v. Cisco Sys., Inc.*, IPR2016-00308, Paper 42, 12-13 (PTAB May 25, 2017)

The references
teach away from
implementing
Drake's QoS-12
anywhere in
Goossens200X

Goossens200X Teaches Away From Implementing Drake's QoS-12 in Goossens200X's IP

26

Dr. Bagherzadeh:



Drake

Goossens200X

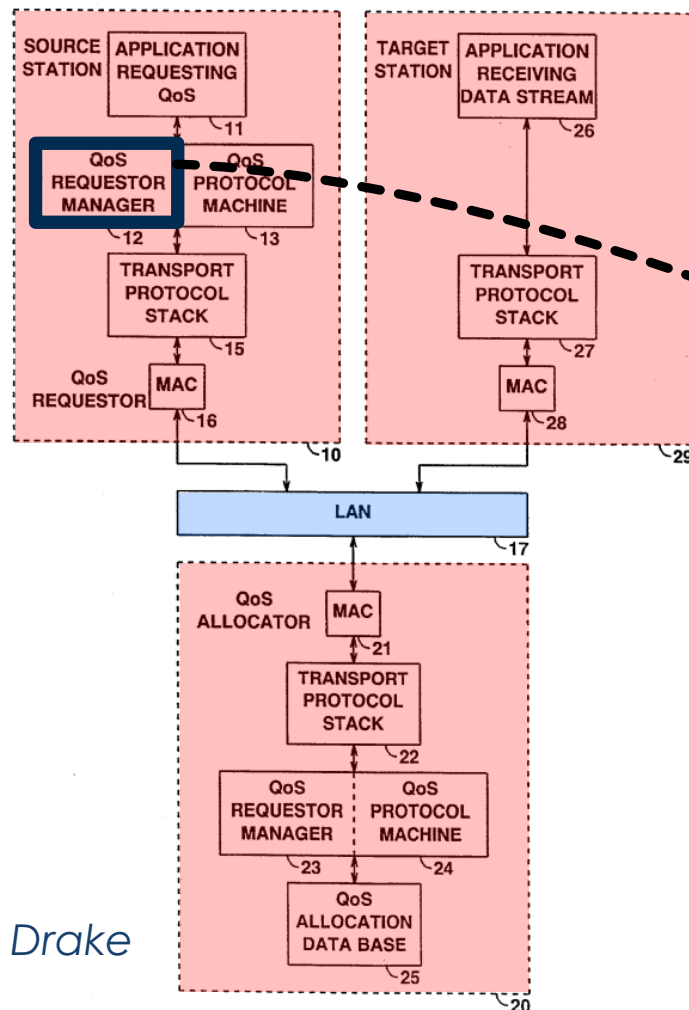
Institution Decision: Petition identifies Drake's source station 10 as the "first module" of the source station. However, Drake's source station 10 corresponds to Goossens2002's IP block,⁴ and a POSITA would have understood that Goossens2002 emphasizes that its IP should *not* contain communication components like Drake's QoS requestor manager. EX. 1005, 1 ("Finally, and most importantly, decoupling of computation (IPs) and communication (NOS) enables compositional layout and timing closure. IPs communicate only using the network so that their layout and timing closure are independent of other IPs."), 2 ("For a given user function, computation is mapped to functional IPs ... and communication to the NOS."), 1 ("We believe in the [IP] re-use model."). That is, a POSITA would have understood that the QoS requestor manager is specifically included within Drake's source station that corresponds to Goossens2002's IP, but Goossens2002 would have dissuaded the POSITA from likewise including that QoS requestor manager within Goossens2002's IP, as Goossens2002 is premised on the IP re-use model and the goal of decoupling IPs from communication components such as Drake's QoS requestor manager. Thus, Goossens2002 teaches away from incorporating Drake's QoS requestor manager.

Ex.2070 ¶180 (citing Ex.1005, 1-2) (Ground 1); see also Ex.2070 ¶255 (citing Ex.1007, 65-66, 78) (similar for Ground 2)

POR, 24, 28-29, 33, 46, 50-52, 55; POSR, 16

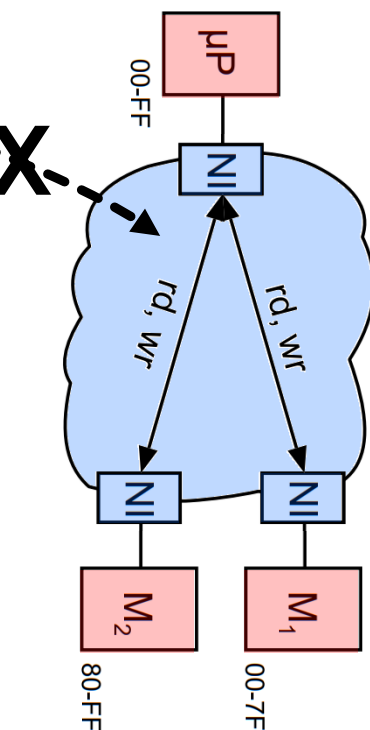
Drake Teaches Away From Implementing Drake's QoS-12 in Goossens200X's NOC

27



Drake

Drake:



Goossens200X

ABSTRACT

A management system for local area networks ensures selected levels of quality of service to all transmission requests submitted to the management system. This management system is attached to the network and receives

Ex.1006,
Abstract

BACKGROUND OF THE INVENTION

order to determine the optimal route for a connection Most packet based local area networks (LANs), such as token rings (IEEE Standard 802.5), do not offer these sophisticated techniques for quality of service management.

Ex.1006,
2:10-15

It is extremely desirable to provide apparatus and a method to control multimedia data stream entry into a LAN,

Referring more particularly to FIG. 1, there is shown a detailed block diagram of a quality of service management system for local area networks comprising a prior art local area network (LAN) 17 comprising a plurality of stations 10, 29, . . . , attached thereto. LAN 17 may, for example, be a Token Ring network. In accordance with the present invention, also attached to LAN 17 is a quality of service (QoS) allocator 20 which implements a quality of service manage-

Ex.1006,
4:18-26

program described in IBM Manual S04G-1046. The QoS requestor manager 12 interacts with application 11 using internal messages as is well known in the art and utilizes

the requestor station 10

Ex.1006, 14:17

Ex.1006, 4:62-64

POR, 24,
28-31, 33
46, 50-55;
POSR, 16-17

Drake Teaches Away From Implementing Drake's QoS-12 in Goossens200X's NOC

28

Dr. Bagherzadeh:

as Goossens2002 and Drake teach completely opposite solutions. Drake is premised on its QoS components being implemented in stations attached to prior art networks, where the network stays the same, whereas Goossens2002 is

Ex.2070, ¶187 (Ground 2); see also *id.* ¶262 (similar for Ground 2) requestor manager. A POSITA would have understood that in Drake, QoS requestor manager 12 (the alleged “communication manager”) is intentionally within source station 10. EX. 1006, Fig. 1, 4:32-47, 4:62-65; Pet., 35 (admitting that “QoS requestor managers [are] associated with source stations”); Ex. 1003 at ¶118 (same). This is further demonstrated by the fact that Drake refers to source station 10 as the “requestor station 10.” EX. 1006, 14:17. This is also demonstrated by the fact that Drake's QoS system, including QoS requestor manager 12, is not implemented within “prior art [LAN] 17” but rather in components such as source station 10 attached to that “prior art” network. EX. 1006, 4:18-26, 4:32-47, 4:62-

Ex.2070, ¶179 (Ground 1); see also *id.* ¶255 (similar for Ground 2)

180. Drake does not suggest that QoS requestor manager 12 can be outside of the source station. In fact, a POSITA would have understood that Drake's QoS requestor manager 12 is a software running on source station 10 and is thus inseparably connected and coupled to the source station, such that QoS requestor manager 12 could not be outside of the source station. However, Drake's source

Ex.2070, ¶180 (Ground 1); see also *id.* ¶255 (similar for Ground 2)

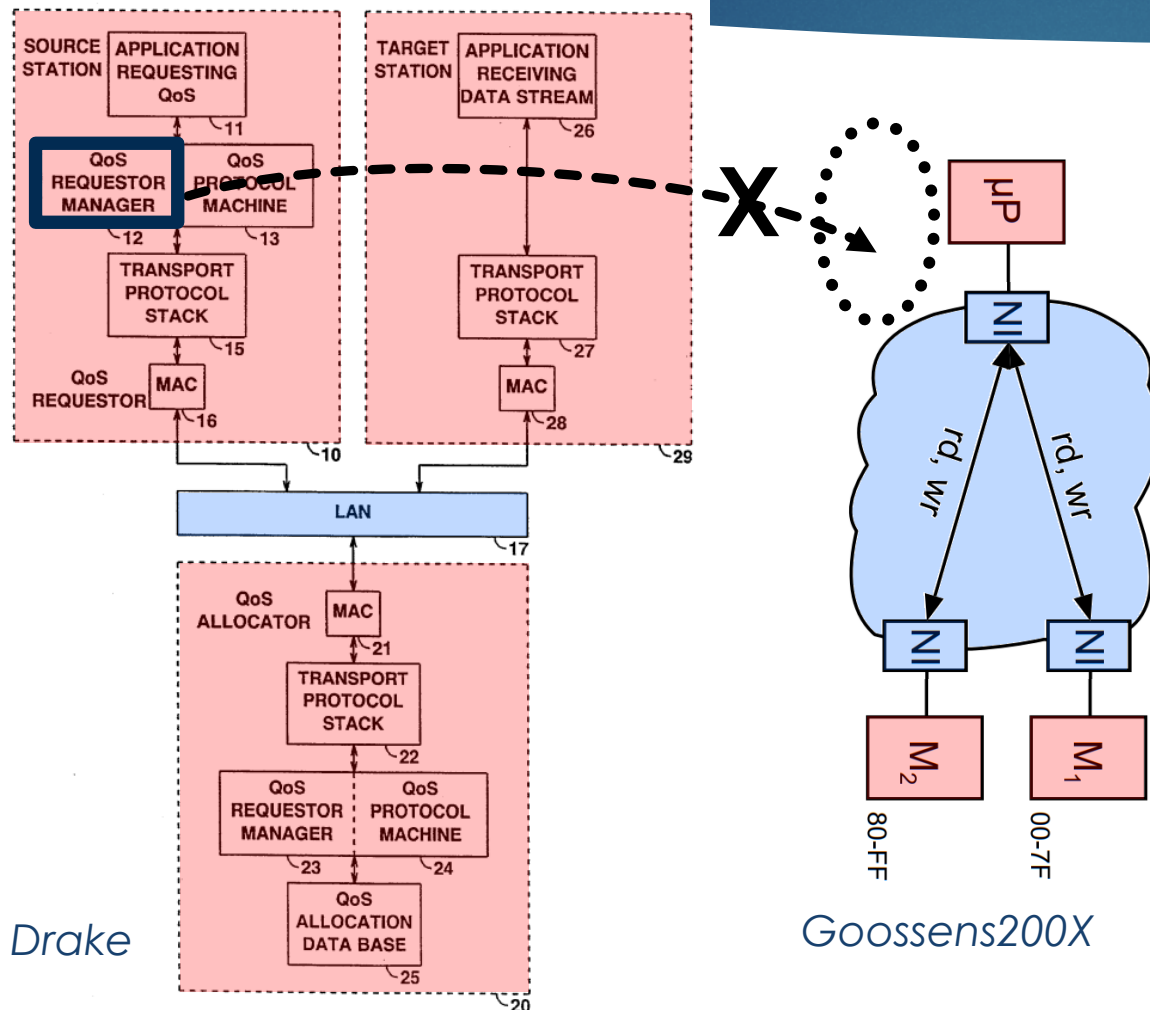
181. Moreover, implementing Drake's QoS requestor manager outside of Drake's source station or the corresponding IP block in Goossens2002 would constitute a modification of Drake's teachings, and based on my review, Petitioner and Dr. Mowry present no alleged motivation for such modification. Also,

Ex.2070, ¶181 (Ground 1); see also *id.* ¶256 (similar for Ground 2)

POSITA Would Not Implement Drake's QoS-12 Outside of Goossens200X's IP and NOC

29

Dr. Bagherzadeh:



188. *Second*, a POSITA also would not have implemented Drake's QoS requestor manager anywhere on Goossens2002's chip other than in the IPs and NOS. To note, a POSITA would have understood Goossens2002's network interfaces to be at least partially within the NOS. For example, a POSITA would have understood that Goossens2002's chip, with its on-chip network, would be subject to several constraints, including physical, size, cost, and resource constraints, and that implementing a communication component outside of the IPs and NOS would require space and resources and would introduce issues regarding complexity, efficiency, component count, manufacturing cost, and technical and other issues that arise when adding such peripheral and intermediary components, including protocols and resources necessary for such communication component to interface and communicate with the network. *See, e.g., '449 Patent, 1:50-2:46.* Implementing the QoS requestor manager on Goossens2002's chip would have required integrated the QoS requestor manager as a separate circuit attached to the network with its own network interface, similar to how an IP has its own network interface. This would result in additional testing, integration, and verification costs, thereby negatively impacting the expected rapid design time to market requirement. It would also introduce additional latency each time an IP block needed to communicate with it.

Ex.2070, ¶188 (Ground 1); see also *id.* ¶263 (similar for Ground 2)

Drake Teaches Away From Implementing Drake's QoS-12 in Goossens200X's NOC

30

Petition:

4:32–37; *see also id.*, 4:62–65, 5:5–8, Fig. 1. Drake explains that there are QoS requestor managers associated with source stations, and that the QoS requestor

Pet., 35

Dr. Mowry:

(Drake) at 4:62–65, 5:5–8, Fig. 1. Drake explains there are QoS requestor managers that are associated with source stations, and that the QoS requestor managers manage

Ex.1003, ¶118

Dr. Mowry:

Q. And in figure 1, we have the Source Station 10, the QoS Allocator 20, and the Target Station 29. All three of those are attached to the LAN 17, correct?

A. Yes, that's correct.

Q. Drake characterizes the LAN 17 as prior art, correct?

A. Probably. I mean, if you could point me to a specific part of it. But I -- I believe so. They're not -- they're not attempting to modify block 17 relative to existing interconnects, so -- I don't know if it literally used those words, but the gist of it is that's correct, definitely.

Ex.2078, 142:21-143:7

Q. And Drake never discloses that the QoS Requestor Manager 12 could be positioned outside of the Source Station 10, correct?

A. Well, there's a distributed design here. Each -- each node that can initiate communication would presumably have a QoS requestor manager. When you're trying to initiate communication with a quality-of-service requirement, the initiator of it would need to have a quality-of-service requestor manager.

Ex.2078, 150:13-22

Q. Well, sitting here today, are you aware of whether Drake expressly discloses whether the QoS Requestor Manager 12 can be positioned outside of the Source Station 10?

A. I don't recall Drake discussing an alternate design off the top of my head.

Ex.2078, 151:16-21

The Reply Fails to Rebut Teaching Away

The Reply:

1. Admits that Drake's QoS-12 would not be implemented in Goossens200X IP

combination. Everyone agrees that each of the Goossens references discloses locating the QoS functionality outside the IP blocks (which is what PO contends

Reply, 10

2. Mischaracterizes and ignores PO's argument and evidence about Drake's teaching away

Aside from simply noting the location of the QoS requestor manager, PO only identifies one citation from Drake in support of its argument: Ex-2006, 2:57-3:3. POR, 52-54 (Ground 1: 29-32). This discussion in Drake does not address the

Reply, 11

3. Asserts a new "network interface" theory (discussed later)

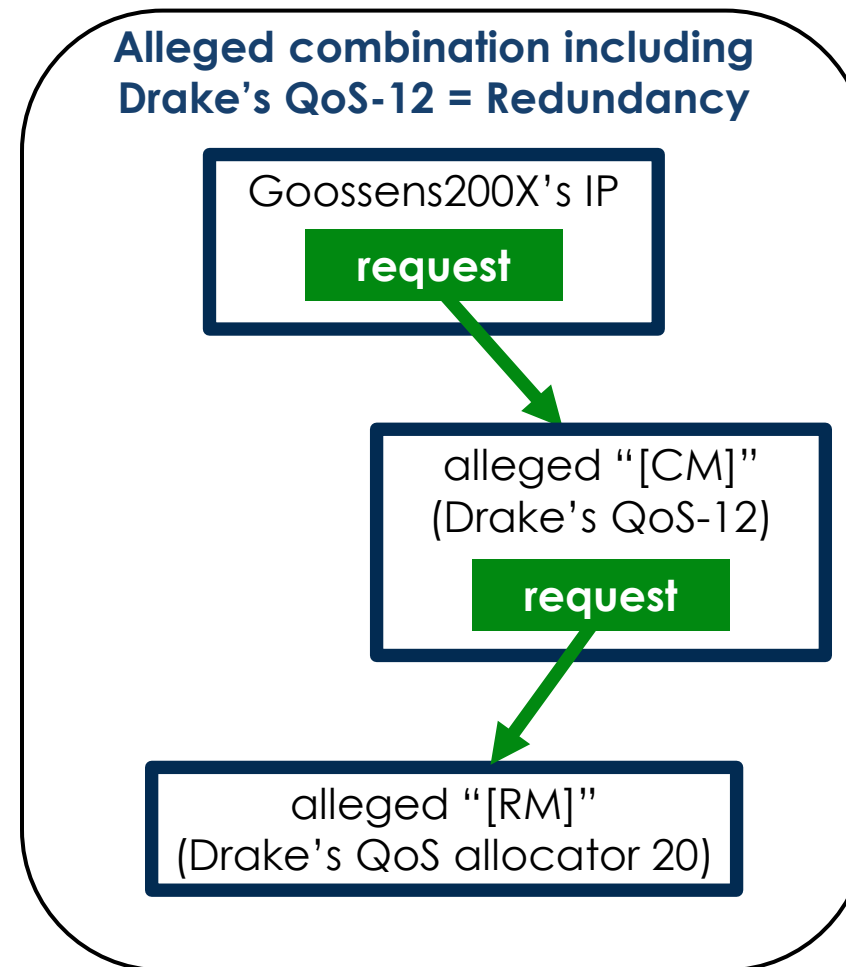
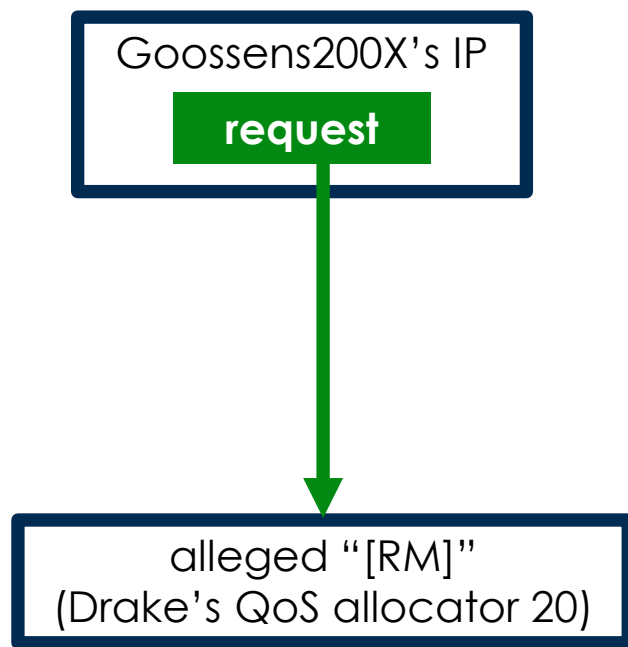
components were outside of IP block, in NoC). As noted above, a POSA would also recognize that Drake's QoS requestor manager 12 was part of Drake's network interface (Ex-1043 ¶¶28; Ex-1006, 4:34-35) and Goossens2003 teaches implementing communication management functionality in the network interface of its NOC (Ex-1003, ¶¶185-186; Ex-1043, ¶¶48, 29).

Reply, 12

Implementing
Drake's QoS-12 in
Goossens200X
would create
redundancy

Drake's QoS-12 Would Be Redundant of Goossens200X's IP

33



POR, 26-28, 33-37, 49-50, 55-60;
POSR, 15-16

Drake's QoS-12 Would Be Redundant of Goossens200X's IP

34

For claim 2, Petition asserts Drake's QoS-12 makes a QoS request, but Goossens200X's IP already does that

Drake's QoS-12

Petition (claim 2):

4:32–37; *see also id.*, 4:62–65, 5:5–8, Fig. 1. Drake explains that there are QoS requestor managers associated with source stations, and that the QoS requestor managers manage communications between modules by “assembl[ing] a request to reserve a QoS connection for a multi-media data stream ... between source station 10 and target station 29,” which request is sent to the QoS allocator (i.e., resource manager). *Id.* This is consistent with the disclosure of the communication manager

Pet., 35 (Ground 1, claim 2); *see also id.*, 63 (relying on Ground 1 for Ground 2)

Drake:

transport protocol stack, 15 to the target station 29. Source station 10 also includes a QoS requestor manager 12 and a QoS protocol machine 13. Together, components 12 and 13 assemble a request to reserve a QoS connection for a multi-media data stream on that path through the LAN 17

Ex.1006, 4:32-36

Goossens200X's IP

Petition admits:

¶128. Goossens2002 describes that its IPs (i.e., processing modules) “can set up and remove connections.” Ex-1005, 3. Goossens2002 explains that the IPs do so by making a “service request” that includes information regarding the performance requirements of the connection. *Id.*, 2–3. The IP that makes a service request is a

Pet., 40 (Ground 1)

obtain connections with certain properties.” Ex-1007, 77. Thus, a POSITA would have understood that Goossens2003's master IPs (i.e., first module) issue requests for connections to the network interfaces (i.e., communication managers). Ex-

service level”). Thus, a POSITA would have understood the requests issued by the IPs comprise desired connection properties. Ex-1003 ¶194.

Pet., 65 (Ground 2)

Goossens2002:

a service request from an IP,

Ex.1005, 3

POR, 26-28, 49-50; POSR, 15

Drake's QoS-12 Would Be Redundant of Goossens200X's IP

35

For claim 2, Petition asserts that Drake's QoS-12 communicates with the alleged "[RM]" (Drake's QoS allocator), but Goossens200X's IP could just do that

Dr. Bagherzadeh:

178. While Petitioner and Dr. Mowry assert that Drake's QoS requestor manager communicates with the alleged "resource manager" (i.e., Drake's QoS allocator, purportedly corresponding to Goossens2002's quality-of-service manager), a POSITA would have understood that this could just be done by Goossens2002's IP block—i.e., Goossens2002's IP block could communicate with the alleged "resource manager." See Pet., 35-36, 41-42 (regarding Drake's QoS requestor manager preparing a request sent to the QoS allocator), 23-24, 26, 32 (associating Drake's QoS allocator with Goossens2002's quality-of-service manager), 40-41 (asserting that Goossens2002's IP sends a request similar to the request sent to Drake's QoS allocator); Ex. 1003 at ¶¶118, 131, 90-91, 94-96, 128-30. Thus, a POSITA would have understood that Goossens2002's IP can generate

Ex.2070, ¶178 (Ground 1)

1003 at ¶¶118, 187, 194. Also, while Petitioner and Dr. Mowry assert that Drake's QoS requestor manager communicates with the alleged "resource manager" (i.e., Drake's QoS allocator, purportedly incorporated into Goossens2003), a POSITA would have understood that this could just be done by Goossens2003's IP block—i.e., Goossens2003's IP block could communicate with the alleged "resource manager." See Pet., 35-36, 63, 66 (regarding Drake's QoS requestor manager preparing a request sent to the QoS allocator), 65-66 (asserting that Goossens2003's IP sends a request similar to the request in Drake); Ex. 1003 at ¶¶118, 187, 196, 193-95. Thus, a POSITA would have understood that

Ex.2070, ¶254 (Ground 2)

Drake's QoS-12 Would Be Redundant of Goossens200X's IP

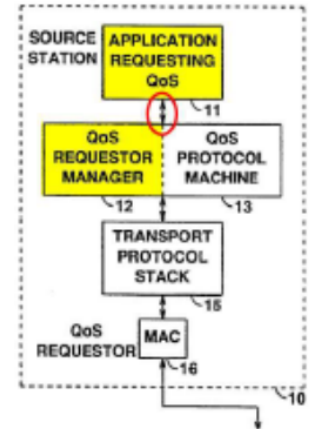
36

For limitations 6[a], Petition alleges no motivation specific to Drake's QoS-12

Petition (limitation 6[a]):

Goossens2002 in view of Drake renders this limitation obvious. Ex-1003 ¶128. Goossens2002 describes that its IPs (*i.e.*, processing modules) “can set up and remove connections.” Ex-1005, 3. Goossens2002 explains that the IPs do so by making a “service request” that includes information regarding the performance requirements of the connection. *Id.*, 2–3. The IP that makes a service request is a “first module” and the IP that is the destination or target of the connection is a “second module.” Ex-1003 ¶128. Similarly, Drake describes that an application in a source station (*i.e.*, first module) “requests a QoS connection to the destination or target station” (*i.e.*, second module). Ex-1006, 4:26–29; *see also id.*, Abstract, 5:25–50, 2:32–41 (describing “requested QoS values”). A POSITA would have understood from these disclosures that the requests described by Goossens2002 and Drake include desired connection properties. Ex-1003 ¶129.

Drake further describes that the application in the source station (*i.e.*, first module) communicates this request to a QoS requestor manager (*i.e.*, communication manager) for subsequent transmission to a QoS allocator, as discussed further below. Ex-1006, 4:62–65 (“The QoS requestor manager 12 interacts with application using internal messages as is well known in the art”), Fig. 1; *see also id.*, 4:32–37, 4:50–54, 5:5–8, 3:21–28. This is indicated by the arrows in Drake's Figure 1. *Id.*, Fig 1 (excerpted, annotated); EX-1003 ¶130.



Pet., 40-41 (Ground 1); *see also id.*, 65-66 (relying on Ground 1 for Ground 2)

Drake's QoS-12 Would Be Redundant of Goossens200X's IP

37

For limitations 6[b]-[c], Petition alleges no motivation specific to Drake's QoS-12

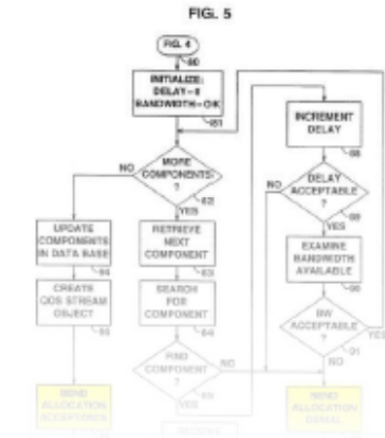
Petition (limitations 6[b]-6[c]): No discussion of Goossens200X

Goossens2002 in view of Drake renders this limitation obvious. Ex-1003

¶131. Drake describes that, having received a request for a connection from an application in the source station (*i.e.*, first module), the QoS requestor manager (*i.e.*, communication manager) “assemble[s] a request to reserve a QoS connection.” Ex-1006, 4:32–37. Drake explains that the QoS requestor manager “utilizes QoS protocol machine 13 to format the QoS request,” which is also referred to by Drake as a “QoS allocation request.” *Id.*, 4:62–65; *see also id.*, 8:31–49, 9:52–10:8 (QoS request “contains a specification of the quality of service

Goossens2002 in view of Drake renders this limitation obvious. Ex-1003

¶133. As discussed regarding element 1[g], Drake describes that, when the QoS allocator receives requests for connections with certain QoS properties, it examines the resources of the network to “determine if the QoS parameters required for the data stream is available,” *i.e.*, whether a connection with the



Pet., 41-43 (Ground 1); *see also id.*, 66 (relying on Ground 1 for Ground 2)

Drake's QoS-12 Would Be Redundant of Goossens200X's IP

38

For limitations 6[a]-[c], Goossens200X's IP would have communicated with the alleged "[RM]" directly, without needing QoS-12

Dr. Bagherzadeh:

into Goossens2002 because if Drake's QoS allocator was implemented in Goossens2002 as Petitioner and Dr. Mowry allege, then a POSITA considering the combination would have understood that Goossens2002's IP would just send its request directly to the QoS allocator, not "to a QoS requestor manager ... for subsequent transmission to [the] QoS allocator" as Petitioner and Dr. Mowry assert. Pet., 41; Ex. 1003 at ¶130 (same). A POSITA would have understood that it would have been redundant and unnecessary for a request issued by Goossens2002's IP to be sent to and issued *again* by a QoS requestor manager.

Ex.2070, ¶194 (Ground 1, limitation 6[a]); see also *id.*, ¶269 (similar for Ground 2)

[c] because if a POSITA was looking to implement Drake's QoS system in Goossens2002 (although, they would not be), then the POSITA would have understood that the alleged "resource manager" (i.e., Drake's QoS allocator) would have received the request directly from, and provided its response to, Goossens2002's IP, not a QoS requestor manager. EX. 1006, 4:50-52 ("[QoS] allocator 20 ... receive[s] the QoS request from [source] station 10"), 11:22-38, 14:22-27 (teaching that QoS allocator 20 sends the response to source station 10); *supra* § IX.C.2,n.4 (explaining that Petitioner associates Drake's source station 10 with Goossens2002's IP); Pet., 34 (admitting that "a requesting module"—like Goossens2002's IP—"sends a request to [Drake's] [QoS] allocator 26"); Ex. 1003 at ¶115 (same). A POSITA would have understood that such direct communication between the alleged "resource manager" (i.e., Drake's QoS allocator) and Goossens2002's IP is actually comparable to communication between Drake's QoS allocator and source station 10. Also, a POSITA would have

Ex.2070, ¶198 (Ground 1, limitations 6[b]-[c]); see also *id.*, ¶273 (similar for Ground 2)

POR, 33-37, 55-60; POSR, 15, 18

Drake's QoS-12 Would Be Redundant of Goossens200X's IP

39

Legal Standard

- No motivation “[g]iven the redundant functions” of primary and secondary reference elements
 - *South-Tek Systems, LLC v. Engineered Corrosion Solutions, LLC*, 748 Fed. App'x 1003, 1006 (Fed. Cir. 2018)
- No motivation because the Board “d[id] not explain why a [POSITA] would be motivated to modify Brown, which already includes vents”
 - *In re Anova Hearing Labs, Inc.*, 809 Fed. App'x 840, 843 (Fed. Cir. 2020)
- No motivation where “both ... references independently accomplish similar functions”; “Because each device independently operates effectively, a [POSITA] ... would have no reason to combine the features of both devices into a single device”
 - *Kinetic Concepts, Inc. v. Smith & Nephew, Inc.*, 688 F.3d 1342, 1369 (Fed. Cir. 2012).

The Reply Fails to Rebut Redundancy or Identify Proper Motivation for QoS-12 in Claim 2

40

The Reply:

1. Mischaracterizes and fails to address PO's redundancy argument for claim 2

“redundant” in Goossens2003. POR, 49-50 (Ground 1: 26-28, 32). But the fact that two references address the same problem is “precisely the reason that there’s a motivation to combine under *KSR* and [Federal Circuit] precedent.” *Intel Corp. v.*

Reply, 8

2. Relies on the mere existence of QoS-12 in Drake, but this (i) is insufficient under *Virtek* and (ii) suggests that QoS protocol machine 13 should also be implemented in Goossens200X, but Petitioner does not argue this

- *Virtek Vision Int'l ULC v. Assembly Guidance Sys., Inc.*, 97 F.4th 882, 886-87 (Fed. Cir. 2024): “The mere fact that ... possible arrangements existed in the prior art does not provide a [motivation]”)

1043, ¶¶23, 44, 50 (Ground 1: ¶¶110, 112). An obvious way to do so would have been to implement Drake's QoS functionality with a communication manager, rather than modify Drake further. Ex-1043 ¶¶50-52 (Ground 1: ¶¶112-114).

Reply, 8

3. Only identifies one alleged motivation specific to Drake's QoS-12: a new “network interface” theory (discussed later)

PO's “redundancy” argument also ignores the known need for interfacing components in both off-chip and on-chip networks. Ex-1043 ¶¶25-29, 51-52

Reply, 9

The Reply Fails to Rebut Redundancy or Identify Proper Motivation for QoS-12 in Claim 6 and 10

41

The Reply's motivation arguments for claims 6 & 10:

1. Merely references its motivation argument "above" for different claims 1-2, which is insufficient

- *ActiveVideo Networks, Inc. v. Verizon Commc'ns, Inc.*, 694 F.3d 1312, 1327-28 (Fed. Cir. 2012) (motivation not specific to the claims was insufficient)

"directly" with the module. POR, 56-60 (Ground 1: 34-37). As explained above, however, there are good reasons a POSA would have been motivated to follow Drake's teaching of including a communication manager in the network interface to facilitate communication with the resource manager. *Supra*, §II.B.1.a; *see also*

Reply, 15

2. Argues there is no motivation "to change Drake's data path," but this mischaracterizes and fails the motivation requirement

- *Virtek Vision*, 97 F.4th 882, 886-87 (Fed. Cir. 2024): "The mere fact that ... possible arrangements existed in the prior art does not provide a [motivation]"

Ex-1043 ¶¶64-67 (Ground 1: ¶¶125-128). And Drake's description of QoS allocator 20 communicating with "source station 10" is not somehow motivation to change Drake's data path (which shows using QoS requestor manager 12). Ex-

Reply, 15

3. Relies on a new "network interface" theory (discussed later), which argues motivation for QoS-12 based on communicating a request and thus fails at least for limitations 6[c]/10[d] involving a "respon[se]"

The alleged combinations do not meet claim 2 (“[CM]”) and limitations 6[a]/10[a] and 6[d]/10[e]

QoS-12 Does Not Disclose the “[CM]” If the “first module” Corresponds to source station 10 (option 1)

43

Claim Construction: The “first module” and “[CM]” must be separate and distinct

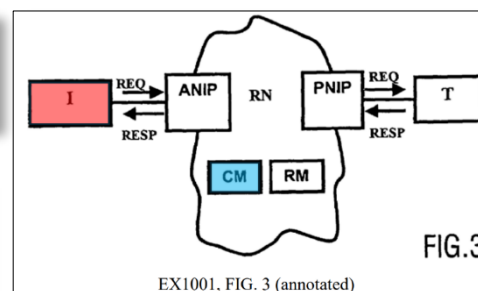
POR: A. The “First Module” and “Communication Manager” Are Separate and Distinct

POR, 12, 14

Claim 6:

6. Integrated circuit according to claim 2, wherein said first module (M; I) is adapted to issue a request (REQ) for a connection with at least one of said second modules to said communication manager (CM), said communication man-

Ex.1001, claim 6; see also *id.*, claim 10 (similar)



This claim construction is undisputed:

Reply:

A. The Board Need Not Determine Whether the “Communication Manager” Must Be Separate From the “First Module”

Reply, 2

Dr. Mowry:

Q Okay. You were not asked to provide any claim construction opinions; correct?

A That's correct.

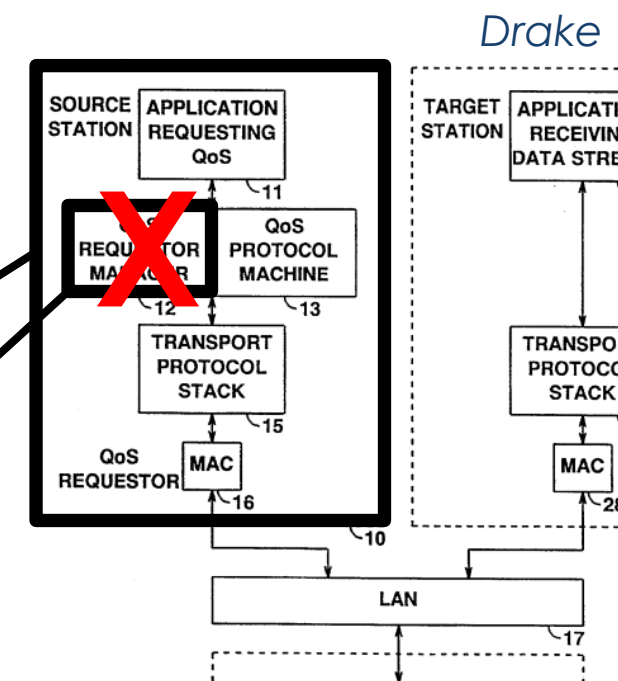
Ex.2088,
13:3-5

Institution Decision: Petition identifies “first module” as Drake’s source station 10

module.” See Prelim. Resp. 29. Petitioner consistently identifies Drake’s source station 10 as the claimed “first module.” See Pet. 27, 32, 40–41, 59.

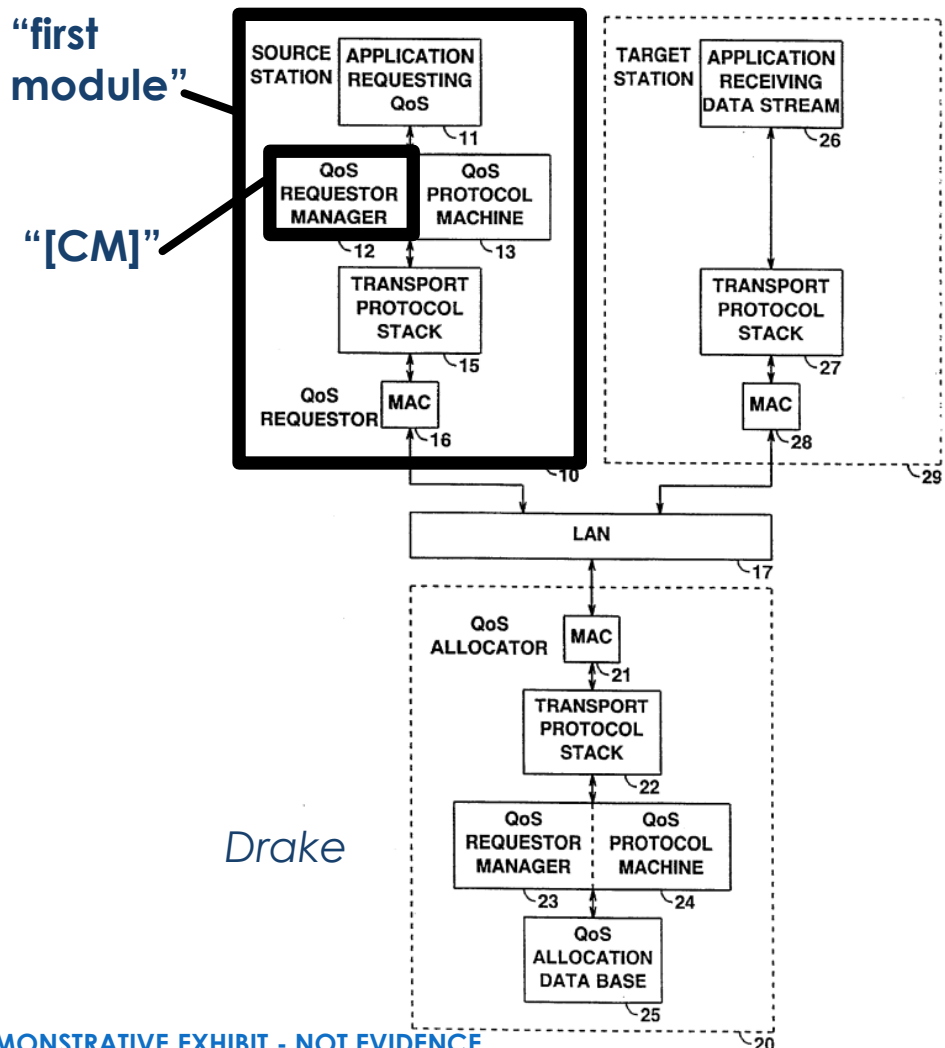
“first module”

“[CM]”



POR, 12-20, 38-40, 60-61;
POSR, 2-3, 20-21; Paper 53, 2

6[a]/10[a] Is Not Met If the “first module” Corresponds to Drake’s source station 10 (option 1)



Limitation 6[a]/10[a]: “first module” issues a request to the “[CM]”

6. Integrated circuit according to claim 2, wherein said first module (M; I) is adapted to issue a request (REQ) for a connection with at least one of said second modules to said communication manager (CM), said communication man-

Ex.1001, claim 6; see also *id.*, claim 10 (similar)

POR:

“communication manager,” respectively. Pet., 40-41, 46-47. Drake does not teach that *source station 10* (alleged “first module”) *issues a request to* QoS requestor manager 12 (alleged “communication manager”) as required for limitations 6[a] and

In Drake, the request to QoS requestor manager 12 is issued by application 11, not source station 10. EX1006, Fig. 1, 4:18-37, 4:62-65; EX2070, ¶214.

However, as explained above, a POSITA would have understood that the claimed “communication manager” cannot be completely within the “first module,” including because the “first module” would not issue a request to itself. *Supra*, §V.A.

POR, 39-41 (Ground 1); see also POR, 62 (similar for Ground 2)

POR, 39-41,
62; POSR, 3,
20-21;
Paper 53, 2

6[d]/10[e] Is Not Met If the “first module” Corresponds to Drake’s application 11 (*option 2*)

45

Limitation 6[d]/10[e]: connection between the first and second module is established

cation manager (CM), wherein a connection between the first and second module is established based on the available properties of said communication channels of said connection.

Ex.1001, claim 6; see also *id.*, claim 10 (similar)

POR:

To the extent that Petitioner relies on Drake’s application 11 as the claimed “first module,” then Petitioner’s Goossens2002/Drake combination fails to meet limitations 6[d] and 10[e], which recite, in part, “[the target] connection between the first and second module [is] established.” EX1001, 19:2-5, 20:4-6; EX2070, ¶230-231. Neither Petitioner’s analysis for limitations 6[d]/10[e] nor the corresponding portions of its expert declaration mention Drake’s application 11, much less include argument or evidence that a “connection between” application 11 and Drake’s target station 29 (alleged “second module”) “[is] established,” as recited by these limitations. See Pet., 43-44, 47; EX1003 ¶134; see also EX2078, 62:3-7, 171:21-172:4 (admitting Drake’s “connection [is] between the source station and the destination station”).

POR, 45 (Ground 1); see also POR, 63-64 (similar for Ground 2)

POR, 45, 63-64; POSR, 3, 24-25

The Reply's new “first module” theories

To Avoid Options 1-2, Reply Asserts a New “first module” Theory: Disavowal of Any Reliance on Drake (option 3)

47

Reply:

Regardless, PO’s argument is irrelevant because the Petition and Dr. Mowry

rely on *Goossens* for the claimed “first module.” *E.g.*, Petition, 21

recognized in its Institution Decision and discussed further below, in the asserted combinations Drake’s QoS requestor manager 12 (the communication manager) is implemented in the NOC of the Goossens references, not in the first module (IP block). *E.g.*, Paper 10, 66, 85.

Reply, 4

claimed “[CM]”

the “communication manager.” PO’s argument to the contrary is based on the false premise that “Petitioner relies on Drake’s source station 10 for the claimed ‘first module.’” POR, 60-61 (Ground 1: 38). As noted above, the Petition relies on *Goossens2003* for the modules. Petition, 55 (“[Goossens2003’s] IPs constitute

Reply,
15-16

Limitations 6[a]/10[a]

PO’s argument again ignores the combination. PO argues that *Drake* does not teach that “source station 10 (alleged ‘first module’) issues a request to” the QoS requestor manager. POR, 62 (Ground 1: 39). The Petition relies on *Goossens’ IP module* as the “first module” that “issue[s] [a] request.” Petition, 65-66 (Ground 1: 40-41). PO does not dispute that *Goossens2003* (and *Goossens2002*) discloses

Reply, 17

Limitations 6[d]/10[e]

Again, PO simply ignores the combination. In the combination, *Goossens2003* provides the first and second modules that the connection is established between.

Reply, 21

E.g., Petition, 55, 65-66 (Ground 1: 21-22, 40-41) PO does not dispute this.

cites Petition’s analyses of 1[a] and 6[a], not 6[d]/10[e]

Reply's "first module" Theory of Disavowing Any Reliance on Drake (option 3) Is New and Inconsistent

48

Petition Relies on Drake for the "first module"

Petition, claim 2 ("[CM]"):

3. Claim 2: "Integrated circuit according to claim 1, further comprising: at least one communication manager (CM) for managing the communication **between different modules**"

requestor managers associated with source stations, and that the QoS requestor managers manage communications between modules by "assembl[ing] a request to reserve a QoS connection for a multi-media data stream ... **between source station 10 and target station 29,**" which request is sent to the QoS allocator (i.e., resource

Pet., 35 (claim 2; only discusses Drake); see also Pet., 63 (Ground 2 relying on Ground 1 for claim 2)

Qualcomm Institution Decision, limitation 6[a]:

allocator." Pet. 41 (emphases omitted). Petitioner's explanation indicates that **Petitioner identifies source station 10 as the claimed "first module" for limitation 6.a** and identifies application 11 as a component in the claimed "first module" involved in "issu[ing] a request." *Id.*; see *id.* at 27, 32,

Petition, limitation 6[d]:

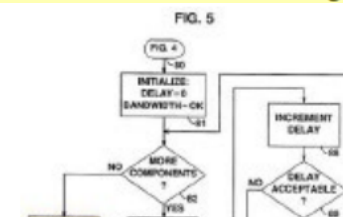
- e. Claim 6[d]: "wherein a **connection between the first and second module is established based on the available properties of said communication channels of said connection**"

¶134. Drake describes that, if the QoS allocator determines that the requested QoS properties are available, the requested **connection between the source and target**

stations is established along a designated path

through the network and required resources are

reserved. See Ex-1006, Abstract ("An allocator



Pet., 43 (6[d]; only discusses Drake); see also Pet., 47 (relying on 6[d] for 10[e]), 67 (Ground 2 relying on Ground 1 for 6[d]), 70 (relying on 6[d] for 10[e])

Reply's "first module" Theory of Disavowing Any Reliance on Drake (*option 3*) Is New and Inconsistent

49

Dr. Mowry Relies on Drake for the "first module"

Dr. Mowry, 1st deposition:

Q. So in your declaration, you've mapped Drake's source station to the first module in the claims, correct?

A. Yes.

Ex.2078, 173:8-11

Q. Can you tell me which of the components in figure 1 of Drake correspond to the claimed first module?

A. Well, in this scenario it's box 11, which is inside the source station.

Ex.2078, 174:23-175:2

Dr. Mowry, 2nd deposition:

But the application 11 in Drake corresponds to the first module. So it's clear to a person of ordinary

Ex.2088, 175:15-16

service. But the -- so it is true that the -- that the application 11 is what I identify as the first module.

Ex.2088, 178:4-5

And then in the combination, the teachings of Drake are combined with those things. And in that combination it's the application 11 that corresponds to the first module in those combinations.

Ex.2088, 180:12-15

I'm simply taking teachings from Drake to combine it with Goossens, and in my combination it's application 11 that I map onto the first module.

Ex.2088, 184:10-12

Motion to Strike: Reply's New "first module" Theory (option 3) Is Improper and Should Be Excluded

50

Legal Standards

- PTAB Consolidated Trial Practice Guide (Nov. 2019) at 73-74 (instructing that "petitioner may not submit new evidence or argument in reply that it could have presented earlier," and "a reply ...that raises a new issue or belatedly presents evidence may not be considered")
 - *Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1369-70 (Fed. Cir. 2016) (affirming the Board's exclusion of petitioner's reply and accompanying declaration for presenting a new obviousness argument not included in the Petition)
 - *Henny Penny Corp. v. Frymaster LLC*, 938 F.3d 1324, 1331 (Fed. Cir. 2019) (affirming the Board's disregard of new theory in petitioner's reply that disavowed reliance on secondary reference for a claim element)
- *Netflix, Inc. v. DivX, LLC*, 84 F.4th 1371, 1377 (Fed. Cir. 2023) ("[P]etitioner may not rely on a vague ... petition and later fault the Board for failing to understand what the petition really meant")
- *Fantasia Trading LLC v. CogniPower LLC*, IPR2021-00071, Paper 55, 20-23 (PTAB May 11, 2022) ("[W]e do not permit Petitioner and [its expert] to identify [the element] during cross examination and then completely change that identification, after [PO] argued the initial identification was flawed")

Reply's "first module" Theory (*option 3*) Is Also Improper Due to Inconsistency

51

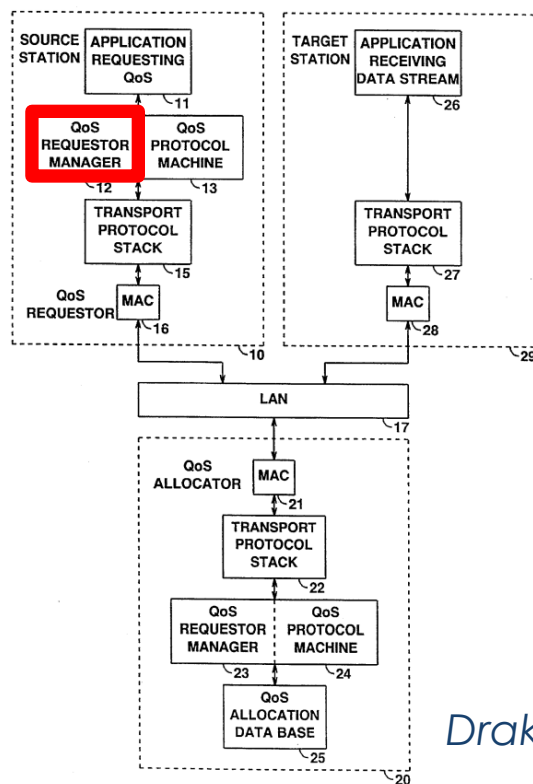
Legal Standards

- "The petition must specify where each element of the claim is found in the prior art"
 - 37 C.F.R. § 42.104(b)(4)
- "Petitioner's inconsistent identification of the claimed [element] runs afoul of [37 C.F.R. § 42.104(b)(4)]"
 - *Power Integrations, Inc. v. Semiconductor Components Indus., LLC*, IPR2017-01907, Paper 31 at 22-24 (PTAB Mar. 11, 2019)
- "Petitioner's inconsistent arguments ... do not meet the requirement of our rules"
 - *Denso Corp. v. Collision Avoidance Techs. Inc.*, IPR2017-01715, Paper 27 at 69 (PTAB Jan. 22, 2019)
- "It is unclear from Petitioner's [inconsistent] argument[s] where each element of challenged claims ... is found"
 - *Kranos Corp. v. Riddell, Inc.*, IPR2016-01649, Paper 25 at 41 (PTAB Feb. 7, 2018)

Reply's "first module" Theory (option 3) Nonetheless Fails

52

Claims 2 and 6 recite the "first module" and the Petition relies on Drake for claims 2 and 6, so the Petition must identify some component in Drake for the "first module"



Drake

Petition:

3. Claim 2: "Integrated circuit according to claim 1, further comprising: at least one communication manager (CM) for managing the communication between different modules"

Claim 1 is obvious. See VII.A.2. In addition, Goossens2002 in view of

Drake renders this limitation obvious. Ex-1003 ¶117. Drake discloses a "communication manager" in the form of a "QoS requestor manager." Ex-1006,

- b. Claim 6[a]: "wherein said first module (M; I) is adapted to issue a request (REQ) for a connection with at least one of said second modules to said communication manager (CM)"

Goossens2002 in view of Drake renders this limitation obvious. Ex-1003

- e. Claim 6[d]: "wherein a connection between the first and second module is established based on the available properties of said communication channels of said connection"

Goossens2002 in view of Drake renders this limitation obvious. Ex-1003

Without identifying a "first module" in Drake, the Reply fails to show:

- that Drake's QoS-12 (alleged "[CM]") "manag[es] the communication between ... modules" (for claim 2) or
- that the "first module" "issue[s] a request ... to" Drake's QoS-12 (alleged "[CM]") (for limitation 6[a])

The Reply does not dispute that 6[d]/10[e] are not met if Petitioner relies on Drake's application 11 for the "first module"

To At Least Avoid Option 1, Reply Asserts New Theory that “first module” Is Drake’s application 11 (option 2)

53

Reply:

Petitioner acknowledges that the Board preliminarily found that Petitioner was referring to Drake’s “source station 10” as the first module in Drake. Paper 16, 23-24. However, Petitioner respectfully notes that the Petition and Dr. Mowry consistently point to the “application in the source station” as the thing specifically making the service request. Petition, 27 (“[S]tation 10 is the source of a desired

Reply, 3

Reply's “first module” Theory of Relying on Drake's Application 11 (option 2) Is New and Inconsistent

54

Petition Relies on Drake's source station 10 for the “first module”

Petition, claim 2 (“[CM]”):

3. Claim 2: “Integrated circuit according to claim 1, further comprising: at least one communication manager (CM) for managing the communication **between different modules**”

requestor managers associated with source stations, and that the QoS requestor managers manage communications between modules by “assembl[ing] a request to reserve a QoS connection for a multi-media data stream ... **between source station 10 and target station 29,**” which request is sent to the QoS allocator (i.e., resource

Pet., 35 (claim 2); see also Pet., 63 (Ground 2 relying on Ground 1 for claim 2)

Qualcomm Institution Decision, limitation 6[a]:

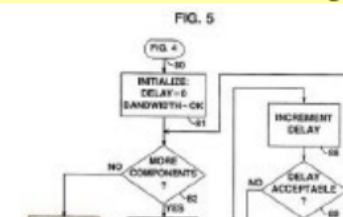
allocator.” Pet. 41 (emphases omitted). Petitioner's explanation indicates that **Petitioner identifies source station 10 as the claimed “first module” for limitation 6.a** and identifies application 11 as a component in the claimed “first module” involved in “issu[ing] a request.” *Id.*; see *id.* at 27, 32,

Petition, limitation 6[d]:

- e. Claim 6[d]: “wherein a **connection between the first and second module is established based on the available properties of said communication channels of said connection**”

¶134. Drake describes that, if the QoS allocator determines that the requested QoS properties are available, the requested **connection between the source and target stations is established** along a designated path

through the network and required resources are reserved. See Ex-1006, Abstract (“An allocator



Pet., 43 (6[d]); see also Pet., 47 (relying on 6[d] for 10[e]), 67 (Ground 2 relying on Ground 1 for 6[d]), 70 (relying on 6[d] for 10[e])

Reply's "first module" Theory of Relying on Drake's Application 11 (option 2) Is New and Inconsistent 55

Dr. Mowry, 1st deposition: identifies Drake's source station 10 as the "first module"

Q. So in your declaration, you've mapped Drake's source station to the first module in the claims, correct?
A. Yes.

Ex.2078, 173:8-11

Dr. Mowry, 2nd deposition: identifies Drake's source station 10 as the "module" in the '449 Patent and Goossens2003

Q Yes. Box 61 in Figure 4 of Drake involves a request to register the source station in the QoS allocator station 20; correct?

A Yes. And the reason for this is that, for example, if you look at the -- if you look at Figure 1, the end point for the interconnect, which in this case is LAN 17, those are stations or modules in the '449 terminology.

And so, for example, from the perspective of the LAN, one of the end points is source station 10, which is going to be the source of this quality of service communication, and another end point is target station 29.

Ex.2088, 71:12-24

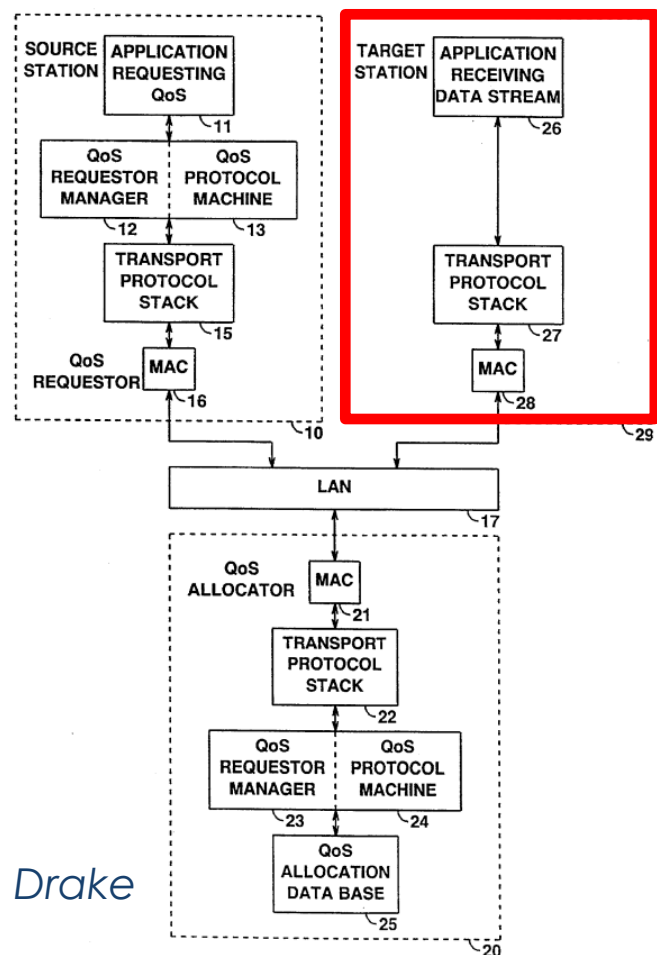
Q Using Figure 4.5 of Goossens2003 as an example, which of these three network interfaces would a person of skill in the art implement Drake's QoS requestor manager 12?

But in any module that can initiate communication that could be a source station, it would need to have access to a communication manager.

Ex.2088, 84:24-89:2, 89:18-20

Reply's “first module” Theory of Relying on Drake's Application 11 (option 2) Is New and Inconsistent

56



Drake

Petition: identifies the “second module” as Drake’s target station 29, not application 26

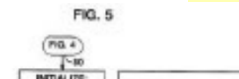
“second module.” Ex-1003 ¶128. Similarly, Drake describes that an application in a source station (*i.e.*, first module) “requests a QoS connection to the destination or target station” (*i.e.*, second module). Ex-1006, 4:26–29; *see also id.*, Abstract,

Pet., 40 (Ground 1, limitation 6[a]); *see also* Pet., 46–47 (relying on 6[a] for 10[a], 65–66 (Ground 2 relying on Ground 1 for 6[a]), 69 (relying on 6[a] for 10[a])

- e. **Claim 6[d]: “wherein a connection between the first and second module is established based on the available properties of said communication channels of said connection”**

Goossens2002 in view of Drake renders this limitation obvious. Ex-1003

¶134. Drake describes that, if the QoS allocator determines that the requested QoS properties are available, the requested connection between the source and target stations is established along a designated path



Pet., 43 (Ground 1, limitation 6[d]); *see also* Pet., 47 (relying on 6[d] for 10[e]), 67 (Ground 2 relying on Ground 1 for 6[d]), 70 (relying on 6[d] for 10[e])

Motion to Strike: Reply's New "first module" Theory (option 2) Is Improper and Should Be Excluded 57

Legal Standards

- PTAB Consolidated Trial Practice Guide (Nov. 2019) at 73-74 (instructing that "petitioner may not submit new evidence or argument in reply that it could have presented earlier," and "a reply ...that raises a new issue or belatedly presents evidence may not be considered")
 - *Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1369-70 (Fed. Cir. 2016) (affirming the Board's exclusion of petitioner's reply and accompanying declaration for presenting a new obviousness argument not included in the Petition)
- *Netflix, Inc. v. DivX, LLC*, 84 F.4th 1371, 1377 (Fed. Cir. 2023) ("[P]etitioner may not rely on a vague ... petition and later fault the Board for failing to understand what the petition really meant")
- *Arista Networks, Inc. v. Cisco Sys., Inc.*, IPR2016-00308, Paper 42, 12-13 (PTAB May 25, 2017) (striking new theory despite its discussion in expert deposition, as the deposition did not remedy the petition and declaration's deficiency)

Reply's "first module" Theory (*option 2*) Is Also Improper Due to Inconsistency

58

Legal Standards

- "The petition must specify where each element of the claim is found in the prior art"
 - 37 C.F.R. § 42.104(b)(4)
- "Petitioner's inconsistent identification of the claimed [element] runs afoul of [37 C.F.R. § 42.104(b)(4)]"
 - *Power Integrations, Inc. v. Semiconductor Components Indus., LLC*, IPR2017-01907, Paper 31 at 22-24 (PTAB Mar. 11, 2019)
- "Petitioner's inconsistent arguments ... do not meet the requirement of our rules"
 - *Denso Corp. v. Collision Avoidance Techs. Inc.*, IPR2017-01715, Paper 27 at 69 (PTAB Jan. 22, 2019)
- "It is unclear from Petitioner's [inconsistent] argument[s] where each element of challenged claims ... is found"
 - *Kranos Corp. v. Riddell, Inc.*, IPR2016-01649, Paper 25 at 41 (PTAB Feb. 7, 2018)

Reply's "first module" Theory (option 2) Nonetheless Is Wrong and Fails

59

Dr. Bagherzadeh: "first module" would be source station 10

24; *see also* Pet., 40, 46-47. Indeed, if a POSITA was motivated to combine Goossens2002 and Drake (although they would not be, as I explain herein), then the POSITA would have understood Goossens2002's IP to correspond to Drake's source station 10, not application 11 therein.

Ex.2070, 83-84 n.4 (Ground 1); *see also id.*, 133 n.8 (similar for Ground 2)

POR:

231. Neither Petitioner's analysis for limitations 6[d]/10[e] nor the corresponding portions of its expert declaration mention Drake's application 11, much less include argument or evidence that a "connection between" application 11 and Drake's target station 29 (alleged "second module") "[is] established," as recited by these limitations. *See* Pet., 43-44, 47; EX1003 ¶134; *see also* EX2078, 62:3-7, 171:21-

POR, 45 (Ground 1); *see also* POR, 63-64 (similar for Ground 2)

Q. Sitting here today, do you recall? Do you have a position about what is the module in Drake?

MR. CHRISTOPHER: Same objection.

THE WITNESS: I believe the modules would be stations 10.

BY MR. LOUWAGIE:

Q. So your opinion is that the source station 10 is a module?

A. Yes.

Q. Okay.

What is the basis for that opinion?

A. It would be obvious to a POSITA that's the module because it is the source of requesting and receiving the replies and so on. Those are my indications. I can read the details in my declaration, if you want.

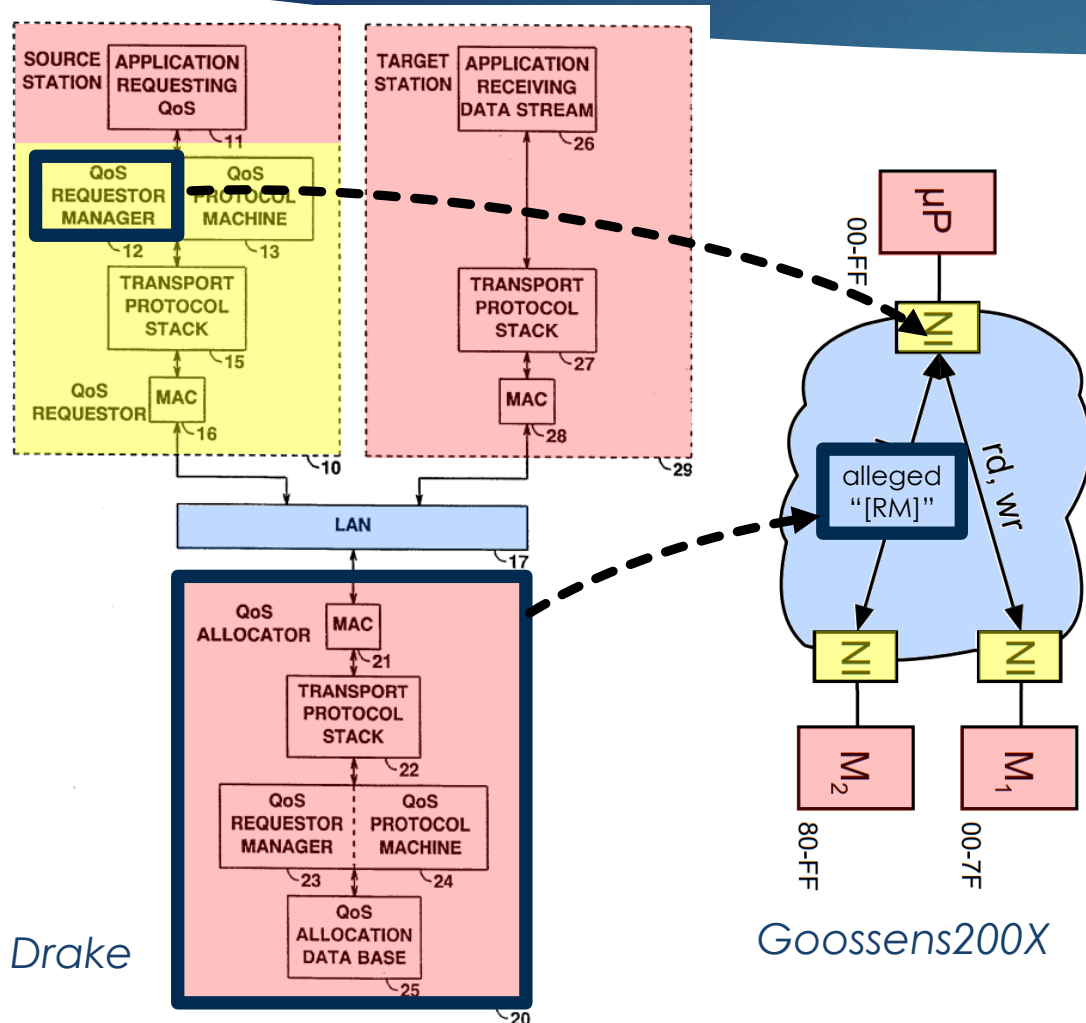
Ex.1037, 62:9-24

POR, 45, 63-64; POSR, 2-4, 24-25

The Reply's new “network interface” (“NI”) theory

Reply's New "NI" Theory for How and Why QoS-12 Would Be Implemented in Goossens200X

61



Reply's New "NI" theory:

- (i) Drake's QoS-12 is an NI component;
- (ii) Drake's QoS-12 would be implemented in an NI of Goossens200X's NOC; and
- (iii) a POSITA would be motivated to do this because of an alleged "need for interfacing"

Reply's New "NI" Theory for How and Why QoS-12 Would Be Implemented in Goossens200X 62

New "NI" theory in the Reply:

PO's "redundancy" argument also ignores the known need for interfacing components in both off-chip and on-chip networks. Ex-1043 ¶¶25-29, 51-52 (Ground 1: ¶¶113-114). A POSA would have known that Goossens2003's NOC would desirably include an interfacing component like Drake's communication manager (QoS requestor manager) because the "re-use[d]" IP blocks

Reply, 9

Drake indicates that QoS requestor manager 12 provides interfacing. Ex-1043,

Reply, 9

⁵ PO incorrectly contends that Dr. Mowry was "evasive" when asked where Drake's QoS requestor manager would be implemented in Goossens. Dr. Mowry testified that in Drake it is shown in the network interface, and that would be the "natural place to put it" in Goossens. Ex-2078, 203:24-204:9. As is evident from

Reply, 13

components were outside of IP block, in NoC). As noted above, a POSA would also recognize that Drake's QoS requestor manager 12 was part of Drake's network interface (Ex-1043 ¶28; Ex-1006, 4:34-35) and Goossens2003 teaches implementing communication management functionality in the network interface of its NOC (Ex-1003, ¶¶185-186; Ex-1043, ¶¶48, 29).

Reply, 12

"directly" with the module. POR, 56-60 (Ground 1: 34-37). As explained above, however, there are good reasons a POSA would have been motivated to follow Drake's teaching of including a communication manager in the network interface to facilitate communication with the resource manager. *Supra*, §II.B.1.a; *see also*

Reply, 15

POSR, 5-6, 8, 11-12, 16, 18-19; Paper 53, 3-5

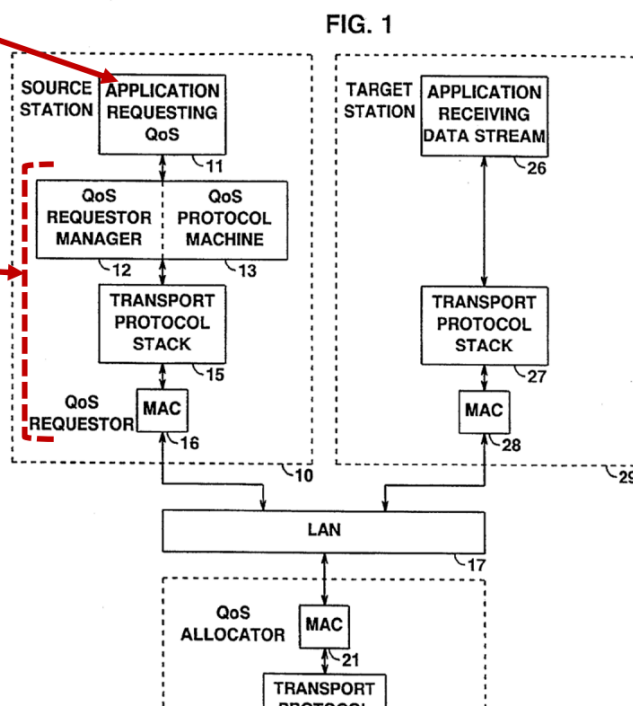
Reply's New "NI" Theory for How and Why QoS-12 Would Be Implemented in Goossens200X

63

New "NI" theory in Dr. Mowry's Reply Declaration:

Application 11 "requests a QoS connection," and also transmits the multimedia data stream (for example, Exhibit 1006, 4:27-32, 4:48-50)

Network interface "components" (for example, Exhibit 1006, 4:34-35)



Ex.1043 ¶15

28. A POSITA would have understood Drake to teach that the QoS requestor manager 12 is part of the network interface components for source station 10. This would have been understood because (A) network interfaces were

Ex.1043 ¶28

52. A POSITA would understand that Goossens2003's NOC would desirably include a component to take the signal from the "re-use[d]" IP block and communicate with the network. Exhibit 1007, Abstract. Different re-used IPs would typically use different protocols to describe the type of service it wanted to send its data over. Exhibit 1010 at 1. Therefore, Goossens2003's NOC would have been expected to use a component such as Drake's QoS requestor manager 12 to assemble/format a request that could be understood by the network. That is exactly

Ex.1043 ¶52 (Ground 2); see also *id.* ¶114 (similar for Ground 1)

Motion to Strike: Reply's New "NI" Theory Is Improper and Should Be Excluded

64

Legal Standards

- PTAB Consolidated Trial Practice Guide (Nov. 2019) at 73-74 (instructing that "petitioner may not submit new evidence or argument in reply that it could have presented earlier," and "a reply ...that raises a new issue or belatedly presents evidence may not be considered")
 - *Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1369-70 (Fed. Cir. 2016) (affirming the Board's exclusion of petitioner's reply and accompanying declaration for presenting a new obviousness argument not included in the Petition)
- *Kingston Tech. Co. v. Spex Techs., Inc.*, IPR2017-01021, Paper 39, 33-34 (PTAB Oct. 1, 2018) (Boudreau, ALJ) (new reply argument failed)
- *Samsung Elecs. Co. v. Resonant Sys., Inc.*, IPR2023-00992, Paper 47, 89-92 (PTAB Jan. 8, 2025) (Amundson, ALJ) (new reply argument failed)
- *Arista Networks, Inc. v. Cisco Sys., Inc.*, IPR2016-00308, Paper 42, 12-13 (PTAB May 25, 2017) (striking new theory despite its discussion in expert deposition, as the deposition did not remedy the petition and declaration's deficiency)
- *Colas Sols., Inc. v. Blacklidge Emulsions, Inc.*, 759 F.App'x 986, 990 (Fed. Cir. 2019) ("[S]imply point[ing] out the flaws in the underlying evidence" does not "open[] the door" for new theories)

Reply's New "NI" Theory Is Undermined by and Inconsistent with Dr. Mowry's Testimony

65

The Reply and Dr. Mowry misquote his 1st deposition testimony and disavow certain answers

Reply:

⁵ PO incorrectly contends that Dr. Mowry was "evasive" when asked where Drake's QoS requestor manager would be implemented in Goossens. Dr. Mowry testified that in Drake it is shown in the network interface, and that would be the "natural place to put it" in Goossens. Ex-2078, 203:24-204:9. As is evident from the transcript, the subsequent testimony PO cites resulted from Dr. Mowry (mis)understanding that PO's counsel was asking instead about the *resource manager*. Ex-1043 ¶¶155-57.

Reply, 13

Dr. Mowry's
Actual
Testimony:

Q. You have not explicitly defined in paragraph 122 where Drake's QoS requestor manager would be implemented as a circuit on the integrated circuit chip in Goossens2002?

THE WITNESS: Well, there are -- I'm referring to the teachings of Drake, and there would be several -- I mean, there would be several options for where this might be implemented. It's shown here in the network interface. That would be a natural place to put it. I

Dr. Mowry Reply Declaration:

155. The Patent Owner's brief, at pages 31-32 of Paper 35, mischaracterizes my testimony regarding implementing Drake's communication manager in the Goossens systems.

156. I actually testified that Drake shows its QoS requestor manager (*communication manager*) "in the network interface" and "[t]hat would be the natural place to put it" in Goossens' system. Exhibit 2078, 203:24-204:9 (emphasis added, see also the green highlighted text below). Then, as the testimony shows, I thought that I had misunderstood the question and that Patent Owner's attorney was instead asking about Drake's *resource* manager (not Drake's communication manager), and so I changed my response to start talking about Drake's *resource manager* (blue highlighted text):

Ex.1043 ¶¶155-56

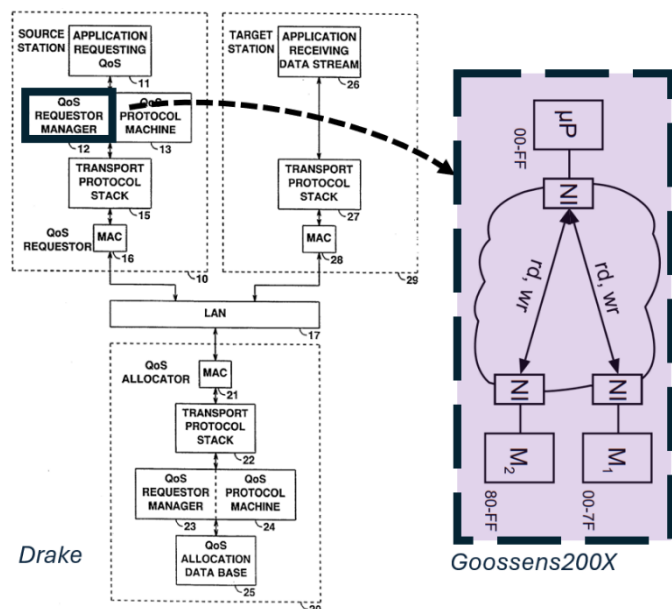
Ex.2078, 203:24-204:8

Reply's New "NI" Theory Is Undermined by and Inconsistent with Dr. Mowry's Testimony

66

Dr. Mowry repeatedly testified in his 1st deposition that QoS-12 could go "anywhere" in Goossens200X

Dr. Mowry
(1st deposition):



Drake

Goossens200X

You don't explicitly state anywhere here between paragraphs 155 and paragraph 166 where Drake's QoS requestor manager would be implemented on the Goossens2003 chip, correct?

A. Okay. I think maybe -- maybe I'm possibly understanding your question, or how to answer your question, rather.

So the answer is, it can go anywhere on the chip as long as it has access to the -- as long as it's attached to the NOC, because the only requirement is that the source -- the IP block that's the source of communication just has to be able to talk to it. So physically it can go anywhere on the chip provided that it has a connection to the NOC. And that would be true of essentially the whole chip. So you have flexibility, really, to put it anywhere. You just have to attach it to the NOC. And the same is true for Goossens2002 as well. It can go anywhere on the chip. The only requirement is it just has to be connected to the network on chip.

Ex.2078, 211:6-25

(during redirect)

Q. Is deciding where specifically to implement the QoS requestor manager within the chip of Goossens2002 -- would that have been something that was within the ordinary skill of a POSA in early 2002?

MR. CHRISTOPHER: Objection to form.

THE WITNESS: Well, absolutely. It would be something that a POSA in that time frame would be very comfortable doing, because, as I mentioned, it would be clear -- obvious that it could go anywhere on the chip as long as it had a connection to the interconnect, because the only requirement, similar to figure 1 in Drake, is that it just has to be -- have connectivity with the -- with the IPs through the interconnect.

BY MR. KOHLHEPP:

Q. Would the answer you just gave change at all if the relevant time frame was early 2003?

A. No, it would not.

Ex.2078, 233:10-234:1

Reply's New "NI" Theory Is Undermined by and Inconsistent with Dr. Mowry's Testimony

67

After PO's motion-to-strike request, Dr. Mowry 2nd deposition backtracked from the NI theory

Dr. Mowry
(2nd deposition):

Ex.2088, 82:1-10
(Grounds 1 & 2)

Would it be fair to say that your opinion is that Drake's QoS requestor manager 12 could be implemented anywhere on the chips in either of the Goossens references so long as it is attached to the network?

A Yes, that's correct. As I said in that sentence we're looking at, a natural place would be to put it in the network interface, but it -- but that's not the only possibility. It would need to be attached to the network.

Ex.2088, 81:7-15
(Grounds 1 & 2)

Q In your second declaration, you have opined that it would have been obvious to implement Drake's QoS requestor manager 12 in the network interfaces of the Goossens references; correct?

THE WITNESS: I'm saying that that's a natural place to put it. That's not necessarily the only place, but that -- I'm saying that that's a natural place to locate it. It's one of the options.

If we were to assume that each of the modules in Figure 4.5 could act as an initiator module, each of the network interfaces would need to include a communication manager; correct?

A Well, as I said before, the network interface is the natural place -- is a natural place to put the communication manager. And in order to -- there are other possibilities for where it's located.

Ex.2088, 89:7-14
(Ground 2)

Virtek Vision Int'l ULC v. Assembly Guidance Sys., Inc., 97 F.4th 882, 886-87 (Fed. Cir. 2024) (“[O]bviousness concerns whether a [POSITA] not only could have made but would have been motivated to make the combinations or modifications”)

Reply's New "NI" Theory Is Undermined by and Inconsistent with Dr. Mowry's Testimony

68

Dr. Mowry's 2nd deposition is internally inconsistent regarding Goossens2003 (Ground 2)

Dr. Mowry (2nd deposition) saying QoS-12 would *not* be limited to Goossens2003's NI:

Would it be fair to say that your opinion is that Drake's QoS requestor manager 12 could be implemented anywhere on the chips in either of the Goossens references so long as it is attached to the network?

Ex.2088, 82:1-10

A Yes, that's correct. As I said in that sentence we're looking at, a natural place would be to put it in the network interface, but it -- but that's not the only possibility. It would need to be attached to the network.

If we were to assume that each of the modules in Figure 4.5 could act as an initiator module, each of the network interfaces would need to include a communication manager; correct?

Ex.2088, 89:7-14

A Well, as I said before, the network interface is the natural place -- is a natural place to put the communication manager. And in order to -- there are other possibilities for where it's located.

Dr. Mowry (2nd deposition) saying QoS-12 *would* be limited to Goossens2003's NI:

Q And then same question for Goossens2003. It's your opinion that the network interface is not the only place where the QoS requestor manager 12 for Drake could be implemented in Goossens2003 in your proposed combination; correct?

A No, that's incorrect. Goossens2003 already discloses a communication manager, and it is in the network interface.

So when I map the teachings of Drake onto the Goossens2003 reference, in that case the communication manager, which corresponds to the QoS requestor manager in Drake, that definitely is in Goossens2003's network interface.

Ex.2088, 95:14-96:1

Dr. Mowry's Inconsistent Positions for Implementing Drake's QoS-12 in Goossens200X are Improper 69

Legal Standards

- “The petition must specify where each element of the claim is found in the prior art”
 - 37 C.F.R. § 42.104(b)(4)
- “Petitioner's inconsistent arguments ... do not meet the requirement of our rules”
 - *Denso Corp. v. Collision Avoidance Techs. Inc.*, IPR2017-01715, Paper 27 at 69 (PTAB Jan. 22, 2019)
- “It is unclear from Petitioner's [inconsistent] argument[s] where each element of challenged claims ... is found”
 - *Kranos Corp. v. Riddell, Inc.*, IPR2016-01649, Paper 25 at 41 (PTAB Feb. 7, 2018)

Reply's "NI" Theory is Wrong – Drake's QoS-12 Is Not an NI Component

70

Drake's QoS-12 is a QoS component, not an NI component

Dr. Mowry asserts that QoS-12 assembles/formats a request to be "understood by the network":

But as Dr. Mowry admits, QoS-12 assembles/formats a QoS request to be understood by QoS-allocator 20, not by the network:

send its data over. Exhibit 1010 at 1. Therefore, Goosens2003's NOC would have been expected to use a component such as Drake's QoS requestor manager 12 to assemble/format a request that could be understood by the network. That is exactly what Drake teaches the QoS requestor manager 12 is for. Exhibit 1006, 4:33-35

Ex.1043 ¶152 (Ground 2); see also *id.* ¶114 (similar for Ground 1)

Q The QoS requestor manager 12 and QoS protocol machine 13 in the source station assemble and format the QoS request so that it can be understood by the QoS requestor manager 23 in the allocator station 20; correct?

A Well, the goal is to communicate with the allocator station -- QoS allocator station 20. So, yes, that is the intention, is to assemble and format the request so that it can be understood by QoS allocator 20.

Ex.2088, 61:7-15

Dr. Mowry recognizes that QoS-12 is actually a QoS component:

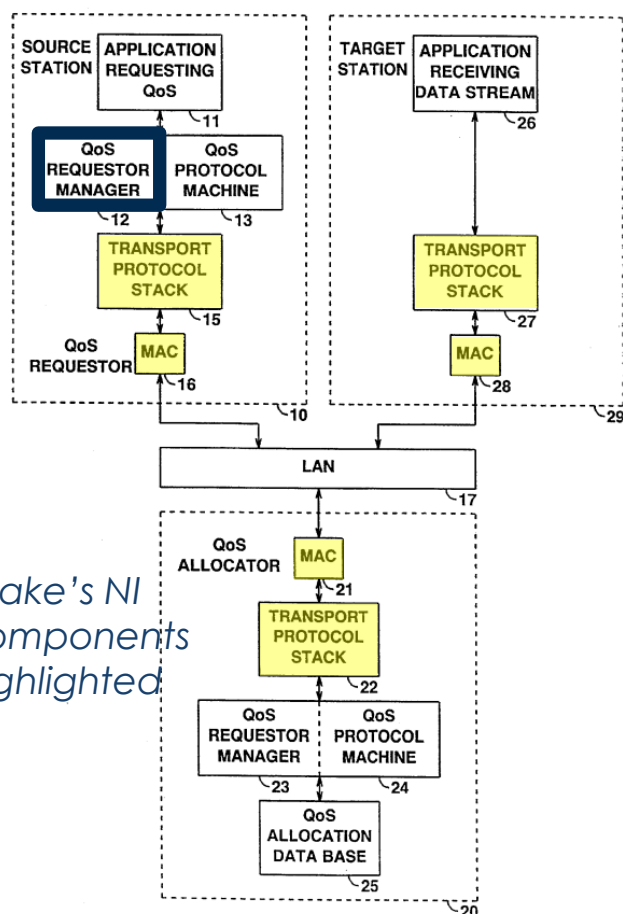
NOC with Drake's QoS teachings would be to simply use Drake's QoS components communicating with each other as Drake taught (including the QoS requestor manager 12 that "assemble[s]" / "format[s]" the request).

Ex.1043 ¶152

Reply's "NI" Theory is Wrong – Drake's QoS-12 Is Not an NI Component

71

Drake's NI components are the Transport Protocol Stack and MAC, not QoS-12



QoS-12 only assembles/formats the QoS request, whereas components 15 & 16 format/launch the request packet:

QoS protocol machine 13. Together, components 12 and 13 assemble a request to reserve a QoS connection for a program described in IBM Manual S04G-1046. The QoS requestor manager 12 interacts with application 11 using internal messages as is well known in the art and utilizes QoS protocol machine 13 to format the QoS request.

Ex.1006, 4:36-37, 4:62-65

between source station 10 and target station 29. Using a standard LAN transport protocol 15 to format a request packet, the packet is launched on LAN 17 through a medium access control (MAC) entity 16. LAN transport protocol 15

Ex.1006, 4:37-40

Dr. Mowry acknowledges that Drake's LAN is a packet-based network:

Q Would you agree that the LAN 17 disclosed in Drake is a packet-based network?

A I'm trying to locate where that's -- all the places where that's discussed in Drake. It certainly is discussed as being a packet-based network.

I don't recall whether it discusses other possibilities, but it certainly discusses that -- it discusses it being a packet-based network, yes.

Ex.2088, 48:24-49:6

Dr. Mowry admits that components 15 & 16 "allow" QoS-12 to communicate over LAN 17:

Q Okay. You would agree that the transport protocol stack 15 and MAC 16 allow the QoS requestor manager 12 to communicate with the LAN 17; correct?

A The role of the transport protocol stack 15 and the MAC 16 is to facilitate that communication over the LAN, yes, that's true.

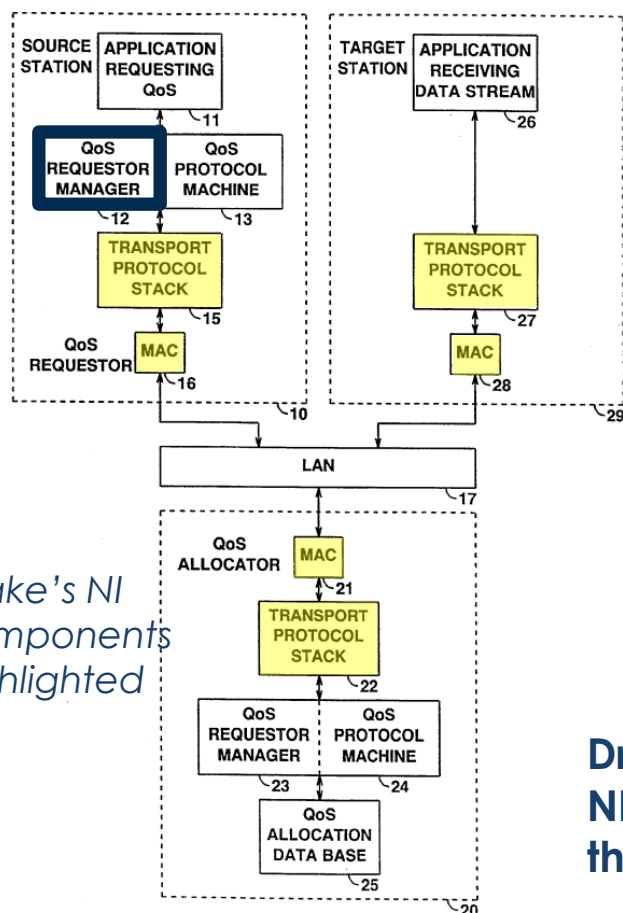
Ex.2088, 38:17-22

Drake's NI components highlighted

Reply's "NI" Theory is Wrong – Drake's QoS-12 Is Not an NI Component

72

Drake's NI components are the Transport Protocol Stack and MAC, not QoS-12



Components 15 & 16, unlike QoS-12:

- (i) are "standard parts of all stations attached to [the] LAN"; and
- (ii) their "details ... are determined by the LAN itself" so that they can communicate with the LAN

Drake:

access control (MAC) entity 16. LAN transport protocol 15 and MAC 16 are standard parts of all stations attached to a LAN, the details of which are determined by the LAN itself,

Ex.1006, 4:40-42

Dr. Mowry:

Q And a person of skill in the art would understand that the details of LAN transport protocol 15 and MAC 16 are determined by the LAN so that those components can communicate with the LAN; correct?

A It's true that those components need to communicate with the LAN, and they need to understand how to do that, yes.

Ex.2088, 37:25-38:13

Q Drake does not disclose that the details of the QoS requestor manager 12 are determined by the LAN itself; correct?

A I don't recall a discussion of that issue in Drake. It's possible that I mis- -- I don't recall it -- discussing the details of that being determined by the LAN.

Dr. Mowry says an NI's role is to know the network details:

above, network interfaces "decouple computation from communication" by enabling their host/IP module to communicate without requiring specific knowledge of the low-level network details. A POSITA would understand that

Ex.1043, ¶151

Drake's NI components highlighted

There Is No Motivation for Drake's QoS-12 in Goossens200X's NI for Network Interfacing

73

(1)

The “interfacing” allegedly performed by Drake's QoS-12 is to “assemble/“format” a request:

Reply:

Drake indicates that QoS requestor manager 12 provides interfacing. Ex-1043, ¶¶28, 15; Ex-1006, 4:34-35 (“assemble[s] a request”). And Goossens2003 already

Reply, 9

Dr. Mowry Reply Decl.:

28. A POSITA would have understood Drake to teach that the QoS requestor manager 12 is part of the network interface components for source station 10. This would have been understood because (A) network interfaces were ¶77); (B) Drake specifically teaches that the functionality of its QoS request manager 12 includes “assembl[ing]” and “format[ing]” the QoS request to enable

Ex.1043, ¶28

But Goossens200X's IP already does this:

Petition:

¶128. Goossens2002 describes that its IPs (*i.e.*, processing modules) “can set up and remove connections.” Ex-1005, 3. Goossens2002 explains that the IPs do so by making a “service request” that includes information regarding the performance requirements of the connection. *Id.*, 2–3. The IP that makes a service request is a

Pet., 40 (Ground 1); see also *id.*, 65 (similar for Ground 2)

Goossens2002:

a service request from an IP,

Ex.1005, 3

There Is No Motivation for Drake's QoS-12 in Goossens200X's NI for Network Interfacing

74

(2)

The Reply's alleged "need for interfacing" in Goossens200X is to translate IPs' "different protocols" to be "understood by the network":

communicate with the network. Exhibit 1007, Abstract. Different re-used IPs would typically use different protocols to describe the type of service it wanted to send its data over. Exhibit 1010 at 1. Therefore, Goossens2003's NOC would have been expected to use a component such as Drake's QoS requestor manager 12 to assemble/format a request that could be understood by the network. That is exactly

Ex.1043 ¶152 (Ground 2); see also *id.* ¶114 (similar for Ground 1)

Reply:

(Ground 1: ¶¶113-114). A POSA would have known that Goossens2003's NOC would desirably include an interfacing component like Drake's communication manager (QoS requestor manager) because the "re-use[d]" IP blocks Goossens2003 discloses typically used different protocols to describe the type of service it wanted to send data over. Ex-1043 ¶¶51-52 (Ground 1: *id.* ¶¶113-14).

But Drake's QoS-12 does not do that and instead assembles/formats a request to be understood by QoS allocator 20:

Drake:

QoS protocol machine 13. Together, components 12 and 13 assemble a request to reserve a QoS connection for a program described in IBM Manual S04G-1046. The QoS requestor manager 12 interacts with application 11 using internal messages as is well known in the art and utilizes QoS protocol machine 13 to format the QoS request.

Ex.1006, 4:36-37, 4:62-65

Dr. Mowry:

Q The QoS requestor manager 12 and QoS protocol machine 13 in the source station assemble and format the QoS request so that it can be understood by the QoS requestor manager 23 in the allocator station 20; correct?

A Well, the goal is to communicate with the allocator station -- QoS allocator station 20. So, yes, that is the intention, is to assemble and format the request so that it can be understood by QoS allocator 20.

Ex.2088, 61:7-15

Reply, 9

There Is No Motivation for Drake's QoS-12 in Goossens200X's NI for Network Interfacing

75

Dr. Mowry:

(3)

The interfacing component and function for which Drake's QoS-12 was allegedly needed would already be obvious in Goossens2003

Dr. Mowry
Reply Decl.:

send its data over. Exhibit 1010 at 1. Therefore, Goossens2003's NOC would have been expected to use a component such as Drake's QoS requestor manager 12 to assemble/format a request that could be understood by the network. That is exactly

including the details of the QoS components. A POSITA would not expect that Goossens2003's network would be able to perform its QOS functionality without a component to assemble the QoS request from the different re-used IP protocols.

Ex.1043 ¶52 (Ground 2); see also *id.* ¶114 (similar for Ground 1)

Reply:

50-52 (Ground 1: ¶¶112-114). This is more evidence a POSA would be motivated to use the communication manager component teaching of by Drake, to implement the communication management function already taught by Goossens2003. Ex-

Reply, 9

Q A person of skill in the art would understand that the network interfaces disclosed in Goossens2003 would take the signal from the IP block and communicate with the network; correct?

A Yes, I think that's -- yup. That's basically -- that's -- you're more or less reading the sentence there. Yes, that's correct.

Ex.2088,
128:2-8

Q You haven't formed any opinions as to whether it would be technically possible to perform the QoS functionality described in Goossens2003 without a component to assemble the QoS request; correct?

A Well, as I said a person --
MR. KOHLHEPP: (Indecipherable.)
(Stenographer clarification.)
MR. KOHLHEPP: Object to form.

THE WITNESS: A person of ordinary skill in the art would not expect that that would be -- that the Goossens2003 would be able to perform this functionality without a component that assembles the QoS request from the different reused IP protocols.

Ex.2088,
132:13-25

There Is No Motivation for Drake's QoS-12 in Goossens200X's NI for Network Interfacing

(4)

Even if QoS-12 is part of Drake's NI, it would contain a dedicated processor and thus not be feasible on Goossens200X's chip

'449 patent:

tively high cost compared to off-chip networks. An off-chip network interface usually contains a dedicated processor to implement the protocol stack up to network layer or even higher, to relieve the host processor from the communication processing. Including a dedicated processor in a network interface is not feasible on chip, as the size of the network interface will become comparable to or larger than the IP to be connected to the network. Moreover, running the protocol

Ex.1001, 2:17-24

Dr. Mowry:

Q The '449 patent teaches that off-chip network interfaces usually include a dedicated processor; correct?

A That's what the sentence says.

Q And that would be consistent with the understanding of a person of skill in the art; correct?

A Yes. That's a common way to implement a network interface for an off-chip network.

Ex.2088, 158:23-159:5

The Reply's new “resource manager” argument

Reply's New Argument about Drake's QoS allocator 20 in Goossens200X Is New and Fails

78

Reply:

Ex-1003, ¶¶156-166, 173; Petition, 51-54, 57-58. And the combination itself shows where Drake's QoS allocator would receive requests from: Goossens2003's IP module (the unit making the request) through Drake's QoS requestor manager 12 (data path shown in Drake). Petition, 61-62; Ex-1043 ¶¶43-45. PO's

Reply, 14

(1) Reply's argument is new and improper:

or QoS-12. POR, 32, 54; EX2070, ¶¶173-74, 248-49. Tellingly, the Reply does not and cannot identify such explanation in the Petition or associated declaration, as the Reply's citations (Pet., 51-54, 57-58, 61-62; EX1003, ¶¶156-66, 173) do not specify from where QoS allocator 20 would receive the request and do not even address

Sur-Reply, 17

(2) Reply's argument is based on the Reply's new "first module" (option 2) and "NI" theories (previously discussed)

(3) Reply's new argument is based on Drake's "data path," which is inapplicable because per the Reply, Drake's components are arranged differently in Drake (outside the network) versus Goossens200X (inside the network):

IP modules. In the combination, the QoS components (including the communication manager) would still be in the location described in Goossens: outside the IP modules. Ex-1043 ¶¶7, 25-29. Because the communication manager

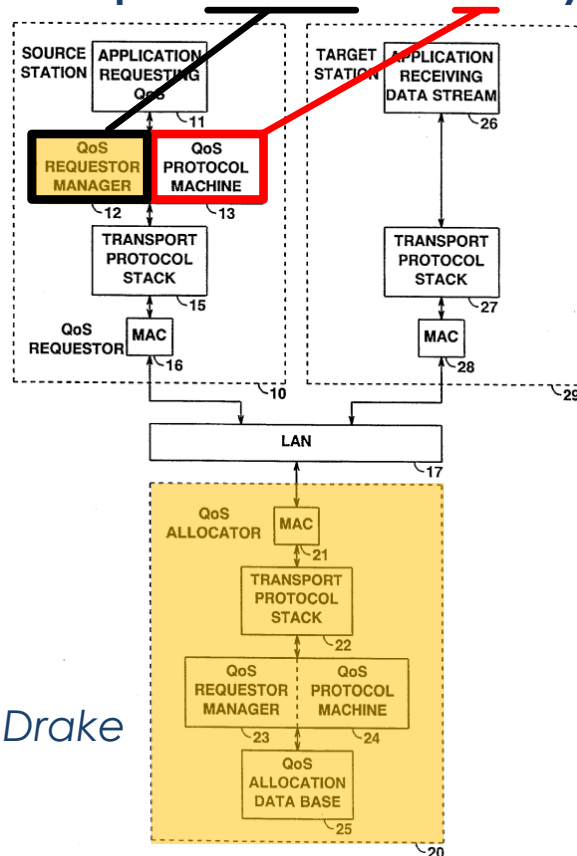
Reply, 2

Petitioner's alleged combinations are based on hindsight

Petitioner's Combinations Are Improperly Based on Hindsight

80

The Petition cherry-picks Drake's components and does not address Drake's QoS protocol machine 13 despite QoS-12 and it only operating together:



Drake

Drake:

QoS protocol machine 13. Together, components 12 and 13 assemble a request to reserve a QoS connection for a

program described in IBM Manual S04G-1046. The QoS requestor manager 12 interacts with application 11 using internal messages as is well known in the art and utilizes QoS protocol machine 13 to format the QoS request.

Ex.1006,
4:36-37,
4:62-65

Dr. Mowry:

Q So would you agree that the QoS protocol machine 13 is involved in formatting the QoS request?

A Yes. The Drake reference discusses QoS protocol machine 13 as that it is utilized in order to format the QoS request.

Ex.2088, 60:7-11

Q Drake does not disclose that the QoS requestor manager 12 can independently assemble a request without the QoS protocol machine 13; correct?

THE WITNESS: Well, what it says is between the two components 12 and 13, they're able to assemble a request.

It does not provide specific details in the sentence about the nature of how that occurs, but through the combination of those two components they assemble the request.

Ex.2088, 53:2-12

Petitioner's Combinations Are Improperly Based on Hindsight

81

Additional showings of hindsight:

Dr. Mowry relies on the '449 Patent for guidance:

THE WITNESS: From the context of the '449 patent, I'm applying the teachings of Drake to the two Goossens references, Goossens2002 and Goossens2003. And in that context everything here would be integrated onto a single chip in a system on chip. In

Ex.2088, 19:25-20:4

A POSITA who is reading the '449 patent in this combination where we're using the teachings of Drake and applying them to either Goossens2002 or Goossens2003, the POSITA would understand that the -- the QoS allocator 20 would be integrated onto the same chip for the system on chip. So it would not be a stand-alone server in that

Ex.2088, 21:3-8

Dr. Mowry reads the function of Drake's QoS-12 (assembling a request) into claim 2 for the claimed "[CM]":

Q Claim two does not require that the communication manager assemble a QoS request; correct?

THE WITNESS: Given that claim two is dependent upon claim one, reading claim one in that context, a person of ordinary skill in the art would understand that the communication manager discussed in claim two would be assembling a -- a quality of service request because it needs to reserve a connection with the desired quality of service properties.

Ex.2088, 138:2-11

The Alleged Combinations Also Do Not Meet Limitations 6[b]/10[b] and 6[c]/10[d]

Limitations

6[b]/10[b] – CM forwards the request to the RM

6[b]: “said communication manager (CM) is adapted to forward said request (REQ) for a connection with communication channels each having a specific set of connection properties to said resource manager (RM),”

10[b]: “the communication manager forwarding the request to a resource manager;”

Drake's QoS-12 (alleged "[CM]") Does Not "forward" a Request to QoS allocator 20 (alleged "[RM]")

Drake's only disclosures for QoS-12 merely say that QoS-12 "assemble[s]" / "format[s]" a request, not "forward[s]" a request:

QoS protocol machine 13. Together, components 12 and 13 assemble a request to reserve a QoS connection for a

program described in IBM Manual S04G-1046. The QoS requestor manager 12 interacts with application 11 using internal messages as is well known in the art and utilizes QoS protocol machine 13 to format the QoS request.

Ex.1006, 4:36-37, 4:62-65

Drake just teaches that QoS allocator 20 receives the request from source station 10:

12 forwards a request to QoS allocator 20. EX2070, ¶220. Drake teaches that the request received by QoS allocator 20 is sent from source station 10, not from QoS requestor manager 12 therein. EX1006, Fig. 1, 4:50-54 ("allocator 20 ... receive[s] the QoS request from station 10"), 5:5-8 ("Allocator station 20 ... receives ... the QoS request from source station 10"), 9:52-10:8 ("included in the allocation request message" is "the source address field 52 (Source MAC Address)" "of the source ... station[]"), Fig. 3, 10:41-46 ("source station 10 actually sends a request to the allocator [20]), Fig. 4; Paper 10, 35-36, 39; EX2070, ¶220.

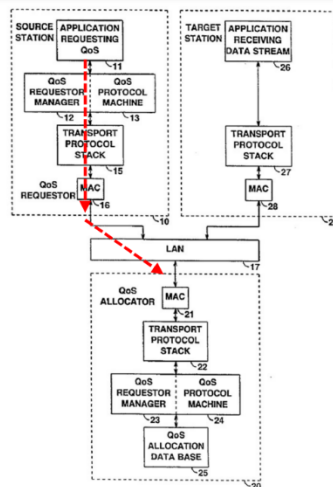
POR,
41-42

Reply Switches to New Theory Based on Drake's "path" and a POSITA's Purported Knowledge

85

Reply:

4:32-37, 4:62-65, 4:50-54; *see also* Petition. Drake's Figure 1 shows only one path through the components in source station 10:



agrees. Ex-1037, 53:21-56:13; Ex-1036. Thus, when Drake says that the request to QoS allocator 10 comes from "source station 10," a POSA knows that QoS allocator 12 in source station 10 "forward[ed] the request" as claimed—there is no alternative path disclosed. Ex-1043 ¶84 (Ground 1: ¶143).

But this "path" shows, as Dr. Bagherzadeh testified, that QoS-12 just sends the request to components 15-16 and those components 15-16 send the request to QoS allocator 20:

221. A POSITA would have understood that Drake teaches that QoS requestor manager 12, along with QoS protocol machine 13, merely "assemble[s]" and "format[s]" a request and sends it to transport protocol stack 15, not that QoS requestor manager 12 sends the request to QoS allocator 20. EX. 1006, 4:32-37

POSITA would have understood that after QoS requestor manager 12 assembles/formats the request, Drake teaches that source station 10 then uses transport protocol stack 15 and MAC entity 16 for formatting and launching on LAN 17, respectively, a request packet for sending the request to QoS allocator 20. EX. 1006, 4:37-40, Fig. 1; Paper 14 at 35. Thus, if a POSITA were to understand that any particular component(s) of source station 10 send or forward the request to allocator 20, it would be transport protocol stack 15 and/or MAC entity 16, not

Ex.2070 ¶221

Limitations

6[c]/10[d] – RM responds to the CM

6[c]: “– said resource manager (RM) responding with the availability of the requested connection to said communication manager (CM),”

10[d]: “the resource manager responding with the availability of the target connection to the communication manager; and”

Petition's 6[c] Analysis Does Not Even Mention Drake's QoS-12 (alleged "[CM]")

87

The POR explains that there is no mention of Drake's QoS-12 (alleged "[CM]") in the Petition's 6[c] analysis (or cited support) for Ground 1:

Lastly, Petitioner fails to establish that these limitations are disclosed or obvious over Drake. Critically, there is no mention of QoS requestor manager 12 in Petitioner's 6[c] analysis, the portions of Drake cited therein, or the corresponding portion of Petitioner's expert declaration, much less any argument or showing that Drake discloses or even renders obvious that QoS allocator 20 sends the QoS allocation reply to QoS requestor manager 12. Pet., 42-43 (citing EX1006, 4:55-57, 8:20-29, 8:50-64, Fig. 5); EX1003 ¶133; EX2070, ¶228. In fact, the cited portions

POR, 44

And the Petition's 6[c] analysis for Ground 2 relies on its Ground 1 analysis:

d. Claim 6[c]

Goossens2003 in view of Drake renders this limitation obvious. Ex-1003 ¶197. As discussed in Ground I, Drake describes that, when the QoS allocator and connection properties are available. See VII.A.7.d.

Pet., 66

POR, 44-45, 63; POSR, 23

Drake's QoS-12 (alleged "[CM]") Does Not Receive⁸⁸ a "respon[se]" From QoS allocator 20 (alleged "[RM]")

Drake's only disclosures for QoS-12 merely say that QoS-12 "assemble[s]" / "format[s]" a request, not receive a "respon[se]":

QoS protocol machine 13. Together, components 12 and 13 assemble a request to reserve a QoS connection for a

program described in IBM Manual S04G-1046. The QoS requestor manager 12 interacts with application 11 using internal messages as is well known in the art and utilizes QoS protocol machine 13 to format the QoS request.

Ex.1006, 4:36-37, 4:62-65

Drake just teaches that QoS allocator 20 sends the QoS allocation reply (alleged "respon[se]") to source station 10:

Instead, Drake teaches that QoS allocator 20 sends the QoS allocation reply to source station 10. EX1006, 4:54-57 ("station 10 is notified"), 8:20-29 (describing "QoS allocation reply" as a "message[] exchanged between the stations of the [LAN]"), 14:22-27 ("AllocationReply message is ... sent from allocator station 20 ... to source station 10," and "source station 10 ... receives the AllocationReply message"), 11:22-48 (describing that allocation acceptance/denial messages in Fig. 5 are sent to, and received by, "source station 10"), 9:52-10:2 (describing a "QoS message," such as QoS allocation reply, as including a "source address field 52 (Source MAC Address)" for the source station); EX2078, 153:11-18; EX2070, ¶226. As for QoS

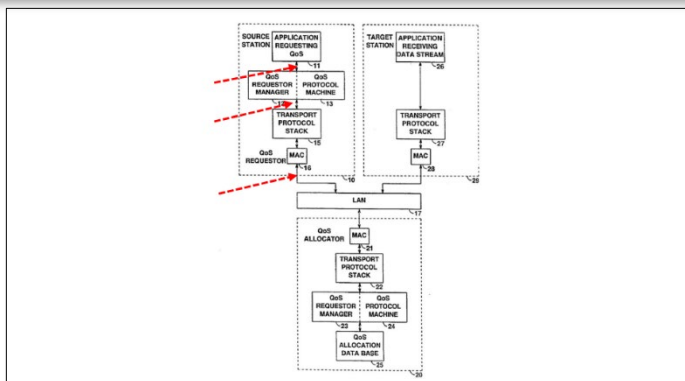
POR, 43

POR, 42-45, 63; POSR, 23-24

Reply Switches to New Theory Based on Drake's "path" and a POSITA's Purported Understanding

Reply:

4:62-64. A POSITA would understand that the only way Drake's QoS system works is for the reply from QoS allocator 20 to get back to application 11 in source station 10, the entity that made the QoS request in the first place. Ex-1043 ¶93 (Ground 1: ¶153); Ex-1037, 59:22-60:2 ("Q: But [the message] does go from QoS allocator to application requesting QoS? A: Yes."). And Drake only shows one path for that reply, and it goes first to the QoS requestor manager 12 that interfaces with application 11. This is clear from Figure 1, which also shows double-headed



But the Reply's new argument merely asserts that Drake's reply goes *through* QoS-12 en route to application 11, which—as the POR and Dr. Bagherzadeh explained—does not constitute “responding ... to” QoS-12 as recited in 6[c]/10[d]:

connection is available for such transmission. Also, a POSITA would have understood that even if the QoS allocation reply is sent to application 11 via the path shown by Drake's Figure 1 within source station 10, which purportedly includes QoS requestor manager 12, this would not constitute QoS allocator 20 “responding ... to” QoS requestor manager 12 (alleged “communication manager”) “with the availability of the [target] connection,” as recited by the claim

Ex.2070 ¶227

¶¶91-92 (Ground 1: ¶¶151-52). There is no bypass indicated. See Ex-1037, 60:3-

“independently
[configurable/
adjustable]”

(Ground 1)

1[e]: “wherein the at least one connection comprises a set of communication channels each having a set of connection properties, the connection properties of the different communication channels of said connection being **adjustable independently**,

10[pre.2]: “wherein said connections comprises a set of communication channels each having a set of connection properties, any communication channel being **independently configurable**,”

Goossens2002 Does Not Disclose “independently [configurable/adjustable]” channels/properties

91

“independently configurable” = “[a]ble to be configured with connection properties that do not depend on those of another configuration” Ex.2040, 13

Dr. Mowry’s opinion is based on Goossens2002 “describ[ing] that each channel has certain properties,” but as his quote shows, Goossens2002 only says “[a]” channel, not “each” channel:

In my opinion, a POSITA would have understood that each of the different channels described by Goossens2002 can have different connection properties, *i.e.*, that they are “adjustable independently.” A POSITA would have understood this because, rather than describing that each *connection* has certain properties, Goossens2002 describes that each channel has certain properties. For example, as previously discussed, Goossens2002 explicitly states that “[a] channel can have a combined throughput and latency guarantee (GT), or be best effort (BE), with an unspecified finite latency upper bound.” Ex-1005 (Goossens2002) at 3. Therefore, a POSITA

Ex.1003 ¶103

Regardless, Dr. Mowry admits that “independently [configurable/adjustable]” requires more than just to channels with different connection properties:

Q. So -- so I'm understanding you correctly, **two channels that have different sets of connection properties are not necessarily independently configurable. Is that fair?**

A. It depends on whether they can be configured or adjusted. If it's -- if it's just permanently static,

Ex.2078,
114:8-13

Q. So in the example I've been giving you about channel 1 and channel 2, **I want you to assume that the connection properties for each channel could be adjusted and they're not static. With that assumption, are those two channels independently configurable?**

A. Potentially. Depends on the details.

Ex.2078,
114:17-22

Drake Does Not Disclose “independently [configurable/adjustable]” channels/properties

92

The Petition assumed that Drake discloses multiple channels based on Drake’s disclosure of sending data in “forward” and “backward” directions:

Drake. Ex-1003 ¶¶106–107. Like Goossens2002, Drake describes two different channels: one in the “forward direction,” for communications “from source station 10 to target station 29,” and a second in the “backward direction,” for communications “from the target station 29 to the source station 10.” Ex-1006,

Pet., 29

The Petition’s assumption fails – Drake does not teach multiple channels:

duplex channel A communications channel capable of simultaneous duplex communication. (C/LM) 802.3-1998

duplex (1) A simultaneous, two-way, independent transmission in both directions. *Synonym:* full duplex.

Ex.1024, 11

Dr. Mowry:

Q My question was you agree that a duplex channel can enable two-way communication over one channel; correct?

A I believe that's what the sentence says there, yes.

Ex.2088, 148:12-16

Dr. Bagherzadeh:

at 5:30-50). I disagree. A POSITA would understand this passage to mean that Drake’s “forward direction” and “backward direction” are along the same communication channel. This understanding is supported by the use of the term

Ex.2070
¶157

opposite direction a second time). Because Drake relates to Token Ring networks, a POSITA would understand that Drake contemplates one channel, which is either a half-duplex or full-duplex channel.

Ex.2070
¶158

Drake Does Not Disclose “independently [configurable/adjustable]” channels/properties

93

The Reply’s argument that Drake discloses multiple channels as transmission paths or data streams contradicts the Petition’s reliance on those transmissions and streams as “connections,” not “channels”:

Reply:

Third, the preferred embodiment of Drake supports multiple independent channels. For example, the algorithm for allocating a QoS transmission path supports multiple QoS transmission paths; in other words, multiple channels. Ex-1043 ¶107; Ex-1006, 10:9-11:48. Drake also describes using multiple “data streams,” additional disclosure of multiple channels. E.g., Ex-1006, Abstract, 5:8-

Reply, 23

Petition:

second modules. Drake likewise describes “connections” between source and target stations (*i.e.*, first and second processing modules), which it also refers to as “QoS connections,” “QoS streams” and “QoS data streams.” See Ex-1006, 4:26–29 (“[S]tation 10 is the source of a desired multimedia transmission and comprises an application 11 which requests a **QoS connection** to the destination or target station 29.”), 7:45–8:5 (“QoSStream 42–Represents a QoS reserved end-to-end data stream”), 14:2–7 (“each source station, like source station 10 in FIG. 1, must continually refresh its request for the QoS data stream allocation at predetermined intervals or the requested bandwidth will be de-allocated to make this bandwidth available for other **connections**.”), 15:28–31; EX-1003 ¶¶96–98; *see also id.*,

Pet.,
27

No Reasonable Expectation of Success Under Petitioner's POSITA Definition

A POSITA Under Petitioner's Definition Would Not Have Expected to Successfully Implement Drake's Teachings in Goossens200X's NoC

95

Petitioner and Dr. Mowry's POSITA definition encompasses someone with only a Bachelor's in computer science and two years of experience with networking technologies, with no SoC or NoC experience:

61. It is my opinion that a POSITA at the time of the '449 patent would have had at least a Bachelor's degree in computer science, electrical engineering, computer engineering, or an equivalent technical degree, and two or more years of experience with system-on-chip, interconnect, or networking technologies.

Ex.1003 ¶161

Dr. Bagherzadeh explained that someone with that education and experience would not have a reasonable expectation of success:

IX.C.2), a POSITA would have had no expectation of success in making the proposed combination. This is especially true where the relevant POSITA in this proceeding is an individual without any specific knowledge regarding the design of a SoC. Below, I reproduce Dr. Mowry's proposed level of skill for this proceeding,

205. Without specific education and work experience in NoC technology, a person with merely an undergraduate degree in electrical or computer engineering and two years of general experience in networking technologies would not have possessed the requisite skill to implement Drake's teachings into the NoC

Ex.2070 ¶¶201, 205

**Petitioner Failed to Establish that
Goossens2002 and Goossens2003 Were
Publicly Available Prior Art**

The Petition's Insufficiency and Incorporation-By-Reference and Reply's New Theories and Evidence Are Improper

97

Petition:

- Conclusory assertion with blanket citations → is improper and should not be considered per:
 - 37 C.F.R. § 42.104(b)(5); 37 C.F.R. § 42.22(a)(2); 37 C.F.R. § 42.6(3)
 - *Cisco Sys., Inc. v. C-Cation Techs., LLC*, IPR2014-00454, Paper 12 at 9 (PTAB Aug. 29, 2014) (Informative) (petition improperly cited exhibits "to support conclusory statements" with no explanation)
 - *Medivis, Inc. v. Novarad Corp.*, IPR2023-00042, Paper 35 at 28-30 (PTAB Mar. 6, 2024) (declining to consider incorporated-by-reference declarations regarding publication)
- For Goossens2002 – cites only Ex.1025 (MacPherson on availability via DATE02 Conference)
- For Goossens2003 – cites only Ex.1027 (O'Bryan on availability via UT) and Ex.1028 (SpringerLink 2023)

(precedential). Supporting documentation and testimonial evidence demonstrate that Goossens2002 and Goossens2003 are printed publications that were publicly available prior to the '449 Patent's priority date. [See Ex-1025; Ex-1027; Ex-1028;](#)

Pet., 10

Reply:

- For Goossens2002 – argues availability via IEEE Xplore and newly cites Ex.1044 (Dutt on availability via IEEE Xplore and via DATE02 Conference) and Ex.1026 (IEEE Bibliographic webpage)
- For Goossens2003 – cites Ex.1035 (Hall-Ellis, not about UT)
- Improper to "reopen the record" with new theories and evidence per:
 - *Hulu, LLC v. Sound View Innovations, LLC*, IPR2018-01039, Paper 29 at 15 (PTAB Dec. 20, 2019) (precedential)

Petitioner Fails to Establish Public Availability of Goossens2002 at the DATE02 Conference

98

Petition cites Ex.1025 (MacPherson)

- No personal knowledge of DATE 02 Conference or evidence of POSITAs at Conference
 - *Power Integrations, Inc. v. Semiconductor Components Industries, LLC*, IPR2017-01904, Paper 9 at 13-18 (PTAB Mar. 12, 2018) (conference paper was not prior art because no evidence that conference was promoted to or attended by POSITAs)
- No personal knowledge of, and cannot attest to the accuracy of, IEEE's metadata for Goossens2002

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EX2081, 3

Q. You don't have any personal knowledge regarding the conference in February 2004, right?

A. No, I don't.

Ex.2080 (MacPherson Deposition), 20:25-21:2

Q. All right. So to recap, the statements in your declaration regarding the Radulescu article are based on the information in IEEE's records, correct?

A. Yes.

Ex.2080, 25:15-18

I asked, would it be fair to say that you cannot attest to whether the underlying information, including the metadata, which was received from the conference organizers, is accurate?

A. Yes.

Ex.2080, 26:6-10

Petitioner Fails to Establish Public Availability of Goossens2002 at the DATE02 Conference

99

Reply cites Ex.1044 (Dutt)

- No personal knowledge of Goossens2002 at DATE02 Conference
- Did not retain his copy of the DATE02 Conference papers
- Bases his testimony on 3rd-party sources for which he has no personal knowledge
- Interested witness

Q So you agree that you've received at least \$200,000 in unrestricted research gifts from Qualcomm, correct?

A That is correct.

Ex.2087, 126:3-6

And my question was simply: You have co-authored articles with Qualcomm employees or affiliates, correct?

A Yes, I have.

Ex.2087, 130:12-14

Q So this article that you co-authored with Qualcomm employees was supported in part by a gift from Qualcomm, correct?

A Yeah.

Ex.2087, 130:20-23

Q And -- and the -- your way of knowing that the Goossens 2002 reference was included in the DATE 2002 conference proceedings and presented at that conference is based on the DATE conference archive in Exhibit 1039 and the various sources listed in -- below paragraph 23 of your -338 declaration; is that fair?

THE WITNESS: Yeah.

Ex.2087, 98:23-99:5

Q Okay. So you agree you did not create the online archive of Exhibit 1039 in the -338 IPR?

A I did not create this archive. This archive was created by the conference organizers and is maintained by the conference organizers for all past DATE conferences.

Ex.2087, 100:25-101:8

Q But as you stated, you agree that you did not create these sources listed in paragraph 23 of your -338 declaration, correct?

A Yes, I did not create these. But I'm referring to them for additional information. Yes.

Q Do you recall personally seeing Goossens 2002 prior to being engaged in the -338 IPR?

A I guess my answer would be similar to the previous paper, the 2004 paper. I may have seen the paper. We may have reviewed the paper after the conference. I may even have attended the session when the paper was presented. But I don't have a definitive recollection.

Ex.2087, 89:17-24

Q Dr. Dutt, what did you do with your personal physical copy of the DATE 2002 conference proceedings after the conference?

A Frankly, I -- I don't remember. I may have brought it back with me. I may have looked at the papers, and if they were too heavy, I may have left them there, knowing that I could access the papers later. I do not have recollection of that at this time.

Ex.2087, 106:10-17

Ex.2087,
102:18-22

Petitioner Fails to Establish Public Availability of Goossens2002 via IEEE Xplore in the Relevant Timeframe

100

Petition cites Ex.1025 (MacPherson)

- No evidence of Goossens2002's availability via IEEE Xplore in the relevant timeframe
 - *Hulu, LLC v. Sound View Innovations, LLC*, IPR2018-01039, Paper 29 at 9 (PTAB Dec. 20, 2019) (inquiry whether reference in library "was sufficiently indexed, catalogued, and shelved")
 - *Acceleration Bay, LLC v. Activision Blizzard Inc.*, 908 F.3d 765, 774 (Fed. Cir. 2018) (holding that "although [the reference] was indexed by author and year, it was not meaningfully indexed such that an interested artisan exercising reasonable diligence would have found it")

Reply cites Ex.1044 (Dutt)

- He "understand[s]" that Goossens2002 was available via IEEE Xplore in the relevant timeframe merely based on Ex.1025-1026 provided to him by counsel, not his personal knowledge

26. I understand that Goossens2002 was added to IEEE Xplore on 07

August 2002. Exhibit 1026; Exhibit 1025. In that timeframe (early 2002) a POSA,

Ex.1044, ¶26

Q Exhibit 1025 in the -338 IPR was provided to you by your attorneys, correct?

A That's correct.

Q Exhibit 1025 does not mention the date August 7th, 2002, correct?

A It doesn't appear to mention that date.

Ex.2087, 116:10-15

Q Exhibit 1026 was provided to you by your attorneys, correct?

A That is correct.

Ex.2087,
121:12-14

Q As you testified earlier today, you were not involved with the uploading of documents to IEEE Xplore; is that right?

A Yes.

Ex.2087,
115:14-17

Petitioner Fails to Establish Public Availability of Goossens2003

101

Petition cites Ex.1028 (SpringerLink 2023)

- Insufficient per:
 - In-Depth Geophysical, Inc. v. Conocophillips Co.*, IPR2019-00849, Paper 14 at 10-11 (PTAB Sept. 6, 2019) (“vague date listed on a website page” was insufficient)
 - Adobe Systems Inc. v. Grecia*, IPR2018-00419, Paper 9 at 9-10 (PTAB Sept. 7, 2018) (finding Internet Archive capture insufficient to establish public accessibility)



Ex.1028, 1

Petition cites Ex.1027 (O'Bryan re: availability via UT Libraries)

- No evidence that Goossens2003 was indexed (or how) in the relevant timeframe

Mr. O'Bryan:

Q. So Exhibit A in your declaration is not the catalog record from the original UT Cat system for the Networks-on-Chip book, correct?

THE WITNESS: That is correct.

Ex.2079, 13:12-16

Mr. O'Bryan, in the note at the bottom of Page 1, top of Page 2 of your declaration, other than the catalog date, that note does not identify any other specific information from the UT Cat system that was archived in the ALMA system for the Networks-on-Chip book; is that correct?

A. Correct. It does not state that.

Ex.2079,
16:11-17

Reply and Ex.1035 (Hall-Ellis *not* re: UT Libraries)

- The Reply argues mere “technical accessibility,” with no explanation of how a POSITA could locate Goossens2003 in any alleged library with reasonable diligence
 - E.g., Acceleration Bay, LLC v. Activision Blizzard Inc.*, 908 F.3d 765, 772 (Fed. Cir. 2018) (no public accessibility where reference “was not indexed in a meaningful way,” despite year and author indexed)