

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

HEWLETT PACKARD ENTERPRISE COMPANY,
ARUBA NETWORKS, LLC, NETGEAR, INC., and
RUCKUS WIRELESS, INC.,
Petitioner,

v.

Q3 NETWORKING LLC,
Patent Owner.

IPR2021-00753
Patent 7,457,627 B2

Before BARBARA A. PARVIS, JO-ANNE M. KOKOSKI, and
RUSSELL E. CASS, *Administrative Patent Judges*.

PARVIS, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining All Challenged Claims Unpatentable
35 U.S.C. § 318(a)

I. INTRODUCTION

We instituted an *inter partes* review of claims 1–4 and 8–12 (“challenged claims”)¹ of U.S. Patent No. 7,457,627 B2 (Ex. 1001, “the ’627 Patent”) owned by Q3 Networking LLC (“Patent Owner”). Paper 10 (“Decision to Institute” or “Inst. Dec.”). We have authority to hear this *inter partes* review under 35 U.S.C. § 6. This Final Written Decision issues pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. We determine that Hewlett Packard Enterprise Company, Aruba Networks, LLC, Netgear, Inc., and Ruckus Wireless, Inc. (collectively “Petitioner”) has proved by a preponderance of the evidence that claims 1–4 and 8–12 of the ’627 patent are unpatentable.

A. Background

Petitioner filed a Petition (Paper 4 (“Pet.”)) requesting an *inter partes* review of claims 1–4 and 8–12 of the ’627 Patent, along with the supporting Declaration of Anthony Acampora, Ph.D. (Ex. 1003). Patent Owner filed a Preliminary Response. Paper 8 (“Prelim. Resp.”).

The Decision to Institute was entered on October 8, 2021. Inst. Dec. 1. Subsequently, Patent Owner filed a Patent Owner Response. Paper 13 (“PO Resp.”). Petitioner filed a Reply. Paper 14 (“Pet. Reply”). Patent Owner did not file a Sur-reply. Neither party requested an oral hearing and no oral hearing was held.

¹ In certain portions of the Petition, only claims 1–4, 8, 9, 11, and 12 are identified as challenged claims, but not claim 10. *See, e.g.*, Pet. 3, 4, 13. Petitioner, however, provides full contentions for claim 10. *Id.* at 19–32, 47–58. We treat the omission of claim 10 from certain pages of the Petition as a harmless error and proceed on the basis that the Petition includes the challenges to claim 10 set forth therein. Pet. 19–32, 47–58.

B. Real Parties-in-Interest

Petitioner identifies as the real parties-in-interest the following: Hewlett Packard Enterprise Company, Aruba Networks, LLC, Netgear, Inc., Ruckus Wireless, Inc., CommScope Holding Company, Inc., CommScope, Inc., Arris US Holdings, Inc., ARRIS International plc, ARRIS Enterprises LLC, and ARRIS Solutions, Inc. Pet. 1. Patent Owner names itself as the real party-in-interest. Paper 6, 2.

C. Related Matters

Each party identifies judicial matters that would affect, or be affected by, a decision in this proceeding. In particular, the parties inform us that the '627 patent is asserted in the following district court proceedings: *Q3 Networking LLC v. CommScope Holding Company, Inc.*, Case No.1:20-cv-01263 (D. Del.); *Q3 Networking LLC v. Netgear, Inc.*, Case No. 1:20-cv-01264 (D. Del.); and *Q3 Networking LLC v. Hewlett Packard Enterprise Co.*, Case No. 1:20-cv-01265 (D. Del.) (“parallel district court proceedings”), which were filed September 21, 2020, and are stayed. Pet. 1–2; Paper 6, 2. The parties additionally identify the following proceeding as a related matter: Certain Routers, Access Points, Controllers, Network Management Devices, Other Networking Products, and Hardware and Software Components Thereof, Inv. No. 337-TA-1227 (ITC), filed September 22, 2020 (“the parallel ITC proceeding”). Pet. 2; Paper 6, 2–3.²

² Petitioner submitted an Order and Notice in the parallel ITC proceeding indicating that the investigation as to the '627 patent has been terminated. Exs. 1016, 1017.

D. The '627 Patent

The '627 patent relates to a method, computer program product, terminals, and configurations for the transfer of data with a verified QoS (quality of service) in a communication network. Ex. 1001, 1:15–18. The communication network includes a call control level, a resource control level, and two terminals for data transfer. *Id.* at 10:65–11:1.

Figure 1, reproduced below, illustrates the communication network.

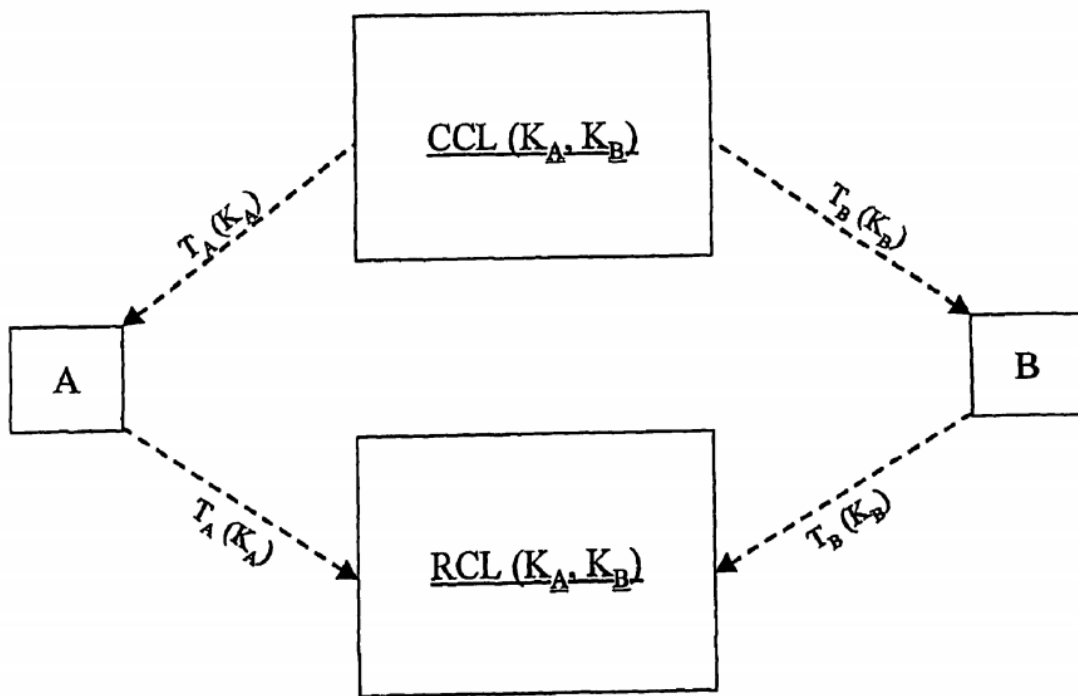


FIG 1

Figure 1, above, illustrates the communication network with call control level (CCL), resource control level (RCL), terminals A and B, secrets K_A and K_B , and tokens T_A and T_B . Ex. 1001, 10:65–11:3.

The '627 patent describes as background that in architectures for transfer of voice and image data via a packet-orientated internet protocol

(IP) network, the call control level and resource control level are functionally separate. *Id.* at 3:35–41. According to the '627 patent, functions assigned to the call control level include (1) conversion of telephone numbers and other alias addresses, such as computer names, to transport addresses, such as internet addresses; (2) registration of compatible devices; and (3) optionally a basic admission check may be performed along with bandwidth control. *Id.* at 3:42–54. Functions assigned to the resource control level include (1) controlling capacity by controlling the traffic volume supplied to the communication network by packet streams, for example, by controlling the transfer capacity of individual packet streams; (2) optionally providing policy activation where appropriate, which involves, for a prioritized packet stream, reserving resources in the communication network; and (3) optionally providing priority management by applying, checking, and, if necessary, correcting priority flags in the packets on the basis of the priority of their packet streams, if the packets are already flagged with priorities. *Id.* at 4:31–44.

The '627 patent describes that a token encrypted by secret K_A is created by a gatekeeper at the call control level taking into account the quality of service requirement. *Id.* at 4:15, 12:53–55. The encrypted token T is transferred to terminal A. *Id.* at 12:61–62. Terminal B indicates acceptance of the call with a message to the gatekeeper, which is transferred by the gatekeeper to terminal A. *Id.* at 12:65–13:3. The encrypted token is then incorporated by terminal A in an otherwise unmodified standard resource reservation protocol (RSVP) message and transferred to the edge device. *Id.* at 13:4–6. The encrypted token T is decrypted by the edge device using the secret K_A and then used to verify the correctness of the quality of service requirement. *Id.* at 13:6–9.

E. Illustrative Claim

Petitioner challenges claims 1–4 and 8–12 of the '627 patent. Pet. 3, 19–32, 47–58. Claims 1, 8, and 10–12 are the independent claims. Claims 2–4 and 9 depend directly from claim 1. Independent claim 1, reproduced below, is illustrative of the claimed subject matter.

1. [1a³] A method for transferring data with a verified QoS in a communication network, which includes a call control level, a resource control level and at least one terminal assigned to data transfer, comprising:

[1b] determining a QoS requirement for data transfer and verified at call control level;

[1c] creating and transferring, taking into account the QoS requirement verified at the call control level, at least one encrypted token to the terminal;

[1d] transferring the verified QoS requirement and the encrypted token to the resource control level from the terminal;

[1e] decrypting, at the resource control level, the encrypted token, and verifying the QoS requirement using the decrypted token; and

[1f] configuring the communication network taking into account the QoS requirement verified, such that the data is transferred with the verified QoS.

Ex. 1001, 15:50–67.

F. Evidence

Petitioner relies on the patent document references summarized below.

Name	Patent Document	Exhibit
Reeves	US 7,571,238 B1, issued on August 4, 2009	1004

³ Herein we use Petitioner's designations for the elements of claim 1. Pet. 19–32, 47–58.

Name	Patent Document	Exhibit
Rivest	US 4,405,829, issued on September 20, 1983	1005
Chen	US 6,487,170 B1, issued on November 26, 2002	1006
Gleichauf	US 7,412,598 B1, issued on August 12, 2008	1007

Petitioner also relies on the Declaration of Dr. Acampora (Ex. 1003) as supporting its contentions that the challenged claims are unpatentable. Patent Owner did not file a Declaration with technical opinions in support of its positions in this proceeding.

G. Asserted Grounds

Petitioner asserts that the challenged claims of the '627 patent are unpatentable based on the following grounds summarized below:

Claims Challenged	35 U.S.C. § ⁴	References/Basis
1, 3, 4, 8–12	103(a)	Reeves, Rivest
2	103(a)	Reeves, Rivest, Chen
1, 3, 4, 8–12	103(a)	Gleichauf, Reeves
2	103(a)	Gleichauf, Reeves, Chen

II. ANALYSIS

A. Legal Standards

To prevail in its challenge to Patent Owner's claims, Petitioner must demonstrate that the claims are unpatentable and that burden never shifts to the patentee. *Dynamic Drinkware, LLC v. Nat'l Graphics, Inc.*, 800 F.3d

⁴ Because the challenged claims of the '627 patent have an apparent effective filing date before March 16, 2013, the 35 U.S.C. §§ 102 and 103 provisions of the Leahy-Smith America Invents Act ("AIA"), Pub. L. No. 112-29, §§ 3(b)–3(c), 3(n)(1), 125 Stat. 284, 285–87, 293 (2011) do not apply.

1375, 1378 (Fed. Cir. 2015). A patent claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) when in evidence, objective evidence of nonobviousness, i.e., secondary considerations.⁵ *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

B. Level of Ordinary Skill in the Art

Petitioner asserts that a person of ordinary skill in the art the time of the invention would have had “an undergraduate degree in Electrical Engineering or Computer Science and four or more years of experience in networking, or a Master’s degree in Electrical Engineering or Computer Science and two or more years of experience in networking.” Pet. 7 (citing Ex. 1003, 11). At the institution stage, we adopted Petitioner's assessment of the level of skill for one of ordinary skill in the art with an exception. Inst. Dec. 8. Patent Owner does not dispute Petitioner’s proposal. *See generally* PO Resp.

Considering the subject matter of the ’627 patent, the background technical field, and the asserted prior art, we maintain our agreement with Petitioner’s proposed qualifications for an ordinary level of skill, except we

⁵ Patent Owner does not present objective evidence of nonobviousness in this proceeding.

continue to decline to adopt “or more” as that language is vague and open-ended. Inst. Dec. 8. Otherwise, Petitioner’s proposed definition is consistent with the level of skill reflected in the specification of the ’627 patent and the asserted prior art references. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001).

Accordingly, except as noted above, we adopt Petitioner's assessment of the level of skill for one of ordinary skill in the art.

C. Claim Construction

We construe the challenged claims by applying the standard used in federal courts, in other words, “the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. [§] 282(b),” which is articulated in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). 37 C.F.R. § 42.100(b) (2020). Under this standard, the words of a claim generally are given their “ordinary and customary meaning” as would be understood by one with ordinary skill in the art in the context of the specification, the prosecution history, other claims, and even extrinsic evidence including expert and inventor testimony, dictionaries, and learned treatises, although extrinsic evidence is less significant than the intrinsic record. *Phillips*, 415 F.3d at 1312–17. Usually, the specification is dispositive, and it is the single best guide to the meaning of a disputed term. *Id.* at 1315. Notwithstanding the importance of a specification, limitations in the specification must not be read into the claims absent lexicography or disavowal. *Hill-Rom Services, Inc. v. Stryker Corp.*, 755 F.3d 1367, 1371 (Fed. Cir. 2014).

Petitioner provides the parties’ claim construction positions from the parallel ITC proceeding. Pet. 8–12. Petitioner also provides as exhibits claim construction briefs by the parties submitted in that parallel proceeding. *See*

Exs. 1012–1015. Petitioner asserts for all disputed terms that the Petition demonstrates unpatentability of the challenged claims under either party’s construction. Pet. 8–9. Patent Owner has not pointed to positions taken in the parallel ITC proceeding in support of its positions here or otherwise raised in this proceeding claim construction positions from the parallel ITC proceeding. *See generally* PO Resp. Also, neither party provided us with an order regarding claim construction by the ITC before the parallel ITC investigation was terminated as to the ’627 patent. Here, we consider only arguments raised by the parties in the instant proceeding in the manner that they were raised.⁶

At the institution stage, we considered Patent Owner’s arguments regarding whether the preambles of the independent claims are limiting and Patent Owner’s proposed narrowing of the terms “call control level” and “resource control level.” Inst. Dec. 10–14. We now consider the parties’ further arguments regarding the issues preliminarily addressed at the institution stage, as well as the parties’ arguments as to whether “transferring the verified QoS requirement and the encrypted token” recited in claims 1, 8, and 10 and similar recitations in claims 11 and 12 place limits on how the verified QoS requirement and the encrypted token are packaged for transfer.

Except to the extent discussed below, we do not discern a need to make determinations regarding the construction of any term. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017

⁶ We also do not consider the arguments referenced in the claim construction briefing submitted by Petitioner in the ITC (Exs. 1012–1015), except to the extent an argument has been reproduced in the briefing in the instant proceeding. Exs. 1012–1015. “Arguments must not be incorporated by reference from one document into another document.” 37 C.F.R. § 42.6.

(Fed. Cir. 2017)), *cert. denied*, 138 S. Ct. 1695 (April 30, 2018) (noting that “we need only construe terms ‘that are in controversy, and only to the extent necessary to resolve the controversy’”) (citing *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)). We use the ordinary and customary meaning for remaining terms.

1. Are the preambles of the independent claims limiting?

We turn to Patent Owner’s assertion that the “Petition incorrectly argues that the preambles are not limiting.” PO Resp. 4. More specifically, Patent Owner argues that the preambles “are limiting both because they recite structure that provides antecedent basis for several claim terms, as the Board correctly recognized (DI at 11), and because they define the structure of and are necessary to give life and meaning to the claims.” *Id.* With respect to providing antecedent basis, Patent Owner argues the preambles of independent claims 1, 10, 11, and 12 introduce certain claim elements, i.e., “a ‘verified QoS,’ a ‘communication network,’ a ‘call control level,’ a ‘resource control level,’ and a ‘terminal/end point.’” *Id.* at 5.

With respect to defining the structure of and being necessary to give life and meaning to the claims, Patent Owner argues that “the preamble to claims 1 and 10 requires ‘a communication network, which includes a call control level, a resource control level and at least one terminal.’” *Id.* at 5–6. Patent Owner also argues “[s]imilarly, the preamble to claims 11 and 12 requires the communications network to have ‘a Call Control Level for verifying whether a QoS request may be issued’ and ‘a Resource Control Level for configuration of the network such that the information can be transmitted in the network with the requested QoS.’” *Id.* at 6. Patent Owner argues “the preamble to claim 8 defines the structure of the claim — namely

that the claimed computer program exists within a computer readable medium.” *Id.*

Petitioner states that it “maintains that the preambles are not limitations because they merely recite a purpose or intended use of the claimed method.” Pet. Reply 4 (citing, *e.g.*, *TomTom, Inc. v. Adolph*, 790 F.3d 1315, 1323–24 (Fed. Cir. 2015)); *see also* Pet. 19, 34 (stating the same). Petitioner argues that “apart from the ‘functional separation of the call and resource control levels’ of claims 11 and 12, addressed in detail below, [Patent Owner] does not dispute that the prior art teaches each element of the preambles.” Pet. Reply 5. Petitioner argues that Patent Owner’s arguments “do not present an actual dispute for the Board to resolve” because “[r]egardless of whether the Board elects to give patentable weight to the preambles or not, the subject matter of the preambles is fully taught by the combinations of references on which this Review has been granted.” *Id.* at 4–5.

We consider whether the preambles are limiting in view of the principles below.

“Generally,” we have said, “the preamble does not limit the claims.” *Allen Eng’g Corp. v. Bartell Indus., Inc.*, 299 F.3d 1336, 1346 (Fed. Cir. 2002). Nonetheless, the preamble may be construed as limiting “if it recites essential structure or steps, or if it is ‘necessary to give life, meaning, and vitality’ to the claim.” *Catalina Mktg. Int’l, Inc. v. Coolsavings.com, Inc.*, 289 F.3d 801, 808 (Fed. Cir. 2002), quoting *Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1305 (Fed. Cir. 1999). A preamble is not regarded as limiting, however, “when the claim body describes a structurally complete invention such that deletion of the preamble phrase does not affect the structure or steps of the claimed invention.” *Catalina*, 289 F.3d at 809.

Am. Medical Sys., Inc. v. Biolitec, Inc., 618 F.3d 1354, 1358–59 (Fed. Cir. 2010). Also, “[w]hen limitations in the body of the claim rely upon and derive antecedent basis from the preamble, then the preamble may act as a necessary component of the claimed invention.” *Eaton Corp. v. Rockwell Int’l Corp.*, 323 F.3d 1332, 1339 (Fed. Cir. 2003).

At the institution stage, we said the “preambles of claims 1, 10, 11, and 12 recite terms that provide antecedent basis as follows: (1) a ‘verified QoS,’ (2) a ‘communication network,’ (3) a ‘call control level,’ (4) a ‘resource control level,’ and (5) a ‘terminal’ or an ‘end point.’” Inst. Dec. 11 (citing Ex. 1001, 15:49–67, 16:39–18:21).⁷ The preamble is limiting to the extent that it recites structure that provides antecedent basis to the terms (1) a “verified QoS,” (2) a “communication network,” (3) a “call control level,” (4) a “resource control level,” and (5) a “terminal” or an “end point.” *Id.*

At the institution stage, we stated that “no further determinations are needed to resolve a dispute before us because at this early juncture Petitioner has made a sufficient showing even if the preambles are limiting.” Inst. Dec. 11 (citing *Nidec*, 868 F.3d at 1017). Based on the full record, we agree with Petitioner (Pet. Reply 5) that except for a “functional separation of the call and resource control levels” recited in the preambles of claims 11 and 12, Patent Owner does not dispute that the prior art teaches each element of the

⁷ We further noted that the “preambles of claims 11 and 12 vary slightly by reciting ‘Call Control Level’ and ‘Resource Control Level’ with each word capitalized.” Inst. Dec. 11 n.7 (citing Ex. 1001, 16:59–18:21). We stated “[h]erein, we use either case to refer to these same terms recited in all independent claims.” *Id.* Neither party has disputed our determination to use either case to refer to these same terms and we maintain that determination based on the entire record now before us.

preambles. At this final stage, we maintain our determination that no further construction is needed to resolve a dispute before us because, based on the complete record now before us, Petitioner has shown that the prior art teaches the preambles even if the preambles are limiting.

As an independent reason for our conclusions herein, we, however, further find that Patent Owner's argument that the preambles of claims 1, 10, 11, and 12 define the structure of and are necessary to give life and meaning to the claims is cursory and not supported by argument or evidence in the record. The preambles of claims 1, 10, 11, and 12 recite methods for transferring data in a communication network that has or includes call and resource control levels. Consistent with Petitioner's arguments (Pet. Reply 4), the recitations relied on by Patent Owner (PO Resp. 4–6) merely recite a purpose or intended use of the claimed method, i.e., to transfer data in a communication network. The preambles of claims 11 and 12 include other recitations not relied upon or discussed by Patent Owner. Upon review, based on the entire record before us, as a separate, independent reason for our determination, we are not persuaded that the preambles of claims 1, 10, 11, and 12 are limiting except to the extent they provide antecedent bases for the recitations noted above.

2. *“call control level” and “resource control level”*

Petitioner provides the claim construction positions of the parties in the parallel ITC proceeding for these terms. Pet. 9–10. Petitioner argues that the “Petition demonstrates unpatentability of the challenged claims under either construction.” *Id.* at 9.

At the institution stage, we declined to adopt the construction that Patent Owner urged implicitly in its arguments. Inst. Dec. 13. We stated “[a]t this preliminary stage in the proceeding, we determine that the claim

does not require ‘complete separation’ such that direct communication between the call control level and resource control level is prohibited and must be through a terminal.” *Id.* We stated we “do not discern a reason, based on the intrinsic evidence, for reading into the claims a requirement for complete separation or a prohibition on direct communication between the levels.” *Id.* at 14.

In its Patent Owner Response, Patent Owner argues that each of the independent claims requires a call control level and resource control level that must be functionally separate. PO Resp. 6–9. In particular, Patent Owner argues that “while the ’627 patent recognizes ‘a number of architectures’ for the transfer of data via a packet-oriented network, the patent expressly states that ‘the fact that call control level and resource control level are functionally separate is common to all.’” *Id.* at 6 (quoting Ex. 1001, 3:34–41). Patent Owner also argues the “specification provides guidance as to the meaning of this functional separation: ‘[f]or a professional person skilled in the art it is particularly clear that concepts such as . . . “call control level” or “resource control level” should be understood in the functional rather than physical sense.’” *Id.* at 6–7 (quoting Ex. 1001, 15:41–45). In its discussion of Petitioner’s element-by-element analysis, Patent Owner also argues that Figures 1 and 2 of the ’627 patent “depict the complete functional separation of the CCL and the RCL.” *Id.* at 10–11. Patent Owner argues that “claims 11 and 12 explicitly call for ‘a functional separation of the call and resource control levels.’” *Id.* at 6 (quoting Ex. 1001, 16:64–65, 18:1–2).

Patent Owner further argues our “initial determination” failed “to give proper weight to the clear and unmistakable language of the applicant during prosecution.” *Id.* at 9. Patent Owner asserts the following:

The prosecution history provides further guidance. In an Office Action Response, in order to overcome a rejection due to prior art, the patentee explained the relationship between the CCL and RCL:

In the instant invention, there is a network in which the network control level CCL and the network level RCL are separate with a clear function split as to which task is handled in which level. Processing, extending over both levels, of a task which has effects on both levels (for example, assumption of requested connections in the CCL but reservation of resources for the assumed connections in the RCL) is not provided by a single, uniform instance extending over both levels in this network. In this case, a separate instance is to be provided in each level, the instance being concerned in each case with those aspects which occur in the level in question. In addition, a reconciliation mechanism between the two separate instances is to be provided. Here, the invention applies since a consequence of the splitting of the processing of tasks extending over both levels into separate instances is that each instance receives its own address and can be reached by anyone. This can, in particular, also be a non-authorized hacker who intends to use the network in an impermissible manner.

Id. at 7 (quoting Ex. 1002, 111) (alterations in original).

Patent Owner also asserts the following:

The applicant also explained that:

For protection against hackers of this type, the invention provides that the two instances share a common secret code and use it in order to encrypt and decrypt messages exchanged between them. For complete separation of the two levels CCL and RCL, it is provided in addition that the instances do not communicate directly but rather indirectly via the terminal which for its part communicates directly with the RCL and with the CCL. Thus, the

separation between the CCL and RCL remains completely intact since no messages are exchanged between the CCL and RCL.

Id. at 7–8 (quoting Ex. 1002, 111) (alterations in original).

Patent Owner argues “[b]ecause of this, applicant overcame the prior art because that reference failed to disclose messages sent ‘via the terminal,[’] as required by the claimed invention.” *Id.* at 8. Patent Owner argues “[t]he applicant, in describing the meaning of the functional split between the CCL and RCL, explicitly disclaimed an interpretation wherein the CCL and RCL can communicate directly.” *Id.* (citing *Epistar Corp. v. Int’l Trade Comm’n*, 566 F.3d 1321, 1334 (Fed. Cir. 2009)); *see also id.* at 9 (citing Ex. 1002, 111) (“Here, the applicant argued in no uncertain terms that the functional separation between the CCL and RCL must be a ‘complete separation’ such that they ‘do not communicate directly.’”). Patent Owner argues “[s]uch a disclaimer can arise from arguments made by an applicant in order to overcome prior art.” *Id.* at 8 (citing *Tech. Props. Ltd. v. Huawei Techs. Co.*, 849 F.3d 1349, 1357 (Fed. Cir. 2017)). Patent Owner also argues its argument is “in no uncertain terms” similar to applicant’s arguments in *Speedtrack, Inc. v. Amazon*, 998 F.3d 1373, 1379 (Fed. Cir. 2021).

Petitioner argues that Patent Owner’s proposed construction is “at odds with the claim language, the specification, and the prosecution history” and that our preliminary determination that Patent Owner’s “interpretation is incorrect should be maintained.” Pet. Reply 5. Petitioner argues “[c]laims 1–10 do not include any limitation directed toward ‘functional separation.’” *Id.* Petitioner also argues “[c]laims 11 and 12 recite ‘functional separation of the call and resource control levels,’ but do not recite that such functional separation must be **complete** such that all communication between the call

control level and resource control level is precluded as PO now asserts.” *Id.* at 5–6. Petitioner also argues if call control level and resource control level “are interpreted as being required to be functionally separate by definition, the recitation of ‘functional separation’ in claims 11 and 12 is rendered superfluous” and such construction is disfavored. *Id.* at 11–12 (citing *Intel Corp. v. Qualcomm Inc.*, 21 F.4th 801, 809–10 (Fed. Cir. 2021)). Petitioner also argues “the recitation of ‘functional separation’ in claims 11 and 12 provides a presumption under the doctrine of claim differentiation that the patentee did not intend to limit claims 1–4 and 8–10 to functionally separate call and resource control levels.” *Id.* at 12 (citing *Curtiss-Wright Flow Control Corp. v. Velan, Inc.*, 438 F.3d 1374, 1381 (Fed. Cir. 2006)).

Petitioner argues that the portions of the ’627 patent Specification relied on by Patent Owner do not support Patent Owner’s position. *Id.* at 6–8. Petitioner argues that the Specification’s statement in its background section that the “call control level and resource control level are functionally separate” in a number of architectures does not state or suggest that “the functional separation is complete or that the CCL and RCL do not communicate with each other in these prior art architectures, and PO has not submitted any evidence to establish that a POSITA^[8] would understand this to be the case.” *Id.* at 6. Regarding the other statement relied on by Patent Owner, Petitioner argues the “mere fact that the call control level and resource control level can be understood as different functional ‘concepts’ does not mean that they are completely separate or that they do not communicate with each other, and PO has again not submitted any evidence to the contrary.” *Id.* at 7. Petitioner argues “[i]ndeed, this statement can

⁸ POSITA refers to a person having ordinary skill in the art.

easily be understood to mean that the CCL and RCL must have different functions but *need not* be physically separate (and therefore not ‘completely’ separate).” *Id.*

Petitioner further argues that whether the call control level and resource control level are functionally separate is distinguishable from whether the call control level and resource control level communicate with each other. *Id.* at 7–8. Petitioner also argues that the statements in the ’627 patent Specification relied on by Patent “fall far short of the exacting standards necessary to establish the lexicography or disavowal required to support [Patent Owner’s] construction.” *Id.* at 8.

Regarding the prosecution history, Petitioner argues Patent Owner quotes two paragraphs, but omits a third paragraph that includes the argument that overcame the rejection. *Id.* That third paragraph with Petitioner’s alterations is reproduced below.

Trans discloses, in paragraphs 870–871, that with the aid of tokens the amount of data transmitted in the network may be controlled. For this, tokens are laid in a bucket at a certain rate and data may be transmitted as long as there are still tokens in the bucket, where with each individual transmission process one token is taken from the bucket. In addition, Trans discloses, in paragraphs 954–957, that “authorized users” can protect their data against “eavesdropping by third parties” with the aid of encryption. An application of the encryption technologies to the tokens, however, is not disclosed in Trans. *Specifically Trans fails to disclose **encryption of the tokens in the CCL, decryption and verification of the tokens in the RCL, and transmission of encrypted tokens by the CCL to the RCL via the terminal, as required by the claimed invention.***

Id. at 8–9 (quoting Ex. 1002, 112) (alterations in the original).

Petitioner argues that contrary to Patent Owner’s arguments, the argument made during prosecution to overcome the prior art “is a narrow

argument that a **specific encrypted token** must be transmitted via the terminal.” Pet. Reply 9. Petitioner argues that the argument made during prosecution “is not a clear and unmistakable definition or disavowal forbidding all direct communication between the CCL and RCL and/or complete functional separation of the CCL and RCL.” *Id.*

Petitioner also argues that the amendments made during prosecution support its position. *Id.* at 9–10. Petitioner argues the following:

In the prior amendment dated July 28, 2005, PO added new claims 11 and 12 that required both (1) transmitting an encoded token from the CCL to an end point (i.e., a terminal) and transmitting the encoded token from the end point/terminal to the RCL, and (2) “a functional separation of the call and resource control levels” (but not a *complete* functional separation). Ex. 1002 at 132. At the same time, PO also chose not to add any requirement for any functional separation to claims 1-10. Ex. 1002 at 130-132. These choices demonstrate that PO understood how to limit its claims to require functional separation between the CCL and RCL when it so desired.

Id. at 9–10.

We start by noting that the parties’ arguments include differing descriptions of Patent Owner’s proposal. For instance, Patent Owner characterizes its proposal as requiring (1) a call control level and resource control level that are “functionally separate” (*see, e.g.,* PO Resp. 6), (2) “the *complete* functional separation” of the call control and resource control levels (*see, e.g., id.* at 10–11 (emphasis added)), (3) complete separation such that instances do not communicate directly (*see, e.g., id.* at 7–8), (4) separation that remains completely intact since no messages are exchanged by the call control level and the resource control level (*see, e.g., id.*), and (5) sending messages or communicating via a terminal (*see, e.g., id.* at 8). Petitioner adds to the aforementioned characterizations by describing

Patent Owner’s arguments as precluding “communication of all information between the CCL and RCL under all circumstances” (Pet. Reply 6) and requiring “the prohibition of all communication” between the resource control level and the call control level (*id.* at 8).

Petitioner argues that functional separability is distinguishable from whether the call control level and resource control level communicate with each other. Pet. Reply 6–8. We agree with Petitioner in that regard.⁹ Indeed, our view is that complete functional separation also is distinguishable from whether the call control level and resource control level communicate with each other. At the institution stage, we stated “[a]t this preliminary stage in the proceeding, we determine that the claim does not require ‘complete separation’ such that direct communication between the call control level and resource control level is prohibited and must be through a terminal.” Inst. Dec. 13. We clarify here that our determination referred to Patent Owner’s characterization of “complete separation,” i.e., such that direct communication between the call control level and resource control level is prohibited and must be through a terminal. We are not of the view that the phrase “complete separation” itself prohibits communication between completely separate levels.

Importantly, as will be discussed below (*see* §§ II.D, II.F), the prior art teaches the disputed recitations even if the claims are limited as Patent Owner proposes. Nonetheless, below in our discussion of the parties’ dispute regarding the terms “call control level” and “resource control level,” we

⁹ Petitioner provides examples including a process of serving a web page, which appear to be meant to illustrate Petitioner’s arguments rather than providing actual factual scenarios supporting Petitioner’s arguments. We do not determine whether Petitioner’s illustrative examples are accurate.

point to certain weaknesses in arguments made by Patent Owner to provide further explanation and independent reasoning supporting our conclusions herein.

We begin with the claim language. *See Allergan Sales, LLC v. Sandoz, Inc.*, 935 F.3d 1370, 1373 (Fed. Cir. 2019) (“[C]laim construction must begin with the words of the claims themselves.”) (quoting *Amgen Inc. v. Hoechst Marion Roussel, Inc.*, 457 F.3d 1293, 1301 (Fed. Cir. 2006)). We agree with Petitioner’s arguments regarding the claim language. Pet. Reply 5–12. Consistent with Petitioner’s arguments, claims 1, 8, and 10 do not recite expressly “functional separation,” but the recitation is of two levels, i.e., a “call control level” and the “resource control level.” *See, e.g.*, Ex. 1001, 15:50–67. Claims 11 and 12 recite in the preambles “a functional separation of the call and resource control levels.” *Id.* at 16:60–67, 18:1–4. None of the challenged claims recite “complete separation.” Also, the claims do not include recitations that would require a prohibition of communication between the resource control level and call control level.

Patent Owner, for the most part, does not address the language of the claims. PO Resp. 6–9. Patent Owner argues only that “claims 11 and 12 explicitly call for ‘a functional separation of the call and resource control levels.’” *Id.* at 6 (citing Ex. 1001, 16:64–65, 18:1–2). Those recitations are found in the preambles of claims 11 and 12. Patent Owner argues that the entirety of each of the preambles is limiting in one sub-section of the Patent Owner Response without addressing or discussing “a functional separation” recited in the preambles of claims 11 and 12 (*id.* at 4–6) and then in another sub-section Patent Owner refers to the recitation of “a functional separation of the call and resource control levels” in claims 11 and 12 as though that portion of the preamble is limiting. *Id.* at 6. Patent Owner’s argument that “a

functional separation of the call and resource control levels” in claims 11 and 12 is limiting is cursory and unsupported by meaningful discussion in the Patent Owner Response. *Id.* at 4–6.

Furthermore, even if the preambles are limiting, we agree with Petitioner’s argument that if call control level and resource control level “are interpreted as being required to be functionally separate by definition, the recitation of ‘functional separation’ in claims 11 and 12 is rendered superfluous” and such construction is disfavored. Pet. Reply at 11–12 (citing *Intel*, 21 F.4th at 809–10). Additionally, the recitation of “a functional separation” in claims 11 and 12 supports that the patentee did not intend to limit claims 1–4 and 8–10 to functionally separate call and resource control levels. See *Intellectual Ventures I LLC v. T-Mobile USA, Inc.*, 902 F.3d 1372, 1379 (Fed. Cir. 2018) (“Even more telling is the patentee’s addition, in the 2002 Reply, of claim 19, which expressly provides that the ‘application type’ can be recognized through ‘analysis of at least one of: ... information operated on at layer 3 of the OSI model, information operated on at layer 4 of the OSI model, ... and information operated on at layer 7 of the OSI model.’ This shows that the patentee knew how to restrict the resource allocator to using information obtained from layer 7. If the patentee had intended to similarly restrict the resource allocator in claim 1, it could have done so using the language of claim 19, but did not.”) (emphasis added) (citing *Unwired Planet, LLC v. Apple Inc.*, 829 F.3d 1353, 1359 (Fed. Cir. 2016)); *Unwired Planet*, 829 F.3d at 1358–59 (“[T]he patent contains other claims, for example claim 21, that specifically recite ‘establishing a voice communication channel,’ a limitation not present in the asserted claims. If the patentee intended to restrict the claims-at-issue to

require a voice input to travel over a particular type of channel, it could have included that same limitation.”).

Thus, absent some definition or disclaimer in the intrinsic record (whether explicit or implicit), none of the claims require the overly narrow limitations argued by Patent Owner including “complete separation” or the prohibition of communication between the call control level and the resource control level. *See Trustees of Columbia University v. Symantec Corp.*, 811 F.3d 1359, 1363–64 (Fed. Cir. 2016).¹⁰

The ’627 patent Specification does not include any such definition or disclaimer. We agree with Petitioner’s arguments explaining why the portions of the ’627 patent Specification do not support Patent Owner’s position. Pet. Reply 6–8. For instance, the first portion of the ’627 patent describes the following:

A number of architectures have been described for the transfer of voice and image data via a packet-orientated IP network (e.g. the internet)-also known as “V[]oIP” [Voice over Internet Protocol] in the international standardization committees IETF (Internet[]Engineering Task Force) and ITU (International Telecommunications Union). *The fact that call*

¹⁰ Unless otherwise noted, we use the phrase “the prohibition of communication between the call control level and the resource control level” and similar phrases to refer to all arguments by Patent Owner (PO Resp. 4–9) relating to the statements in the prosecution history that “the instances do not communicate directly but rather indirectly via the terminal” and the separation “remains completely intact since no messages are exchanged between the CCL and RCL.” Ex. 1002, 111. Those phrases also are used to refer to Petitioner’s characterizations of Patent Owner’s arguments including Petitioner’s statements describing Patent Owner’s arguments as precluding “communication of all information between the CCL and RCL under all circumstances” (Pet. Reply 6) and requiring “the prohibition of all communication” between the resource control level and the call control level (*id.* at 8).

control level and resource control level are functionally separate is common to all.

Ex. 1001, 3:34–41 (emphasis added).

The first portion relied on by Patent Owner reproduced above pertains to VoIP architectures, but Patent Owner does not argue that the claimed invention is limited to those architectures and we do not discern reasoning in the record before us to limit the claims in that manner. Consistent with Petitioner’s arguments, the first portion of the Specification does not describe the overly narrow limitations argued by Patent Owner including “complete separation” or the prohibition of communication between the resource control level and call control level.

The second portion of the ’627 patent Specification relied on by Patent Owner states “[f]or a professional person skilled in the art it is particularly clear that concepts such as ‘terminal,’ ‘call control level’ or ‘resource control level’ should be understood in the functional rather than physical sense.” Ex. 1001, 15:41–45. We agree with Petitioner (Pet. Reply 7) that the second portion indicates that the call control level and resource control level have different functions, but are not required to be physically separate. We note that Petitioner’s description of the levels as having “different” functions is not synonymous with the levels being functionally separate. Consistent with Petitioner’s arguments, the second portion relied on by Patent Owner does not describe the overly narrow limitations argued by Patent Owner including “complete separation” or the prohibition of communication between the resource control level and call control level.

Figures 1 and 2 of the ’627 patent referred to by Patent Owner illustrate particular communications via a terminal. Ex. 1001, Figs. 1, 2. Those figures do not provide a definition or a disclaimer. *Id.* Also, Figures 1

and 2 of the '627 patent do not use Patent Owner's terminology, e.g., "complete separation" and do not describe or require prohibitions, such as that proposed by Patent Owner. That the '627 patent illustrates particular communications via a terminal does not describe prohibiting any communication between the resource control level and call control level.

In summary, we agree with Petitioner's arguments regarding the '627 patent Specification. Importantly, we agree with Petitioner that the '627 patent does not describe the overly narrow limitations argued by Patent Owner including "complete separation" or the prohibition of communication between the resource control level and call control level.

Finally, we turn to the prosecution history. We agree with Petitioner that Patent Owner omits an important, third paragraph in its quote of the relevant prosecution history arguments. Pet. Reply 8. We also agree with Petitioner that applicant's argument is narrow and is "that a **specific encrypted token** must be transmitted via the terminal." *Id.* at 9.

Consistent with Petitioner's arguments, Applicant's arguments made during prosecution do not support the overly narrow limitations argued by Patent Owner including "complete separation" or the prohibition of communication between the resource control level and call control level. For instance, the statements in the prosecution history relied on by Patent Owner describe specific communications, not all communications. In particular, the statements that "the instances do not communicate directly but rather indirectly via the terminal" and the separation "remains completely intact since no messages are exchanged between the CCL and RCL" (PO Resp. 7–9 (citing Ex. 1002, 111)) relate to processing "requested connections in the CCL" for which "reservation of resources" is "in the RCL." Ex. 1002, 111.

Additionally, consistent with Petitioner’s position, the arguments made by Applicant to overcome the prior art related to encryption of particular communications. For that instance, Applicant argued “*the invention provides that* the two instances share a common secret code and use it in order to *encrypt and decrypt* messages exchanged between them.” *Id.* (emphases added). Without referring to “the invention,” Applicant noted that “the instances do not communicate directly but rather indirectly via the terminal” and the separation “remains completely intact since no messages are exchanged between the CCL and RCL.” *Id.*

Furthermore, we agree with Petitioner that Applicant’s arguments to overcome the prior art are made in the third paragraph of argument omitted by Patent Owner. In that paragraph, Applicant specifically referred to the prior art with respect to the application of encryption, arguing “[a]n *application of the encryption technologies to the tokens* is, however, not disclosed.” Ex. 1002, 112 (emphasis added). Applicant argued that the prior art “fails to disclose encryption of the tokens in the CCL, decryption and verification of the tokens in the RCL, and transmission of encrypted tokens by the CCL and RCL via the terminal, as required by the claimed invention.” *Id.*

We agree with Petitioner’s characterization of Applicant’s arguments made to overcome the prior art, i.e., that applicant’s argument is narrow and is “that a **specific encrypted token** must be transmitted via the terminal.” Pet. Reply 9. As noted above, Patent Owner did not file a Sur-reply and thus declined the opportunity to respond to Petitioner’s arguments, including Petitioner’s explanation of the prosecution history, in a sur-reply.

Although not necessary for our determination, as will be discussed further below (*see* §§ II.D, II.F), in the instant proceeding, the asserted prior

art teaches sending encrypted messages via the terminal and, further, meets the recitation even using Patent Owner's construction. Nonetheless, Patent Owner argues in this proceeding for a more limited construction than is supported by arguments made by Applicant during prosecution.

Patent Owner makes arguments relying on cases regarding disclaimer. PO Resp. 8–9 (citing Ex. 1002, 111; *Epistar*, 566 F.3d at 1334; *Tech. Props.*, 849 F.3d at 1357; *Speedtrack*, 998 F.3d at 1379). Importantly, however, Patent Owner's arguments are based on its mischaracterization of the prosecution history and the actual arguments made by Applicant to try to overcome the prior art. The cases relied on by Patent Owner are inapposite because disclaimer in those cases relates to arguments actually made to overcome prior art.

Patent Owner's argument that our "initial determination" failed "to give proper weight to the clear and unmistakable language of the applicant during prosecution" (*id.* at 9) also is based on Patent Owner's mischaracterization of the prosecution history. We have considered the entirety of the prosecution history and the statements relied on by Patent Owner in their proper context and find that the arguments that Applicant actually made do not support Patent Owner's position.

Based on the complete record now before us, we maintain our preliminary determination that the claims do not require "complete separation" or that direct communication between the call control level and resource control level is prohibited. Patent Owner's position is not consistent with the language of the claims, the '627 patent Specification, or the prosecution history. We do not discern a reason, based on the entirety of the record now before us, for reading into the claims a prohibition on direct communication between the levels.

No further construction of “call control level” and “resource control level” is needed to resolve a dispute before us. *See infra* §§ II.D, II.F.

3. *Does “transferring the verified QoS requirement and the encrypted token” recited in claims 1, 8, and 10 and similar recitations in claims 11 and 12 place limits on how the verified QoS requirement and the encrypted token are packaged for transfer?*

Patent Owner argues “[e]lement 1d (as well as elements 8d, 10d, 11f, and 12f) requires that ‘the verified QoS requirement and the encrypted token’ must both be transferred to the RCL.” PO Resp. 14 (citing Ex. 1001, 5:59–60). Patent Owner argues that the claims explicitly require “that the QoS requirement and the encrypted [token] are separate elements.” *Id.* at 15. Patent Owner also argues “Petitioner points to nothing within the ’627 patent, nor can it, that describes the encrypted token as ‘containing’ the QoS requirement.” *Id.*

Petitioner argues that the claim language “places no limits on how the verified QoS requirement and the encrypted token are packaged for transfer.” Pet. Reply 17. Petitioner argues that the “claim language encompasses separate or combined transfer of the verified QoS requirement and the encrypted token.” *Id.*

We agree with Petitioner. The claim language does not place limits on packaging for transfer and encompasses separate or combined transfer of the verified QoS requirement and the encrypted token.

We also look to the ’627 patent Specification and disagree with Patent Owner. We find that Petitioner’s arguments are consistent with the ’627 patent Specification. For instance, the Specification describes creating at least one token “taking into account the verified QoS requirement” and “*all or a major part of the resource and QoS requirement data is input into this token.*” Ex. 1001, 12:53–57 (emphasis added). The ’627 patent Specification

also describes transferring tokens in standardized messages of existing protocols. *Id.* at 11:32–34 (“The Tokens T_A , T_B respectively are transferred in the standardized messages of the H.225.0, SIP, RSVP protocols.”)

Patent Owner’s overly narrow implicit proposed construction that does not encompass separate or combined transfer is not consistent with the intrinsic evidence. Patent Owner does not address the embodiment above described in the ’627 patent Specification or provide an explanation supporting that the claims should be construed narrowly so as to exclude this embodiment. *See generally* PO Resp. Patent Owner also does not point to an alternate embodiment of the ’627 patent that supports its position. *Id.*

Upon consideration of the complete record before us, we agree with Petitioner that the claim language “places no limits on how the verified QoS requirement and the encrypted token are packaged for transfer.” Pet. Reply 17. We also agree with Petitioner that the “claim language encompasses separate or combined transfer of the verified QoS requirement and the encrypted token.” *Id.* No further determinations are needed to resolve a dispute before us. *See infra* §§ II.D, II.F.

*D. Unpatentability of Claims 1, 3, 4, and 8–12 under
35 U.S.C. § 103 as Obvious over Reeves and Rivest*

Petitioner asserts that claims 1, 3, 4, and 8–12 are unpatentable as obvious over the combined teachings of Reeves and Rivest. Pet. 4. Patent Owner counters that the asserted prior art does not teach (1) functionally separate call and resource control levels (PO Resp. 10–13), (2) verifying the QoS requirement (*id.* at 13–14), or (3) separately transferring a verified QoS requirement and an encrypted token (*id.* at 14–16).

We begin with an overview of Reeves and Rivest. We then turn to the parties’ contentions.

I. Reeves

Reeves relates to authorizing communication services over a network. Ex. 1004, 1:6–8. Figure 2 of Reeves illustrates a block representation of network elements. *Id.* at 2:53–55.

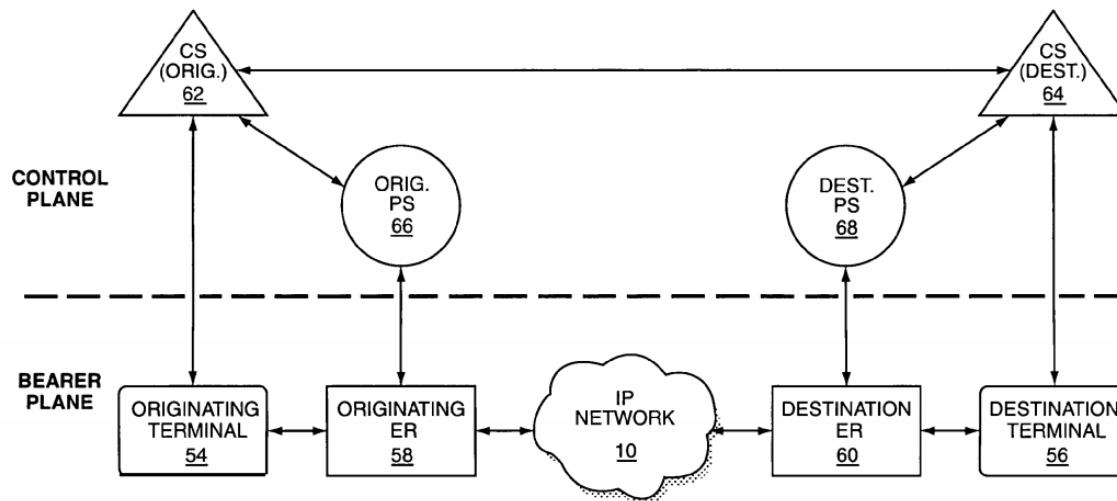


FIG. 2

Figure 2, above, illustrates a block representation of network elements for establishing communications between originating terminal 54 and destination terminal 56, with originating terminal 54 communicating with originating edge router 58 and destination terminal communicating with destination edge router 60 to access IP network 10. *Id.* at 2:53–55, 4:40–50.

For telephone communication, originating server 62 of the communication service provider is contacted by originating terminal 54 to make the telephone call. *Id.* at 5:3–7. Originating communication server 62 verifies that the calling user is a valid subscriber, and determines that the originating user subscribes to the requested service. *Id.* at 5:8–10. Originating communication server 62 then authorizes the requested service, if appropriate, by issuing authorization indicia information. *Id.* at 5:10–13. This authorization indicia contains the identity of the originating user, the

identity of the communication service provider, and the resources the originating user is authorized to receive. *Id.* at 5:13–16. The authorization indicia is time-stamped and digitally signed according to the authentication protocol provided by authentication server 52. *Id.* at 5:22–24. The time-stamped and signed authorization information is referred to as a media authorization object (MAO). *Id.* at 5:24–26.

Originating terminal 54 sends the MAO embedded in a communication request to originating edge router 58. *Id.* at 5:58–60. Originating edge router 58 extracts the MAO from the request and requests permission to establish the connection and resources from originating policy server 66. *Id.* at 5:60–63. Originating policy server 66 determines whether to grant permission based on the MAO and other traditional criteria. *Id.* at 5:63–66. If permission is granted, originating edge router 58 informs originating terminal 54, which alerts originating communication server 62 of the grant. *Id.* at 6:2–6.

Reeves also describes using resource reservation protocol (RSVP) for reservation setup and control for streaming, media communications or other applications that require circuit-switched emulation on an IP network 10. *Id.* at 8:9–12. RSVP transmits data path (PATH) messages containing the traffic specification information to destination terminal 56. *Id.* at 8:15–17. Each RSVP-enabled device in IP network 10, such as originating and destination edge routers 58 and 60 establishes a “PATH-state” that includes the previous source address of the PATH message to define each of the next-hop addresses between original and destination terminals 54 and 56. *Id.* at 8:18–22. Destination edge router 60 requests that destination policy server 68 authorize services and that request also includes the MAO. *Id.* at 8:34–38.

When the connection information between the two endpoints has been established and the path has been defined using the PATH message, destination terminal 56 sends a reservation request message (RESV) along the path to the source of the PATH message to reserve resources. *Id.* at 8:44–50. The RESV message will preferably include the traffic specification, quality of service (QoS) level required and any other information necessary for reservation. *Id.* at 8:50–53.

2. *Rivest*

Rivest relates to cryptographic communications systems and methods. Ex. 1005, 1:11–13. Rivest describes when user A wants to send user B a “signed” document M, user A first uses his own decryption key D_A to transform M into a signed message word. *Id.* at 3:40–42. User A then uses user B’s encryption key E_B to generate a signed ciphertext word, which is sent to user B. *Id.* at 3:43–45. User B initially uses his secret decryption key D_B to reduce the signed ciphertext to a signed message word. *Id.* at 3:45–48. Now using user A’s encoding key E_A , user B decodes the signed message word. *Id.* at 3:48–50.

3. *Independent Claim 1*

a) *Reasoning to Combine*

Petitioner contends “Reeves discloses digitally signing data without indicating a specific method for digitally signing data” and “Rivest teaches a common method for digitally signing data using asymmetric encryption.” Pet. 18. Relying on the testimony of Dr. Acampora, Petitioner contends “[i]t would have been obvious for a POSITA at the time of the alleged invention of the ’627 patent to combine the teachings of Reeves and Rivest.” *Id.* (citing Ex. 1003 ¶¶ 114–120).

More specifically, Petitioner contends that a person having ordinary skill in the art “would have found the digital signature techniques of Rivest to be an obvious choice from among a limited number of well-known alternatives.” *Id.* (citing Ex. 1003 ¶¶ 114–120). Dr. Acampora testifies that a person having ordinary skill in the art would have known of “two well-known techniques for producing a digital signature.” Ex. 1003 ¶ 114. Dr. Acampora provides detailed testimony describing the two techniques and testifies that “Rivest discloses the second technique.” *Id.* ¶¶ 115–120. Dr. Acampora testifies Rivest’s technique would have been “an obvious choice from among a limited number of well-known alternatives that can be selected for the digital signing required by Reeves.” *Id.* ¶ 120.

Petitioner also contends the following:

[F]or situations such as that described in Reeves, where the MAO is likely to be a small message, the digital signature techniques of Rivest are desirable because encryption of the entire MAO ensures both authenticity of the sender and privacy of the message. The use of Rivest’s digital signature technique furthers the secure authorization goals of Reeves *better* than other digital signature techniques where the entire MAO is not encrypted.

Pet. 18 (emphasis added (citing Ex. 1003 ¶ 117)). Dr. Acampora testifies “for situations such as that described in Reeves, where the MAO is likely to be a small message, the digital signature techniques of Rivest are desirable because encryption of the entire MAO is possible such that, in addition to authenticating the server, privacy of the message is also maintained.” Ex. 1003 ¶ 120.

Dr. Acampora also testifies that with Petitioner’s proposed combination “the policy server know[s] that the indicated QoS was authenticated by an authorized communication server and could not have been forged by an originating terminal (or anything else, for that matter)”

and the “privacy of the QoS needs of the originating terminal is maintained.” *Id.* Dr. Acampora testifies “[u]se of Rivest’[s] disclosed method of digitally signing a message would further Reeves’ goal of providing ‘secure authorization indicia.’” *Id.* (citing Ex. 1004, code (57), 4:33–35).

Patent Owner does not dispute Petitioner’s arguments or evidence regarding Petitioner’s reasoning to combine the teachings of Reeves and Rivest. We agree with Petitioner’s arguments and credit the testimony of Dr. Acampora because Petitioner’s arguments and Dr. Acampora’s testimony are consistent with and supported by the evidence of record.

After consideration of the contentions and the evidence of record based on the entire record, we are persuaded that Petitioner has offered articulated reasoning with a rational underpinning as to why one of ordinary skill in the art would have combined the teachings of Reeves and Rivest in the manner recited in claim 1.

b) Element 1a: The Preamble

The preamble of claim 1 is a “method for transferring data with a verified QoS in a communication network, which includes a call control level, a resource control level and at least one terminal assigned to data transfer.”¹¹ Petitioner contends that Reeves teaches the preamble by describing establishing communications between originating terminal 54 and destination terminal 56, each of which communicate with edge routers (originating edge router 58 and destination edge router 60, respectively) to access IP network 10. Pet. 20 (citing, *e.g.*, Ex. 1004, 4:40–61). Petitioner contends that Reeves teaches the call control level recited the preamble in

¹¹ As discussed with respect to claim construction (*see supra* § II.C.1), as an independent reason for our conclusions herein, we discuss Petitioner’s arguments showing that the preamble is met even if it is limiting.

claim 1 based on Reeves's disclosure of originating communication server 62 sending the MAO. *Id.* at 20–21 (citing, *e.g.*, Ex. 1004, 4:40–61, 5:10–26). Petitioner contends that Reeves teaches the resource control level recited in the preamble of claim 1 based on Reeves's disclosure of edge router 58 and policy server 66. *Id.* at 21 (citing, *e.g.*, Ex. 1004, 5:60–67).

Petitioner submits the testimony of Dr. Acampora as supporting evidence. *Id.* at 19–22 (citing, *e.g.*, Ex. 1003 ¶¶ 102–105). Dr. Acampora testifies “[s]erver 62 is a call control level element that control[s] the call or session, while edge router 58 and policy server 66 are resource control level elements that include a resource controller that performs capacity control, and these levels are functionally separate because they are located in separate devices and operate separately.” Ex. 1003 ¶ 102.

Patent Owner argues that Reeves does not teach functionally separate call and resource control levels. PO Resp. 10–14. Patent Owner's arguments are based on Patent Owner's proposed construction. For the reasons given with respect to claim construction (*see supra* § II.C.2), we decline to narrow the claims in the manner proposed by Patent Owner because Patent Owner's position on claim construction is not consistent with the intrinsic evidence.

Although not necessary, as an independent reason for our conclusions herein, we find that Reeves teaches the preamble even using Patent Owner's narrow construction. Petitioner contends that Reeves teaches the preamble by describing establishing communications between originating terminal 54 and destination terminal 56, each of which communicate with edge routers (originating edge router 58 and destination edge router 60, respectively) to access IP network 10. Pet. 20 (citing Ex. 1004, 4:40–61). Reeves describes that originating communication server 62 (relied on by Petitioner for teaching the call control level) sends the MAO to the originating terminal 54

at block 102. Ex. 1004, 5:39–41. Originating terminal 54 sends the MAO embedded in a communication request to originating edge router 58. *Id.* at 5:58–60. As illustrated in Figure 2 of Reeves, originating terminal 54 and originating edge router 58 operate in the bearer plane. *Id.* at Fig. 2. Originating edge router 58 extracts the MAO from the request and requests permission to establish the connection and resources from originating policy server 66. *Id.* at 5:60–63. Originating policy server 66 determines whether to grant permission based on the MAO and other traditional criteria. *Id.* at 5:63–66. As discussed above, Petitioner relies on Reeves’s disclosure of edge router 58 and policy server 66 for teaching the resource control level. Pet. 21 (citing, *e.g.*, Ex. 1004, 5:60–67).

The portion of Reeves cited by Patent Owner understood in context is consistent with Petitioner’s argument that Reeves teaches the preamble even using Patent Owner’s proposed, overly narrow constructions. *See, e.g.*, Pet. 20–21; Reply 14. More specifically, Patent Owner’s argument relies entirely on a two-way arrow between originating communication server 62 and originating policy server 66 illustrated in Figure 2 of Reeves. PO Resp. 10–13. Reeves’s disclosure relating to that arrow is minimal and indicates that communication depicted by the arrow is *optional*. In particular, Reeves describes that “[t]he policy servers 66, 68 *may* contact the respective communication server to confirm or aid the authorization process.” Ex. 1004, 5:67–6:2 (emphasis added). Reeves would have been correctly understood, consistent with Petitioner’s contentions (*see, e.g.*, Pet. 20–21; Ex. 1003 ¶¶ 99–103; Reply 14), to include both options, *i.e.*, that the contact occurs, as well as that policy servers 66, 68 do not contact the respective communication server. Importantly, Reeves teaches that “originating communication server 62 *preferably* sends the MAO to the originating

terminal 54 (block 102).” Ex. 1004, 5:39–41 (emphasis added). Thus, Reeves’s teachings considered in their entirety support Petitioner’s contentions that *preferably* communications occur *via the terminal* and no direct communications occur between the call control level and resource control level, which meets the disputed limitations even under all Patent Owner’s proposed, overly narrow constructions.

As is discussed with respect other elements of claim 1, Petitioner also relies on Reeves’s teachings relating to RSVP. *See, e.g.*, Pet. 28–30 (citing, *e.g.*, Ex. 1004, 8:10–33, 8:44–9:20). Reeves’s disclosures relating to RSVP also describe communications via terminal 54, like Reeves’s disclosures above. Ex. 1004 8:24–26 (describing sending a PATH message including a MAO from originating terminal 54), 8:37–40 (describing a RESV message traversing the network to originating terminal 54). We find Petitioner’s contentions that Reeves’s disclosures relating to RSVP satisfy the preamble to be consistent with Reeves’s disclosure. For these reasons and the reasons given above, as an independent reason for our conclusions herein, Reeves teaches the preamble even under all Patent Owner’s proposed, overly narrow constructions.

We turn to Petitioner’s argument and Dr. Acampora’s testimony that server 62 is a call control level element that controls the call or session. *See, e.g.*, Pet. 21; Ex. 1003 ¶ 102. Petitioner’s argument and Dr. Acampora’s testimony (*id.*) are consistent with and supported by the evidence of record including Reeves’s description relating to functions performed by server 62, such as verifying “that the calling user is a valid subscriber,” determining that “the originating user subscribes to the requested service,” “authoriz[ing] the requested service, if appropriate,” and “issuing authorization indicia information,” which is referred to as MAO. Ex. 1004, 5:8–26.

Petitioner’s argument and Dr. Acampora’s testimony that edge router 58 and policy server 66 are resource control level elements that perform capacity control (*see, e.g.*, Pet. 21; Ex. 1003 ¶ 102) also are consistent with Reeves’s description relating to terminal 54 sending the MAO “to the necessary network elements responsible for *reserving resources* for the communication connection.” Ex. 1004, 5:49–52 (emphasis added). Reeves includes further supporting description including that the MAO is embedded in a communication request and sent to originating edge router 58, which extracts the MAO and requesting permission from policy server 66. *Id.* at 5:50–67. Petitioner’s argument and Dr. Acampora’s testimony that Reeves’s levels are functionally separate because they are located in separate devices and operate separately (*see, e.g.*, Pet. 21; Ex. 1003 ¶ 102) are consistent with and supported by the evidence of record, including the teachings above and Figure 2 illustrating that server 62, terminal 54, edge router 58, and policy server 66 are separate devices. Ex. 1004, 5:8–26, 5:48–67, Fig. 2.

In summary, we agree with Petitioner’s arguments and credit the testimony of Dr. Acampora because Petitioner’s arguments and Dr. Acampora’s testimony are consistent with and supported by the evidence of record. Petitioner’s contentions are not undermined by Patent Owner’s arguments. After consideration of the contentions and the evidence of record, we find that Petitioner has shown that Reeves teaches the preamble of claim 1.

c) *Element 1b: “determining a QoS requirement for data transfer and verified at call control level”*

Relying on the testimony of Dr. Acampora, Petitioner contends that Reeves teaches element 1b based on Reeves’s disclosure that originating

communication server 62 verifies that the user subscribes to the requested service and authorizes the requested service by creating and issuing a MAO. Pet. 23–25 (citing, *e.g.*, Ex. 1004, 5:3–26; Ex. 1003 ¶¶ 106–109). Petitioner also points to Reeves’s disclosure that network elements “may use the authorization indicia to access a policy server to gain approval for reservation of the resources” such as “sufficient bandwidth, **quality of service, or like resource.**” *Id.* at 23 (citing Ex. 1004, 2:31–36). Petitioner also points to the operation of the session initiation protocol (SIP) proxy in authenticating information contained in the MAO. *Id.* at 24–25 (citing, *e.g.*, Ex. 1004, 7:27–31; Ex. 1003 ¶ 111).

Dr. Acampora testifies that the “communication server 62 determines and verifies a QoS requirement for data transfer.” Ex. 1003 ¶ 106 (citing Ex. 1004, 5:3–26); *see also id.* ¶ 111 (“The originating communication server 62 is a call control element” and “the originating communication server (call control level) verifies the QoS requirement by verifying that the requested services are authorized for provisioning to the terminal.”).

Dr. Acampora testifies that to issue the MAO containing “the *resources* the originating user is authorized to receive,” communications server 62 necessarily determines what those resources are. *Id.* ¶ 107 (quoting Ex. 1004, 5:13–16) (alteration in original). Dr. Acampora also testifies that “QoS is a resource.” *Id.* ¶¶ 107–108 (citing Ex. 1004, 2:31–36).

Patent Owner argues that the verification is not at the call control level. PO Resp. 13–14. Patent Owner argues that “while the communication server 62 issues authorization indicia information, that information is authenticated, *i.e.*, verified, by the authorization server 52.” *Id.* at 14. Patent Owner also argues “there is no disclosure within Reeves of establishing the MAO that does not involve the authentication server 52.” *Id.*

In its Reply, Petitioner responds that Patent Owner quotes Reeves “incompletely.” Pet. Reply 15. Petitioner argues the “full quote regarding sending authorization indicia is as follows: ‘the authorization procedure may allow the authentication server 52 to send authentication indicia to establish the MAO **at the originating communication server 62** or originating terminal.’” Pet. Reply 15 (citing Ex. 1004, 5:27–29). Petitioner also argues that Patent Owner “not only confusingly interprets ‘sending’ authentication indicia as ‘verifying’ a QoS requirement, but also disregards the recipient of the sent indicia (i.e., the CCL).” *Id.* at 15–16.

We agree with Petitioner. Consistent with Petitioner’s arguments and Dr. Acampora’s testimony, Reeves describes “originating communication server 62 will . . . authorize the requested service, if appropriate.” Ex. 1004, 5:10–12. Reeves describes that that “originating call server 62 acts as a SIP [Session Initiation Protocol] proxy.” *Id.* at 7:19–20. Reeves describes that communication server 62 acting as the SIP proxy “forwards the invitation to the intended destination terminal 56.” *Id.* at 7:23–26. Reeves describes the forwarding process in more detail including that communication server 62 acting as the SIP proxy “appends *the MAO for authorizing the service and the resources necessary to provide the service.*” *Id.* at 7:27–29 (emphasis added). Reeves describes that communication server 62 acting as the SIP proxy “preferably includes its own identity, and *authenticates the information contained therein.*” *Id.* at 7:29–31 (emphasis added).

Additionally, consistent with Petitioner’s arguments and Dr. Acampora’s testimony, Reeves describes that the MAO preferably contains “the *resources* the originating user is authorized to receive.” Ex. 1004, 5:13–16 (emphasis added). Reeves also describes quality of service as an exemplary resource by stating the “communication may

provide transfer of data for any type of media, including voice, audio and video, where it is necessary to reserve bandwidth, *quality of service, or like resource.*” *Id.* at 2:31–36 (emphasis added).

In summary, we agree with Petitioner’s arguments and credit the testimony of Dr. Acampora because Petitioner’s arguments and Dr. Acampora’s testimony are consistent with and supported by the evidence of record. Petitioner’s contentions are not undermined by Patent Owner’s arguments. After consideration of the contentions and the evidence of record, we find that Petitioner has shown that Reeves teaches element 1b of claim 1.

d) Element 1c: “creating and transferring, taking into account the QoS requirement verified at the call control level, at least one encrypted token to the terminal”

Petitioner contends that Reeves teaches element 1c based on Reeves’s disclosure of issuing the MAO with authorization information that is time-stamped and digitally signed. Pet. 25 (citing, *e.g.*, Ex. 1004, 5:13–16, 5:22–24). Petitioner also notes that Reeves discloses using public and private key encryption technologies or authentication protocols to facilitate authorization. *Id.* at 26 (citing Ex. 1004, 5:33–36). Petitioner also points to Rivest’s disclosure of using enciphered communication for sending a signed document between two users. *Id.* at 26–27 (citing Ex. 1005, 3:40–52). As discussed above (*see supra* § II.D.3.a), we are persuaded that Petitioner has offered articulated reasoning with a rational underpinning as to why one of ordinary skill in the art would have combined the teachings of Reeves and Rivest in the manner recited in claim 1. Petitioner submits the testimony of Dr. Acampora as supporting evidence. *Id.* at 25–27 (citing Ex. 1003 ¶¶ 112–113, 119–120).

Patent Owner does not dispute Petitioner's arguments or evidence regarding element 1c except as discussed with respect to "call control level" recited in the preamble. *See supra* § II.D.3.b. We agree with Petitioner's arguments and credit the testimony of Dr. Acampora because Petitioner's arguments and Dr. Acampora's testimony are consistent with and supported by the evidence of record. After consideration of the contentions and the evidence of record, we find that Petitioner has shown that Reeves teaches element 1c of claim 1.

e) *Element 1d: "transferring the verified QoS requirement and the encrypted token to the resource control level from the terminal"*

Petitioner contends that Reeves teaches element 1d based on Reeves's disclosure that "the originating terminal 54 will send the MAO embedded in the communication request to the originating edge router 58 (block 108)" and the "originating edge router 58 will extract the MAO from the request and request permission to establish the connection and resources from the associated, originating policy server 66 (block 110)." Pet. 27 (quoting Ex. 1004, 5:58–63). Petitioner also points to Reeves's disclosure that "[t]he originating edge router 58 forwards the request, with the MAO, to its associated, originating policy server 66 using COPS (block 226)." *Id.* (quoting Ex. 1004, 8:26–29).

Petitioner also contends if element 1d "is interpreted as requiring the transfer of two instances of the verified QoS requirement (one instance as the verified QoS requirement and a second instance as part of the encrypted token), Reeves in view of Rivest renders it obvious." *Id.* at 28. Petitioner points to Reeves's additional disclosure of terminal 54 sending a PATH message including the MAO. *Id.* (citing Ex. 1004, 5:58–63, 8:10–29).

Petitioner submits the testimony of Dr. Acampora as supporting evidence. *Id.* at 27–28 (citing Ex. 1003 ¶¶ 121–122). Dr. Acampora testifies that “by sending the MAO in the communication request to the originating edge router 58, the terminal 54 is transferring the verified QoS requirement and the encrypted token (MAO) to the resource control level” because the “encrypted token (MAO) contains the verified QoS requirement.” Ex. 1003 ¶¶ 121–122. Dr. Acampora also provides testimony in support of Petitioner’s contention that if element 1d “is interpreted as requiring the transfer of two instances of the verified QoS requirement (one instance as the verified QoS requirement and a second instance as part of the encrypted token), Reeves in view of Rivest renders it obvious.” *Id.* ¶ 122 (citing Ex. 1004, 5:48–55, 5:58–60, 6:23–26, 8:10–29). Dr. Acampora testifies that a “PATH message is a standard message used in RSVP” that is “known to include QoS requirements as a standard feature of RSVP.” *Id.* Dr. Acampora’s testimony points to Reeves’s disclosure that “RSVP transmits PATH messages containing the traffic specification information,” which is “defined in terms of the upper and lower bounds of bandwidth, *delay and jitter*.” *Id.* (citing Ex. 1004, 8:13–16). Dr. Acampora testifies that delay and jitter requirements are QoS requirements. *Id.*

Patent Owner argues that element 1d “requires that ‘the verified QoS requirement and the encrypted token’ must both be transferred to the RCL.” PO Resp. 14 (citing Ex. 1001, 15:59–60). Patent Owner also argues that “[o]ther claim elements further demonstrate that the verified QoS requirement and the encrypted token cannot be the same thing.” *Id.* Patent Owner also asserts that Petitioner’s arguments are “inconsistent with the claim’s explicit requirement that the QoS requirement and the encrypted are separate elements that interact with each other to perform the claimed

method.” *Id.* at 15. Regarding Petitioner’s contention and Dr. Acampora’s testimony that if element 1d is interpreted as requiring the transfer of two instances of the verified QoS requirement, Reeves in view of Rivest renders it obvious, Patent Owner argues “neither Petitioner nor their expert provide any argument about what disclosure in Rivest could be combined with Reeves, or what disclosure in Rivest would in any way lead a POSITA conclude that Reeves could be modified or otherwise discloses the limitation.” *Id.*

Petitioner responds the claim language “places no limits on how the verified QoS requirement and the encrypted token are packaged for transfer.” Pet. Reply 17. Petitioner also argues that the “claim language encompasses separate or combined transfer of the verified QoS requirement and the encrypted token.” *Id.* Petitioner states “[t]here is no dispute that the MAO is the encrypted token and also contains the verified QoS requirement.” Pet. Reply 17 (citing PO Resp. 14–16). Petitioner argues “Reeves teaches transferring the MAO to the RCL from the terminal.” *Id.* (citing Pet. 17–18; Ex. 1004, 5:58–63; 8:10–29). Petitioner also responds that its contention and Dr. Acampora’s testimony that if element 1d is interpreted as requiring the transfer of two instances of the verified QoS requirement, Reeves in view of Rivest renders it obvious refers to the ground of unpatentability, but Petitioner argues that it has shown that “the element is taught by Reeves.” *Id.* at 18.

We agree with Petitioner. Patent Owner’s contentions are premised on Patent Owner’s proposed construction, which we decline to adopt for the reasons set forth above. *See* § II.C.3. For the reasons discussed above (*id.*), we agree with Petitioner that the claim language “places no limits on how the verified QoS requirement and the encrypted token are packaged for

transfer.” Pet. Reply 17. We also agree with Petitioner that the “claim language encompasses separate or combined transfer of the verified QoS requirement and the encrypted token.” *Id.*

Additionally, Patent Owner’s argument that “[o]ther claim elements further demonstrate that the verified QoS requirement and the encrypted token cannot be the same thing” (PO Resp. 14) is misplaced. We agree with Petitioner that “[t]he Petition does not allege that the verified QoS requirement and the encrypted token are the ‘same thing.’” Pet. Reply 17. We also agree with Petitioner that Patent Owner does not dispute “that the MAO is the encrypted token and also contains the verified QoS requirement.” *Id.* (citing PO Resp. 14–16).

Consistent with Petitioner’s contentions and Dr. Acampora’s testimony, Reeves describes “the originating terminal 54 will send the MAO embedded in the communication request to the originating edge router 58 (block 108).” Ex. 1004, 5:58–60. Also, Petitioner’s contentions and Dr. Acampora’s testimony are consistent with Reeves’s disclosure that the MAO contains “the resources the originating user is authorized to receive” (*id.* at 5:13–16) and that quality of service is an exemplary resource (*id.* at 2:31–36).

We also agree with Petitioner’s contentions and Dr. Acampora’s testimony that Reeves teaches transfer of two instances of the verified QoS requirement (one instance as the verified QoS requirement and a second instance as part of the encrypted token). Pet. 28; Ex. 1003 ¶ 122. Petitioner’s showing in this regard meets element 1d even under Patent Owner’s proposed construction as both the QoS requirement and the encrypted token are transferred. Pet. 28. We agree with Petitioner (Pet. Reply 18) that the Petition relies on Reeves, not Rivest for this teaching. Patent Owner’s

dispute regarding Rivest's lack of teaching does not discuss Reeves's teachings discussed in the Petition in support of Petitioner's contention. PO Resp. 15. Patent Owner's argument that the Petition does not address other claim limitations (*id.* at 16) is inconsistent with the arguments in the Petition and Dr. Acampora's testimony.

Consistent with Petitioner's contentions and Dr. Acampora's testimony (Pet. 28; Ex. 1003 ¶ 122), Reeves describes that "RSVP transmits PATH messages containing the traffic specification information." Ex. 1004, 8:15–17. Reeves describes that "[t]ypically, senders of information define outgoing traffic for the communication in terms of the upper and lower bounds of bandwidth, delay and jitter." *Id.* at 8:12–15. Reeves describes "[t]o set up the communication path, the originating terminal 54 will send a first PATH message, which includes the MAO, to the originating edge router 58 (block 224)." *Id.* at 8:23–26.

Contrary to Patent Owner's argument (PO Resp. 16), the Petition demonstrates that creating and sending the MAO meets the other limitations recited in claim 1. Pet. 18–32. Reeves's disclosure that "senders of information" perform the defining (Ex. 1004, 8:13–15) and Reeves's disclosure that originating communication server 62 sends "authorization indicia information" are consistent with and support Dr. Acampora's testimony that claim 1 is met by the alternate embodiment. Ex. 1003 ¶ 122. Dr. Acampora's testimony (*id.*) also is consistent with Reeves's disclosure that sending of the PATH message is by terminal 54 (Ex. 1004, 8:13–15), which receives the MAO from communication server 62 (*id.* at 5:39–41).

In summary, we agree with Petitioner's arguments and credit the testimony of Dr. Acampora because Petitioner's arguments and Dr. Acampora's testimony are consistent with and supported by the evidence

of record. Petitioner's contentions are not undermined by Patent Owner's arguments. After consideration of the contentions and the evidence of record, we find that Petitioner has shown that Reeves teaches element 1d of claim 1.

f) Element 1e: “decrypting, at the resource control level, the encrypted token, and verifying the QoS requirement using the decrypted token”

Petitioner contends that Reeves teaches element 1e based on Reeves's disclosure of the originating policy server 66 verifying that the requested services are authorized using the MAO. Pet. 29 (citing Ex. 1004, 8:23–33). Petitioner also points to Reeves's disclosure of reserving resources using a RESV message that includes the quality of service required, as well as Reeves's disclosure of providing the MAO with the RESV message. *Id.* at 29–30 (citing Ex. 1004, 8:44–9:20). Petitioner further asserts that a person having ordinary skill in the art would have understood that to access encrypted digital data, the data must be decrypted. *Id.* at 30 (citing Ex. 1005, 3:40–52); *see also* Ex. 1003 ¶ 126 (including Dr. Acampora's testimony that a “POSITA would understand that in order to access data digitally signed in this fashion for the verification discussed above, it must be decrypted using the receiver's private key and the sender's public key”).¹² Relying on the testimony of Dr. Acampora, Petitioner asserts, therefore, policy server 66 decrypts the MAO and a person having ordinary skill in the art would have understood that decrypting at policy server 66 would safeguard the data. Pet. 30–31 (citing Ex. 1003 ¶ 126). Petitioner submits the testimony of

¹² Each of Petitioner argument and Dr. Acampora's testimony includes citations to Exhibit 1004, but appears to refer to Exhibit 1005. We treat this as harmless error.

Dr. Acampora as supporting evidence. *Id.* at 28–31 (citing Ex. 1003 ¶¶ 124–126).

Patent Owner does not dispute Petitioner’s arguments or evidence regarding element 1e. We agree with Petitioner’s arguments and credit the testimony of Dr. Acampora because Petitioner’s arguments and Dr. Acampora’s testimony are consistent with and supported by the evidence of record. After consideration of the contentions and the evidence of record, we find that Petitioner has shown that the asserted art teaches element 1e of claim 1.

g) Element 1f: “configuring the communication network taking into account the QoS requirement verified, such that the data is transferred with the verified QoS”

Petitioner contends that Reeves teaches element 1f based on Reeves’s disclosure of forming a connection between edge routers 58 and 60. Pet. 31 (citing, *e.g.*, Ex. 1004, 6:24–33). Petitioner also provides the testimony of Dr. Acampora that a person having ordinary skill in the art would have understood that Reeves teaches configuring the communication network by propagating the MAO. *Id.* at 31–32 (citing, *e.g.*, Ex. 1003 ¶ 129).

Patent Owner does not dispute Petitioner’s arguments or evidence regarding element 1f. We agree with Petitioner’s arguments and credit the testimony of Dr. Acampora because Petitioner’s arguments and Dr. Acampora’s testimony are consistent with and supported by the evidence of record. After consideration of the contentions and the evidence of record, we find that Petitioner has shown that Reeves teaches element 1f of claim 1.

h) Conclusion

After consideration of the contentions and the evidence of record, we find that Petitioner has shown that the combination of Reeves and Rivest

teaches each recitation of claim 1. Also, we are persuaded that Petitioner has offered articulated reasoning with a rational underpinning as to why one of ordinary skill in the art would have combined the teachings of Reeves and Rivest in the manner recited in claim 1.

Based on the complete record now before us, we determine that Petitioner has proved, by a preponderance of the evidence, that claim 1 is unpatentable under 35 U.S.C. § 103(a) as obvious over Reeves and Rivest.

4. *Independent Claims 8 and 10–12*

Independent claims 8 and 10–12 are similar to independent claim 1. Petitioner’s analysis of claims 8 and 10 is the same as the analysis of claim 1, except for additional analysis provided for claim 8 discussed below. Pet. 19–32. Petitioner’s analysis of claims 11 and 12 largely relies on Petitioner’s analysis of claims 1, 8, and 10. *Id.* at 33–38. Petitioner submits further testimony of Dr. Acampora as supporting evidence. *Id.* (citing, *e.g.*, Ex. 1003 ¶¶ 139–141, 145, 147, 148, 152–153). Petitioner accounts for all differences in the claims.

For instance, claim 8 recites a “computer readable medium storing a computer program, which is executable by a processor.” Petitioner points to claims 22 and 25 in Reeves reciting “computer readable medium comprising software for instructing a computer to.” *Id.* at 22 (citing Ex. 1004, 13:52–14:11, 14:21–16). Petitioner asserts that claim 22 of Reeves recites steps that are performed by Reeves’s terminal 54, router 58, and servers 62 and 66. *Id.* Petitioner also points to the understanding of a person having ordinary skill in the art of those devices. *Id.* (citing Ex. 1003 ¶ 105).

Each of the preambles of claims 11 and 12 recites “a functional separation of the call and resource control levels.” As we discussed with respect to claim construction (*see* § II.C.2), Patent Owner’s argument that “a

functional separation of the call and resource control levels” in claims 11 and 12 is limiting is cursory and unsupported by meaningful discussion in the Patent Owner Response. As we also discussed with respect to claim construction, none of the claims require the overly narrow limitations argued by Patent Owner, including “complete separation” or the prohibition of communication between the call control level and the resource control level. *Id.* Our discussion of the parties’ claim construction arguments applies to claims 11 and 12 even assuming the preambles of those claims are limiting, with the exceptions that we agree with Petitioner’s arguments regarding rendering superfluous the “functional separation” recitation. Although the recitation of “a functional separation of the call and resource control levels” in the preambles of claims 11 and 12 is more limited than the recitations of “call control level” and “resource control level” in other independent claims, even assuming the preambles of claims 11 and 12 are limiting, the recitations are not limited so as to require “complete” separation and do not prohibit communication.

As we discussed above in the element-by-element analysis of claim 1 (*see* § II.D.3), as an independent reason for our conclusions herein, we find that Reeves teaches the preamble even under all Patent Owner’s proposed, overly narrow constructions. That analysis also applies to the recitation of “a functional separation of the call and resource control levels” in the preambles of claims 11 and 12.

We further agree with Petitioner’s argument, referring back to claim 1, that the recitation of “a functional separation of the call and resource control levels” in the preambles of claims 11 and 12 is met by Reeves’s teaching that server 62 corresponding to the call control level and edge router 58 and policy server 66 corresponding to the resource control

level are located in separate devices and operate separately. Pet. 35–36 (citing, *e.g.*, Ex. 1003 ¶ 139). Consistent with Petitioner’s arguments, Reeves’s communication server 62 performs verifications and issues the MAO to originating terminal 54. *See, e.g.*, Ex. 1004, 5:8–13, 5:39–41. Originating terminal 54 sends the MAO embedded in a communication request to originating edge router, which extracts the MAO and requests permission from originating policy server 66. *Id.* at 5:58–65.

Each of claims 11 and 12 also recites “checking correctness of the verified QoS request using the decoded token.” For that recitation in claims 11 and 12, Petitioner provides the testimony of Dr. Acampora and asserts “[i]t would have been obvious to a POSITA to configure the policy server 66 to compare the verified QoS from the PATH message with the verified QoS in the MAO to ensure a match, thereby preventing errors.” Pet. 38 (citing Ex. 1003 ¶¶ 152–153).

Patent Owner does not argue claims 8 and 10–12 separately. *See generally* PO Resp. We agree with Petitioner’s arguments and credit the testimony of Dr. Acampora because Petitioner’s arguments and Dr. Acampora’s testimony are consistent with and supported by the evidence of record.

After consideration of the contentions and the evidence of record, we find that Petitioner has shown that the combination of Reeves and Rivest teaches each recitation of claims 8 and 10–12. Also, we are persuaded that Petitioner has offered articulated reasoning with a rational underpinning as to why one of ordinary skill in the art would have combined the teachings of Reeves and Rivest in the manner recited in the claims.

Based on the complete record now before us, we determine that Petitioner has proved, by a preponderance of the evidence, that claims 8 and

10–12 are unpatentable under 35 U.S.C. § 103(a) as obvious over the combined teachings of Reeves and Rivest.

5. *Dependent Claims 3, 4, and 9*

Claim 3 depends directly from claim 1 and further recites “wherein data of variable value is incorporated in the encrypted token.” Relying on the testimony of Dr. Acampora, Petitioner argues that Reeves teaches this recitation based on Reeves disclosure that “[t]he authorization indicia is preferably time-stamped and digitally signed according to the authentication protocol provided by the authentication server 52.” Pet. 32 (quoting Ex. 1004, 5:22–24; Ex. 1003 ¶ 131). Petitioner also points to Reeves’s disclosure that “the ‘authorization indicia will preferably contain the identity of the originating user, the identity of the communication service provider, and the resources the originating user is authorized to receive.’” *Id.* (quoting Ex. 1004, 5:13–16). Dr. Acampora testifies “[t]he time stamp and digital signature are data of variable value.” Ex. 1003 ¶ 131. Dr. Acampora also testifies that each of the identity of the originating user, the identity of the communication service provider, and the resources the originating user is authorized to receive are variable in value depending on the respective identities and requested resources. *Id.*

Patent Owner does not dispute separately Petitioner’s arguments or evidence regarding the further recitation in claim 3. We agree with Petitioner’s arguments and credit the testimony of Dr. Acampora because Petitioner’s arguments and Dr. Acampora’s testimony are consistent with and supported by the evidence of record. Based on the complete record now before us, we find that Petitioner has shown that the further recitation in claim 3 is taught by Reeves.

Claim 4 depends directly from claim 1 and further recites “wherein the encrypted token is transferred between the terminal and the call control level and/or between the terminal and the resource control level in existing signaling messages.” Relying on the testimony of Dr. Acampora, Petitioner argues that Reeves teaches this recitation based on Reeves’s disclosure that terminal 54 sends the MAO embedded in a communication request to originating edge router 58, which extracts the MAO from the request. Pet. 32–33 (citing Ex. 1004, 5:58–6:6; Ex. 1003 ¶¶ 132, 134). Petitioner also points to Reeves’s disclosure that “the originating terminal 54 will send a first PATH message, which includes the MAO, to the originating edge router (block 224).” *Id.* at 33 (quoting Ex. 1004, 8:23-25).

Patent Owner does not dispute separately Petitioner’s arguments or evidence regarding the further recitation in claim 4. We agree with Petitioner’s arguments and credit the testimony of Dr. Acampora because Petitioner’s arguments and Dr. Acampora’s testimony are consistent with and supported by the evidence of record. Based on the complete record now before us, we find that Petitioner has shown that the further recitation in claim 4 is taught by Reeves.

Claim 9 depends directly from claim 1 and further recites “wherein at least one terminal comprises means for implementing the method.” For the same reasons above in the element-by-element analysis of claim 1 (*see* § II.D.3), we agree with Petitioner’s arguments that Reeves teaches the further recitation in claim 9. Patent Owner does not dispute claim 9 separately.

In summary, we have considered Petitioner’s arguments and evidence for dependent claims 3, 4, and 9. Patent Owner does not present arguments separately contesting Petitioner’s assertions for claims 3, 4, and 9. We agree

with Petitioner's arguments that dependent claims 3, 4, and 9 would have been obvious over Reeves and Rivest for the reasons given in this section with respect to those claims as well as the reasons given for claim 1.

Based on the complete record now before us, we determine that Petitioner has proved, by a preponderance of the evidence, that claims 3, 4, and 9 are unpatentable under 35 U.S.C. § 103(a) as obvious over the combined teachings of Reeves and Rivest.

E. Unpatentability of Claim 2 under 35 U.S.C. § 103(a) over Reeves, Rivest, and Chen

Petitioner asserts that dependent claim 2 is unpatentable as obvious over the combination of Reeves, Rivest, and Chen. Pet. 4. Patent Owner does not present arguments separately contesting Petitioner's assertions for claim 2. PO Resp. 16 n.2.

We begin with an overview of Chen. We then turn to Petitioner's contentions.

1. Chen

Chen relates to a method and apparatus for providing admission control and network quality of service. Ex. 1006, 1:18–20. Chen describes forwarding REQUEST messages that request the establishment of a flow by specifying the desired level of service that the sender application would like to receive. *Id.* at 5:56–60. Chen also describes using repeated REQUEST messages to accommodate for certain changes that may occur in a network, such as topology changes, link failures, and route changes. *Id.* at 6:4–7.

2. Dependent Claim 2

Dependent claim 2 recites “wherein the call control level repeatedly transfers the token to the terminal, which is forwarded from there to the resource control level.” Petitioner relies on Chen for teaching using repeated

REQUEST messages to accommodate for certain changes that may occur in a network, such as topology changes, link failures, and route changes.

Pet. 41 (citing Ex. 1006, 5:56–6:7). Petitioner submits the testimony of Dr. Acampora as supporting evidence. *Id.* at 41–42 (citing Ex. 1003 ¶¶ 164–165).

Relying on the testimony of Dr. Acampora, Petitioner also provides contentions regarding reasoning to combine the teachings of Reeves, Rivest, and Chen. *Id.* at 40–41 (citing Ex. 1003 ¶¶ 163–165). For instance, Petitioner contends the following:

A POSITA would have found repeatedly transmitting requests including the MAO to be an obvious modification to improve performance and efficiency in the systems described by Reeves, because it would allow the systems to dynamically modify bandwidth allocations to more closely match the ongoing communications over the network. Indeed, Chen describes multiple scenarios where repeatedly sending a REQUEST message is advantageous. Repeated REQUEST messages can allow rejected requests to be subsequently accepted during connection formation, while after the connection is formed, the system can use the repeated REQUEST messages to alter connection parameters.

Id. at 40 (citing Ex. 1006, 9:57–61, 12:43–13:29).

Patent Owner does not argue claim 2 separately. PO Resp. 16 n.2. Petitioner’s assertions and Dr. Acampora’s testimony regarding claim 2 are consistent with and supported by the cited portions of Reeves, Rivest, and Chen.

After consideration of the contentions and the evidence of record, we find that Petitioner has shown that the combination of Reeves, Rivest, and Chen teaches each recitation of claim 2. Also, we are persuaded that Petitioner has offered articulated reasoning with a rational underpinning as

to why one of ordinary skill in the art would have combined the teachings of Reeves, Rivest, and Chen in the manner recited in claim 2.

Based on the complete record now before us, we determine that Petitioner has proved, by a preponderance of the evidence, that claim 2 is unpatentable under 35 U.S.C. § 103(a) as obvious over the combined teachings of Reeves, Rivest, and Chen.

F. Unpatentability of Claims 1, 3, 4, and 8–12 under 35 U.S.C. § 103(a) over Gleichauf and Reeves

Petitioner asserts that claims 1, 3, 4, and 8–12 are unpatentable as obvious over the combination of Gleichauf and Reeves. Pet. 4, 42–58. Patent Owner counters that the asserted prior art does not teach (1) functionally separate call and resource control levels (PO Resp. 17–19), (2) separately transferring a verified QoS requirement and an encrypted token (*id.* at 19–20), or (3) “verifying the QoS requirement using the decrypted token” (*id.* at 20–21).

We begin with an overview of Gleichauf. We then turn to the parties’ contentions.

1. Gleichauf

Gleichauf relates to IP telephony and real-time insertion of services during a call session over a communications network. Ex. 1007, 1:8–11. Figure 1, reproduced below, illustrates a block diagram of communications system 10 that supports real-time insertion of services during a call session over network 12. *Id.* at 2:59–62.

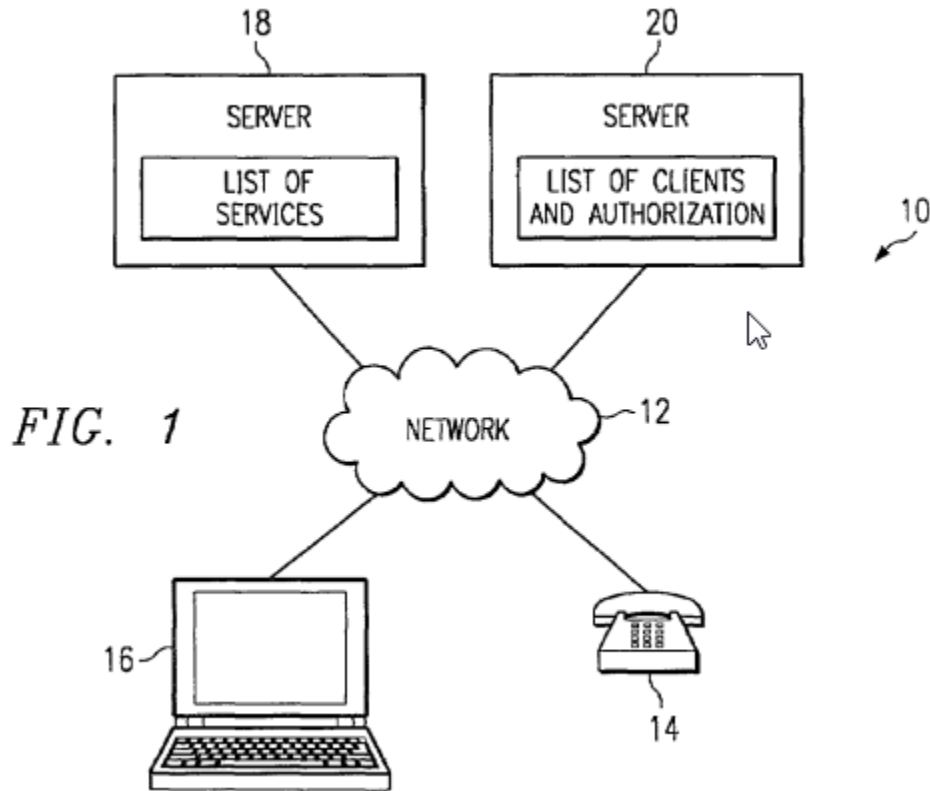


Figure 1, above, illustrates a block diagram of communication system 10 that includes network 12, clients 14 and 16, and servers 18 and 20. *Id.* at 2:61–62.

For real-time insertion of services into the call session, client 14 initiates service request message (SRM) 30 to server 20. *Id.* at 6:49–50. If server 20 determines that client 14 is authorized to use the requested services, server 20 sends authorization ticket 32 to client 14. *Id.* at 6:58–60. Server 20 encrypts authorization ticket 32 using its private key. *Id.* at 6:62–63.

Upon receiving authorization ticket 32, client 14 sends authorization message 34 to server 18. *Id.* at 6:65–66. Server 18 decrypts authorization message 34 and reads authorization message 34 to retrieve the requested services. *Id.* at 7:2–4. Server 18 then sends service message 36 in a secure manner to client 14 and service message 38 to client 16. *Id.* at 7:4–7. Service

messages 36 and 38 include the requested services from authorization message 34. *Id.* at 7:8–9.

Gleichauf describes client 14 making a request for more bandwidth using RSVP for a service with increased media. *Id.* at 6:22–27. According to Gleichauf, RSVP enables networks to obtain special qualities of service for the media flow across network 12. *Id.* at 6:26–29. If an RSVP server determines that the bandwidth for the call session may be increased, an acknowledgement message may be sent to client 14 indicating that the bandwidth has been increased. *Id.* at 6:31–34. Otherwise, the RSVP server notifies client 14 that a best-effort mode may be used for communication on network 12. *Id.* at 6:35–36. If the minimum required bandwidth is available, the call session provisioning proceeds by using the bandwidth to transfer the service over network 12 and between clients 14 and 16. *Id.* at 6:37–40.

2. *Independent Claim 1*

a) *Reasoning to Combine*

Relying on the testimony of Dr. Acampora, Petitioner argues that a person having ordinary skill in the art would have combined the teachings of Gleichauf and Reeves. Pet. 45–47 (citing Ex. 1003 ¶¶ 178–179). Petitioner contends that a person having ordinary skill in the art would have combined the teachings of Gleichauf and Reeves “because to the extent Gleichauf does not explain its resource control using the RSVP server in detail, Reeves teaches how the RSVP server element(s) can be configured to constitute an RCL.” Pet. 45. Relying on the testimony of Dr. Acampora, Petitioner contends that “implementing RSVP servers generally would have been well known” and that a person having ordinary skill in the art would have known that “any of several well-known embodiments, including the RSVP-enabled network of Reeves, could be used.” *Id.* at 46; Ex. 1003 ¶ 178. Petitioner also

asserts that making the proposed combination “would allow Gleichauf’s system to provision resources using the same ticket for obtaining services from server 18.” *Id.*

Patent Owner does not dispute Petitioner’s arguments or evidence regarding Petitioner’s reasoning to combine the teachings of Gleichauf and Reeves, except to the extent discussed below with respect to element 1d. *See infra* § II.F.2.e. We agree with Petitioner’s arguments and credit the testimony of Dr. Acampora (Pet. 45–47; Ex. 1003 ¶¶ 178–179) because Petitioner’s arguments and Dr. Acampora’s testimony are consistent with and supported by the evidence of record and for the further reasons given below. *See infra* § II.F.2.e. After consideration of the contentions and the evidence of record, we are persuaded that Petitioner has offered articulated reasoning with a rational underpinning as to why one of ordinary skill in the art would have combined the teachings of Gleichauf and Reeves in the manner recited in claim 1. We find that Petitioner’s showing is not undermined by Patent Owner’s contentions. *Id.*

b) Element 1a: The Preamble

The preamble of claim 1 is a “method for transferring data with a verified QoS in a communication network, which includes a call control level, a resource control level and at least one terminal assigned to data transfer.” Ex. 1001, 15:50–53. Petitioner contends that Gleichauf teaches the preamble based on Gleichauf’s disclosures relating to real-time insertion of services into an IP telephone call session. Pet. 47–49 (citing, *e.g.*, Ex. 1007, code (57), 2:59–62, 3:5–6, 3:24–25, 3:66–4:22, 6:20–40, 6:53–63). Petitioner asserts that a person having ordinary skill in the art “would have understood server 18 and server 20 to be functionally separate control levels in network 12, specifically, server 20 is a CCL that controls the call or

session, and server 18 is configured to, at minimum, control and provision resources for clients 14 and 16.” *Id.* at 47–48 (citing Ex. 1003 ¶ 171).

Petitioner also asserts “[t]o the extent Gleichauf does not explain how to configure the RSVP server, a POSITA would have found it obvious to do so as taught by Reeves” and points to Reeves’s disclosure of edge router 58 and policy server 66, which Petitioner asserts teaches the resource control level. *Id.* at 50. Petitioner submits the testimony of Dr. Acampora as supporting evidence. *Id.* at 47–50 (citing, *e.g.*, Ex. 1003 ¶¶ 171, 172, 175, 177–179).

Patent Owner argues that the combination of Gleichauf and Reeves does not teach functionally separate call and resource control levels. PO Resp. 17–19. Patent Owner’s arguments are based on Patent Owner’s proposed claim construction. For the reasons given above (*see supra* § II.C.2), we decline to narrow the claims in the manner proposed by Patent Owner because Patent Owner’s position on claim construction is not consistent with the intrinsic evidence.

Although not necessary, as an independent reason for our conclusions herein, we find that Gleichauf teaches the preamble even using Patent Owner’s narrow construction. Patent Owner’s arguments rely on a one-way arrow from server 20 to server 18 illustrated in Figure 2B of Gleichauf. PO Resp. 17–19 (including annotations to Figure 2B of Gleichauf stating “Impermissible Direct Communication” between server 18 and server 20). Patent Owner also argues that Petitioner “concedes that the servers 18 and 20 directly communicate” because “Petitioner contends that a POSITA would have understood that Gleichauf discloses sending ‘the same encrypted token . . . to an RCL,’ which is the same ‘token’ allegedly encrypted by the CCL.” *Id.* at 18 (citing Pet. 55). Patent Owner also points to Gleichauf’s statement that “communication between servers 18 and 20 and clients 14

and 16 may occur over a single communication medium or multiple different communication mediums.” *Id.* (quoting Ex. 1007, 6:41–44). Patent Owner also argues that Reeves does not remedy the deficiency. *Id.* at 19.

Contrary to Patent Owner’s argument, Petitioner relies on a different embodiment illustrated with respect to Gleichauf’s Figure 2A. Pet. 47–50 (citing, e.g., Ex. 1007, 6:20–40, Fig. 2A). Gleichauf’s Figure 2A is reproduced below.

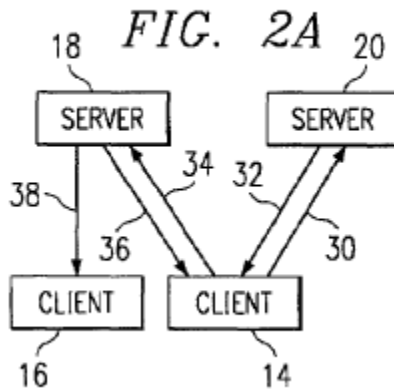


Figure 2A of Gleichauf illustrates a block diagram of communications for real-time insertion of services into a call session. Ex. 1007, 6:48–49.

As shown in Figure 2A, communications are via client 14. *Id.* at Fig. 2A, 6:49–50 (describing that “client 14 initiates SRM 30 to server 20”), 6:58–60 (describing that “[i]f server 20 determines that client 14 is authorized to use the requested services, server 20 sends authorization ticket 32 to client 14”), 6:65–66 (describing that “[c]lient 14 then sends authorization message 34 to server 18.”). Dr. Acampora testifies that “[c]lients 14 and 16 are terminals assigned to data transfer.” Ex. 1003 ¶ 171 (citing Ex. 1007, 3:24–25). We credit Dr. Acampora’s testimony as it is consistent with Gleichauf’s teachings including that “[n]etwork 12 may be

coupled to other IP networks and may communicate media between clients 14 and 16.” Ex. 1007, 3:24–25.

Figure 2A of Gleichauf does not include any arrow illustrating direct communications between server 20 and server 18. Gleichauf describes Figure 2A as “*one embodiment* for real-time insertion of services into a call session.” *Id.* at 6:48–49 (emphasis added). Gleichauf describes Figure 2B as “*an alternative embodiment* for real-time insertion of services into a call session.” *Id.* at 7:10–11 (emphasis added).

Patent Owner’s argument that Petitioner “concedes that the servers 18 and 20 directly communicate” because “Petitioner contends that a POSITA would have understood that Gleichauf discloses sending ‘the same encrypted token . . . to an RCL,’ which is the same ‘token’ allegedly encrypted by the CCL” (PO Resp. 18 (citing Pet. 55)), mischaracterizes Petitioner’s statement. Petitioner does not concede that the servers communicate directly. Pet. 54–55. Instead, Petitioner is discussing the modification of Gleichauf to incorporate the teachings of Reeves. *Id.* Petitioner’s argument is that it would have been obvious to send an encrypted token that indicates the verified QoS requirements to a resource control level in view of the combined teachings of Gleichauf and Reeves. *Id.* As discussed above, we find that Reeves teaches the preamble of claim 1 even under all Patent Owner’s proposed, overly narrow constructions. *See* § II.D.3.

Patent Owner’s reliance on Gleichauf’s statement that “communication between servers 18 and 20 and clients 14 and 16 may occur over a single communication medium or multiple different communication mediums” (PO Resp. 18 (quoting Ex. 1007, 6:41–44)) is misplaced. First, the statement does not pertain to only Figure 2A relied on by Petitioner, but, instead, pertains to that embodiment as well as the alternative embodiments.

Patent Owner quotes only part of the statement. Gleichauf states “[r]eferring to *FIGS. 2A through 2C*, communication between servers 18 and 20 and clients 14 and 16 may occur over a single communication medium or multiple different communication mediums.” Ex. 1007, 6:41–44 (emphasis added). Also, Patent Owner equates communication medium with communications without addressing the differences. Gleichauf describes that “[t]he communication medium may be twisted pair wire, coaxial cable, fiber optic links, or any suitable communication medium for transmitting packets of information over network 12.” *Id.* at 6:44–47. Thus, Gleichauf’s teachings meet the disputed limitations even under all Patent Owner’s proposed, overly narrow constructions.

We turn to Patent Owner’s argument that Reeves does not remedy the deficiency. PO Resp. 19. We are not persuaded that Patent Owner’s argument undermines Petitioner’s showing because, for the reasons discussed above with respect to obviousness of claim 1 over Reeves and Rivest, we are persuaded Reeves teaches the preamble of claim 1. *See supra* § II.D.3.a.

In summary, we agree with Petitioner’s arguments and credit the testimony of Dr. Acampora because Petitioner’s arguments and Dr. Acampora’s testimony are consistent with and supported by the evidence of record. Petitioner’s contentions are not undermined by Patent Owner’s arguments. After consideration of the contentions and the evidence of record, we find that Petitioner has shown that the asserted prior art teaches the preamble of claim 1.

c) Element 1b: “determining a QoS requirement for data transfer and verified at call control level”

Petitioner contends that Gleichauf teaches element 1b based on Gleichauf’s disclosure of sending service request message (SRM) 30 to server 20, which determines if client 14 is authorized to use the requested services, as well as Gleichauf’s description of using RSVP to obtain special qualities of service. Pet. 50–51 (citing Ex. 1007, 6:20–40, 6:49–60). Petitioner alternatively points to its contentions for limitation 1b provided for the first ground of obviousness over Reeves and Rivest, including Petitioner’s assertion that Reeves’s MAO contains the resources the originating user is authorized to receive, such as quality of service. *Id.* at 51–52 (citing Ex. 1004, 2:31–36, 5:13–16, Pet. 22–25). Petitioner submits the testimony of Dr. Acampora as supporting evidence. *Id.* at 50–52 (citing, e.g., Ex. 1003 ¶¶ 182–185).

Patent Owner does not dispute Petitioner’s contentions or evidence regarding element 1b except as discussed with respect to “call control level” recited in the preamble. *See supra* § II.F.2.b. We agree with Petitioner’s arguments and credit the testimony of Dr. Acampora because Petitioner’s arguments and Dr. Acampora’s testimony are consistent with and supported by the evidence of record. After consideration of the contentions and the evidence of record, we find that Petitioner has shown that the asserted prior art teaches element 1b of claim 1.

d) Element 1c: “creating and transferring, taking into account the QoS requirement verified at the call control level, at least one encrypted token to the terminal”

Petitioner contends that Gleichauf teaches element 1c based on Gleichauf’s disclosure that server 20 encrypts authorization ticket 32 using its private key and sends authorization ticket 32 to client 14. Pet. 52–53

(quoting Ex. 1007, 6:58–63); *see also id.* (quoting Ex. 1007, 9:22–25 (describing server 20 sending authorization ticket to client 14)). Petitioner also references its contentions for limitation 1b. *Id.* at 53. Petitioner submits the testimony of Dr. Acampora as supporting evidence. *Id.* at 52–53 (citing, *e.g.*, Ex. 1003 ¶¶ 186–188).

Patent Owner does not dispute Petitioner’s arguments or evidence regarding element 1c except as discussed with respect to “call control level” recited in the preamble. *See supra* § II.F.2.b. We agree with Petitioner’s arguments and credit the testimony of Dr. Acampora because Petitioner’s arguments and Dr. Acampora’s testimony are consistent with and supported by the evidence of record. After consideration of the contentions and the evidence of record we find that Petitioner has shown that the asserted prior art teaches element 1c of claim 1.

e) Element 1d: “transferring the verified QoS requirement and the encrypted token to the resource control level from the terminal”

Petitioner contends that Gleichauf teaches element 1d based on Gleichauf’s disclosure of client 14 sending the authorization ticket to server 18. Pet. 53–54 (citing, *e.g.*, Ex. 1007, 5:45, 6:64–7:1, 9:28–29). Petitioner also points to the combination of Gleichauf and Reeves and, more specifically, Petitioner points to Reeves’s disclosures of originating terminal 54 sending the MAO to originating edge router 58, and terminal 54 transferring a PATH message and separately including the MAO to edge router 58. *Id.* at 54–55 (citing, *e.g.*, Ex. 1004, 5:58–63). Petitioner submits the testimony of Dr. Acampora as supporting evidence. *Id.* at 53–55 (citing, *e.g.*, Ex. 1003 ¶¶ 191, 194–196).

Patent Owner argues that element 1d “requires that ‘the verified QoS requirement and the encrypted token’ must both be transferred to the RCL.”

PO Resp. 19 (citing Ex. 1001, 15:59–60). Patent Owner also argues that “[o]ther claim elements further demonstrate that the verified QoS requirement and the encrypted token cannot be the same thing.” *Id.* Patent Owner also points to Petitioner’s statement that “the same encrypted authorization ticket 32 that was sent to server 18 *can* also be sent to an RCL (e.g., modified RSVP server) as taught by Reeves.” *Id.* at 19–20 (citing Pet. 54). Patent Owner asserts that Petitioner’s “argument invites error, as the Federal Circuit has repeatedly held that it is insufficient to demonstrate that a combination *could* be made; instead one must show that a combination *would* have been obvious.” *Id.* (citing *In re Stepan*, 868 F.3d 1342, 1345–46 n. 1 (Fed. Cir. 2017); *Winner Intern. Royalty Corp. v. Wang*, 202 F.3d 1340, 1349 (Fed. Cir. 2000)). Patent Owner also argues that Reeves does not remedy the deficiency. *Id.* at 20.

Petitioner responds “[a]s discussed above with respect to Ground 1, the claims encompass transferring the QoS requirement and encrypted token together, as in Gleichauf’s authorization ticket 32.” Pet. Reply 19. Petitioner also responds that Patent Owner’s argument that “the word ‘can’ invites error . . . ignores subsequent discussion in the Petition, which supplies a rationale for sending the same authorization ticket 32 to the RCL.” *Id.* at 20 (citing PO Resp. 19–20). Petitioner further argues the following:

Specifically, “it would be obvious to send the same encrypted token (**which indicates the QoS requirements and is secure**) to an RCL that can perform processing **to deliver the required QoS** over the network.” Petition, 55 (citing EX1003, ¶196) (emphasis added). That is, the system described by Gleichauf already produces the authorization ticket 32. The authorization ticket 32 is already a secure encrypted token and already includes the QoS requirements. It would be obvious to a POSITA to simply deliver this existing secure encrypted token and QoS requirement message to an RCE that is configured to perform

processing to deliver the required QoS. When read in its entirety, the Petition clearly supplies a rationale for the combination. Tellingly, PO provides no rebuttal to this rationale.

Id. at 20.

We agree with Petitioner. Patent Owner's contentions are premised on Patent Owner's proposed construction, which we decline to adopt for the reasons set forth above. See § II.C.3. For the reasons discussed above (*id.*), we agree with Petitioner that the claim language "places no limits on how the verified QoS requirement and the encrypted token are packaged for transfer." Pet. Reply 17. We also agree with Petitioner that the "claim language encompasses separate or combined transfer of the verified QoS requirement and the encrypted token." *Id.*

We also agree with Petitioner that the subsequent argument in the Petition that a person having ordinary skill in the art would have made the proposed combination to deliver the existing, secure token indicating the QoS requirement so as to deliver the required QoS over the network. Pet. 55; Ex. 1003 ¶ 196; Pet. Reply 20. After consideration of the contentions and the evidence of record, we are persuaded that Petitioner has offered articulated reasoning with a rational underpinning as to why one of ordinary skill in the art would have combined the teachings of Gleichauf and Reeves in the manner recited in element 1d.

We turn to Patent Owner's argument that Reeves does not remedy the deficiency. PO Resp. 20. We are not persuaded that Patent Owner's argument undermines Petitioner's showing because, for the reasons discussed above with respect to obviousness of claim 1 over Reeves and Rivest, we are persuaded Reeves teaches element 1d of claim 1. *See supra* § II.D.3.e.

In summary, we agree with Petitioner’s arguments and credit the testimony of Dr. Acampora because Petitioner’s arguments and Dr. Acampora’s testimony are consistent with and supported by the evidence of record. Petitioner’s contentions are not undermined by Patent Owner’s arguments. After consideration of the contentions and the evidence of record, we find that Petitioner has shown that the asserted prior art teaches element 1d of claim 1.

f) *Element 1e: “decrypting, at the resource control level, the encrypted token, and verifying the QoS requirement using the decrypted token”*

Petitioner contends that Gleichauf teaches element 1e based on Gleichauf’s disclosure that “[u]pon receiving the authorization ticket, server 18 reads the authorization ticket to retrieve the requested service in the database at step 94.” Pet. 55–56 (quoting Ex. 1007, 9:31–33). Petitioner also relies on its discussion of limitation 1b. *Id.* (citing Pet. 50–52). Petitioner further points to the combined teachings of Gleichauf and Reeves and asserts “[t]o make the RSVP request and get the required QoS, the client 14 sends the authorization ticket 32 to an RCL (Gleichauf’s modified server 18/RSVP server, Reeves’ originating edge router 58/originating policy server 66).” *Id.* at 56 (citing Pet. 53–55 (discussing limitation 1d)). Relying on the testimony of Dr. Acampora, Petitioner asserts that a person having ordinary skill in the art would have understood that in the process of forming the connection, a determination will be made as to whether the requested QoS can be provided. *Id.* at 56 (citing Ex. 1003 ¶¶ 200–201).

Patent Owner argues “the Petitioner concedes that the proposed combination of Gleichauf and Reeves would use an *encrypted* token at the RCL.” PO Resp. 21 (citing Pet. 57). Patent Owner argues that “using the

encrypted token to verify the QoS requirement does not satisfy the claim limitation.” *Id.*

We maintain our findings and determinations at the institution stage. Inst. Dec. 35–37. In particular, Patent Owner takes Petitioner’s statement out of context. Although Petitioner states “the combination of Gleichauf and Reeves discloses verifying a QoS requirement using the encrypted token,” considering the entirety of Petitioner’s contentions for limitation 1d, we understand Petitioner’s statement to pertain to the identity of the token, i.e., the encrypted token. In its Reply Petitioner states, “[a]s the Board correctly recognized, the Petitioner used the term ‘encrypted token’ to identify the specific token relative to the broader context of Gleichauf and Reeves.” Pet. Reply 21 (citing Inst. Dec. 36).

Also, Petitioner’s statement appears to be a subset of Petitioner’s overall contentions. In particular, in the Petition, Petitioner also asserts “the encrypted token (authorization ticket 32/authorization ticket 34) is *decrypted* and used to verify a QoS requirement.” Pet. 55 (emphasis added). Petitioner also asserts that the resource control layer will decrypt prior to reading. Pet. 56. Petitioner further provides the testimony of Dr. Acampora that “Gleichauf in view of Reeves discloses *decrypting* the encrypted token (authorization ticket 32/authorization message 34) and reading the *decrypted* information to retrieve requested services and verify a QoS requirement using the decrypted token.” Ex. 1003 ¶ 198 (emphases added). Petitioner asserts in its Reply “[t]he authorization ticket 18 must be decrypted to be read.” Pet. Reply 21 (citing Ex. 1007, 9:31–33; Petition 55–56).

Consistent with Petitioner’s contentions and Dr. Acampora’s testimony, in a portion of Gleichauf relied on for limitation 1b, Gleichauf describes decrypting authorization message 34 prior to reading it. Ex. 1007,

7:2–4 (“[s]erver 18 decrypts authorization message 34 with a public key associated with server 20 and reads authorization message 34 to retrieve the requested services.”). Furthermore, authorization message 34 “includes the client identity and the requested services from authorization ticket 32.” *Id.* at 6:67–7:1.

In summary, we agree with Petitioner’s arguments and credit the testimony of Dr. Acampora because Petitioner’s arguments and Dr. Acampora’s testimony are consistent with and supported by the evidence of record. Petitioner’s contentions are not undermined by Patent Owner’s arguments. After consideration of the contentions and the evidence of entire record now before us, we find that Petitioner has shown that the asserted prior art teaches element 1e of claim 1.

g) *Element 1f: “configuring the communication network taking into account the QoS requirement verified, such that the data is transferred with the verified QoS”*

Petitioner contends that Gleichauf teaches element 1f based on Gleichauf’s disclosure of sending service messages 36 and 38, which include the requested services from authorization message 34. Pet. 57 (citing Ex. 1007, 7:2–9). Petitioner also points to Gleichauf’s and Reeves’s teachings regarding using RSVP to configure the network to provide the required quality of service. *Id.* at 57–58 (citing Ex. 1007, 6:20–40; Ex. 1004, 6:20–44). Petitioner submits the testimony of Dr. Acampora as supporting evidence. *Id.* at 57–58 (citing, e.g., Ex. 1003 ¶¶ 206, 208–209).

Patent Owner does not dispute Petitioner’s arguments or evidence regarding element 1f. We agree with Petitioner’s arguments and credit the testimony of Dr. Acampora because Petitioner’s arguments and Dr. Acampora’s testimony are consistent with and supported by the evidence

of record. After consideration of the contentions and the evidence of record, we find that Petitioner has shown that the asserted prior art teaches element 1f of claim 1.

h) Conclusion

After consideration of the contentions and the evidence of record, we find that Petitioner has shown that the combination of Gleichauf and Reeves teaches each recitation of claim 1. Also, we are persuaded that Petitioner has offered articulated reasoning with a rational underpinning as to why one of ordinary skill in the art would have combined the teachings of Gleichauf and Reeves in the manner recited in the claim.

Based on the complete record now before us, we determine that Petitioner has proved, by a preponderance of the evidence, that claim 1 is unpatentable under 35 U.S.C. § 103(a) as obvious over the combined teachings of Gleichauf and Reeves.

3. Independent Claims 8 and 10–12

Independent claims 8 and 10–12 are similar to independent claim 1. Petitioner’s analysis of claims 8 and 10 is the same as the analysis of claim 1, except for additional analysis provided for claim 8 discussed below. Pet. 47–58. Petitioner’s analysis of claims 11 and 12 largely relies on Petitioner’s analysis of claims 1, 8, and 10. *Id.* at 60–65. Petitioner submits the testimony of Dr. Acampora as supporting evidence. *Id.* (citing, *e.g.*, Ex. 1003 ¶¶ 219, 223, 225–226, 233–235, 240–241). Petitioner accounts for all differences in the claims.

For instance, claim 8 recites a “computer readable medium storing a computer program, which is executable by a processor.” Petitioner points to Gleichauf’s claims 27–32, which recite “logic encoded in media.” Pet. 50

(citing Ex. 1007, 13:64–15:13). Petitioner also points to the understanding of a person having ordinary skill in the art of Gleichauf’s clients 14 and 16 and severs 18 and 20. *Id.* (citing Ex. 1003 ¶ 180).

We discuss the recitation “a functional separation of the call and resource control levels” with respect to claim construction and obviousness over the combined teachings of Reeves and Rivest. *See* §§ II.C.2, II.D.4. That discussion applies to obviousness over the combined teachings of Gleichauf and Reeves, except to the extent that Petitioner relies on different teachings. As we discuss above, the claims are not limited as proposed by Patent Owner. *Id.* Also, as an independent reason, we find that the asserted prior art meets the claims under all Patent Owner’s proposed, overly narrow constructions. *See* §§ II.D.4, II.F.2.

Each of claims 11 and 12 also recites “checking correctness of the verified QoS request using the decoded token.” For that recitation in claims 11 and 12, Petitioner relies on the testimony of Dr. Acampora and asserts “[i]t would have been obvious to a POSITA to configure the policy server 66 to compare the verified QoS from the PATH message with the verified QoS in the MAO to ensure a match, thereby preventing errors.” *Id.* at 65 (citing Ex. 1003 ¶¶ 240–241).

Patent Owner does not argue claims 8 and 10–12 separately. *See generally* PO Resp. We agree with Petitioner’s arguments and credit the testimony of Dr. Acampora because Petitioner’s arguments and Dr. Acampora’s testimony are consistent with and supported by the evidence of record.

After consideration of the contentions and the evidence of record, we find that Petitioner has shown that the combination of Gleichauf and Reeves teaches each recitation of claims 8 and 10–12. Also, we are persuaded that

Petitioner has offered articulated reasoning with a rational underpinning as to why one of ordinary skill in the art would have combined the teachings of Gleichauf and Reeves in the manner recited in the claims.

Based on the complete record now before us, we determine that Petitioner has proved, by a preponderance of the evidence, that claims 8 and 10–12 are unpatentable under 35 U.S.C. § 103(a) as obvious over the combined teachings of Gleichauf and Reeves.

4. *Dependent Claims 3, 4, and 9*

Claim 3 depends directly from claim 1 and further recites “wherein data of variable value is incorporated in the encrypted token.” Relying on the testimony of Dr. Acampora, Petitioner asserts that Gleichauf teaches this recitation based on Gleichauf’s disclosure that “the authorization ticket includes the client identity for client 14 and the requested service.” Pet. 58–59 (quoting Ex. 1007, 5:42–44; citing Ex. 1003 ¶ 212). Petitioner also relies on more detailed teachings relating to changing requested services. *Id.* (citing Ex. 1007, 2:62–3:2). Petitioner further refers to its contentions for elements 1a, 1c, and 1d. *Id.* Dr. Acampora testifies that the “client identity and requested service” are “data of variable value.” Ex. 1003 ¶ 212. Dr. Acampora testifies that his opinion is supported by Gleichauf’s teachings that the “encrypted token includes a client identity from among multiple possible clients and a requested service from among multiple possible services.” *Id.* (citing Ex. 1007, 2:62–3:2, 5:42–44).

Patent Owner does not dispute separately Petitioner’s arguments or evidence regarding the further recitation in claim 3. We agree with Petitioner’s arguments and credit the testimony of Dr. Acampora because Petitioner’s arguments and Dr. Acampora’s testimony are consistent with and supported by the evidence of record. Based on the complete record now

before us, we find that Petitioner has shown that the further recitation in claim 3 is taught by the combination of Gleichauf and Reeves.

Claim 4 depends directly from claim 1 and further recites “wherein the encrypted token is transferred between the terminal and the call control level and/or between the terminal and the resource control level in existing signaling messages.” Petitioner points to Reeves’s teachings that Petitioner relied on with respect to claim 4 and obviousness over Reeves and Rivest. *Compare* Pet. 59–60 (citing Ex. 1004, 5:58–6:6, 8:15–17, 8:23–25), *with id.* at 32–33 (citing Ex. 1004, 5:58–6:6, 8:15–17, 8:23–25). Petitioner also submits the testimony of Dr. Acampora as supporting evidence. *Id.* at 59–60 (citing Ex. 1003 ¶¶ 215–217).

Patent Owner does not dispute separately Petitioner’s arguments or evidence regarding the further recitation in claim 4. We agree with Petitioner’s arguments and credit the testimony of Dr. Acampora because Petitioner’s arguments and Dr. Acampora’s testimony are consistent with and supported by the evidence of record. Based on the complete record now before us, we find that Petitioner has shown that the further recitation in claim 4 is taught by the combination of Gleichauf and Reeves.

Claim 9 depends directly from claim 1 and further recites “wherein the at least one terminal comprises means for implementing the method.” For the same reasons set forth above in the element-by-element analysis of claim 1 (*see* § II.F.2), we agree with Petitioner’s arguments that Reeves teaches the further recitation in claim 9. Patent Owner does not dispute claim 9 separately.

In summary, we have considered Petitioner’s arguments and evidence that dependent claims 3, 4, and 9 would have been obvious over the combination of Gleichauf and Reeves. Patent Owner does not present

arguments separately contesting Petitioner's assertions for claims 3, 4, and 9. We agree with Petitioner's arguments for dependent claims 3, 4, and 9 for the reasons given in this section with respect to those claims as well as the reasons given for claim 1.

Based on the complete record now before us, we determine that Petitioner has proved, by a preponderance of the evidence, that claims 3, 4, and 9 are unpatentable under 35 U.S.C. § 103(a) as obvious over Gleichauf and Reeves.

G. Unpatentability of Claim 2 under 35 U.S.C. § 103(a) over Gleichauf, Reeves, and Chen

Petitioner asserts that dependent claim 2 is unpatentable as obvious over the combination of Gleichauf, Reeves, and Chen. Pet. 4. Dependent claim 2 recites "wherein the call control level repeatedly transfers the token to the terminal, which is forwarded from there to the resource control level." Petitioner relies on Chen for teaching using repeated REQUEST messages to accommodate for certain changes that may occur in a network, such as topology changes, link failures, and route changes. *Id.* at 67 (citing Ex. 1006, 5:56–6:7). Petitioner submits the testimony of Dr. Acampora as supporting evidence. *Id.* at 66–68 (citing, *e.g.*, Ex. 1003 ¶¶ 249–251).

Relying on the testimony of Dr. Acampora, Petitioner also provides contentions regarding reasoning to combine the teachings of Gleichauf, Reeves, and Chen. *Id.* at 66–67 (citing, *e.g.*, Ex. 1003 ¶¶ 249–251). For instance, Petitioner contends the following:

A POSITA would have found repeatedly transmitting requests including the requested resource needs to be an obvious modification to improve performance and efficiency in the systems described by Gleichauf, because it would allow the systems to dynamically modify bandwidth allocations to more closely match the ongoing communications over the network.

Indeed, Chen describes multiple scenarios where repeatedly sending a REQUEST message is advantageous. Repeated REQUEST messages can allow requests that are initially rejected to be subsequently accepted during connection formation, while after the connection is formed, the system can use the repeated REQUEST messages to alter connection parameters if necessary.

Id. at 66 (citing Ex. 1006, 9:57–61, 12:43–13:29).

Patent Owner does not argue claim 2 separately. *See generally* PO Resp. We agree with Petitioner’s arguments and credit the testimony of Dr. Acampora because Petitioner’s arguments and Dr. Acampora’s testimony are consistent with and supported by the evidence of record.

After consideration of the contentions and the evidence of record, we find that Petitioner has shown that the combination of Gleichauf, Reeves, and Chen teaches each recitation of claim 2. Also, we are persuaded that Petitioner has offered articulated reasoning with a rational underpinning as to why one of ordinary skill in the art would have combined the teachings of Gleichauf, Reeves, and Chen in the manner recited in claim 2.

Based on the complete record now before us, we determine that Petitioner has proved, by a preponderance of the evidence, that claim 2 is unpatentable under 35 U.S.C. § 103(a) as obvious over Gleichauf, Reeves, and Chen.

III. CONCLUSION¹³

Petitioner has proved by a preponderance of the evidence that claims 1–4 and 8–12 of the ’627 patent are unpatentable. The outcome for the challenged claims is set forth in the table below. In summary:

¹³ Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner’s attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or*

Claims Challenged	35 U.S.C. §	References/ Basis	Claims Shown Unpatent- able	Claims Not shown Unpatent- able
1, 3, 4, 8–12	103(a)	Reeves, Rivest	1, 3, 4, 8–12	
2	103(a)	Reeves, Rivest, Chen	2	
1, 3, 4, 8–12	103(a)	Gleichauf, Reeves	1, 3, 4, 8–12	
2	103(a)	Gleichauf, Reeves, Chen	2	
Overall Outcome			1–4, 8–12	

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that Petitioner has shown by a preponderance of the evidence that claims 1–4 and 8–12 of the '627 patent are unpatentable; and

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

Reexamination During a Pending AIA Trial Proceeding. See 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. See 37 C.F.R. § 42.8(a)(3), (b)(2).

IPR2021-00753
Patent 7,457,627 B2

FOR PETITIONER:

James Heintz
Nicholas Panno
Tiffany Miller
DLA Piper LLP
jim.heintz@dlapiper.com
nicholas.panno@dlapiper.com
tiffany.miller@dlapiper.com

FOR PATENT OWNER:

Justin Kimble
Nelson Bumgardner Albritton P.C.
justin@nelbum.com