

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

UNITED SERVICES AUTOMOBILE ASSOCIATION,
Petitioner,

v.

PNC BANK, N.A.,
Patent Owner.

IPR2021-01248
Patent 7,949,788 B2

Before MICHAEL R. ZECHER, JULIET MITCHELL DIRBA, and
RUSSELL E. CASS, *Administrative Patent Judges*.

ZECHER, *Administrative Patent Judge*.

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

I. INTRODUCTION

Petitioner, United Services Automobile Association (“USAA”), filed a Petition requesting an *inter partes* review (“IPR”) of claims 1–5 and 7–10 of U.S. Patent No. 7,949,788 B2 (Ex. 1001, “the ’788 patent”). Paper 1 (“Pet.”). Patent Owner, PNC Bank, N.A. (“PNC”), filed a Preliminary Response. Paper 6 (“Prelim. Resp.”). Taking into account the arguments presented in PNC’s Preliminary Response, we determined that the information presented in the Petition established that there was a reasonable likelihood that USAA would prevail with respect to challenging at least one of claims 1–5 and 7–10 of the ’788 patent as unpatentable. Pursuant to 35 U.S.C. § 314, we instituted this IPR on January 14, 2022, as to all challenged claims and all grounds raised in the Petition. Paper 8 (“Institution Decision” or “Dec. on Inst.”).

During trial, PNC filed a Patent Owner Response (Paper 13, “PO Resp.”), USAA filed a Reply to the Patent Owner Response (Paper 17, “Pet. Reply”), and PNC filed a Sur-reply to the Reply (Paper 18, “PO Sur-reply”). A consolidated oral argument with related IPR2021-01163 was held on October 12, 2022, and a transcript of the hearing is included in the record. Paper 26 (“Tr.”).

We have jurisdiction under 35 U.S.C. § 6. This decision is a Final Written Decision under 35 U.S.C. § 318(a) as to the patentability of claims 1–5 and 7–10 of the ’788 patent. For the reasons we identify below, we hold that USAA has demonstrated by a preponderance of the evidence that all challenged claims are unpatentable.

A. Related Matters

The parties indicate that the '788 patent is the subject of the district court case captioned *United Services Automobile Association v. PNC Bank, N.A.*, No. 2:20-cv-00319-JRG (E.D. Tex.). Pet. 53; Paper 4 (PNC's Mandatory Notices), 2. PNC represents that, on September 16, 2022, a jury in the district court case "found claims 3 and 10 of [the '788 patent] not invalid." Paper 22 (PNC's Updated Mandatory Notices), 1).

In addition to this Petition, USAA filed a petition requesting an IPR of claims 1–17 of U.S. Patent No. 8,868,786 B1 (Ex. 3001, "the '786 patent). *United Services Automobile Ass'n v. PNC Bank, N.A.*, IPR2021-01163, Paper 1 (PTAB June 23, 2021) (Petition). The petition challenging claims 1–17 of the '786 patent was granted on January 10, 2022 (IPR2021-01163, Paper 9 (Institution Decision)), and a final written decision as to those challenged claims is entered concurrently herewith.

B. Real Party in Interest

USAA identifies itself as the only real party in interest. Pet. 53. PNC identifies itself as the only real party in interest. Paper 4, 2.

C. The '788 Patent

The '788 patent, titled "Apparatus, Systems and Methods for Transformation Services," issued from U.S. Patent Application No. 11/804,664 ("the '664 application"), filed on May 18, 2007. Ex. 1001, codes (54), (21), (22). U.S. Patent Application No. 13/088,877, filed on April 18, 2011—now the '786 patent involved in related IPR2021-01163—is a divisional of the '664 application. Ex. 3001, codes (21), (22), (62).

The '788 patent generally relates to "[d]ata communications between computer applications or networks" and, in particular, to "secure routing and

data transformation over one or more communication networks.” Ex. 1001, 1:7–9. According to the ’788 patent, while “[c]orporate reliance on technology has increasingly become more . . . pervasive,” “the proliferation of different computer systems and applications that use different communications protocols, security mechanisms, languages, data structures and platforms has also made the information technology infrastructure of the typical business enterprise more complex.” *Id.* at 1:13–21. The ’788 patent identifies a situation where “a source computer application or network within a corporate enterprise,” such as a bank, “may need to share confidential customer information with external networks of partners or other organizations.” *Id.* at 1:40–43. In this particular situation, the ’788 patent states that “a need exists for an intermediary transformation service to assign appropriate security controls to messages from source computer applications or networks prior to their transmission over a communications network.” *Id.* at 1:46–50.

The ’788 patent addresses this problem by providing “a web services hub [that] receives a request from a data source system, transforms the request, and transmits the transformed request to an external system.” Ex. 1001, 1:54–56. The ’788 patent discloses using “[a] secure service router coupled to the web services hub [to] authenticate[] the data source system and locate[] a transformation service to transform the request.” *Id.* at 1:56–59.

Figure 1 of the ’788 patent, reproduced below, illustrates “a high-level schematic diagram of one embodiment of a business enterprise network that includes a web services hub.” Ex. 1001, 1:63–67.

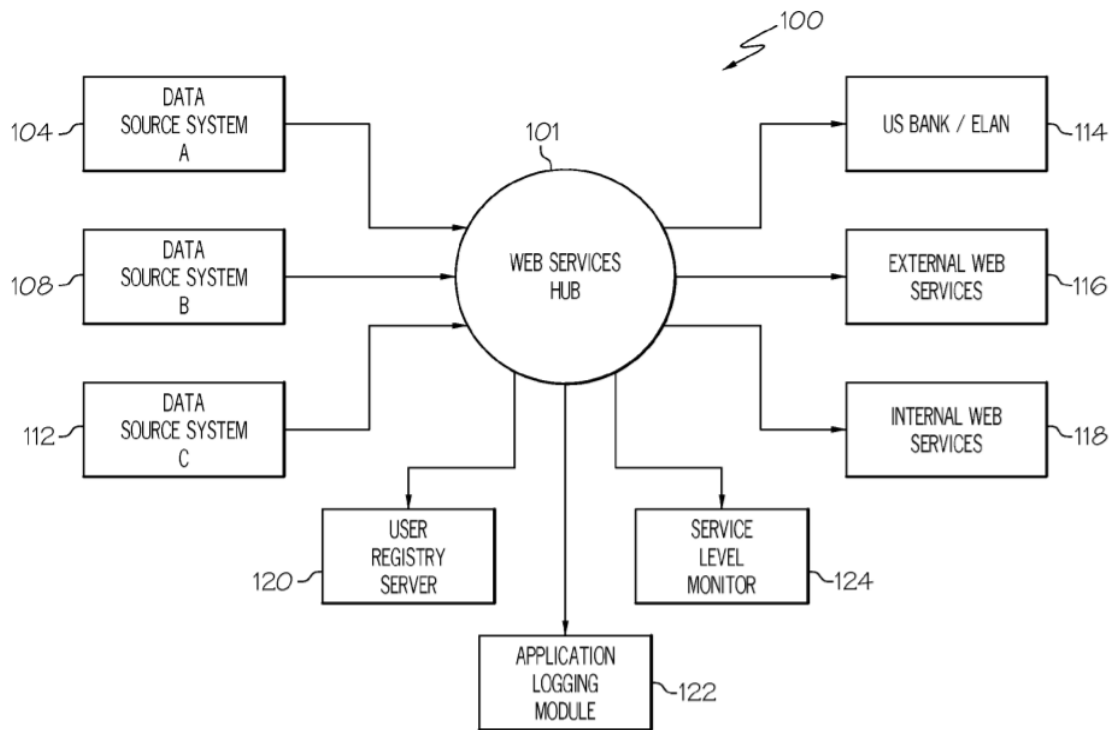


FIG. 1

Figure 1, reproduced above, illustrates business enterprise network 100 that includes web services hub 101, a plurality of business processes employing one or more data source systems 104, 108, 112, one or more target internal or external web services 114, 116, 118, user registry server 120, application logging module 122, and service level monitor 124. *Id.* at 2:56–61, 3:5–10. Notably, “web service hub 101 . . . enable[s] dynamic routing and transformation services for web based applications” using “synchronous or asynchronous processing models.” *Id.* at 3:12–16.

As one example of the transformation services provided by web service hub 101, the '788 patent discloses that “secure service router 220” located therein may “verify access and transmission rights of data source system A 104 using SOURCE header parameter.” Ex. 1001, 9:58–61, Fig. 2. “[S]ecure service router 220 may review SOURCE header parameter to

determine the format of the incoming request from data source system A 104” and, if necessary, transmit the request to transformation and/or business logic module 212, which, in turn, transforms the request prior to transmitting it to external system 213. *Id.* at 9:61–67, 10:15–23, Fig. 2. After transforming and transmitting the request to the external system, web service hub 101 receives a response from external system 213, transforms the response to a format recognizable by data source system A 104, and then transmits the newly formatted response to data source system A 104. *See id.* at 10:31–42.

C. Challenged Claims

Of the challenged claims, claim 1 is the only independent claim. Independent claim 1 is directed to “[a] method.” Ex. 1001, 14:61. Claims 2–5 and 7–10 directly or indirectly depend from independent claim 1. *Id.* at 15:10–24, 15:31–48. Independent claim 1 is illustrative of the challenged claims and is reproduced below:

1. A method, comprising:

receiving a message from a data source system, the message comprising at least one header parameter stored in at least one header parameter field, the message to be transmitted to an external system;

determining the message type based on the at least one header parameter;

verifying access and transmission rights of the data source system and the external system; and

transmitting the message to a message transformation logic module; [and]

receiving the message to be transformed from the data source system at the message transformation logic module from a secure service router, the message comprising the at least one

header parameter stored in the at least one header parameter field.

Id. at 14:61–15:9.

D. Asserted Prior Art References

USAA relies on the prior art references set forth in the table below.

Pet. 3.

Name¹	Reference	Dates	Exhibit No.
Corneil	US 2003/0065623 A1	published Apr. 3, 2003; filed Oct. 1, 2001	1004
Abjanic	US 2003/0069975 A1	published Apr. 10, 2003; filed Dec. 22, 2000	1005

E. Asserted Grounds of Unpatentability

USAA challenges claims 1–5 and 7–10 of the '788 patent based on the grounds of unpatentability set forth in the table below. Pet. 3–4, 10–49.

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1–5, 7–10	103(a) ²	Corneil
8–10	103(a)	Corneil, Abjanic

USAA supports its arguments in the Petition with the testimony of Sam Malek, Ph.D. Ex. 1003 (Declaration of Dr. Malek in support of Petition).

PNC supports its arguments in the Patent Owner Response with the

¹ For clarity and ease of reference, we only list the first named inventor.

² The Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112–29, 125 Stat. 284, 287–88 (2011), amended 35 U.S.C. § 103, effective March 16, 2013. Because the '788 patent issued from the '664 application, which was filed before this date, the pre-AIA version of § 103 applies. Ex. 1001, codes (21), (22).

testimony of Stephen Gray. Ex. 2006 (Declaration of Mr. Gray in support of Patent Owner's Response).

II. ANALYSIS

A. Claim Construction

In an IPR based on a petition filed on or after November 13, 2018, such as here, claim terms are construed using the same claim construction standard as in a civil action under 35 U.S.C. § 282(b). *See* 37 C.F.R. § 42.100(b) (2019). That is, claim terms generally are construed in accordance with their ordinary and customary meaning, as would have been understood by a person of ordinary skill in the art, in view of the specification and the prosecution history pertaining to the patent at issue. *See id.* The ordinary and customary meaning of a claim term “is its meaning to the ordinary artisan after reading the entire patent,” and “as of the effective filing date of the patent application.” *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313, 1321 (Fed. Cir. 2005) (en banc).

In its Petition, USAA contends that “[n]o [claim] terms need construction to resolve the issues presented in [the] Petition and the terms should be accorded their plain and ordinary meaning as would be understood by a [person of ordinary skill in the art] in light of the intrinsic evidence,” including the ’788 patent and its prosecution history. Pet. 10. In the Institution Decision, we addressed arguments previously presented by PNC that: (1) “external system” should mean “a system external to the institution receiving the request from the data source system”; and (2) “secure service router” should mean “a component the authenticates the data source system, locates a service, and forwards a message or request to the service.” *See*

Dec. on Inst. 8–11. We address both claim terms below based on the arguments and evidence presented during trial. We also address the claim term “verifying access and transmission rights of the data source system and the external system” because it became clear during trial that the parties dispute the meaning of this claim term.

1. “external system”

In the Institution Decision, we preliminary determined that the claim term “external system” did not require a construction because, based on the preliminary record, there was no dispute between the parties as to whether Corneil’s second trading partner 217 teaches this claim term. Dec. on Inst. 8–9. PNC does not maintain its preliminary argument that the claim term “external system” requires construction. *See* PO Resp. 11–17; PO Sur-reply 2–8. Based the fully developed trial record, there is no readily discernible controversy between the parties that requires us to construe this claim term. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (noting that “we need only construe terms ‘that are in controversy, and only to the extent necessary to resolve the controversy’” (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))).

2. “secure service router”

In the Institution Decision, we did not adopt PNC’s proposed construction of the claim term “secure service router.” Instead, we noted that, because we are charged with interpreting this claim term consistently across the ’788 patent and the ’786 patent, we preliminary determined that, at a minimum, this claim term must “authenticate the data source system” that sends a message or request because this is recited explicitly in

independent claims 1 and 7 of the '786 patent. Dec. on Inst. 9–11 (citing IPR2021-01163, Paper 9 (Institution Decision)). We, however, noted that two weeks before entering the Institution Decision, USAA submitted a claim construction order from the district court case that construed the claim term “secure service router” to mean a “service router than can verify authentication and authorization.” *Id.* at 11 n.3 (citing Ex. 1037, 88). Based on the timing of this submission, we invited the parties to provide further briefing during trial to help clarify the impact, if any, of the word “router” when arriving at the proper construction of the claim term “secure service router” in the context of the '788 patent. *Id.*

In its Patent Owner Response, PNC acknowledges that both the district court construction and our preliminary determination require that the claim term “secure service router” perform authentication, but PNC asserts that they “both also leave unanswered what is the ‘service router’ that performs the authentication.” PO Resp. 11 (citing Ex. 2006 ¶ 36). PNC contends that the embedded phrase “service router” has no plain and ordinary meaning because, although “the term ‘router’ is widely used and well-understood, the term ‘service router’ is not.” *Id.* at 12 (citing Exs. 2002–2005, each of which provides a dictionary definition of a “router”). According to PNC, dictionary definitions of “router” are not applicable to a “service router” as that term is used in the context of the '788 patent because such definitions are “neither concerned with finding ‘efficient routes’ to forward data packets nor connecting two or more [local area networks].” *Id.* at 12–13. Instead, PNC asserts that the specification of the '788 patent defines a “service router” by implication to mean “hardware and/or software that forwards messages or requests to services.” *Id.* at 13–

14 (citing Ex. 2006 ¶ 37), 16–17 (citing Ex. 2006 ¶ 40); *see also id.* at 15 (arguing that “the specification may define claim terms by implication” (quoting *Irdeto Access, Inc. v. Echostar Satellite Corp.*, 383 F.3d 1295, 1300 (Fed. Cir. 2004))).

To support its proposed construction, PNC directs us to various disclosures of synchronous service routers, asynchronous service routers, and secure service routers throughout the specification of the ’788 patent. PO Resp. 15–16 (citing Ex. 1001, code (57), 1:54–59, 6:17–38, 8:1–12, 11:57–61, Fig. 2). PNC then asserts that, “[i]n each instance, the ‘service router’ (whether synchronous, asynchronous, or secure) identifies or locates a service and forwards a message to that service.” *Id.* at 16 (citing Ex. 2006 ¶¶ 38, 39).

In Petitioner’s Reply, USAA contends that no further construction of the claim term “secure service router” is required beyond our preliminary determination, and USAA argues that we should not adopt PNC’s newly proposed construction in the Patent Owner Response because it “attempt[s] to insert extraneous limitations not supported by the intrinsic record.” Pet. Reply 5. USAA argues that PNC’s newly proposed construction of the embedded phrase “service router” as “hardware and/or software that forwards messages or requests to services” attempts to interject the same limitations (i.e., “locate[] a service, and forward[] a message or request to the service”) that both the district court and the Institution Decision previously rejected. *Id.* (alterations in original). According to USAA, PNC merely omits the words “identifies or locates a service” from its newly proposed construction in the Patent Owner Response, but its declarant, Mr. Gray, admitted during cross-examination that he was reading those

requirements into the use of the word “forward.” *Id.* at 5–6 (citing Ex. 1039, 104:1–5, 144:5–14).

USAA further contends that there is nothing in the specification of the ’788 patent that requires all “service routers” to “identify or locate” a service, which is functionality that only is required by specific challenged claims. Pet. Reply 6 (citing Dec. on Inst. 10). Moreover, USAA argues that the exemplary embodiments disclosed in the specification “do not require ‘service routers’ to do anything more than pass messages along to other components.” *Id.* (citing Ex. 1001, 8:1–12, Fig. 2, request transformer 224). Relying on the cross-examination testimony of its declarant, Dr. Malek, USAA argues that “the specification uses ‘service router’ as a generic term for a software component, with additional requirements for specific service routers being supplied by context within the claims.” *Id.* at 7 (citing Ex. 2008, 60:10–61:6, 66:18–67:15). USAA asserts that the claims at issue here simply require receiving the message to be transformed from the data source system at the message transformation logic module from a secure service router and, as a result, “it does not place any further limitations on the functionality of the secure service router (other than what is implied by the modifier ‘secure’).” *Id.* at 7–8.

In its Patent Owner Sur-reply, PNC contends that, contrary to USAA’s assertion, its newly proposed construction in the Patent Owner Response “does not recite or import the idea of ‘identif[ying] or locat[ing] a service.” PO Sur-reply 3 (citing PO Resp. 16) (alterations in original). PNC argues that USAA misrepresents Mr. Gray’s cross-examination testimony on this particular issue, which was directed to questions regarding the specification of the ’788 patent and not PNC’s newly proposed construction

of the embedded phrase “service router.” *Id.* (citing Ex. 1039, 103:20–104:5). PNC then asserts that USAA’s declarant, Dr. Malek, actually supports its newly proposed construction because he admitted during cross-examination that the claim term “secure service router” should be accorded its plain and ordinary meaning. *Id.* at 3–4 (citing Ex. 2008, 55:4–21).

During oral argument, we questioned whether the “to services” language in PNC’s newly proposed construction for the embedded phrase “service router” was necessary and whether PNC would be amenable to a construction that simply provides for “forward[ing] messages or requests.” Tr. 36:20–22. In response, counsel for PNC stated that the answer to the question was “yes” and, “[i]f the Board were so inclined to construe the term [“service router”] such that it’s hardware and/or software that forwards messages or requests and omitted the to[]services part, that would be fine with [PNC].” *Id.* at 37:8–11.

Based on the fully developed trial record, we maintain our preliminary determination that the claim term “secure service router” must be construed consistently across the ’788 patent and the ’786 patent. Dec. on Inst. 9–11 (citing *SightSound Techs., LLC v. Apple Inc.*, 809 F.3d 1307, 1316 (Fed. Cir. 2015)). As a result, the claim term “secure service router” must “authenticate the data source system” that sends messages or requests because this is recited explicitly in independent claims 1 and 7 of the ’786 patent, but we also adopt certain portions of the “forwarding” aspect of PNC’s newly proposed construction for the embedded phrase “service router.” *See id.* at 10–11. That is, we construe the claim term “secure service router” as “hardware and/or software that authenticates the data source system prior to forwarding messages or requests.” The

“authentication” aspect of our construction finds support in the specification of the ’788 patent, which consistently reinforces that the “secure service router” must authenticate the data source system. Ex. 1001, code (57), 1:54–59, 6:42–44, 8:3–6.

The “forwarding” aspect of our construction, which is functionality provided by each service router disclosed in the ’788 patent, is best illustrated in Figure 2, reproduced below.

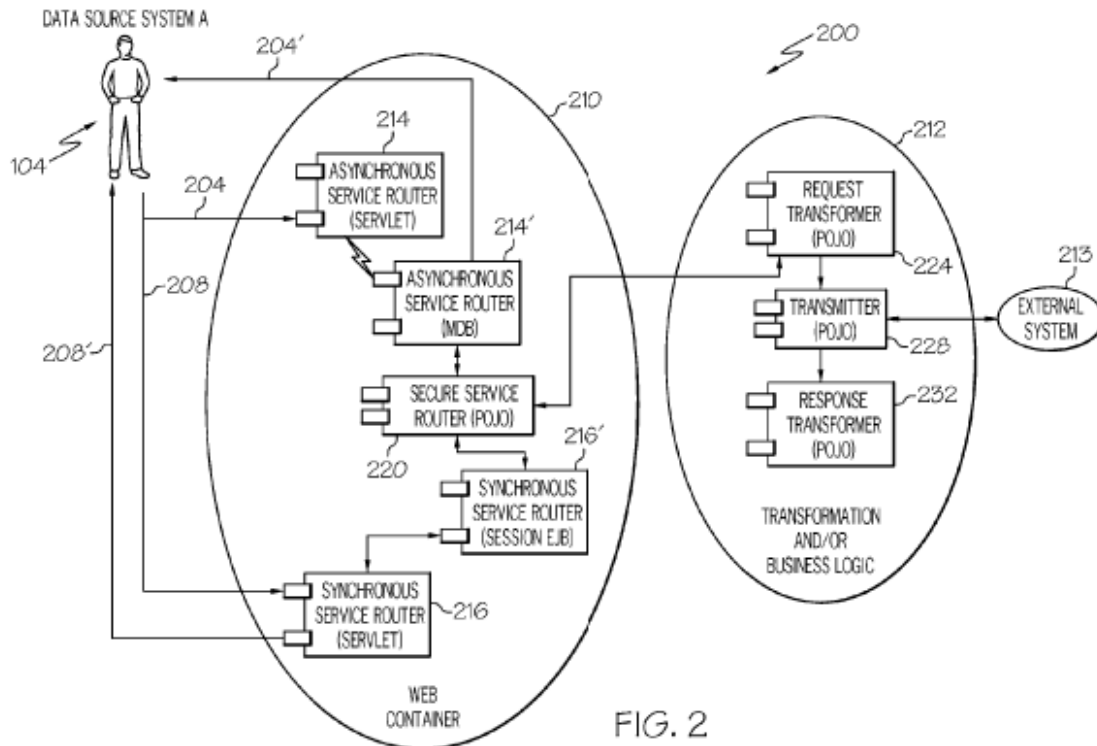


Figure 2, reproduced above, illustrates a high-level process flow request/response connection topology employed in web services hub 101. Ex. 1001, 2:1–3, 5:22–24. This process flow employed by web services hub 101 includes, among other things, web container 210 that requires “asynchronous service routers 214, 214' in data communication with asynchronous communication channels 204, 204', synchronous service

routers 216, 216' in data communication with synchronous communication channels 208, 208', and secure service router 220.” *Id.* at 5:44–51. The corresponding description of Figure 2 repeatedly refers to the various service routers forwarding messages or requests. *See, e.g., id.* at 8:1–3 (“Based on the [uniform resource locator], asynchronous service router 214 or synchronous service router 216 may forward the message or request to secure service router 220.”), 8:10–12 (“Secure service router 220 may then forward the message or request to transformation and/or business logic module 212.”) The process flow illustrated in Figure 2 together with its corresponding description in the specification supports a finding that each of the service routers disclosed in the ’788 patent, including secure service router 220, forwards messages or requests.

Counsel for USAA appeared to agree that each of the service routers disclosed in the specification of the ’788 patent forwards messages or requests. During oral argument, we posed a question as to whether each of the service routers disclosed in the specification of the ’788 patent forwards messages or requests. Tr. 14:9–13. In response, counsel for USAA agreed that “the specification uses the word forwarding to describe how messages get from component to component” (e.g., from one service router to another service router as illustrated in Figure 2 of the ’788 patent), but made clear that his position was that “the plain meaning of the word forwarding” should apply. *Id.* at 14:14–23.

Although we adopt certain portions of the “forwarding” aspect of PNC’s newly proposed construction for the embedded phrase “service router,” we do not adopt the “to services” language. As we explain above, during oral argument, PNC acquiesced to our proposal of removing the “to

services” language from its newly proposed construction for the embedded phrase “service router” such that a “service router” in the context of the ’788 patent simply means “hardware and/or software that forwards messages or requests.” Tr. 36:20–37:11.

In summary, to ensure that we interpret the claim term “secure service router” consistently across the ’788 patent and the ’786 patent, we construe the claim term “secure service router” as “hardware and/or software that authenticates the data source system prior to forwarding messages or requests.”³ As we explain above, this construction also finds support in the specification of the ’788 patent. As a result, we need not resort to the extrinsic evidence, which, under these particular circumstances, includes dictionary definitions of the word “router” and declaration testimony, to determine the proper construction of the claim term “secure service router.” *See Phillips*, 415 F.3d at 1317 (“[W]hile extrinsic evidence can shed useful light on the relevant art, we have explained that it is less significant than the intrinsic record in determining the legally operative meaning of claim language.”).

3. “*verifying access and transmission rights of the data source system and the external system*”

In the Institution Decision, we did not provide an explicit construction for the claim term “verifying access and transmission rights of the data source system and the external system” because, during the preliminary stage of this proceeding, the parties did not identify this claim term as a one

³ In our obviousness analysis below, we address the scope and meaning of the word “forwarding,” as this word pertains to the teachings of Corneil contested by the parties. *See infra* Section II.B.4.b.

that requires an explicit construction. *See* Dec. on Inst. 7–11. However, during trial, it became apparent that the parties dispute the meaning of this claim term.

In its Patent Owner Response, PNC identifies this claim term as one that Corneil purportedly does not teach, but PNC does not propose an explicit construction for this claim term. *See* PO Resp. 11–17, 22–27. In particular, PNC appears to contend that this claim term should be accorded its plain and ordinary meaning based on its general statement that all “[o]ther claim terms,” except the claim term “secure service router,” should be “given their ordinary customary meaning as understood by a [person of ordinary skill in the art].” *Id.* at 17 (citing Ex. 2006 ¶ 41). Yet, when explaining why it believes Corneil does not teach “verifying access and transmission rights of . . . the external system,” we understand PNC to argue that this embedded phrase implicitly requires determining whether the external system is permitted to transmit messages back to the data source system. *See, e.g., id.* at 24 (“Regardless of whether one *could* use a sender’s Trading Partner Profile to determine that a receiving partner is in the same network and *can transmit messages back to the sender*, this claim limitation is met *only if* Corneil actually teaches performing such an action.” (emphases added)). PNC does not reconcile its understanding of this claim term with the district court’s claim construction order, which construed the same claim term in a different way. *See* Ex. 1037, 81–84.

In its Reply, USAA clearly frames the dispute between the parties regarding the scope of “verifying access and transmission rights of the data source system and the external system” as one of claim construction. *See* Pet. Reply 1–4. USAA notes that, after the Petition was filed, the district

court construed this claim term as “determining whether the data source has permission to send messages to the external system and whether the external system has permission to receive messages from the data source.” *Id.* at 1 (citing Ex. 1037, 84). USAA appears to agree with the district court’s construction for this claim term. *Id.* (citing Ex. 1037, 83–84); *see also* Tr. 19:12–17 (confirming that USAA agrees with the district court’s construction). USAA argues that neither PNC nor its declarant, Mr. Gray, addressed the district court’s construction of this claim term in the Patent Owner Response despite identifying it as “one of only two claim elements purportedly missing from the prior art.” Pet. Reply 1–2 (citing PO Resp. 18; Ex. 1039, 103:20–23, 105:6–21).

USAA also disagrees with PNC’s implicit construction of “verifying access and transmission rights of . . . the external system” as requiring a determination whether the external system is permitted to transmit messages back to the data source system. Pet. Reply 2. According to USAA, this requirement is not consistent with the district court’s construction, which requires “determining whether the external system has permission to *receive* messages from the data source.” *Id.* (quoting Ex. 1037, 84) (internal quotations omitted). USAA also argues that the district court’s construction makes sense in light of the plain language of independent claim 1, which only requires a message to be transmitted to the external system. *Id.* (citing Ex. 1037, 83–84). In addition, USAA argues that PNC’s implicit construction would improperly import functionality already required by dependent claims 8–10. *Id.* at 2–3 (citing Ex. 1001, 15:40 (claim 8)). Lastly, USAA argues that PNC does not identify any disclosures in the specification of the ’788 that would support its implicit construction that

requires determining whether the external system is permitted to transmit messages back to the data source system. *Id.* at 3 (citing Ex. 1001, 8:61–63). According to USAA, “[t]here is not even a single example in the specification describing determining that the external system can ‘transmit messages back to the sender.’” *Id.*

In its Sur-reply, PNC also frames the dispute between the parties regarding the scope of “verifying access and transmission rights of the data source system and the external system” as one of claim construction. *See* PO Sur-reply 4–8. PNC argues that this claim term should be accorded its plain and ordinary meaning. *See id.* at 4; *see also id.* at 8 (arguing the same). According to PNC, USAA’s reliance on the district court’s construction of this claim term for the first time in its Reply is a belated new argument that should not be entitled to consideration. *Id.* at 4–5. PNC argues that USAA should not be permitted to rely on the district court’s construction of this claim term at such a late stage because, before filing the Petition in which it argued that all claim terms should be accorded their plain and ordinary meaning, USAA proposed a construction for this claim term in the district court case that it could have proposed in the Petition. *Id.* at 5 (citing Ex. 1037, 81). PNC further argues that it has consistently taken the position that this claim term should be accorded its plain and ordinary meaning, which PNC now asserts “does not require verifying that the external system has the right to send to any *particular* entity, such as the sender.” *Id.* at 6 (citing Ex. 1037, 81; PO Resp. 8, 17).

In any event, PNC contends that we are not obligated to adopt the district court’s construction of this claim term because it is incorrect as neither the plain language of the claims nor the specification of the ’788

patent “describes determining whether the external system has permission to receive messages from the data source [system].” PO Sur-reply 6–7 (citing *Power Integrations, Inc. v. Lee*, 797 F.3d 1318, 1326 (Fed. Cir. 2015)).

PNC asserts that, contrary to USAA’s argument, the specification of the ’788 patent repeatedly provides support for checking transmission rights of the external system. *Id.* at 7 (citing Ex. 1001, 4:9–13, 6:53–56, 8:61–63).

Lastly, PNC argues that its proposed construction does not conflict with the additional limitations of dependent claims 8–10, which relate to receiving, routing, and transforming a response from the external system. *Id.* at 7–8.

As an initial matter, we do not agree with PNC’s argument that USAA’s reliance in its Reply on the district court’s claim construction of the claim term “verifying access and transmission rights of the data source system and the external system” amounts to a belated argument that is not entitled to consideration. Although it is true that USAA argued in the Petition that all claim terms should be accorded their plain and ordinary meaning, as would have been understood by a person of ordinary skill in the art (Pet. 10), there are two reasons USAA’s reliance in its Reply on the district court’s claim construction of this claim term is proper.

First, the district court issued its claim construction order on November 22, 2021, which was roughly four months after the Petition was filed on July 9, 2021. *Compare* Ex. 1037, 130 (district court claim construction order issued on November 22, 2021), *with* Paper 3, 1 (according the Petition a filing date of July 9, 2021). Based on the interplay between the filing of the Petition and the issuance of the district court claim construction order, the Reply was USAA’s first opportunity to address the district court’s claim construction and explain why this construction

comports with USAA's understanding of the plain and ordinary meaning of the claim term "verifying access and transmission rights of the data source system and the external system." Indeed, in the Institution Decision, "we encourage[d] the parties to address the impact of the district court's claim construction on the issues raised in this proceeding." Dec. on Inst. 11 n.3. We cannot then fault USAA for following our instruction, even if PNC choose not avail itself of the same opportunity in the Patent Owner Response.

Second, USAA's arguments in the Reply are responsive to PNC's arguments presented in the Patent Owner Response. Even though PNC does not propose an explicit construction of the claim term "verifying access and transmission rights of the data source system and the external system," it appears to advocate implicitly for one by arguing that Corneil does not teach the term's "plain and ordinary meaning" given Corneil's purported failure to meet certain requirements. Importantly, those requirements are not clearly stated in the claim language itself, and the district court's claim construction does not include those requirements. As a result, we determine that USAA fairly responds to this argument by contending that PNC's requirements are not consistent with the plain and ordinary meaning of this term, as demonstrated by the district court's claim construction order.

Based on the fully developed trial record, PNC fails to articulate clearly its understanding of the plain and ordinary meaning of the claim term "verifying access and transmission rights of the data source system and the external system." On the one hand, PNC argues in the Patent Owner Response that, "[r]egardless of whether one *could* use a sender's Trading Partner Profile to determine that a receiving partner is in the same network

and can transmit messages back to the sender, this claim limitation is met only if Corneil actually teaches performing such an action.” PO Resp. 24; *see also* PO Sur-reply 10 (“USAA’s other arguments . . . fail to provide any evidence that Corneil teaches or suggests verifying the right of a receiving trading partner to transmit a message.”). On the other hand, PNC argues in the Sur-reply that the plain and ordinary meaning of this claim term “does not require verifying that the external system has the right to send to any *particular* entity, such as the sender.” PO Sur-reply 6. Moreover, PNC fails to persuasively show that either understanding of the claim language is consistent with how a person of ordinary skill in the art would have understood this claim term in view of the intrinsic record. PNC’s contradictory and unsupported arguments, together with its failure to state explicitly what it believes is the plain and ordinary meaning of the claim term “verifying access and transmission rights of the data source system and the external system” beyond simply repeating this claim language, render PNC’s arguments ambiguous and unpersuasive, leaving us with the district court’s claim construction order that provides a reasoned analysis.

With this in mind, we see no reason to deviate from the district court’s construction of the claim term “verifying access and transmission rights of the data source system and the external system” as “determining whether the data source has permission to send messages to the external system and whether the external system has permission to receive messages from the data source.” Ex. 1037, 84. We adopt and incorporate by reference the district court’s claim construction analysis, and we do not repeat it in full here. *Id.* at 82–84. We, however, take this opportunity to provide additional

reasoning in support of the district court’s claim construction analysis based on the arguments and evidence presented during trial.

To the extent PNC argues for an implicit construction of the embedded phrase “verifying access and transmission rights of the data source system and the external system” that requires determining whether the external system has permission to transmit messages back to the data source system, we do not agree. *See* PO Resp. 24. It is well-settled that “extraneous” limitations should not be read into a claim. *Renishaw PLC v. Marposs Societa’ per Azioni*, 158 F.3d 1243, 1249 (Fed. Cir. 1998); *E.I. du Pont de Nemours & Co. v. Phillips Petroleum Co.*, 849 F.2d 1430, 1433 (Fed. Cir. 1988). Neither the plain language of independent claim 1 nor the specification of the ’788 patent explicitly requires the external system to transmit a message back to the data source system. Ex. 1001, 14:61–15:9 (claim 1), 4:9–13 (“Accordingly, user registry server 120 may be configured to invoke various routines to authenticate data source systems 104, 108, 112 and/or verify access and transmissions rights of various computer systems and internal and external networks.”), 6:53–56 (stating the same, except limiting it to “various embodiments”). Indeed, independent claim 1 only requires “receiving a message from a data source system” and transmitting “the message to . . . an external system.” *Id.* at 14:62–65. It is not until dependent claim 8, which depends directly from independent claim 1 and further recites, in relevant part, “receiving a response [from] the external system,” that any claim requires the external system to transmit a response message back to the data source system. *Id.* at 15:40.

The most relevant disclosure in the specification of the ’788 patent that PNC relies on to support its reading of “verifying access and

transmission rights of the data source system and the external system” appears in column 8, lines 61–63. *See* PO Sur-reply 7. This disclosure states that “[s]ecure service router 220 verifies 312 access and transmission rights of data source system A 104 and external system 213.” Ex. 1001, 8:61–63. This particular disclosure, however, simply repeats the same language recited in independent claim 1 and provides no additional details as to what it means for secure service router 220 to verify the access and transmission rights of these components. Notably, it does not indicate that the verification process performed by secure service router 220 includes determining whether external system 213 has permission to transmit messages back to data source system A 104.

Reading “verifying access and transmission rights of the data source system and the external system” to require determining whether the external system has permission to transmit messages back to the data source system also does not comport with the arguments advanced by PNC in district court. That is, PNC argued in the district court that the specification of the ’788 patent “leaves open ended the manner in which access and transmission rights can be verified” and “the claim is broad enough to encompass *any* method of verifying access and transmission rights.” Ex. 1037, 81–82.

In summary, we adopt the district court’s construction of the claim term “verifying access and transmission rights of the data source system and the external system” as “determining whether the data source has permission to send messages to the external system and whether the external system has permission to receive messages from the data source.” Ex. 1037, 84.

B. Obviousness Over the Teachings of Corneil

USAA contends that claims 1–5 and 7–10 of the '788 patent are unpatentable under § 103(a) as obvious over teachings of Corneil. Pet. 10–49. USAA contends that the teachings of Corneil account for the subject matter of each challenged claim, and provides reasoning as to why a person of ordinary skill in the art would have been prompted to modify the teachings of this reference. *Id.* During trial, PNC contends that the teachings of Corneil do not account for all the limitations of claims 1, 3, and 5. PO Resp. 22–36; PO Sur-reply 8–29.

Based on the fully developed trial record, we determine that USAA has shown by a preponderance of the evidence that claims 1–5 and 7–10 of the '788 patent are unpatentable as obvious over the teachings of Corneil. We begin our analysis with the principles of law that generally apply to an obviousness ground, an assessment of the level of skill in the art, followed by a brief overview of Corneil, and then we address the parties' contentions with respect to the challenged claims.

1. Principles of Law

A claim is unpatentable under § 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 skill in the art; and (4) when in evidence, objective indicia of non-obviousness

(i.e., secondary considerations, such as commercial success, long-felt but unsolved needs, failure of others, etc.). *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). We analyze the asserted grounds based on obviousness with the principles identified above in mind.

2. *Level of Skill in the Art*

In determining whether an invention would have been obvious at the time it was made, we consider the level of ordinary skill in the pertinent art at the time of the invention. *Graham*, 383 U.S. at 17. “The importance of resolving the level of ordinary skill in the art lies in the necessity of maintaining objectivity in the obviousness inquiry.” *Ryko Mfg. Co. v. Nu-Star, Inc.*, 950 F.2d 714, 718 (Fed. Cir. 1991). The “person having ordinary skill in the art” is a hypothetical construct, from whose vantage point obviousness is assessed. *In re Rouffet*, 149 F.3d 1350, 1357 (Fed. Cir. 1998).

Factors pertinent to a determination of the level of ordinary skill in the art include “(1) the educational level of the inventor; (2) type of problems encountered in the art; (3) prior art solutions to those problems; (4) rapidity with which innovations are made; (5) sophistication of the technology; and (6) educational level of active workers in the field.” *Envtl. Designs, Ltd. v. Union Oil Co. of Cal.*, 713 F.2d 693, 696 (Fed. Cir. 1983) (citing *Orthopedic Equip. Co. v. All Orthopedic Appliances, Inc.*, 707 F.2d 1376, 1381–82 (Fed. Cir. 1983)). “Not all such factors may be present in every case, and one or more of these or other factors may predominate in a particular case.” *Id.* at 696–97.

Relying on the testimony of Dr. Malek, USAA argues the following:

[a] person of ordinary skill in the art . . . at the time of the alleged invention would have had a Bachelor's degree in computer science, software engineering, or electrical engineering and two years of experience in software development and programming in the area of web services, including familiarity with enterprise systems and standard web transport and security protocols. This level of skill is approximate, and more experience would compensate for less formal education, and vice versa.

Pet. 10 (citation omitted) (citing Ex. 1003 ¶ 53).

In its Patent Owner Response, PNC offers essentially the same assessment of the level of skill in the art as USAA, arguing the following:

[a] "person of ordinary skill in the art" . . . at the time of the alleged invention would have had a degree in electrical engineering, computer engineering, computer science or the equivalent knowledge gained through experience; and at least two years of computer programming experience in the design and implementation of distributed computing systems and related Internet technologies.

PO. Resp. 10 (citing Ex. 2006 ¶ 20).

The level of skill in the art advanced by each party requires at least a Bachelor of Science degree in electrical engineering, computer/software engineering, computer science, or equivalent. We do not discern a material difference between the industry experiences advanced by either party, nor does either party premise arguments on its own industry experience. For purposes of this Final Written decision, we adopt USAA's assessment of the level of skill in the art because Dr. Malek's identification of relevant industry experience applicable to software development and programming in the area of web services, including familiarity with enterprise systems and standard web transport and security protocols, is consistent with the '788

patent and the asserted prior art. We note, however, that our obviousness analysis would be the same under either party's assessment of the level of skill in the art.

3. Overview of Corneil

Corneil generally relates to “[a] service, method, apparatus and/or network configuration that provides the exchange of electronic data or message transactions through a third party network service between trading partners that have disparate systems.” Ex. 1004, code (57). According to Corneil, its system provides data processing services that include, but are not limited to, “authentication, validation, transformation and routing of a plurality of trading partners’ electronic transactions.” *Id.*

The system uses a centralized computing platform to receive input messages from one or more trading partners in one or more message formats. If required[,] messages are transformed to a second message format The data is then sent to the plurality of trading partners as required by the originating trading partner. *Id.*

Figure 2 of Corneil, reproduced below, illustrates a transaction processing system for electronic messages in accordance with one embodiment. Ex. 1004 ¶¶ 15, 32.

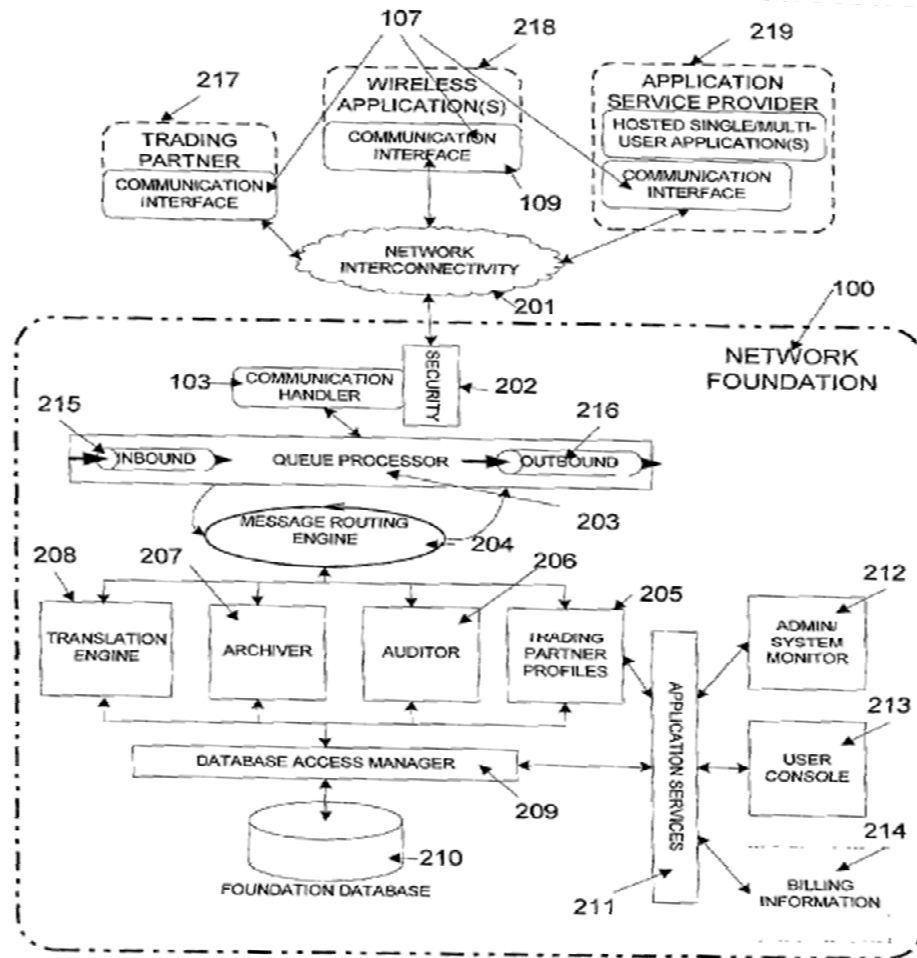


FIGURE 2

Figure 2, reproduced above, illustrates how messages are routed from trading partners 217 through network interconnectivity 201 to network foundation 100. *Id.* ¶¶ 32, 33. Network foundation 100 further includes, among other things, security handler 202 that “executes processes to assure the security of the messages received over” network interconnectivity 201 (e.g., “by validating authentication information”), communication handler 103 that “understands and manages” different communication protocols used by trading partners 217, queue processor 203 that maintains inbound 215 and outbound 216 electronic message queues, and message routing engine

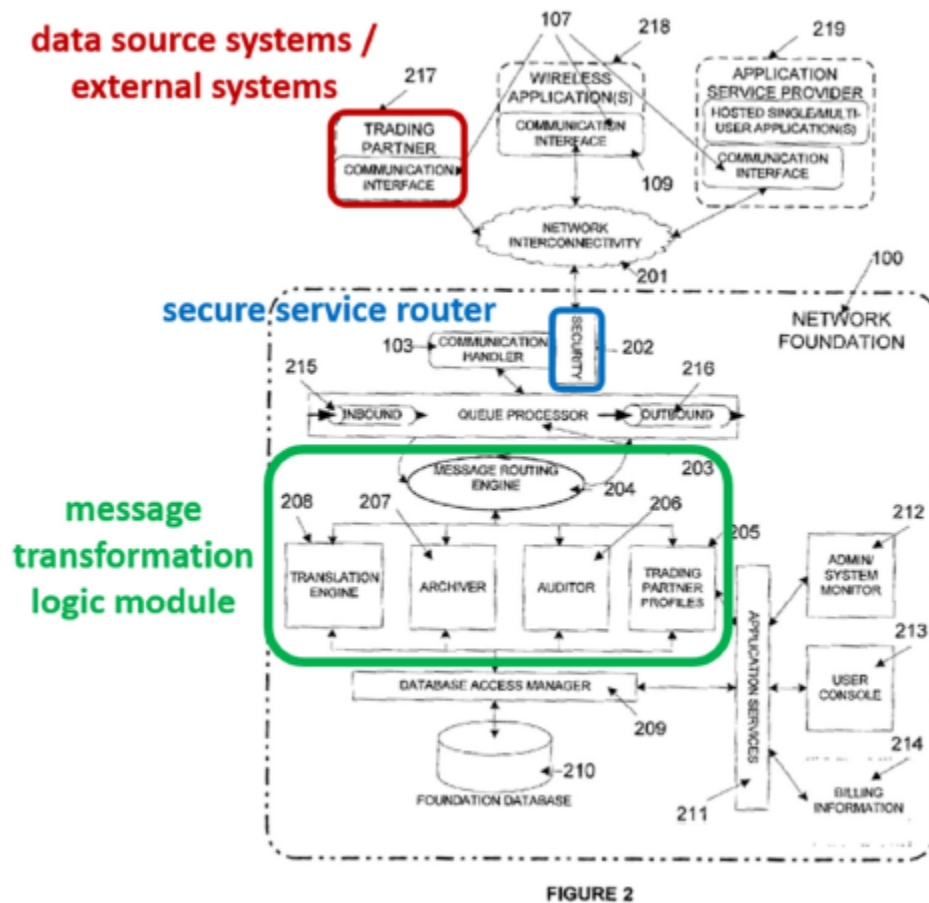
204 that serves as “the main execution thread for transaction processing.”

Id. ¶¶ 33, 34.

When describing the operations of one embodiment, Corneil discloses that message routing engine 204 “picks up, authenticates and properly routes incoming messages and outgoing messages.” Ex. 1004 ¶ 51. In connection with Figure 6 (not reproduced here), Corneil discloses that the processing of messages as they are received by network foundation 101 includes checking the messages “to ensure that they are sent by the authorized Trading Partner by reconciling 604 the message[s] with a Trading Partner Profile.” *Id.* ¶ 45, Fig. 6, step 604.

4. Claim 1

The preamble of independent claim 1 recites “[a] method, comprising.” Ex. 1001, 14:61. To the extent the preamble should be treated as limiting, USAA contends that Corneil teaches the preamble because Figure 2 of Corneil illustrates a system having all the elements of independent claim 1, including multiple “data source systems” and “external systems,” a “secure service router,” and a “message transformation logic module.” Pet. 11. Each of these elements is illustrated in the annotated version of Figure 2 of Corneil, reproduced below.



Id. Based on the annotated version of Figure 2, reproduced above, which illustrates a transaction processing system for electronic messages, USAA argues that “trading partner 217” (in red) represents a collection of “distinct, plural trading partners [who] communicate with each other by routing electronic documents through the managed network.” *Id.* (quoting Ex. 1004 ¶ 23) (alteration in original). More specifically, USAA argues that first trading partner 217 is the “data source system” (in red) that sends a message via web services hub to second trading partner 217 that is the “external system” (also in red). *Id.* at 11–12 (citing Ex. 1003 ¶ 85).

The first step of independent claim 1 recites “receiving a message from a data source system, the message comprising at least one header

parameter stored in at least one header parameter field, the message to be transmitted to an external system.” Ex. 1001, 14:62–65. USAA contends that Corneil teaches this limitation, because similar to the hypertext transfer protocol (“HTTP”) or hypertext transfer protocol secure (“HTTPS”) requests described in the specification of the ’788 patent, Corneil teaches that message routing engine 204 receives messages from first trading partner 217 via HTTP connection protocols that are transmitted to second trading partner 217. Pet. 12–13 (citing Ex. 1004, code (57), ¶ 34; Ex. 1003 ¶¶ 86, 87). USAA further argues that Corneil discloses that message routing engine 204 receives messages that include header information storing multiple message parameters, including “sender and receiver information,” “message incoming and outgoing formats, trading partner information, routing characteristics and application information for [the] transaction.” *Id.* at 13–15 (quoting Ex. 1004 ¶¶ 34, 52) (citing Ex. 1004 ¶¶ 35, 45, Fig. 2; Ex. 1003 ¶ 88) (alteration in original).

The second step of independent claim 1 recites “determining the message type based on the at least one header parameter.” Ex. 1001, 14:66–67. USAA contends that Corneil teaches this limitation because it discloses that the transaction processing system examines the header information of each message “to ‘determine the processes that will be performed on the data,’ i.e., what transformation is required to convert the message from its current type to the desired outgoing format.” Pet. 16–17 (quoting Ex. 1004 ¶ 45) (citing Ex. 1004 code (57), ¶ 34; Ex. 1003 ¶¶ 88, 90). USAA argues that this is the same type of determination disclosed in the specification of the ’788 patent, which provides “determin[ing] whether transformation is

required before transmitting the request to external system 213.” *Id.* at 17–18 (quoting Ex. 1001, 9:61–67).

The third step of independent claim 1 recites “verifying access and transmission rights of the data source system and the external system.” Ex. 1001, 15:1–2. USAA contends that Corneil teaches this limitation because it discloses verifying the identity of the parties to the transaction (i.e., first trading partner 217 and second trading partner 217) and whether they are authorized to perform the requested action. Pet. 18. According to USAA, Corneil accomplishes this verification by cross referencing the header information of a message with the “Trading Partner Profile” records maintained for each trading partner 217 authorized to use the system. *Id.* at 19 (quoting Ex. 1004 ¶ 45). Relying on the testimony of Dr. Malek, USAA argues that “[a person of ordinary skill in the art] would have understood this to include verifying access and transmission rights of the data source system and the external system.” *Id.* (citing Ex. 1003 ¶ 92).

As one example, USAA contends that Corneil’s “Trading Partner Profile” records contain information about “each specific trading partner,” including “other trading partners within their network.” Pet. 19 (quoting Ex. 1004 ¶ 35). USAA then argues that reconciling the header information of a message with the “Trading Partner Profile” records not only includes verifying that first trading partner 217 and second trading partner 217 have access rights to Corneil’s transaction processing system, but also includes verifying that the two trading partners are within each other’s network and, therefore, authorized to transmit messages to one another. *Id.* at 19–20 (citing Ex. 1003 ¶ 92).

Alternatively, USAA contends that “[a]uthenticating and authorizing the source and destination of messages between trading partners was well-known in the prior art in order to maintain the security of sensitive business information and prevent unnecessary expenditure of processing resources by intermediary hub systems such as Corneil’s.” Pet. 20–21 (citing Ex. 1003 ¶ 92). Indeed, USAA argues that Corneil itself provides a sufficient reason to verify the access and transmission rights of first and second trading partners 217 because it tracks how often the trading partners use the transaction processing system and bills them accordingly. *Id.* at 21 (citing Ex. 1004 ¶¶ 11, 45, 46). Relying on the testimony of Dr. Malek, USAA asserts that “[a person of ordinary skill in the art] would . . . have had good reason to verify access and transmission rights of the data source system and the external system in order to ensure that trading partners [217] are not billed for transactions that they did not authorize.” *Id.* at 21–22 (citing Ex. 1003 ¶ 92).

The fourth step of independent claim 1 recites “transmitting the message to a message transformation logic module.” Ex. 1001, 15:3–4. USAA contends that Corneil teaches this limitation because the claimed “message transformation logic module” includes, among other things, Corneil’s message routing engine 204 and translation engine 208. Pet. 23–24 (citing Ex. 1004, Fig. 2 (annotated)). More specifically, USAA argues that message routing engine 204 receives a message from security handler 202 and communication handler 103 and, if necessary, transmits the message to translation engine 208 for transformation to a desired outgoing format. *Id.* at 24–25 (citing Ex. 1004 ¶¶ 33–35, 45; Ex. 1003 ¶ 94).

The last step of independent claim 1 recites “receiving the message to be transformed from the data source system at the message transformation logic module from a secure service router, the message comprising the at least one header parameter stored in the at least one header parameter field.” Ex. 1001, 15:5–9. USAA contends that Corneil teaches this limitation because it discloses transmitting the message from first trading partner 217 through security handler 202 to message routing engine 204 via inbound 215 electronic message queue of queue processor 203 and, if necessary, to translation engine 208 for transformation to a desired outgoing format. Pet. 26–27 (citing Ex. 1004 ¶¶ 33, 35, Fig. 2 (annotated); Ex. 1003 ¶ 95). USAA argues that, as it identifies above with respect to the first method step of independent claim 1, Corneil discloses that the received message includes header information storing at least one message parameter. *Id.* at 27 (citing Ex. 1004 ¶¶ 32, 35, 52). According to USAA, Corneil passes the message from security handler 202 to message routing engine 204 and, if necessary, to translation engine 208, “without stripping the header information from the message, so that [message routing engine 204 and translation engine 208] can also access the header information.” *Id.* (citing Ex. 1004 ¶ 34; Ex. 1003 ¶ 96).

During trial, PNC contends that Corneil does not teach the following limitations of independent claim 1: (1) “verifying access and transmission rights of . . . the external system”; and (2) “receiving the message to be transformed from the data source system at the message transformation logic module from a secure service router.” PO Resp. 25–34; PO Sur-reply 9–24. After considering the parties’ arguments and evidence, USAA has shown by a preponderance of the evidence that Corneil teaches or suggests each

limitation of independent claim 1, notwithstanding PNC's arguments to the contrary. Below, we address PNC's arguments directed to each limitation in turn.

a. "verifying access and transmission rights of . . . the external system"

In its Patent Owner Response, PNC contends that Corneil's cross referencing of a message's header information against trading partner profile records to ensure that the received message header information matches a trading partner profile does not teach the claimed "verifying access and transmission rights of . . . the external system." PO Resp. 22–23 (citing Pet. 11–13, 18–23). According to PNC, "nothing in Corneil describes or even suggests checking the *transmission rights* of the receiving trading partner." *Id.* at 23 (citing Ex. 2006 ¶¶ 50–52). PNC disagrees with USAA's position that, because Corneil discloses that a trading partner's profile includes information about other trading partners in its network, checking the trading profile corresponds to checking the transmission rights of the other trading partners in the network. *Id.* at 23–24 (citing Ex. 1004 ¶¶ 35, 45). PNC then argues that USAA is conflating the following two different concepts: (1) "what one *could determine* from the Trading Partner Profile"; and (2) "what Corneil actually teaches *is determined* from the Trading Partner Profile." *Id.* at 24. PNC further argues that, "[r]egardless of whether one *could* use a sender's Trading Partner Profile to determine that a receiving partner is in the same network and can transmit messages back to the sender, this claim limitation is met only if Corneil actually teachings performing such action." *Id.* PNC then asserts that "it is clear that Corneil does not teach performing such checking of transmission rights of the recipient trading partner." *Id.* (citing Ex. 2006 ¶¶ 53, 54).

PNC also disagrees with USAA’s attempt to modify Corneil to perform checking of transmission rights of the receiving trading partner so that the receiving trading partner is not billed for unauthorized transactions. PO Resp. 24–25. According to PNC, “even if a [person of ordinary skill in the art] were motivated to modify Corneil to check the transmission rights to avoid billing for unauthorized transactions, such checking would be performed at the time a trading partner sought to *transmit* a message, not when the [trading] partner *received* the message.” *Id.* at 25. PNC asserts that it would make no sense to check the transmission rights of the receiving trading partner because the receiving trading partner would not be billed for transmitting. *Id.* (citing Ex. 2006 ¶¶ 55, 56). In addition, PNC disagrees with USAA’s attempt to modify Corneil to perform checking of transmission rights of the receiving trading partner because Corneil discloses delivering messages using secure protocols, such as HTTPS. *Id.* PNC argues that these secure protocols authenticate the identity of the sender and receiver of a message—they do not verify the transmission rights of those entities. *Id.* at 25–26. PNC asserts that USAA fails to provide an adequate explanation as to why Corneil’s use of a secure protocol necessarily verifies the “transmission rights” of the receiving trading partner, as required by independent claim 1. *Id.* at 26 (citing Ex. 2006 ¶ 57).

In its Reply, USAA contends that, when applying the district court’s construction of the claim term “verifying access and transmission rights of the data source system and the external system,” Corneil’s disclosure of cross referencing the header information of a message with the trading partner profile records maintained for each trading partner 217 authorized to use the transaction processing system teaches this limitation. Pet. Reply 8.

According to USAA, the data that is “cross referenced” during this reconciliation process disclosed in Corneil includes (1) “a set of information including sender and receiver information for the message”; and (2) “a set of information including which trading partners are in the sender’s ‘network.’” *Id.* at 8–9 (citing Ex. 1004 ¶ 52; Ex. 1003 ¶¶ 74, 92; Ex. 1039, 114:6–115:9). Relying on the testimony of Dr. Malek, USAA argues that a person of ordinary skill in the art, upon reading the relevant disclosures in Corneil, would have understood “the reconciliation process to include ‘verifying that the data source systems and external system are authorized users of Corneil’s [transaction processing] system (i.e., have appropriate ‘access’ rights) [and] that the two trading partners are within each other’s network and thus permitted to send and receive messages to and from one another (i.e., have ‘transmission rights’).” *Id.* at 9 (citing Ex. 1003 ¶ 92). USAA argues that PNC’s declarant, Mr. Grey, simply repeats the same conclusory assertions in the Patent Owner Response and does provide additional explanation with the necessary factual underpinnings to rebut USAA’s position. *Id.* at 9–10 (citing Ex. 2006 ¶¶ 50–59). USAA also argues that, despite having the opportunity to cross-examine its declarant, Dr. Malek, regarding his relevant testimony and introduce rebuttal evidence of its own, PNC does not cite to Dr. Malek’s cross-examination testimony in its Patent Owner Response nor does PNC directly address any of Dr. Malek’s opinions as to how Corneil verifies access and transmission rights. *Id.* at 10–11.

USAA further contends that PNC does not address its alternative theory as to how Corneil teaches the claimed “verifying access and transmission rights of the data source system and the external system.” Pet. Reply 11–12. According to USAA, “even if Corneil [does] not teach

checking whether the receiving trading partner and sending trading partner are in the same network, this would have been at most a trivial modification to Corneil’s [transaction processing] system that Corneil itself provides a motivation to implement” through its disclosure that the receiving trading partner may be responsible for bills generated for processing messages. *Id.* (citing Ex. 1004 ¶¶ 11, 46, claim 9; Ex. 1003 ¶ 92). USAA argues that Corneil’s reconciliation process already provides a built-in mechanism for verifying the transmission rights of the sending and receiving trading partners against their corresponding trading partner profiles. *Id.* at 13 (citing Ex. 1004 ¶ 45). USAA then asserts that “[i]t would . . . be [a] trivial matter within the skill of a [person of ordinary skill in the art] to check, as part of [Corneil’s] existing reconciliation process, whether the destination partner information included in the message header matches up with the trading partner network information in the trading partner profiles.” *Id.* (citing Ex. 1003 ¶ 92). USAA argues that PNC fails to identify any drawbacks associated with this proposed modification, but instead asserts that it would make “no sense to check the transmission rights of the trading partner that merely receives, because the receiving trading partner would not be billed for transmitting.” *Id.* (quoting PO Resp. 25). USAA argues that PNC’s assertion in this regard fails to appreciate Corneil’s disclosure that the cost for processing messages may be borne by either the sending or receiving trading partner. *Id.* at 13–14 (citing Ex. 1004 ¶¶ 11, 45, 46, claim 9; Ex. 1003 ¶ 92).

In its Sur-reply, PNC contends that, when applying the plain and ordinary meaning of the claim term “verifying access and transmission rights of the data source system and the external system,” Corneil does not

teach this limitation. PO Sur-reply 9. PNC acknowledges that Corneil discloses “cross referenc[ing] message header information with the Trading Partner Profile records,” but argues that Corneil provides no implementation details for this reconciliation process. *Id.* (quoting Ex. 1004 ¶ 45). PNC further argues that, even if this reconciliation process disclosed in Corneil includes checking whether the sender and receiver are in the same network and that the message complies with their specified message requirements, this does not teach verifying that the receiving trading partner has the claimed “transmission rights.” *Id.* (citing Ex. 2006 ¶ 54). In addition, PNC argues that USAA’s other arguments are directed towards establishing that “Corneil verifies the right of the receiving partner to *receive* a message and fail[s] to provide any evidence that Corneil teaches or suggests verifying the right of the receiving partner to transmit a message.” *Id.* at 10. As one example, PNC argues that, regardless of whether the sending or receiving trading partner is billed for a message, Corneil’s billing is based on the receiving trading partner’s receipt of the transmitted message—not the receiving trading partner’s transmission of a separate response message. *Id.* (citing Ex. 2006 ¶¶ 55, 56). As a result, PNC asserts there would be no need to verify the transmission rights of the receiving trading partner. *Id.* As another example, PNC argues that, even if Corneil’s reconciliation process ensures that a receiving trading partner is within the same network as the sending trading partner, this is premised on Corneil verifying the receiving rights of the receiving trading partner—not its transmission rights. *Id.* at 10–11.

Lastly, PNC disagrees with USAA’s position that it would have been obvious to a person of ordinary skill in the art to modify Corneil to verify the

transmission rights of the receiving trading partner because, according to PNC, “USAA never explains why a [person of ordinary skill in the art] would have been motivated to make such a modification.” PO Sur-reply 9–10 (emphasis omitted). Moreover, PNC argues that USAA’s so-called “alternative theory” that such a modification would have been “trivial” as set forth in the Reply falls short because it was a new argument presented for the first time in the Reply and, therefore, should not be entitled to consideration. *Id.* at 11 (citing Pet. 18–23; Pet. Reply 11–12).

Based on the fully developed record, we understand USAA to present the following two alternative arguments as to how Corneil teaches the claimed “verifying access and transmission rights of . . . the external system”: (1) Corneil’s disclosure of cross referencing the header information of a message with the trading partner profile records maintained for each trading partner 217 authorized to use the transaction processing system teaches this limitation; and (2) in any event, it would have been obvious to a person of ordinary skill in the art modify Corneil’s cross referencing procedure to verify the access and transmission rights of second trading partner 217. *See* Pet. 18–23; Pet. Reply 8–14. We address these two alternative theories in turn.

i. USAA’s First Argument

Starting with USAA’s first argument, we agree with USAA that Corneil’s disclosure of cross referencing the header information of a message with the trading partner profile records maintained for each trading partner 217 authorized to use the transaction processing system teaches the claimed “verifying access and transmission rights of . . . the external system.” *See* Pet. 18–20; Pet. Reply 8–11. As we explain in our claim

construction section above, we adopt the district court's construction of the claim term "verifying access and transmission rights of the data source system and the external system" as "determining whether the data source has permission to send messages to the external system and whether the external system has permission to receive messages from the data source." *See supra* Section II.A.3. Corneil discloses that "[a] typical message" received by the transaction processing system illustrated in Figure 2 includes "an electronic message containing header information including, but not limited to, sender and receiver information." Ex. 1004 ¶ 52. In connection with Figure 6, which illustrates a method of processing messages embodying certain aspects of Corneil's disclosed invention, Corneil states "[m]essages are checked to ensure that they are sent by the authorized Trading Partner by reconciling 604 the message[s] with a Trading Partner Profile." *Id.* ¶ 45.

As one example of how Corneil's reconciliation process works, Dr. Malek testifies that "Corneil teaches that its Trading Partner Profile records include information about 'each specific trading partner' including 'other trading partners within their network.'" Ex. 1003 ¶ 92 (quoting Ex. 1004 ¶ 35). He then testifies as follows:

[r]econciling the message header information with the Trading Partner Profile records . . . would thus include not only verifying that the data source system and external system are authorized users of the Corneil's system (i.e., have appropriate 'access' rights) but that the two trading partners [217] are within each other's network and thus permitted to send and receive messages to and from one another (i.e., have 'transmission' rights).

Id. We credit the aforementioned testimony of Dr. Malek because it takes into account the reasonable inferences a person of ordinary skill the art would draw to explain how Corneil's reconciliation process uses the header

information of a message to determine whether first and second trading partners 217 are within the same network and, therefore, authorized to transmit and receive the message. *See KSR*, 550 U.S. at 418 (An obviousness evaluation “need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.”).

Based on Corneil’s disclosures cited above, together with the supporting testimony of Dr. Malek, we find that Corneil’s cross referencing of the header information retrieved from a message sent by first trading partner 217 with “Trading Partner Profile” records includes, among other things, determining whether second trading partner 217 (i.e., the intended recipient of the message) is within the network of first trading partner 217. Upon determining that first and second trading partner 217 are within the same network, it follows that first trading partner 217 is authorized to transmit the message to second trading partner 217 and second trading partner 217 is authorized to receive the message from first trading partner 217. This is consistent with our construction of the claim term “verifying access and transmission rights of the data source system and the external system.”

We do not agree with PNC that Corneil’s reconciliation process does not teach “verifying access and transmission rights of . . . the external system” because its arguments appear to be predicated on the notion that this limitation requires determining whether the external system has permission to transmit messages back to the data source system. *See PO Resp.* 23–24; *PO Sur-reply* 9–11. PNC’s arguments in this regard are based on an implicit

construction of the embedded phrase “verifying access and transmission rights of . . . the external system” that we did not adopt. *See supra* Section II.A.3.

ii. USAA’s Second Argument or “Alternative Theory”

Turning to USAA’s second argument, we also agree with USAA that, even if we assume that Corneil’s reconciliation process does not include checking whether first and second trading partner 217 are in the same network, there is sufficient disclosure in Corneil alone that justifies USAA’s assertion that it would have been obvious to a person of ordinary skill in the art to modify Corneil’s reconciliation process to perform this functionality. *See* Pet. 20–22. Once again, in connection with Figure 6, Corneil states that, “[t]hroughout the processing of the message,” which includes cross referencing the header information of the message with the “Trading Partner Profile” records maintained for each trading partner 217 authorized to use the system, “there is billing information captured 607 based on the value added services performed.” Ex. 1004 ¶ 45. Corneil further discloses that “messages processed by the [transaction processing] system, for example messages translated, routed, stored, etc. will . . . generate billable events.” *Id.* ¶ 46. Those “bills [may be] directed to one of the trading partners identified with the input message” or “bills [may be] directed to one of the trading partners identified with the output message.” *Id.* ¶ 11; *see also id.* at claim 9 (“billing for activities and events of the managed third party network, bills being directed to the one of the trading partners identified with the output message”).

Regardless of whether bills may be directed to first trading partner 217, second trading partner 217, or both, Dr. Malek testifies that “[a person

of ordinary skill in the art] would . . . have had good reason to verify access and transmission rights of the data source system and the external system in order to ensure that trading partners [217] are not billed for transactions that they did not authorize.” Ex. 1003 ¶ 92. We credit Dr. Malek’s testimony on this particular issue because it is consistent with the disclosures in Corneil that we identify above.

Based on Corneil’s disclosures cited above, together with the supporting testimony of Dr. Malek, we agree with USAA that a person of ordinary skill in the art would have found it obvious to modify Corneil’s reconciliation process to verify the access and transmission rights of both first trading partner 217 (i.e., the data source system) second trading partner 217 (i.e., the external system) to track the usage of these trading partners so they are billed accordingly. *See* Pet. 21–22; Pet. Reply 11–14. More specifically, in the particular situation where Corneil intends to bill the second trading partner 217, verifying the transmission and access rights of second trading partner 217 would ensure that second trading partner 217 is billed only after Corneil’s transaction processing system determines that first and second trading partner 217 are within the same network and, therefore, first trading partner 217 is authorized to transmit the message to second trading partner 217 and second trading partner 217 is authorized to receive the message from first trading partner 217.

We do not agree with PNC’s argument that it makes no sense to check the transmission rights of the second trading partner 217 because second trading partner 217 would not be billed for transmitting. *See* PO Resp. 24–25. Once again, PNC’s argument in this regard is based on an implicit construction of the embedded phrase “verifying access and transmission

rights of . . . the external system” that we did not adopt. *See supra* Section II.A.3. Moreover, this argument is undermined by Corneil’s disclosure of billing first trading partner 217, second trading partner 217, or both for their usage of the transaction processing system. Indeed, as we explain above, Corneil explicitly states that “bills [may be] directed to one of the trading partners identified with the input message” or “bills [may be] directed to one of the trading partners identified with the output message.” Ex. 1004 ¶ 11; *see also id.* at claim 9 (“billing for activities and events of the managed third party network, bills being directed to the one of the trading partners identified with the output message”).

We also do not agree with PNC’s assertion that USAA’s second argument or “alternative theory” is a belated argument raised for the first time in the Reply that is not entitled to consideration. *See* PO Sur-reply 11. Contrary to PNC’s assertion, USAA initially presented this second argument in the Petition and only sought to further clarify this alternative theory in the Reply. *Compare* Pet. 20–22, *with* Pet. Reply 11–14.

b. “receiving the message to be transformed from the data source system at the message transformation logic module from a secure service router”

In its Patent Owner Response, PNC contends that USAA improperly relies on Corneil’s security handler 202 to teach the claimed “secure service router.” PO Resp. 27–28 (citing Ex. 1004, Fig. 2; Ex. 2006 ¶ 60). PNC argues that Corneil’s security handler 202 does not satisfy its newly proposed construction of the claim term “secure service router” because Corneil discloses that messages merely “pass through” security handler 202—it does not forward messages to a service. *Id.* at 28–29 (quoting Ex. 1004 ¶¶ 33, 51) (citing Ex. 2006 ¶ 61).

PNC then contends that a person of ordinary skill in the art would have understood that Corneil could have stored incoming messages in a shared memory accessible to both security handler 202 and communication handler 103. PO Resp. 29 (citing Ex. 2006 ¶ 62). To support this argument, PNC directs us to the following: (1) the cross-examination testimony of USAA’s declarant, Dr. Malek, who purportedly agrees that there are many different mechanisms for communicating messages between processes, and that shared memory is one mechanism for communication between two processes on the same computer; and (2) Figure 3 of Corneil, which illustrates security handler 202 and communication handler 103 both located on transaction server/portal server 302. *Id.* at 29–32 (citing Ex. 1004 ¶ 41, Fig. 3; Ex. 2008, 24:15–24, 28:15–20, 31:10–23, 35:7–36:1; Ex. 2006 ¶¶ 63–65). Based on the cross-examination testimony of Dr. Malek and Figure 3 of Corneil, PNC asserts that “a [person of ordinary skill in the art] would have understood it was more likely that the Security Handler 202 and Communication Handler 103 would communicate via shared memory for efficiency because they are on the same computer” and, therefore, “would not have . . . found it obvious that Corneil teaches that Security Handler 202 would have forwarded messages to a service.” *Id.* at 32–33 (citing Ex. 2006 ¶ 66). In addition, PNC argues that Figure 2 of Corneil illustrates that security handler 202 and communication handler 103 “are drawn as adjacent boxes and not as boxes connected via an arrow,” which, according to PNC, further suggests to a person of ordinary skill in the art that these two components “are two aspects of the same process” that “communicate information by using a shared memory.” *Id.* at 33–34 (citing Ex. 1004, Fig. 2; Ex. 2006 ¶ 67).

In its Reply, USAA contends that PNC's argument that Corneil's security handler 202 does not teach the claimed "secure service router" entirely depends on its newly proposed construction of the embedded phrase "service router." Pet. Reply 17. USAA asserts that we should not adopt PNC's newly proposed construction. *Id.* USAA argues that, even if we were to adopt PNC's newly proposed construction, Corneil's security handler 202 authenticates messages received from first trading partner 217 and then forwards those messages onward to services via communication handler 103 and inbound 215 electronic message queue. *Id.* at 17–18 (citing Ex. 1004 ¶¶ 35–37, Fig. 2; Ex. 1003 ¶ 95; Ex. 1039, 145:8–17; Ex. 1044 ¶ 75). To support this argument, USAA provides two general purpose dictionary definitions of "forward" indicating that its plain and ordinary meaning "does not require anything more than passing or sending data onward to another destination, by whatever means." *Id.* at 19 (citing Ex. 1040, 640; Ex. 1041, 296). According to USAA, applying the plain and ordinary meaning of "forward" is consistent with how "every 'service router' described in the specification [of the '788 patent] 'identifies and forwards the message to an applicable service,' even though (as illustrated in Fig. 2) some of the service routers are simply 'pass throughs' on the way to the destination service." *Id.* at 20 (quoting Ex. 1001, 6:14–38) (citing Ex. 1001, Fig. 2). USAA then asserts that, under the plain and ordinary meaning of "forward," Corneil teaches the claimed "secure service router" because PNC admits that messages pass through security handler 202 and communication handler 103 on their way to inbound 215 electronic message queue and translation engine 207 and, therefore, security handler 202 is

sending messages to communication handler 103 after authentication. *Id.* at 20–21 (citing PO Resp. 33).

USAA contends that PNC’s arguments raised in the Patent Owner Response are based on the following two premises: (1) Corneil’s security handler 202 and communication handler 103 communicate via “shared memory”; and (2) sending messages via “shared memory” is not “forwarding.” Pet. Reply 21. USAA argues that the first premise is incorrect because there is nothing in Corneil that requires security handler 202 and communication handler 103 to communicate via “share memory” and, as PNC concedes, communicating via “shared memory” is just one of “many different communication mechanisms for communicating messages between processes.” *Id.* (quoting PO Resp. 29–30). USAA asserts that “Corneil itself does not require any particular communication mechanism, leaving it up to the implementer to choose from among the many known mechanisms for communicating within a software environment.” *Id.* at 22 (citing Ex. 1004 ¶¶ 31, 32; Ex. 2008, 34:19–35:1). Next, USAA argues that the second premise is self-defeating because, even if sending messages via “shared memory” is not “forwarding,” PNC asserts in the Patent Owner Response that Corneil’s security handler 202 and communication handler 103 are “two aspects of the same process.” *Id.* at 25–26 (emphasis omitted) (quoting PO Resp. 33). USAA asserts that, if we were to accept PNC’s reading of Corneil, its transaction processing system would include a single software process that both “authenticates the data source system that sent the message or request” and “forwards messages or requests to services,” thereby satisfying PNC’s newly proposed construction of the claim term “secure service router.” *Id.* at 26.

In its Sur-reply, PNC contends that Corneil discloses that messages pass through security handler 202 on their way to communication handler 103, but “passively allowing messages to pass through is not the same as actively passing a message on.” PO Sur-reply 13 (citing Ex. 1004 ¶¶ 33, 41, 45, 51, Fig. 1; Ex. 1040, 640; Ex. 1041, 296); *see also id.* at 14 (arguing that “*passing through* is not the same as affirmatively *passing on*”) 16 (arguing that “messages merely pass through Security Handler 202 and that Security Handler 202 does not actively forward messages to any other component of Corneil”). PNC asserts that, apart from attorney argument, “USAA provides no evidence . . . that forwarding a message encompasses merely by allowing the message to pass through the component.” *Id.* at 13; *see also id.* at 16 (arguing that “USAA provides no expert testimony and only attorney argument that Security Handler 202 forwards messages, as opposed to merely allowing messages to pass through.”). According to PNC, Corneil’s communication handler 103—not security handler 202—sends messages to inbound 215 electronic message queue, which, in turn, allows message routing engine 204 to retrieve the messages and send them to translation engine 208 for further processing. *Id.* at 14 (citing Ex. 1004 ¶ 51, Fig. 2).

PNC then reiterates its argument first raised in the Patent Owner Response that, because Corneil’s security handler 202 and communication handler 103 “could have been implemented using shared memory,” security handler 202 does not necessarily forward messages to communication handler 103. PO Sur-reply 18 (citing PO Resp. 25–30). As further support for this argument, PNC asserts the following: (1) forwarding and shared memory are mutually exclusive; (2) USAA provides no evidence that Corneil does not use shared memory instead of forwarding; and (3) USAA’s

other arguments directed to this particular issue are irrelevant because they either rely on the '788 patent as a road map or they mischaracterize the evidence of record. *Id.* at 18–23.

The parties' dispute as to whether Corneil teaches "receiving the message to be transformed from the data source system at the message transformation logic module from a secure service router" centers on whether Corneil's security handler 202 teaches the claimed "secure service router." Based on the fully developed record, we agree with USAA that Corneil's security handler 202 teaches the claimed "secure service router." *See* Pet. 26–27. As we explain in our claim construction section above, we construe the claim term "secure service router" as "hardware and/or software that authenticates the data source system prior to forwarding messages or requests." *See supra* Section II.A.2. Corneil discloses that many of the components that operate within the transaction processing system illustrated in Figure 2, including security handler 202, are described "by function" and constitute "software processes." Ex. 1004 ¶¶ 32, 41. Notably, Corneil discloses that security handler 202 ensures the security of the message sent by first trading partner 217 over network interconnectivity 201, "for example by validating authentication information." *Id.* ¶ 33; *see also id.* ¶ 31 (disclosing that security handler 202 contains a "set of tools . . . that assist with the process of securing data to the network [that] include, but are not limited to validation, authentication and authorization"). Based on these cited disclosures, we find that Corneil's security handler 202 is a software process that uses the information contained within each message to authenticate first trading partner 217.

Corneil further discloses that, after security handler 202 ensures the security of the messages sent by first trading partner 217 over network interconnectivity 201, “for example by validating authentication information,” the messages “pass through” a layer of security handler 202. Ex. 1004 ¶ 33. Stated differently, if the information contained within each message authenticates first trading partner 217, Corneil’s security handler 202 allows the messages to “pass through” a layer of its software process. If the information contained within each message does not authenticate first trading partner 217, security handler 202 will not allow the messages to “pass through” a layer of its software process. Once the messages sent by first trading partner 217 “pass through” a layer of security handler 202, they are sent to communication handler 103, which, in turn, “provides connectivity” to trading partners 217 because it “understands and manages” different communication protocols used by those trading partners. *Id.* In our view, Corneil’s disclosure of communication handler 103 receiving messages that “pass through” a layer of security handler 202 satisfies the “forwarding” aspect of our claim construction because, in essence, this process involves security handler 202 forwarding the messages where first trading partner 217 has been authenticated to communication handler 103.

We do not agree with PNC’s arguments that attempt to distinguish Corneil’s disclosure of security handler 202 that allows messages to “pass through” a layer of its software process from the “forwarding” now required by our construction of the claim term “secure service router.” *See* PO Sur-reply 13–17. PNC does not provide a persuasive explanation as to why the word “forward” should be accorded anything other than its plain and ordinary meaning. Instead, we agree with USAA that the word “forward”

should be accorded its plain and ordinary meaning as evidenced by two dictionary definitions. *See* Pet. Reply 19 (citing Exs. 1040, 1041). This first dictionary is Collins English Dictionary that was published by HarperCollins Publishers in 2005. Ex. 1040. One of the definitions provided in the Collins English Dictionary for the word “forward” is “to send forward or pass on to an ultimate destination.” *Id.* at 640. The second dictionary definition is Wiley Electrical and Electronics Engineering Dictionary that was published by John Wiley & Sons, Inc. in 2004. Ex. 1041. The Wiley Electrical and Electronics Engineering Dictionary defines the word “forward” as “[t]o send on to a new destination. For example, to forward data, or a telephone call.” *Id.* at 296. Both dictionary definitions support USAA’s position that the plain and ordinary meaning of the word “forward” is passing or sending data onward to another destination, by whatever means. *See* Pet. Reply 19. As we explain above, Corneil’s security handler 202 performs this function. That is, once the information contained within each message is used to authenticate first trading partner 217, a layer of Corneil’s security handler 202 passes or sends those messages (i.e., data) onward to communication handler 103 (i.e., another destination).

We also do not agree with PNC’s arguments that a person of ordinary skill in the art would have understood that Corneil’s security handler 202 and communication handler 103 *could be* implemented using “shared memory” and, therefore, security handler 202 would not necessarily forward messages to communication handler 103. *See* PO Resp. 29–33; PO Sur-reply 17–23. As an initial matter, contrary to PNC’s arguments, USAA does not take this position in the Petition when arguing that Corneil’s security handler 202 teaches the claimed “secure service router,” nor does USAA use

language that would implicate the doctrine of inherency (e.g., inherently, necessarily, necessarily present, etc.). *See* Pet. 26–27. Instead, as we explain above, we understand USAA to argue that Corneil’s security handler 202 teaches the claimed “secure service router” because Corneil discloses the following: (1) security handler 202 is a software process that uses the information contained within each message to authenticate first trading partner 217; (2) once first trading partner 217 has been authenticated, a layer of Corneil’s security handler 202 forwards those messages by passing or sending them onward to communication handler 103. Ex. 1004 ¶¶ 31, 33, 41.

We recognize that there is some testimony in the fully developed record suggesting that, because Corneil’s Figure 3 illustrates that security handler 202 and communication handler 103 both reside on transaction server/portal server 302, it is possible that these two components could, instead, communicate using “shared memory.” Ex. 2006 ¶¶ 63–65; Ex. 2008, 31:10–23, 35:7–36:1. We, however, find that this is not the most logical reading of Corneil. PNC does not direct us to, nor can we find, a disclosure in Corneil indicating that security handler 202 and communication handler 103 actually operate in this way. *See* Pet. Reply 21–22 (citing Ex. 1004 ¶¶ 31, 32; Ex. 2008, 30:18–24, 35:7–36:1). Instead, as we note above, Corneil discloses that the messages “pass through” a layer of security handler 202 before being sent to communication handler 103 (Ex. 1004 ¶ 33), and we are persuaded that this particular disclosure teaches security handler 202 forwarding messages to communication handler 103.

In any event, even if we were to assume that Corneil’s security handler 202 and communication handler 103 communicate using “shared

memory,” which, as we explain above, is not the most logical reading of Corneil, this still would satisfy the “forwarding” aspect of our claim construction for the claim term “secure service router.” In our view, there would be a need for Corneil’s security handler 202 to notify communication handler 103 of the information contained within each message so that communication handler 103 may “provide[] connectivity” to trading partners 217 because it is the main conduit identified within Corneil’s transaction processing system that “understands and manages” different communication protocols used by those trading partners. Ex. 1004 ¶ 33.

c. Summary

We have reviewed USAA’s arguments and supporting evidence as to how the teachings of Corneil account for all the limitations of independent claim 1, and we agree with and adopt USAA’s analysis. *See* Pet. 10–18, 23–25. In summary, USAA has demonstrated by a preponderance of the evidence that the subject matter of independent claim 1 would have been obvious over the teachings of Corneil.

5. Claims 2, 4, and 7–10

USAA also contends that dependent claims 2, 4, and 7–10 of the ’788 patent are unpatentable under § 103(a) as obvious over teachings of Corneil. Pet. 28, 31–34, 37–49. USAA explains how the teachings of Corneil account for the subject matter of each dependent claim, and provides reasoning as to why a person of ordinary skill in the art would have been prompted to modify the teachings of this reference. *Id.*

As one example, claim 2 directly depends from independent claim 1 and further recites “receiving the message at a secure service router.” Ex. 1001, 15:10–11. USAA contends that Corneil teaches this limitation

because it discloses that security handler 202 receives a message from first trading partner 217 over network interconnectivity 201. Pet. 28 (citing Ex. 1004 ¶ 33; Ex. 1003 ¶ 97).

As another example, claim 4 directly depends from independent claim 1 and further recites “receiving the message from the data source system either from an asynchronous or synchronous communication channel.” Ex. 1001, 15:15–18. USAA contends that Corneil teaches this limitation because it discloses that the transaction processing system receives messages from trading partners 217 through both “secure and unsecure modes using standard HTTP, HTTPS, FTP [file transfer protocol], JMS [java message service], and SMTP [simple mail transfer protocol] protocols or any other [protocols] understood by Security Handler (FIG. 2, 202[]) and Communication Handler (Fig. 1, 103).” Pet. 31 (quoting Ex. 1004 ¶ 45). According to USAA, because Corneil’s transaction processing system uses data protocols such as HTTP and HTTPS, this necessarily means that it receives messages through either a synchronous or asynchronous channel. *Id.* Relying on the testimony of Dr. Malek, USAA asserts that “[i]t was well-known in the art that communications over a communications channel, such as HTTP, could either be asynchronous or synchronous, depending on whether the sender waits for a response from the server (synchronous) or continues to work, expecting to be notified of a response in the future (asynchronous).” *Id.* at 32–33 (citing Ex. 1003 ¶ 102; Ex. 1014, 125, 135⁴). As a result, USAA argues that, when Corneil’s transaction processing

⁴ All references to Exhibit 1014 refer to the original page numbers located in the either the top, left-hand corner or top, right-hand corner of each page.

system receives messages, those messages “will necessarily be received either from a synchronous communications channel or an asynchronous (i.e., not synchronous) communication channel, depending on whether the sender waits to receive a response or not.” *Id.* at 33 (citing Ex. 1003 ¶ 102). USAA asserts that either of these two possibilities would teach the additional limitation of dependent claim 4. *Id.*

During trial, PNC does not address separately USAA’s arguments and supporting evidence as to how the teachings of Corneil account for the additional limitations of dependent claims 2, 4, and 7–10. *See* PO Resp. 34–36; PO Sur-reply 29. We have reviewed USAA’s arguments and supporting evidence as to how the teachings of Corneil account for the additional limitations of these dependent claims, and we agree with and adopt USAA’s analysis. *See* Pet. 28, 31–34, 37–49. Accordingly, USAA has demonstrated by a preponderance of the evidence that the subject matter of dependent claims 2, 4, and 7–10 would have been obvious over the teachings of Corneil.

6. Claim 3

Claim 3 depends from dependent claim 2, which, in turn, depends from independent claim 1, and further recites “mapping the message to the secure service router based on the message type.” Ex. 1001, 15:12–14. USAA contends that the ’788 patent provides little guidance as to what it means to “map” a message to the secure service router beyond the plain language of dependent claim 3. Pet. 28. Based on certain disclosures in the specification of the ’788 patent, USAA argues that mapping a message to a router may include routing the message to or otherwise designating the router to handle the message. *Id.* (citing Ex. 1001, 8:49–52, 8:55–60;

Ex. 1003 ¶ 98). With this in mind, USAA contends that Corneil teaches the limitation of dependent claim 3 because it discloses that security handler 202 is designated to handle certain types of messages, such as HTTP, HTTPS, FTP, JMS, and SMTP protocols. *Id.* at 29 (citing Ex. 1004 ¶ 45).

According to USAA, messages of these types are routed to security handler 202 to “validat[e] authentication information.” *Id.* (quoting Ex. 1004 ¶ 33) (citing Ex. 1003 ¶ 99).

USAA further contends that messages delivered via the various protocols supported by Corneil’s security handler 202 include distinct header parameters that indicate the message type. Pet. 29. As one example, USAA argues that HTTP messages include a set of parameters defined by the HTTP standard. *Id.* (citing Ex. 1033, 21, 23–26; Ex. 1003 ¶ 100). As another example, USAA argues that JMS messages have different header parameters. *Id.* at 29–30 (citing Ex. 1034, 27–28). Relying on the testimony of Dr. Malek, USAA asserts that “[a person of ordinary skill in the art] would . . . have understood Corneil to teach mapping messages of a type supported by secure service router (e.g., HTTP, or JMS) to the secure service router based on the message type.” *Id.* at 30 (citing Ex. 1003 ¶ 100).

In its Patent Owner Response, PNC contends that Corneil does not teach the limitation of dependent claim 3 because security handler 202 does not teach the claimed “secure service router.” PO Resp. 35. PNC also contends that, because Corneil discloses that all incoming messages pass through security handler 202, regardless of the message type, it does not teach “mapping” of incoming messages to security handler 202 “based on the message type,” as recited in dependent claim 3. *Id.* (citing Ex. 1004 ¶ 33, Fig. 2; Ex. 2006 ¶ 70). PNC asserts that this holds true despite

USAA's argument that "messages having types that require security processing would be routed to Corneil's security handler 202." *Id.* (citing 1004 ¶ 33, Fig. 2; Ex. 2006 ¶ 71).

In its Reply, USAA contends that "[t]here is nothing in [dependent] claim 3 prohibiting all messages from being 'mapped' to the same service router," and that Corneil discloses that security handler 202 understands certain types of messages. Pet. Reply 26 (citing Ex. 1004 ¶ 45). According to USAA, PNC concedes that security handler 202 receives messages that require security processing. *Id.* (citing PO Resp. 35). PNC argues that dependent claim 3 does not require there to be other types of messages, but even if this claim included such a requirement, Corneil's disclosure implies that security handler 202 only understands certain protocols that are supported by the transaction processing system. *Id.* at 26–27 (citing Ex. 1004 ¶ 45; Ex. 1003 ¶ 99). Lastly, PNC argues that Corneil's disclosure of "secure and un-secure modes" for messages is further evidence that security handler 202 maps some types of messages (e.g., mapping would be unnecessary for messages received in the "un-secure mode"). *Id.* at 27 (citing Ex. 1003 ¶¶ 62–64).

In its Sur-reply, PNC contends that, even if we were to accept USAA's argument that all incoming messages are mapped to Corneil's security handler 202, then the mapping would not be "based on message type" as required by dependent claim 3. PO Sur-reply 25 (citing Pet. Reply 26). PNC also disagrees with USAA's argument that Corneil's security handler 202 only understands certain types of protocols. *Id.* (citing Pet. Reply 26–27). Relying on Figure 2 of Corneil, PNC argues that all messages sent from one trading partner 217 to another trading partner 217

are routed through security handler 202, and “Corneil never even suggests that Security Handler 202 may receive messages in protocols it does not understand.” *Id.* at 25–27 (citing Ex. 1004 ¶¶ 33, 41, 45). Lastly, PNC argues that Corneil’s disclosure that security handler 202 supports both “secure and un-secure modes” for messaging “eliminates any reason [why] a [person of ordinary skill in the art] would have had for creating separate components for secure and un-secure messages.” *Id.* at 27 (citing Ex. 1004 ¶ 45).

Based on the fully developed trial record, we agree with USAA that, because security handler 202 supports a secure mode of messaging, which may include mapping messages received in HTTPS or JMS protocols, it teaches the limitation of dependent claim 3. As USAA correctly notes in the Petition, the ’788 patent provides little guidance as to what it means to “map” a message to the secure service router beyond the plain language of dependent claim 3. *See* Pet. 28. The words “maps” or “mapped” appear in the specification of the ’788 on three occasions outside the claims. The relevant disclosure is reproduced below:

Web services hub 101 determines 308 the message or request type based on the message or request header parameters, e.g., by reviewing the message or request header parameters, to establish an appropriate service router. Accordingly, web services hub 101 *maps* the message or request to the appropriate asynchronous service router 214 or synchronous service router 216 based on the message type. In one embodiment, the message or request may be in the form of an [extensible markup language] script provided with a [uniform resource locator] specifying the nature of the request. In such an embodiment, an asynchronous request is *mapped* to asynchronous service router 214, and a synchronous request is *mapped* to synchronous service router 216. The designated asynchronous service router 214 or synchronous

service router 216 transmits the message or request to secure service router 220.

Ex. 1001, 8:46–60 (emphases added). Based on this cited disclosure, mapping a message in the context of the '788 patent appears to include no more than routing the message to a router or otherwise designating the router to handle the message.

With this in mind, Corneil discloses delivering messages to the transaction processing system illustrated in Figure 2 “in secure and un-secure modes using standard HTTP, HTTPS, FTP, JMS and SMTP protocols or any other [protocol] understood by” security handler 202 and communication handler 103. Ex. 1004 ¶ 45. In the particular situation where messages are delivered to Corneil’s transaction processing system in a “secure mode,” such as HTTPS or JMS messages, those messages are routed to security handler 202 for further processing, which includes “validating [their] authentication information.” *Id.* ¶ 33. In our view, this is consistent with mapping a message in the context of the '788 patent because it encompasses routing HTTPS or JMS messages to security handler 202 or otherwise designating security handler 202 to handle HTTPS or JMS messages. This also accounts for mapping messages “based on message type” as required by dependent claim 3 because the messages routed to security handler 202 are secure messages of a specific type—namely, messages in HTTPS or JMS protocols.

We do not agree with PNC’s argument that Corneil does not teach the limitation of dependent claim 3 because security handler 202 does not teach the claimed “secure service router.” PO Resp. 35. In our discussion of independent claim 1 above, we explain how Corneil’s security handler 202

satisfies our construction of the claim term “secure service router.” *See supra* Section II.B.4.b. Accordingly, for the same reasons we identify above, PNC’s argument is unavailing.

We have reviewed USAA’s arguments and supporting evidence as to how the teachings of Corneil account for the additional limitation of dependent claim 3, and we agree with and adopt USAA’s analysis. *See* Pet. 28–31. In summary, USAA has demonstrated by a preponderance of the evidence that the subject matter of dependent claim 3 would have been obvious over the teachings of Corneil.

7. Claim 5

Claim 5 depends from dependent claim 4, which, in turn, depends from independent claim 1, and further recites “mapping an asynchronous message to an asynchronous secure service router based on the message type; or mapping a synchronous message to a synchronous the [sic] secure service router based on the message type.” Ex. 1001, 15:19–23. USAA contends that Corneil teaches these limitations for the same reasons it identifies above with respect to dependent claims 3 and 4. Pet. 34. That is, USAA argues that Corneil’s transaction processing system supports either asynchronous or synchronous messages and it discloses mapping these messages to security handler 202 based on the message type. *Id.* at 34–35.

Alternatively, USAA contends that, even if PNC were to argue that dependent claim 5 requires the presence of both an asynchronous secure service router and a synchronous secure service router with messages mapped to a particular secure service router based on its communication mode, this variation would have been obvious to a person of ordinary skill in the art. Pet. 35. According to USAA, Corneil already discloses that its

transaction processing system “has been designed to scale horizontally” in order to accommodate user traffic and volume of messages, and that its software processes are similarly “built in a modular fashion and can scale up as required.” *Id.* (quoting Ex. 1004 ¶ 41) (citing Ex. 1003 ¶ 105). Based on Corneil’s disclosure of scalability, USAA argues that a person of ordinary skill in the art would have been motivated to split security handler 202 into a synchronous secure service router that handles synchronous requests and an asynchronous secure service router that handles asynchronous requests. *Id.* (Ex. 1003 ¶ 105). USAA asserts that this would have allowed Corneil’s transaction processing system “to better balance its user traffic; for example, by allocating more processing resources to handling synchronous requests . . . versus less time-sensitive asynchronous requests.” *Id.* at 35–36 (citing Ex. 1003 ¶ 105). USAA also provides reasons why there would be a reasonable expectation of success in modifying Corneil in this way, including, among other things, that Corneil’s transaction system is already “built in a modular fashion” and “designed to scale horizontally.” *Id.* at 37 (quoting Ex. 1004 ¶ 41) (citing Ex. 1003 ¶ 105).

In its Patent Owner Response, PNC contends that “[USAA] never argues, much less establishes, that Corneil teaches both synchronous and asynchronous security handlers [202].” PO Resp. 36. Absent sufficient evidence that Corneil would support more than one type of security handler 202, PNC asserts that USAA fails to demonstrate that Corneil “maps” to a particular security handler 202 based on message type, as required by dependent claim 5. *Id.*

In its Reply, USAA contends that dependent claim 5 uses the word “or” and, therefore, does not require both synchronous and asynchronous

secure service routers. Pet. Reply 27. In any event, USAA argues that PNC ignores the alternative argument presented in the Petition that it would have been obvious to a person of ordinary skill in the art to modify Corneil's transaction processing system to use one secure service router for synchronous messages and another secure service router for asynchronous messages "to more efficiently handle requests of each type which were known [to] require different resources and responses." *Id.* (citing Pet. 35–37; Ex. 1003 ¶ 105).

In its Sur-reply, PNC contends that USAA "never establishes, or even argues, why a [person of ordinary skill in the art] would have been motivated to modify Corneil to support asynchronous and synchronous messaging protocols." PO Sur-reply 28. PNC also argues that USAA does not explain why a person of ordinary skill in the art "would have been motivated to support such protocols by modifying Corneil to implement two different types of secure service router[s]." *Id.* Instead, PNC argues that USAA engages in impermissible hindsight reconstruction. *Id.*

Based on the fully developed record, we agree with USAA that dependent claim 5 uses the word "or" and, therefore, requires either an asynchronous secure service router or a synchronous secure service router—not both. *See* Pet. 34–35; Pet. Reply 27. With this in mind, we agree with USAA that Corneil accounts for the limitation of dependent claim 5 for the same reasons we identify above with respect to dependent claims 3 and 4. *See supra* Section II.B.5 & 6. As a result, we need not reach USAA's alternative argument that, based on Corneil's disclosure of scalability, a person of ordinary skill in the art would have been motivated to split security handler 202 into a synchronous secure service router that handles

synchronous requests and an asynchronous secure service router that handles asynchronous requests. *See* Pet. 35–37.

We do not agree with PNC’s arguments that Corneil does not teach the limitation of dependent claim 5 because they are predicated on the notion that this claim requires both synchronous and asynchronous secure service routers. *See* PO Resp. 36; PO Sur-reply 28. As we explain above, dependent claim 5 is broader in scope and, therefore, does not require both an asynchronous secure service router and a synchronous secure service router.

We have reviewed USAA’s arguments and supporting evidence as to how the teachings of Corneil account for the alternative limitations of dependent claim 5, and we agree with and adopt USAA’s analysis. *See* Pet. 34–37. In summary, USAA has demonstrated by a preponderance of the evidence that the subject matter of dependent claim 5 would have been obvious over the teachings of Corneil.

*C. Obviousness Over the Combined Teachings of
Corneil and Abjanic*

USAA also contends that dependent claims 8–10 of the ’788 patent are unpatentable under § 103(a) as obvious over the combined teachings of Corneil and Abjanic. Pet. 41–49. USAA contends that the teachings of Corneil and Abjanic account for the subject matter of each challenged claim, and provides reasoning as to why a person of ordinary skill in the art would have been prompted to combine the teachings of these references. *Id.* Apart from the arguments for independent claim 1 raised above in the context of the obviousness ground based on the teachings of Corneil alone, PNC does not address separately USAA’s arguments and supporting evidence as to how the combined teachings of Corneil and Abjanic account for all the

limitations of dependent claims 8–10. *See* PO Resp. 22–37; PO Sur-reply 8–29.

Based on the fully developed trial record, we determine that USAA has shown by a preponderance of the evidence that dependent claims 8–10 of the ’788 patent are unpatentable as obvious over the combined teachings of Corneil and Abjanic. We begin our analysis with a brief overview of Abjanic and then we address USAA’s contentions with respect to the challenged claims.

1. Overview of Abjanic

Abjanic generally relates to a transforming switch “that includes a transformer to transform a message from a first format to a second format, and a switch to switch the message to a selected server or processing node.” Ex. 1005, code (57). In one embodiment, Abjanic discloses that transforming switch 710 includes, among other things, transformer 715 and switch 165. *Id.* ¶ 73, Fig. 7. “Transformer 715 can transform messages between a variety of different data formats, as required.” *Id.* ¶ 74. As one example of the functionality provided by transformer 715, Abjanic discloses the following:

a first node may issue a request over network or Internet 130 that is received by a second node. The second node may send a response back to the first node. Both the request and response may typically be routed over the Internet or network 130 and transforming switch 710. The request and response may both include data that may need to be transformed.

Id.; *see also id.* ¶ 75 (discloses “four general cases involving transformation,” one of which being “[transformation] may be performed . . . on data in the request and in the response”).

2. Claims 8–10

As one example, claim 8 directly depends from independent claim 1 and further recites “receiving a response [from] the external system; and routing the response to a response transformer.” Ex. 1001, 15:39–41. USAA contends that, to the extent that Corneil does not teach the “receiving” and “routing” steps recited in dependent claim 8, Abjanic teaches these limitations because it discloses transformer 715 that parses and transforms, if necessary, requests and responses into “a format that is compatible with the receiving node.” Pet. 45–46 (quoting Ex. 1005 ¶ 75) (citing Ex. 1005 ¶ 74). USAA argues that Abjanic provides a specific example of a business transaction between “Bookstore.com” and “market.com,” where “Bookstore.com” understands and processes messages in “format A” and “market.com” understands and processes messages in “format B.” *Id.* at 46 (quoting Ex. 1005 ¶ 96) (citing Ex. 1003 ¶ 116). USAA argues that Abjanic’s system uses “tags” and other information to identify messages that need to be transformed so that “Bookstore.com” and “market.com” can communicate. *See id.* (quoting Ex. 1005 ¶ 98).

Turning to rationale to combine, USAA contends that, when considering the teachings of Abjanic it identifies above, a person of ordinary skill in the art would have been motivated “to use Corneil’s [transaction processing] system to receive a response from the external system after it has completed processing a transformed request and to parse and transform that response into a format understandable and processable by the data source system to which the response is to be transmitted.” Pet. 46–47 (citing Ex. 1003 ¶ 117). According to USAA, “[t]his would have allowed a [person of ordinary skill in the art] to implement a business transaction, such as a

purchase order request and response accepting the order, while taking advantage of the translation and efficiency features of Corneil’s [transaction processing] system.” *Id.* at 47.

USAA further contends that Corneil “identifies various advantages of its [transaction processing] system over the traditional approach of direct communication between trading partners.” Pet. 47 (citing Ex. 1004 ¶¶ 3, 5).

USAA then argues the following:

[a person of ordinary skill in the art] would have been motivated to use Corneil’s [transaction processing] system for both request and response messages so that the intended benefits of Corneil—i.e., reduced costs, efficiencies, and scalability in performing translation services—could be achieved by both trading partners [217]—i.e., avoiding the need for “difficult, inflexible and expensive point-to-point integration with trading partners” and costly integration of partner-specific format translation software.

Id. (quoting Ex. 1004 ¶ 4) (citing Ex. 1004 ¶¶ 3, 5; Ex. 1003 ¶ 117). USAA also argues that there would have been a reasonable expectation of success in “using Corneil’s [transaction processing] system to receive and transform a response message from the external system (i.e., second trading partner [217]),” as taught by Abjanic, because it would require “no change to Corneil’s existing functionality,” “it would not add any additional overhead,” and it would result in certain benefits, including “cost savings and efficiency resulting from eliminating point-to-point integrations and improved interoperability between otherwise incompatible systems.” *Id.* at 47–48 (citing Ex. 1003 ¶ 118).

As another example, claim 9 indirectly depends from independent claim 1 and further recites “transforming the response to a format recognizable by the data source system.” Ex. 1001, 15:42–44. USAA

contends that Corneil teaches this limitation because, for many of the same reasons identified above with respect to dependent claim 8, it would have been obvious to a person of ordinary skill in the art to combine the teachings of Corneil and Abjanic in a way that routes a response from second trading partner 217 to translation engine 208 to transform the response to a format recognizable by first trading partner 217. Pet. 48–49.

During trial, PNC does not address separately USAA’s arguments and supporting evidence as to how the combined teachings of Corneil and Abjanic account for the additional limitations of dependent claims 8–10. *See* PO Resp. 36–37; PO Sur-reply 29. We have reviewed USAA’s arguments and supporting evidence as to how the combined teachings of Corneil and Abjanic account for the additional limitations of these dependent claims, and we agree with and adopt USAA’s analysis. *See* Pet. 41–49. Accordingly, USAA has demonstrated by a preponderance of the evidence that the subject matter of dependent claims 8–10 would have been obvious over the combined teachings of Corneil and Abjanic.

III. CONCLUSIONS⁵

Based on the fully developed record, USAA has demonstrated by a preponderance of the evidence that claims 1–5 and 7–10 of the '788 patent are unpatentable under § 103(a) as obvious. A summary of our conclusions is set forth in the table below.

Claims	35 U.S.C. §	Reference(s)/ Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
9	103(a)	Corneil	1–5, 7–10	
9	103(a)	Corneil, Abjanic	8–10	
Overall Outcome			1–5, 7–10	

IV. ORDER

In consideration of the foregoing, it is
ORDERED that claims 1–5 and 7–10 of the '788 patent are held to be unpatentable; and

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

⁵ Should PNC wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this Decision, we draw PNC's attention to the April 2019 Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding. *See* 84 Fed. Reg. 16,654 (Apr. 22, 2019). If PNC chooses to file a reissue application or a request for reexamination of the challenged patent, we remind PNC 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).

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