

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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APPLE INC., AMAZON.COM SERVICES LLC, and  
AMAZON WEB SERVICES, INC.

Petitioners

v.

HEADWATER RESEARCH LLC

Patent Owner

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*Inter Partes* Review Case No. IPR2025-01571

U.S. Patent No. 8,667,571

**PETITION FOR *INTER PARTES* REVIEW  
OF U.S. PATENT NO. 8,667,571**

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## **I. INTRODUCTION**

Petitioners Apple Inc., Amazon.com Services LLC, and Amazon Web Services, LLC (“Petitioners”) request *Inter Partes* Review (“IPR”) and cancellation of Claims 1-30 (the “Challenged Claims”) of U.S. Patent No. 8,667,571 (EX1001, “the ’571 Patent”).

## **II. SUMMARY OF THE ’571 PATENT**

### **A. Priority Date and Description of the ’571 Patent**

The earliest claimed priority for the ’571 Patent is U.S. Application No. 61/206,354, filed January 28, 2009. For purposes of this proceeding only, Petitioners apply January 28, 2009, as the priority date.

The ’571 Patent is generally directed to methods and systems for securely provisioning, activating, and managing end-user devices over wireless networks. EX1001, Abstract. The ’571 Patent describes the method as establishing a “service control link” between an end-user device and a network system. *Id.*, 68:18-27, 69:9-13. The service control link is secured by an encryption protocol and configured to support control-plane communications between the network system and the end-user device. *Id.*, 68:18-27, 69:22-27.

The ’571 Patent discusses the use of device agents within the end-user device to perform “service policy or implementation verification or management functions,” including service allowance or denial, application access control, traffic control, network access control services, authentication services, and more. *Id.*,

15:58-16:2. Dividing functionality between device agents is “a design choice” and “the functional lines can be re-drawn in any technically feasible way that the product designers see fit.” *Id.*, 16:4-12. For example, a device agent may receive server messages over the service control link. *Id.*, 68:42-48. The ’571 Patent explains that the server message can be encrypted together with an identifier to assist in delivering the server message to a specific device agent on an end-user device. *Id.*, 39:19-31. The ’571 Patent alleges these disclosures provide “a communication system and method that provides flexible service plans and management of user network services.” *Id.*, 6:11-15.

#### **B. Level of Ordinary Skill in the Art**

A POSITA at the time of the ’571 Patent would have had a master’s degree in computer engineering, computer science, electrical engineering, or a related field, with at least two years of experience in the field of data communications, or a bachelor’s degree in the same fields with at least four years of experience in the field of data communications. Additional education or experience might substitute for the above requirements.

### **III. REQUIREMENTS UNDER 37 C.F.R. § 42.104**

#### **A. Grounds for Standing Under 37 C.F.R. § 42.104(a)**

Petitioners certify that the ’571 Patent is available for IPR and that Petitioners are not barred or estopped from requesting an IPR challenging the claims of the ’571 Patent.

**B. Identification of Challenge Under 37 C.F.R. § 42.104(b)**

The Challenged Claims of the '571 Patent are unpatentable and should be cancelled (37 C.F.R. § 42.104(b)(1)), and IPR of the Challenged Claims should be granted (37 C.F.R. §42.104(b)(2)).

| Claim(s)                    | Basis <sup>1</sup> | Reference(s)                       |
|-----------------------------|--------------------|------------------------------------|
| 1-3, 5-19, 21, 23-24, 26-30 | §103               | Chia (EX1004), Cunningham (EX1005) |
| 4, 22                       | §103               | Chia, Cunningham, Clontz (EX1006)  |
| 20                          | §103               | Chia, Cunningham, Han (EX1007)     |
| 25                          | §103               | Chia, Cunningham, Qumei (EX1008)   |

Section **Error! Reference source not found.** identifies where each element of the Challenged Claims is found in the prior art. 37 C.F.R. §42.104(b)(4). The exhibit numbers of the evidence relied upon to support the challenges are provided above, and the relevance of the evidence to the challenges raised is provided in Section V. 37 C.F.R. §42.104(b)(5). Exhibits 1001-1046 are also attached.

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<sup>1</sup> The pre-AIA version of 35 U.S.C. § 103 applies.

**C. Claim Construction Under 37 C.F.R. § 42.104(b)(3)**

Other than the means-plus-function terms discussed below, Petitioners submit that no constructions are necessary to resolve the proposed grounds, and that all terms should be given their plain and ordinary meaning consistent with the *Phillips* standard.<sup>2</sup>

Certain Challenged Claims include limitations in means-plus-function format under 35 U.S.C. §112(6).<sup>3</sup>

| <b><i>Claim Term</i></b>                                                                | <b><i>Support</i></b>                                                                                             | <b><i>Structure and Function</i></b>                                                                                                                                                 |
|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Claim 26: “means for providing a first service control link to a first end-user device” | EX1001, 26:53-27:54, 68:18-57, 69:22-25, 87:40-62, 90:10-19, Figs. 9, 16-20 and 24, items 122, 930, 1638 and 2420 | Structure: processor and network hardware executing software including a transport services stack<br><br>Function: providing a first service control link to a first end-user device |
| Claim 26: “means for providing a second service                                         | EX1001, 20:22-28, 20:43-44, 26:53-27:54, 68:18-57, 69:8-13, 69:22-25, 87:40-                                      | Structure: processor and network hardware executing software                                                                                                                         |

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<sup>2</sup> Petitioners’ application of prior art to the Challenged Claims is not a waiver of any argument in litigation regarding a claim term’s construction or indefiniteness.

<sup>3</sup> Petitioners’ identification of support and structure for means-plus-function limitations in the Challenged Claims is not a waiver of any argument in litigation regarding the sufficiency of the support in the ’571 Specification for these limitations.

|                                                                                                                                                                                                        |                                                                                                                                                          |                                                                                                                                                                                                         |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| control link to a second end-user device”                                                                                                                                                              | 62, 90:10-19, Fig. 9, item 930, Figs. 16-20, items 102, 1638, Fig. 24, items 102, 1638, 2420                                                             | including a transport services stack<br><br>Function: providing a second service control link to a second end-user device                                                                               |
| Claim 26: “means for receiving a server message from a particular server”                                                                                                                              | EX1001, 26:53-27:54, 68:60-64, 87:40-62, Fig. 9, item 930, Figs. 16-20, items 122, 1638, Fig. 24, items 2422, 2424                                       | Structure: processor and network hardware executing software including a transport services stack<br><br>Function: receiving a server message from a particular server                                  |
| Claim 26: “means for generating an encrypted message”                                                                                                                                                  | EX1001, 26:53-27:54, 41:27-29, 41:59-42:18, 70:7-14, 87:40-62, 89:3-8, Fig. 9, item 930, Fig. 24, items 2428, 2430                                       | Structure: processor executing an encryption protocol<br><br>Function: generating an encrypted a message                                                                                                |
| Claim 26: “means for sending the encrypted message”                                                                                                                                                    | EX1001, 26:53-27:54, 40:52-54, 70:7-14, 87:40-62, 89:3-8, Fig. 9, item 930, Fig. 24, item 2420                                                           | Structure: processor and network hardware executing software including a transport services stack<br><br>Function: sending the encrypted message                                                        |
| Claim 29: “means for sending a credential, a certificate, or a token to the particular end-user device or obtaining the credential, the certificate, or the token from the particular end-user device” | EX1001, 26:53-27:54, 87:40-62, 106:23-26, 120:51-121:20, 138:23-49, 140:14-32, Fig. 9, item 930, Fig. 24, item 2420, Fig. 43a, Fig. 64, items 6420, 6430 | Structure: processor and network hardware executing software including a transport services stack<br><br>Function: sending a credential, a certificate, or a token to the particular end-user device or |

|  |  |                                                                                             |
|--|--|---------------------------------------------------------------------------------------------|
|  |  | obtaining the credential, the certificate, or the token from the particular end-user device |
|--|--|---------------------------------------------------------------------------------------------|

#### IV. ANALOGOUS PRIOR ART

The prior art is analogous to the claimed invention of the '571 Patent. The prior art is from the same field of endeavor as the '571 Patent, namely electronic device data networking and services. EX1001, Abstract, 5:62-65, 6:11-15, 17:8-15, 26:8-16, 69:22-25, 153:31-37, 154:12-21; EX1004, Abstract, 3:9-17, 3:44-52, 7:46-59, 34:23-32, Figure 34, 40:52-58, 42:35-46, 51:5-14; EX1005, Abstract, [0002], [0006], [0011], [0024], [0060]; EX1006, p. 3, 7, 12, 17; EX1007, Abstract, p. 2, 3, 5, 18, Figure 4A, p. 19; EX1008, Abstract, 1:52-55, 2:1-7; 6:4-11, 6:59-7:4, EX1003, ¶¶61-83.

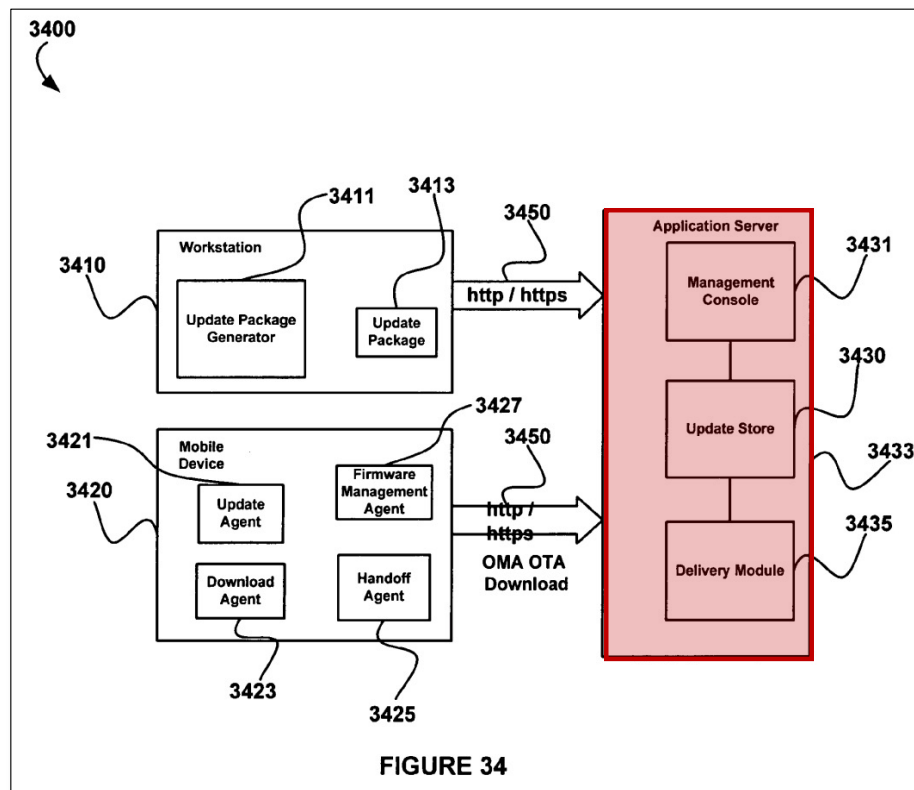
The prior art is also reasonably pertinent to at least one problem facing the '571 Patent's inventors, namely, improving the efficiency of services within a network. EX1001, Abstract, 5:62-65, 6:11-15, 9:19-31, 17:38-48, 21:14-24, 37:33-40, 37:54-58, 68:9-18, 87:20-24; EX1004, 1:54-59, 3:22-24, 9:55-61, 40:28-31, 48:3-12, 49:12-16; EX1005, [0009], [0011], [0029], [0030], [0033]; EX1006, p. 6, 10, 16; EX1007, pp. 1-2, 8, 19; EX1008, 5:55-58, 5:65-6:1, 8:62-9:4, 10:42-52, EX1003, ¶¶61-83.

**V. GROUND 1: CLAIMS 1-3, 5-19, 21, 23-24, 26-30 ARE OBVIOUS OVER CHIA AND CUNNINGHAM**

**A. Claim 1**

**1. Claim 1[Pre]**

To the extent the preamble is limiting, Chia teaches an electronic device network system adapted to perform a method of managing update packages for a plurality of electronic devices. EX1004, Abstract, 7:35-45, 4:29-31. Chia teaches an application server/update management system (red) (*network system*<sup>4</sup>), comprising various components to facilitate updating electronic devices.



<sup>4</sup> Claim language is *italicized*.

EX1004, FIG. 34 (annotated)<sup>5</sup>, 46:52-56, 46:63-64, 47:1-2, 48:13-16. The update management system routes update packages from workstations to mobile devices. *Id.*, 42:9-26. Chia thus teaches a *method* (namely, the method of managing update packages) *performed by a network system* (update management system).

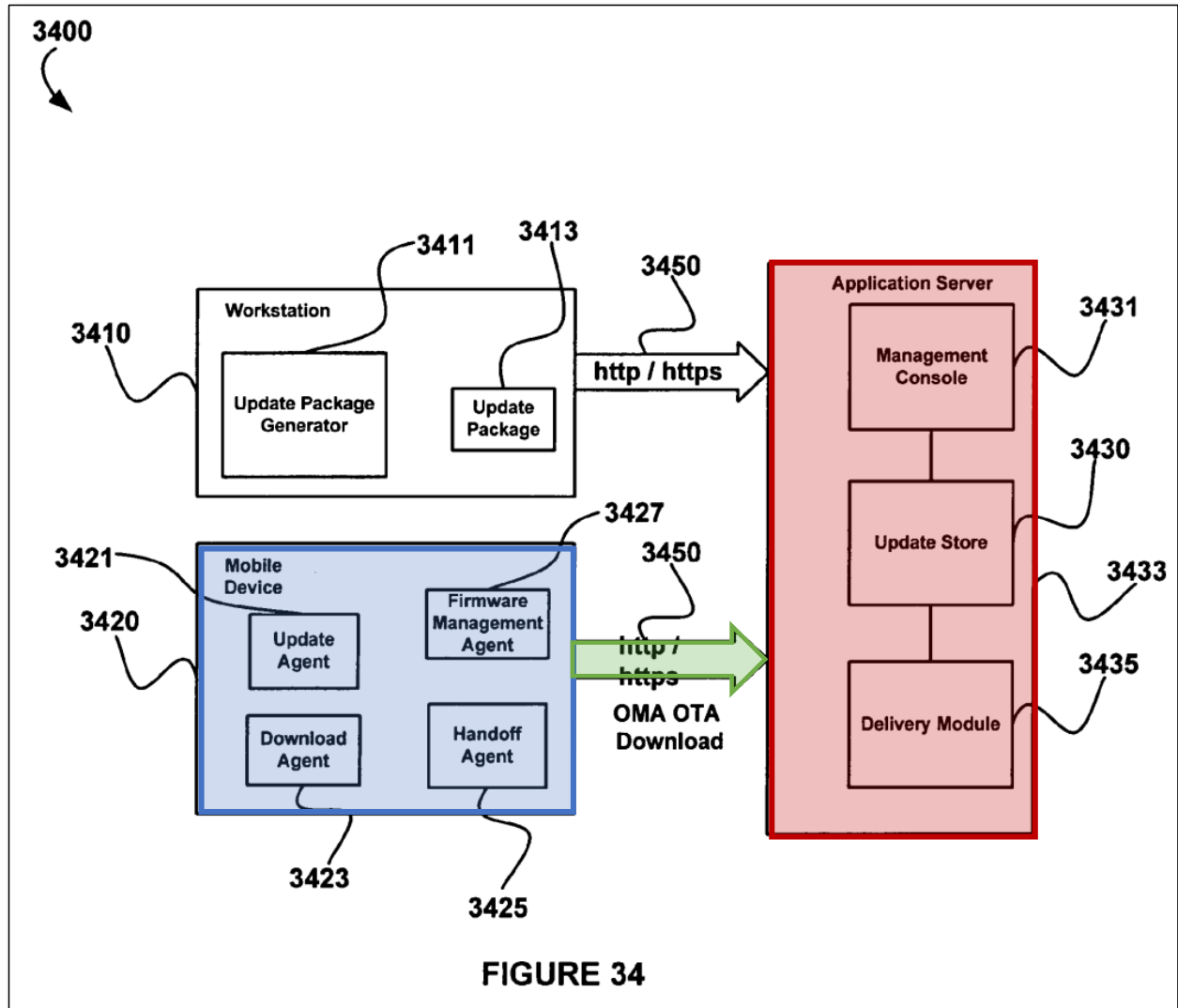
## 2. *Claim [1(a)]*

Chia teaches an electronic device (*first end-user device*) (**blue**) connected (*communicatively coupled*), via an https communication link (*first service control link* in Chia's particular implementation) (**green**), to the *network system* (**red**). See Claim 1[Pre]<sup>6</sup> (mapping how application server in FIG. 34 is an exemplary update management system, i.e., *network system*); EX1003, ¶¶88-93; EX1004, FIGs. 3, 34, 37; EX1003, ¶89 (discussing the relationship of FIGS. 3, 34, 37, and that each figure's disclosed management console, update store, and delivery module are modules or software components co-located on a single server, per EX1004, 15:14-19, 42:9-18).

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<sup>5</sup> All annotations to Figures and emphases in bold are added unless otherwise noted.

<sup>6</sup> All citations to a claim are to the mapping of that claim in this Petition.



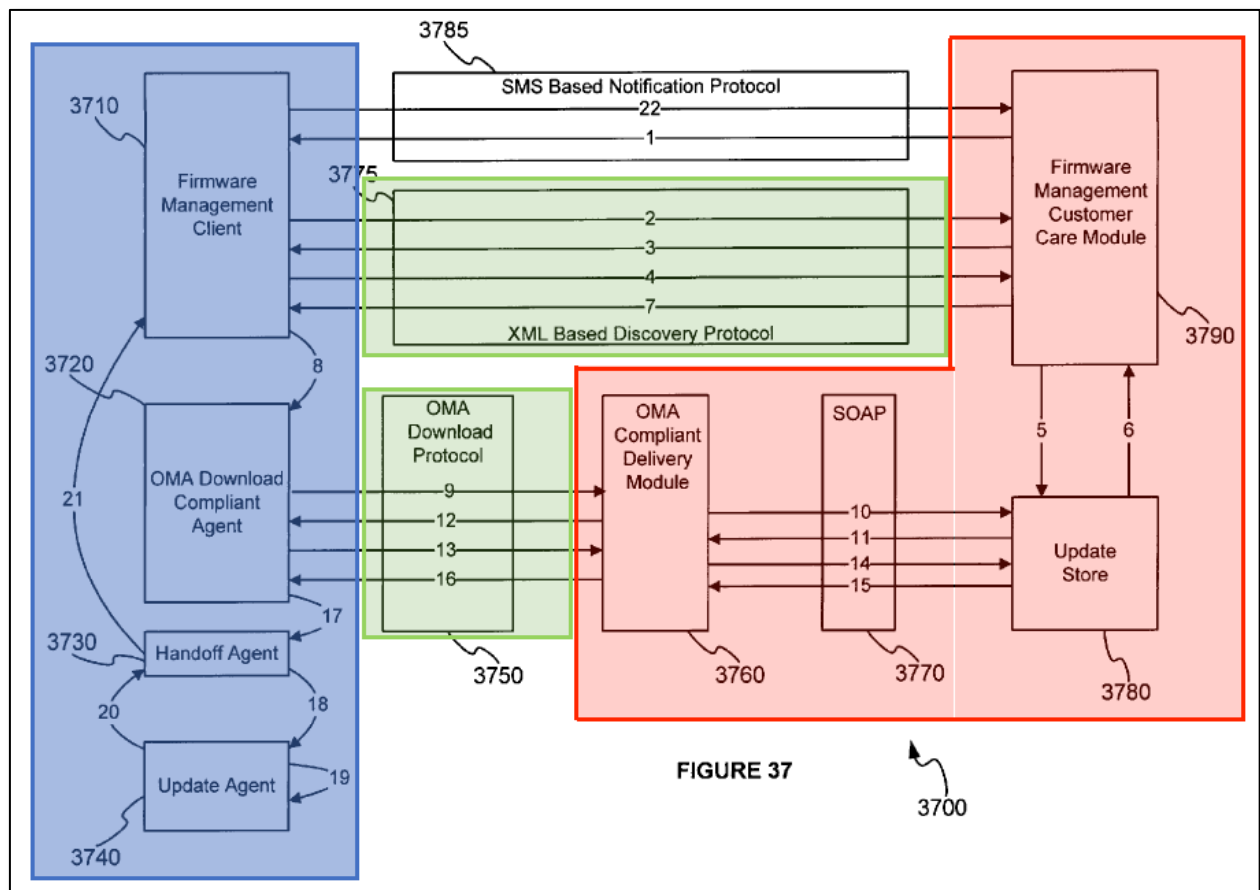
EX1004, FIG. 34.

Chia identifies a mobile device as the electronic device within its system. EX1004, FIG. 34. Because a mobile device, such as a cellular phone, was commonly understood as a device utilized by a user at the terminal edge of a network, a POSITA would have understood Chia's electronic device to be a *first end-user device*. EX1003, ¶90.

Chia's electronic devices are "**communicatively coupled** via a communications link [] to a delivery server...located in a **wireless/carrier network**." EX1004, 8:63-66. Chia describes the communications link as an https link. *Id.*, FIG. 34 (depicted as 3450), 17:21-38, 20:23-30. The delivery module of the update management system (*network system*) supports downloading via HTTPS, where "http is the protocol used for moving hypertext files **across the internet**." *Id.*, 43:20-24, 20:26-27; EX1003, ¶91.

The '571 Patent gives an example of the service control device link operating over Transport Layer Security (TLS) or another secure transport-layer protocol (EX1001, 38:56-60), which, in Chia's particular implementation, is used by HTTPS to provide security. EX1003, ¶91. Thus, a POSITA would have understood that Chia's update management system (*network system*) provides the https communications link (*service control link*) to Chia's mobile device (*end-user device*) located in a wireless/carrier network (*over a first set of one or more wireless networks*). EX1003, ¶¶88-93. Because Chia's system supports hundreds to thousands or millions of electronic devices, a POSITA would have understood that the disclosed "wireless/carrier network" would have *a first set of one or more wireless networks* supporting the devices. EX1004, 16:47-54; 8:63-66; EX1003, ¶¶88-93.

Regarding *providing* a first service control link to an end-user device, Chia describes an embodiment in which the update management system (*network system*) pushes updates to mobile devices. EX1004, 52:39-53:64. The update store, SOAP, OMA Module, and Firmware Management Module of FIG. 37's flow diagram are part of the update management system (*network system*). See EX1003, ¶89; EX1004, 52:39-51. In FIG. 37, the method includes “sending a push notification message” to an end-user device. EX1004, 52:52-56.



EX1004, FIG. 37 (network system (red), end-user device (blue)); EX1003, ¶92. Chia explains this “push” notification message is sent “from the firmware management

customer care module 3790” (a component of the mapped *network system*) “to the firmware management client 3710” (a component of a mapped “end-user device”). *Id.* Transmission of this push message initializes a process resulting in downloading an update package from the update store to the end-user device. EX1004, 52:52-53:47; EX1003, ¶¶92. Thus, in this example, a *first service control link* is “provided” by the network system to the end-user device at least because the initial step in the process of establishing the *first service control link* is transmission of the push message from the firmware management customer care module 3790 on the network system to the firmware management client 3710 on the end-user device. *Id.* Per Dr. Creusere, Chia’s description is logical, as a POSITA would have expected communication links to be initiated by the network system in a “push” update scenario because the end-user device is initially unaware of the need for a communication link to be established. *Id.*

### 3. *Claim [1(a)(i)]*

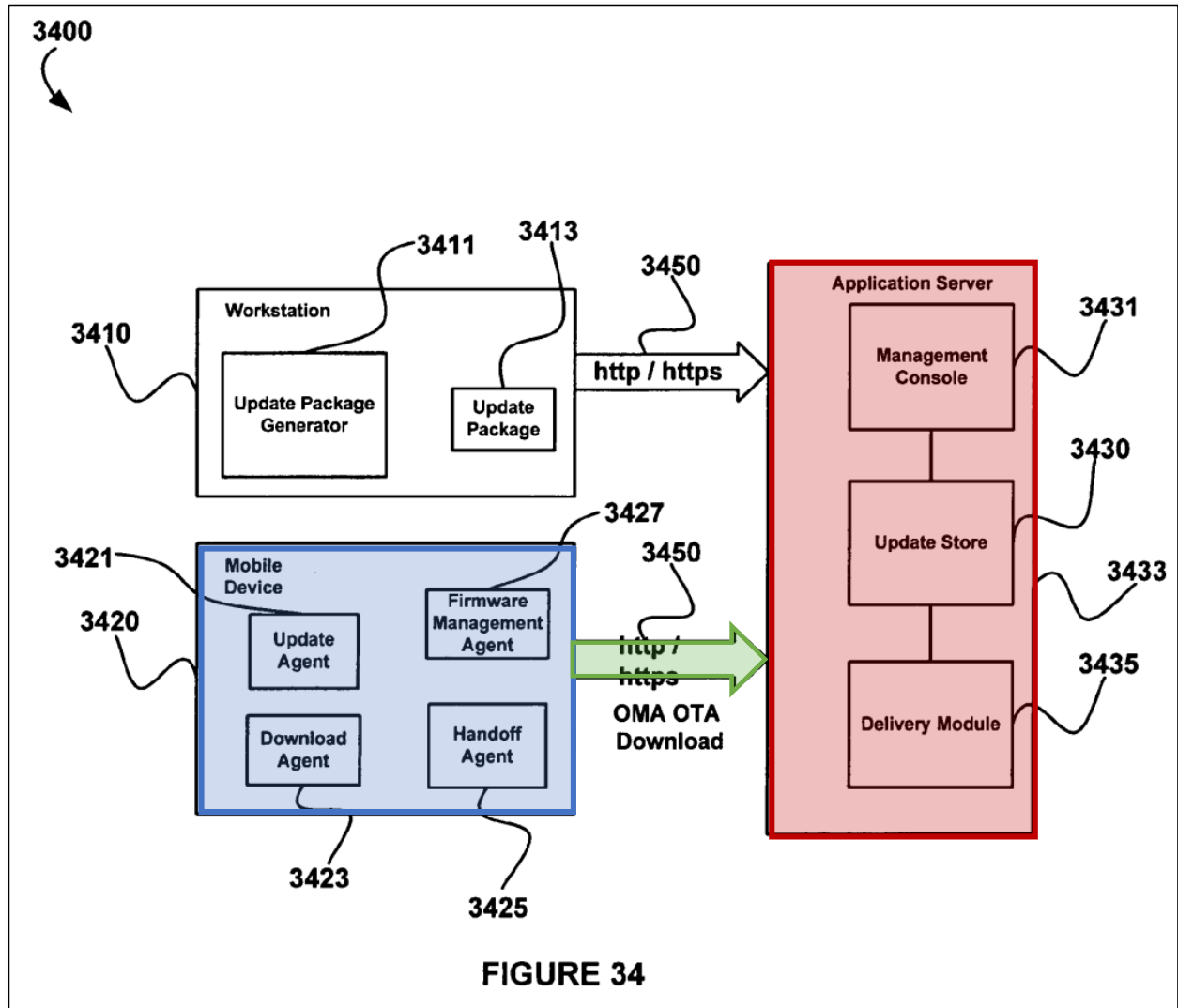
Chia teaches an HTTPS communications link (in Chia’s particular implementation, the *first service control link*) between the mobile device and the update management system. Because Chia discloses that the control link can be an HTTPS connection, Chia teaches a *first service control link secured at least in part by at least a first encryption protocol*. EX1003, ¶¶94-95. Chia teaches “https is the *secure* version of http.” EX1004, 20:26; EX1003, ¶¶91-92. A POSITA would have

understood that HTTPS is secured using encryption, authentication, and integrity checks to make sure data communicated using HTTPS stays private, verified, and unmodified and that, in particular, Chia's HTTPS link would be encrypted. EX1003, ¶¶94-95.

**4. Claim [1(a)(ii)]**

Chia teaches the HTTPS communication link (the *first service control link*) between the update management system (*network system*) and mobile device (*first end-user device*) support[s] first control-plane communications.

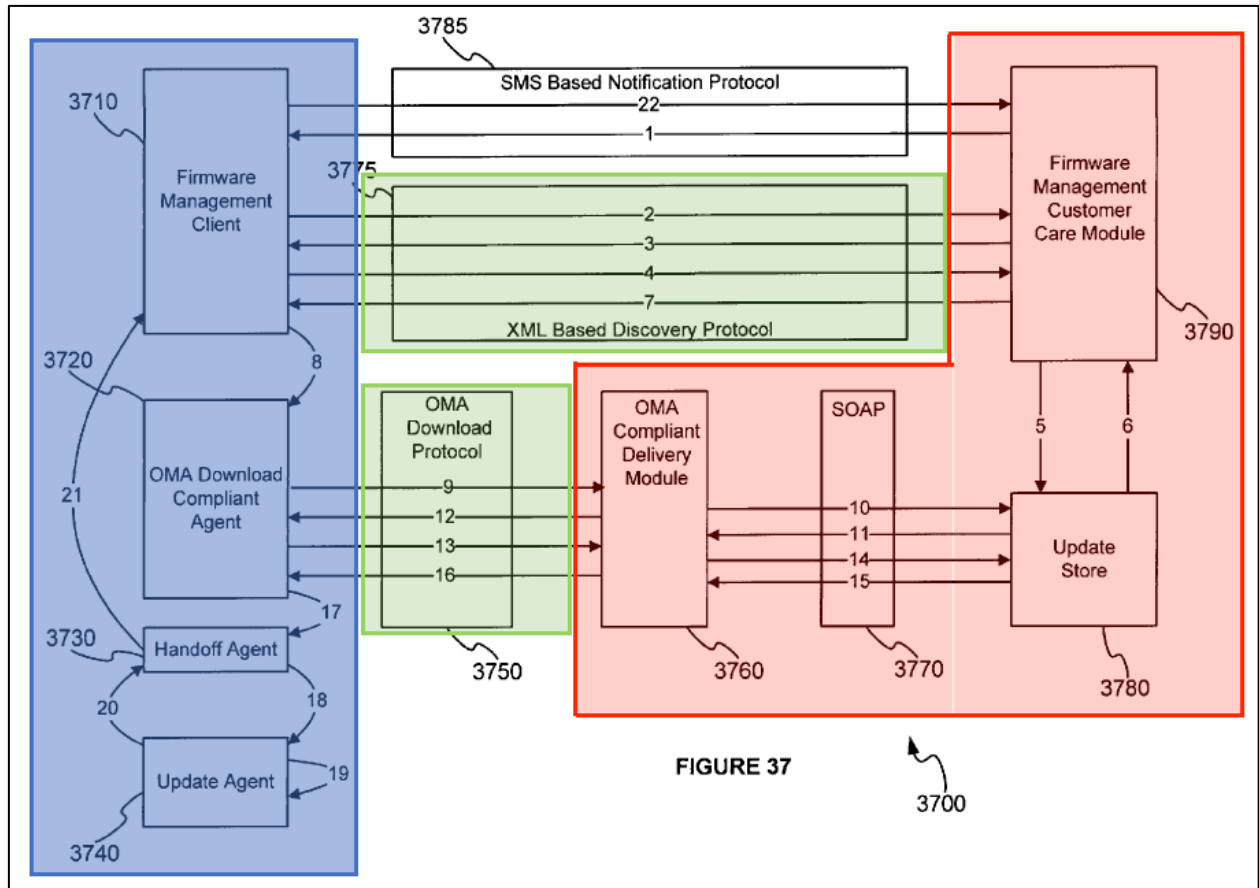
As shown in FIG. 34, an HTTPS communication link exists between the update management system and the mobile device.



EX1004, FIG. 34. Chia explains that “http is the protocol used for moving hypertext files *across the internet*.” *Id.*, 20:24-30. Per Dr. Creusere, these hypertext files would include HTML (HyperText Markup Language) and XML (eXtensible Markup Language) files. EX1003, ¶¶96-97; EX1004, 43:60-61 (listing “[s]end and receive XML messages via HTTP application protocol” as among the functionality of Firmware Management Agent 3427). Thus, a POSITA would have understood that the communications between Firmware Management Agent 3427 and the

Management Console 3431 are sent over HTTPS link 3450. These communications include, for example, “update package specifications” containing “information related to transport of the update package[,]” that are sent from the update management system to the mobile device over the HTTPS link. EX1004, 46:21-24. Because these update package specifications are data relating to the distribution of the updates (analogous to the control plane service policies of the ’571 Patent), rather than the updates themselves, a POSITA would have understood them to be *control-plane communications*. EX1003, ¶¶96-99 (opining that, in Chia’s implementation, “information related to the transport of the update packages” would be control-plane communications as opposed to data-plane communications). Thus, a POSITA would have understood that, in Chia’s implementation, the HTTPS link would carry both *first control-plane communications* and data-plane communications, including the update packages. EX1003, ¶¶96-100. Indeed, sending control-plane communications via HTTPS was well-known and understood at the time of the alleged invention. EX1003, ¶¶96-99.

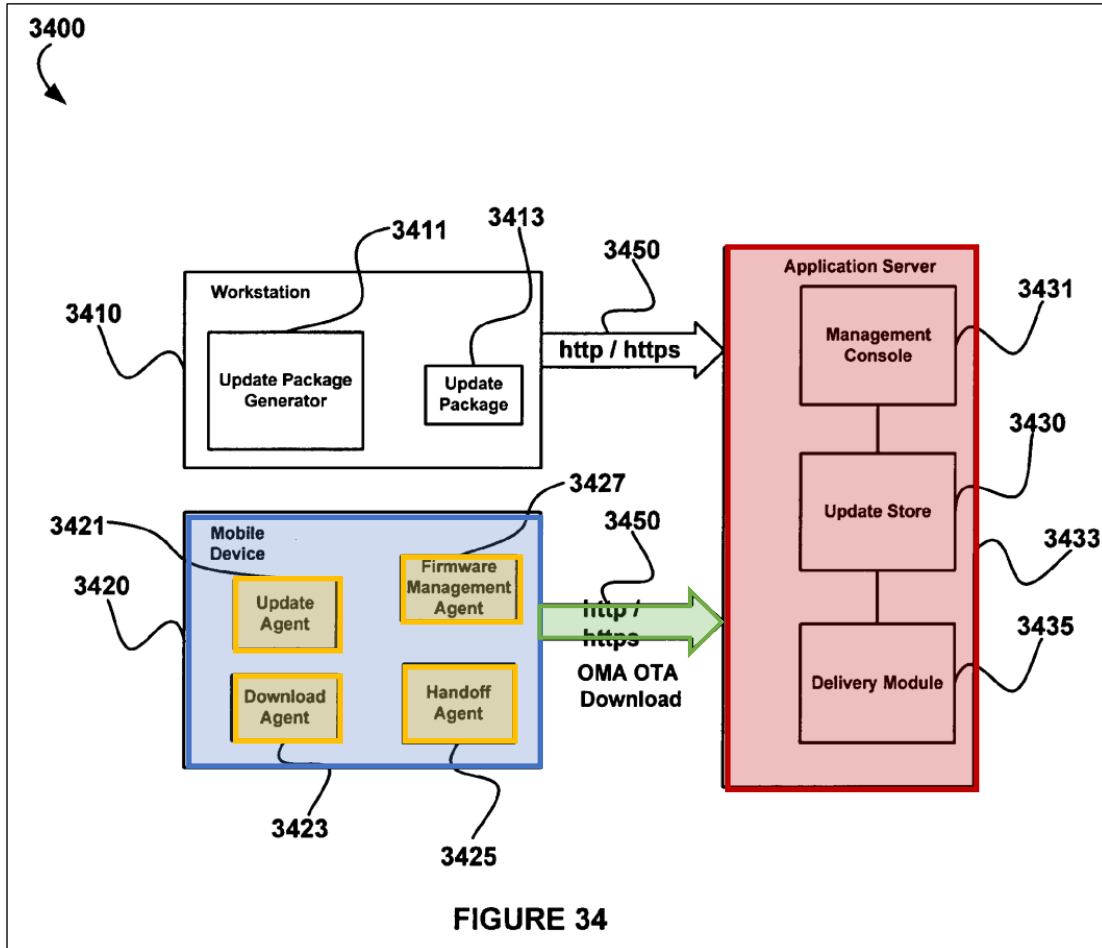
Additionally, FIG. 37 (characterized as “a flow diagram illustrating an exemplary commercial deployment method for a distributed solution according to an embodiment of the present invention”; EX1004, 7:20-22) depicts the message flow between the mobile device (blue) and the application server (red) over the HTTPS link (green) in the architecture of FIG. 34:



EX1004, FIG. 37. FIG. 37 illustrates Chia's conceptual separation between the update discovery data sent via XML-Based Discovery Protocol 3775 (*first control-plane communications*) and the updates themselves sent via Open Mobile Alliance (OMA) download Protocol 3750 (*message payload*). EX1004, 4:42-46; EX1005, 52:39-51 (distinguishing between the "XML-based discovery protocol 3775" and the "OMA download protocol 3750"). Because, as described above, the update metadata is sent via the HTTPS link, the HTTPS link in Chia's implementation is thus a "*first service control link for supporting first control-plane communications between the network system and the first end-user device.*" EX1003, ¶¶96-100.

5. *Claim [1(a)(iii)]*

Chia's mobile device comprises multiple agents (*device agents*) (orange) including an update agent, a download agent, a firmware management agent, and a handoff agent.

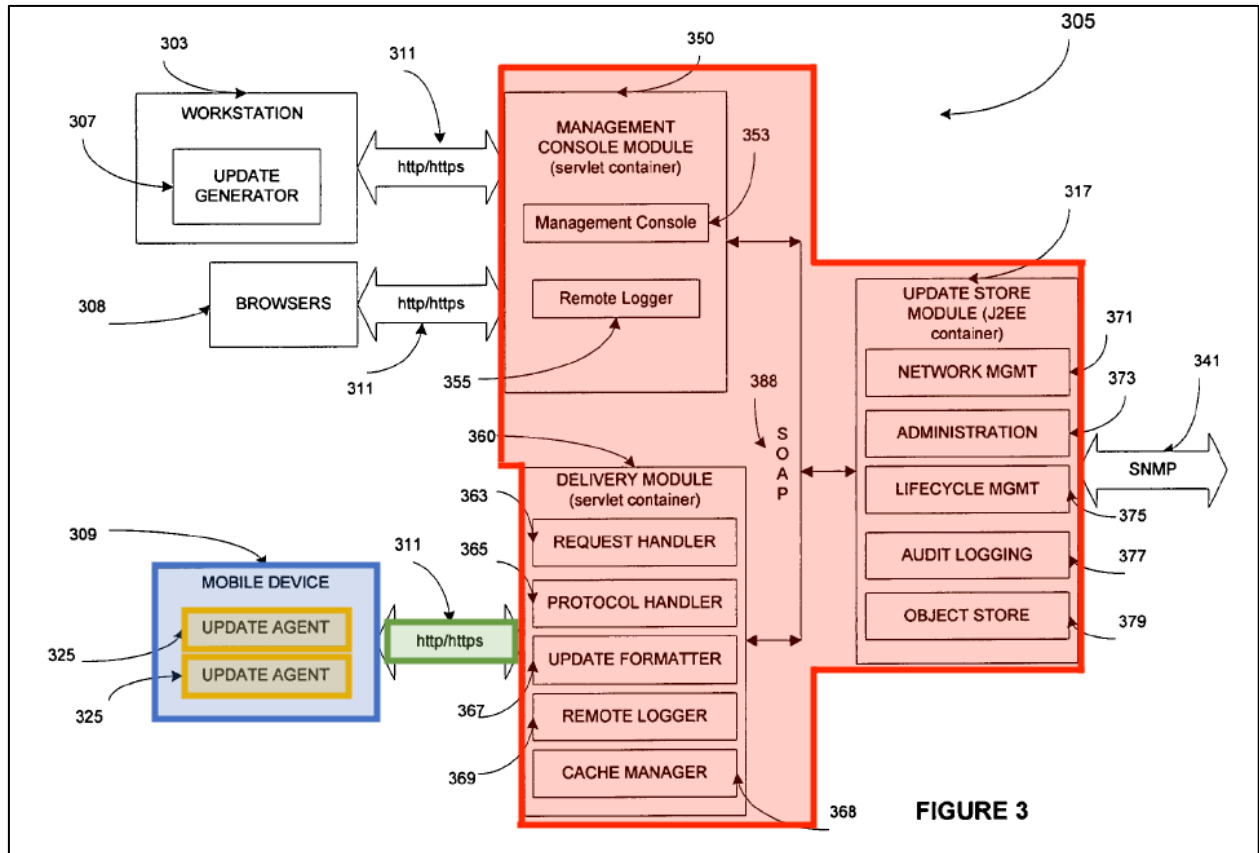


EX1004, FIG. 34.

Chia teaches that the update agent “may be adapted to complement the authentication functionality by providing means to decrypt and verify the update package.” *Id.*, 41:67-42:2. The download agent is “for downloading update

packages.” *Id.*, 43:24-28. The firmware management agent “may control negotiation and downloading of firmware/software to the electronic device.” *Id.*, 42:45-48. Finally, the handoff agent is a software mechanism adapted to perform several functions, including storage of the update package, computation of update state descriptors, reboot of the electronic device, and provision of firmware/software update status. *Id.*, 44:41-52. Thus, Chia teaches *the first end-user device comprising a first set of two or more device agents*.

To the extent that Patent Owner argues that the “first set of two or more device agents” must be multiple instances of the same type of device agent, Chia expressly contemplates embodiments with multiple instances of the update agent. For example, FIG. 3 depicts a mobile device with update agents:



EX1004, FIG. 3. Having multiple distinct update agents in the system of Chia would be useful, for example, for updating different applications running on the mobile device or for updating application software and firmware. EX1003, ¶¶101-104. Furthermore, to the extent that FIG. 3 depicts an embodiment of the mobile device distinct from that of FIG. 34 (rather than simply illustrating the application server at a different level of granularity), it would have been obvious to modify the FIG. 34 embodiment to include the multiple update agents of FIG. 3, to support updating different applications running on the mobile device, or for updating application software and firmware, and doing so would have been the use of a known technique

to improve a similar device in the same way. *Id.* Because Chia's FIG. 34 embodiment includes all the components and programming needed to implement update agents, and given that Chia contemplated embodiments with multiple update agents, a POSITA would have had a reasonable expectation of success in modifying the FIG. 34 embodiment to include the multiple update agents of FIG. 3. EX1003, ¶¶101-105.

**6. Claim [1(a)(iv)]**

As discussed in greater detail below for Claim 1(d)(i), Chia teaches a particular device agent, namely, the update agent, adapted to only open an update package intended for a specific electronic device that the update agent is running on. Claim [1(d)(i)]. Because the update package is intended exclusively for a particular update agent on a specific device, Chia teaches *a particular device agent*. EX1003, ¶106.

**7. Claim [1(b)]**

Chia teaches a plurality of electronic devices connected via an HTTPS communication link (*communicatively coupled*) to an update management system (*network system*). Claim [1(Pre)]. Thus, in addition to providing a first service control link to a first end-user device over a first set of wireless networks, Chia teaches *providing a second service control link to a second end-user device...over a second set of wireless networks*. Claim [1(a)]; EX1003, ¶¶88-93 (describing a plurality as teaching first and second instances).

For example, Chia teaches wireless networks to facilitate downloading update packages by multiple mobile handsets. EX1004, 1:46-53. Chia further teaches scalability of the update management system 305 to “support hundreds to thousands or millions of electronic devices.” *Id.*, 16:47-49. Thus, a POSITA would have understood that a similar HTTPS communication (*second service control link*) would be provided for each electronic device (*second end user device*). EX1003, ¶¶107-108. Further, because the HTTPS communication link is provided to a second device, a POSITA would have understood that receipt of the https communications link would have been done *over a second set of one or more wireless networks*. EX1004, 16:47-54; EX1003, ¶¶88-93, 107-108.

**8. Claim [1(b)(i)]**

As previously discussed, Chia teaches multiple wireless networks to facilitate downloading update packages. Claims [1(a)], [1(b)]; EX1004, 1:46-53. Thus, Chia teaches *the second set of one or more wireless networks being the same as or different from the first set of one or more wireless networks*.

**9. Claim [1(b)(ii)]**

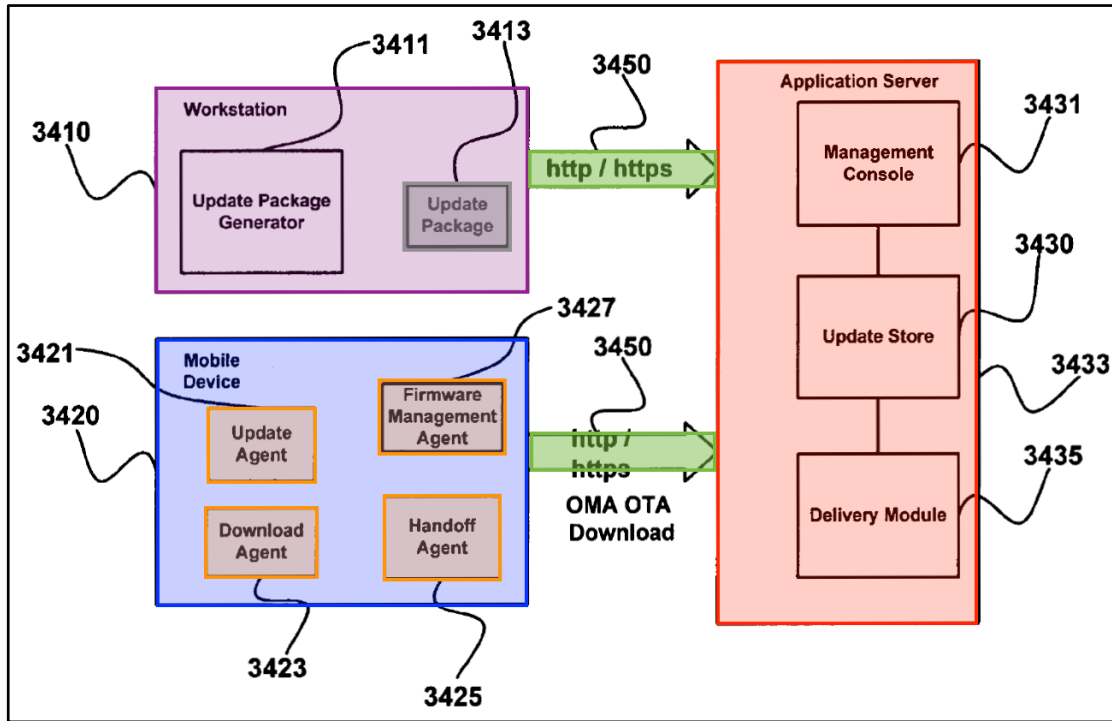
As previously discussed, Chia’s HTTPS communication links (*second service control link*) are *secured at least in part by...a second encryption protocol*. Claims [1(a)-(b)(i)], Claim [1(b)(iii)]. EX1003, ¶110.

**10. Claim [1(b)(iii)]**

Because the *second service control link*, like the first, is Chia's HTTPS communication link, the *second encryption protocol [is] the same as...the first encryption protocol*. Claim [1(a)(i)]. Further, in Chia's implementation, the HTTPS communication link supports control-plane communications between the update management system (*network system*) and the second mobile device (*second end-user device*). Claim [1(a)(ii)].

**11. Claim [1(b)(iv)]**

Because Chia contemplates multiple mobile devices, it would have been understood that each mobile device of the potentially “hundreds to thousands or millions of electronic devices” would include two or more device agents (**orange**), such as shown for mobile device 3420 (**blue**). EX1003, ¶112; Claim [1(a)(iii)].



EX1004, FIG. 34.

## 12. Claim [1(c)]

Chia teaches that the update management system (shown in red in FIG. 34 above) (*network system*) may download an update package (shown in grey in FIG. 34 above) (*server message*) transmitted from a workstation (shown in purple in FIG. 34 above) (*particular server of a plurality of servers*). Chia teaches a delivery module that receives an update package from a workstation via an update store. EX1004, FIG. 34. The update management system is communicatively coupled to a plurality of workstations with a respective plurality of update package generators. *Id.*, 20:20-23, 9:61-65 (discussing a plurality of update package generators located at different facilities). The plurality of servers in Chia additionally includes servers

such as a diagnostics server, a provisioning/billing server, and a device lifecycle management server, which may additionally originate information for delivery to Chia's mobile device. *Id.*, FIG 1B, FIG. 2 (showing these other servers communicatively coupled to the delivery server of the update management system); Claim 2. Thus, Chia teaches a *plurality of servers*. EX1003, ¶¶113-123.

A POSITA would have understood that Chia's "workstations" are "servers" because (1) the '571 Patent describes the naming of servers and functional breakout as simply a "design choice," thus indicating no specific definition of the claimed *server*; and (2) Chia defines its workstations in terms of their function (*i.e.*, the workstation is any computer that runs the update package generator). EX 1001, 16:13-26; EX1004, 40:54-58; EX1003, ¶¶113-119. To the extent PO argues, or the Board finds, Chia's workstations do not teach "servers," a POSITA would have found it obvious to implement the functionality of Chia's workstations including update generators on a server, e.g., the delivery server, of the carrier network, because, as the '571 Patent admits, a POSITA would have recognized that such functional breakout was a design choice. EX1001, 16:13-26; EX1003, ¶¶113-119.

Chia teaches the workstations are adapted to communicate with the network via HTTPS (top **green** arrow in FIG. 34 above). EX1004, 17:21-24. Thus, the workstation (*server*) is *communicatively coupled* to the update management system (*network system*). EX1003, ¶¶124-125. Further, each workstation "may represent a

discrete computing system” and contain an update generator. EX1004, 40:57-58, FIG. 34. The update generator produces update packages (*server messages*). *Id.*, 40:59-62.

The electronic device obtains the update package from the update management system, which receives the update package from the workstation. *Id.*, 42:9-26, FIGs. 3, 37. For example, the update store of the update management system may handle “[u]ploading, retrieving, and managing update packages.” *Id.*, 42:35-46. The delivery module may also “provide a simple object access protocol (SOAP) connection to the update store [] to retrieve an appropriate update package to return to the requesting client.” *Id.*, 43:31-34. Thus, Chia teaches *receiving a server message from a particular server of a plurality of servers communicatively coupled to the network system*. Indeed, a POSITA would have understood that because the update management system is configured to ensure the “***appropriate update package [is returned] to the requesting client***,” namely, the update message that is *received* is from a *particular server*. EX1003, ¶¶124-126.

### 13. Claim [1(c)(i)]

Chia teaches an update package (*server message*) received from an update generator of a workstation by the update management system to be subsequently transmitted (*for delivery*) to the mobile device (*first end-user device*) as part of the *message payload*. As previously described, Chia’s update packages are “needed to

update firmware and/or software.” EX1004, 1:46-47. More specifically, Chia teaches that an update package “may comprise a binary set of executable instruction for converting a first version of firmware/software into a second version of firmware/software.” *Id.*, 40:62-65. An update package may also comprise “a container for the translation instructions/code/data.” *Id.*, 41:6-8. When the electronic device employs the update package, the firmware/software is modified. *Id.*, 41:10-11. Thus, Chia teaches *the server message comprising message payload, at least a portion of the message payload for delivery to the first end-user device*. EX1003, ¶127.

**14. Claim [1(d)]**

**a) Chia’s Teachings**

Chia teaches the update package “may comprise a specification describing packaging of transformations produced by the update package generator [] and consumed by the update agent.” EX1004, 46:14-24. Chia further explains that “the specification may determine what the update agent [] is enabled to read, write, modify, convert, etc.” and “may comprise information related to transport of the update package [] between the update package generator [] and the update agent[.]” *Id.* As discussed for Claim [1(d)(i)], below, a POSITA would have understood that this “information related to transport of the update package [] between the update

package generator [] and the update agent[]” would include an identifier *identifying the particular* update agent that should receive the update package.

Chia explains that “to protect the integrity of the update package [] and to guarantee the source, *an encrypted signature scheme may be supported.*” *Id.*, 50:61-65. Further, “one of the records of the update package [] may hold an encrypted signature employing a selected signature and encryption scheme.” *Id.* Chia teaches that “the download agent [] sends a *unique device value* to the delivery module...*so that the update package [] may be encrypted on the fly.*” *Id.*, 51:5-14.

A POSITA would have understood Chia’s “on the fly” encryption takes place at the update management system within the delivery module. EX1003, ¶¶128-132. Indeed, the purpose of sending the unique device value to the delivery module is to encrypt the update package (*generating an encrypted message*) such that the update agent can “only open an update package [] intended for the specific electronic device that the update agent [] is running on.” EX1004, 51:12-14. Thus, Chia teaches *generating an encrypted message comprising the at least a portion of the message payload*. As discussed below, it would have been obvious to also include *an identifier* in such encrypted message per Cunningham’s teachings. EX1003, ¶¶136-147.

**b) Cunningham's Teachings**

Cunningham teaches generating an encrypted update package with an object identifier during transmission from a server to an electronic device. Cunningham teaches an asynchronous hypertext messaging system and method in which messages are routed from a web server through a communication server and ultimately to a client device. EX1005, [0066], FIG. 2. Like Chia, Cunningham teaches that, “[a]fter the HTTPS link has been created, the communication server creates a new symmetric key on the fly” for encrypting client-server communications in addition to being sent over HTTPS, such that encrypted messages are encrypted twice. *Id.*, [0066].

In Cunningham's system, an identifier is allocated to each logical stream between a client-side consumer object and a server-side resource object. *Id.*, [0033]. This identifier, or Consumer ID (cID), is appended to any communication message associated with the consumer object. *Id.*

Thus, Cunningham teaches *generating an encrypted message* at an intermediate communication server, or *network system*, between a web server and client device. EX1003, ¶¶133-135. Cunningham further teaches that the generated encrypted message comprises *an identifier*, namely the cID. *Id.*

**c) Motivation to Combine**

A POSITA would have found it obvious and been motivated to modify Chia’s “on-the-fly” embodiment with Cunningham’s additional teachings to generate an encrypted message and append a second identifier at the update management system, thus teaching Claim 1(d). EX1003, ¶¶136-147.

For several reasons, a POSITA would have been motivated to modify Chia’s system to implement Cunningham’s double encryption process and second identifier. EX1003, ¶¶136-143. First, Chia explicitly contemplates encrypting the update package “on the fly” at the delivery module but does not provide specificity on how this functionality is implemented. *Id.* Cunningham provides a detailed description of the encryption process used to further protect the integrity of a communication message. EX1003, ¶¶136-143 (describing EX1005, [0066]). Similarly, Chia explicitly contemplates utilizing a “unique device value” to identify the target device for the update package but does not provide specificity on how implemented. EX1003, ¶¶136-143. Cunningham again provides a detailed description of appending a second identifier to better identify the target device (*i.e.*, the consumer ID) for a communication message. EX1003, ¶¶136-143 (describing EX1005, [0033]). Because compounding additional encryption processes with HTTPS was a well-known way to create “a more secure link” (EX1005, [0066]), a POSITA would have been motivated to look to Cunningham as a guide for

implementing a second encryption at Chia's update management system. EX1003, ¶¶136-143; *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 421 (2007) (motivation exists "[w]hen there is a design need...and there are a finite number of identified, predictable solutions" within a POSITA's "technical grasp"); *In re Translogic Technology, Inc.*, 504 F.3d 1249, 1262 (Fed. Cir. 2007).

Second, a POSITA would have recognized that the proposed combination would improve Chia's system in the same way Cunningham's similar system benefits from more secure communication links realized by the additional encryption process. EX1003, ¶144. (establishing that Chia and Cunningham describe similar systems). Chia's system involves passing important firmware/software updates across networks with thousands, or even millions, of devices, so a POSITA would have understood that more secure communication links were beneficial to secure the update packages and ensure integrity, accurate source, and proper content. EX1003, ¶144 (describing EX1004, 50:40–51:4).

Further, a POSITA would have had a reasonable expectation of success when modifying Chia according to Cunningham's teachings. EX1003, ¶¶145-147. Cunningham's additional encryption process and second identifier require simple components that are commonly integrated in systems like Chia's. EX1003, ¶¶145-147. Chia's system already includes comparable servers to Cunningham. *Id.* Encryption of communication packets was prolific in network systems at the time

for use in network communication. EX1003, ¶¶145-147. This is supported by Chia’s explicit contemplation encryption “on the fly” and the use of a “unique identifier.” *Id.*

**15. Claim [1(d)(i)]**

**a) Chia’s Teachings**

Chia teaches the update package specification may comprise “information related to transport of the update package [] between the update package generator [] and the update agent [.]” Claim [1(d)]; EX1004, 46:14-24. Chia also teaches that multiple such update agents are present on the mobile device for updating different components, thus indicating that “information related to the transport of the update package” would include a way to identify the correct update agent for a particular package update. EX1004, 13:29-33, 14:10-13. Thus, a POSITA would have understood that the “information related to transport of the update package [] between the update package generator [] and the update agent [.]” in the update package specification would be used to identify the update agent and assist in delivery. EX1003, ¶¶148-149.

Because different components are updated by different update agents, a POSITA would have understood the update package metadata to include an identifier identifying the update agent (*particular device agent*). EX1003, ¶¶148-149. Chia teaches the update package is downloaded by the download agent and

accessed by the handoff agent, which reboots into the update agent to perform the update. EX1004, 53:44-53. Chia also teaches a plurality of such update agents. *Id.*, FIG. 3, RNs 325. As such, a POSITA would have understood that the update package specification would include an identifier identifying which update agent should be initiated by the handoff (*identifying the particular device agent*), and that the identifier would allow the handoff agent to pass the update package to the appropriate device agent once delivered (*assist[] in delivering the at least a portion of the message payload to the particular device agent*). EX1003, ¶¶148-149.

**a) Cunningham's Teachings**

To the extent PO argues Chia does not disclose this identifier as being part of the update package specification data structure, Cunningham expressly teaches a “Consumer ID” (“cID”) that is “appended to any communication message” associated with the logical stream for the consumer. EX1005, [0033], FIG. 3; Claim [1(d)]. A POSITA would have understood that incorporating this identifier in Chia’s existing data structure would enable (and be consistent with) Chia’s teachings to route the update package to the correct update agent among other device agents present on the mobile device, ensuring compatibility with Chia’s system. EX1003, ¶¶148-150.

**a) Motivation to Combine**

A POSITA would have found it obvious and been motivated to improve Chia's system in the same way Cunningham's similar system benefits from routing messages to appropriate recipients. *Id.* (establishing that Chia and Cunningham describe similar systems). Chia's system involves passing important firmware/software updates to different update agents to update different components. Therefore, a POSITA would have understood that ensuring updates are applied to the correct components would ensure package integrity and prevent package corruption resulting from a package update to the wrong component. *Id.* (describing EX1004, 50:40–51:4).

Further, a POSITA would have had a reasonable expectation of success when modifying Chia according to Cunningham's teachings. *Id.* Cunningham's update agent identifier requires only the addition of simple data structure fields that are commonly integrated in data structures like Chia's. *Id.* Further, identification of a destination for a message where multiple possible recipients are present was prolific in network systems at the time. *Id.* This is supported by Chia's explicit contemplation that the update package specification “may comprise information related to transport of the update package [] between the update package generator [] and the update agent[.]” EX1004, 46:14-24.

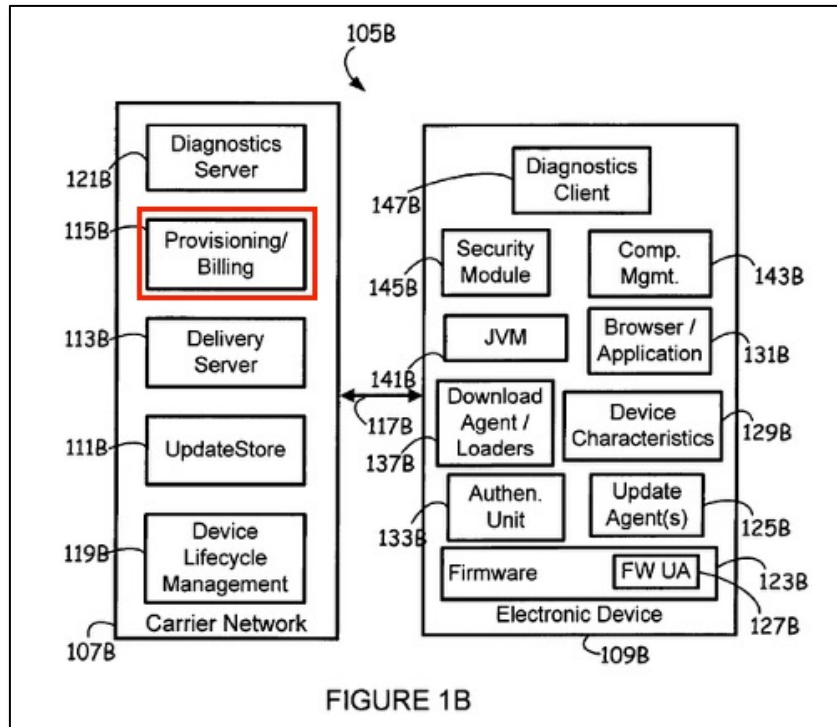
**16. Claim [1(e)]**

Chia-Cunningham teaches that the update package is transported from the update package generator at the workstation, to the update management system where it is further encrypted using the unique device identifier. Claims [1(c)-(d)]. Then, the further encrypted update package (*encrypted message*) is sent from the update management system over HTTPS (*first service control link*) to the update agent at the mobile device (*first end-user device*). EX1004, 53:44-47, 51:6-14; EX1005, [0066].

**B. Claim 2**

Chia teaches the *billing event server* from among the *Markush* options of Claim 2. Chia teaches that the download agent (mapped to the *device agent*) of the electronic device can receive data (such as the update packages discussed above) sent by the delivery module of the update management system (mapped to the *network system* above) that originates at a variety of types of servers (such as the workstation mapped as the *particular server* above) in a carrier network. EX1004, 11:27-31. In the same embodiment, Chia additionally discusses other types of servers that also originate data that is sent by the delivery module to other agents on the mobile device. *See id.*, FIG. 1B; 10:31-33 (“The delivery server 113B may be adapted to dispense update packages to electronic device 109B.”); 13:22-23 (“provisioning may be facilitated by delivery server 113B”). For example, Chia

teaches “provisioning/billing server 115B” (a *billing event server*) as one of the *plurality of servers*. Claim [1(c)]. This “provisioning/billing server” is *communicatively coupled to the network system*. EX1004, 10:16-22; FIG. 1B (showing provisioning/billing server to be part of carrier network 107 and communicatively coupled to the mobile device by communication link 117B). . Billing server 115B originates data sent by the delivery module to security module 145B of the mobile device to lock or unlock the device. *Id.*, 12:57-13:5. Chia further discloses that provisioning/billing server 115B may also “initiate provisioning of new software applications and end user services in the electronic device.” *Id.*, 13:21-22; EX1003 ¶¶152-155 (opining that a POSITA would have understood that the provisioning/billing server 115B would cause the delivery module to communicate with the download agent and update agent to initiate provisioning of new software). When provisioning a software application in this way, a POSITA would have understood that the provisioning/billing server 115B would cause a software update message to be sent from the delivery module to the update agent of the mobile device in the same way as a software update message from the workstations and would satisfy the remaining limitations of claim 1 for the same reasons discussed above. *Id.*



EX1004, FIG. 1B. A POSITA would have understood that FIG. 1B depicts Chia's teachings of sending information originating at the *plurality of servers* to the corresponding agents of an electronic device, consistent with its teachings discussed in the context of Claim 1. EX1003, ¶155. Thus, Chia teaches that the *particular server* comprises at least a *billing event server*.

### C. Claim 3

Chia teaches *information associated with a service usage or cost* in the form of a “For Fee” type update package. For example, the update management system “may be adapted to supply *billing event information* to an existing billing infrastructure and *to offer ‘For Fee’ type updates*, for example.” EX1004, 38:9-14. A POSITA would have understood that update packages containing “billing event

information” and “For Fee” type updates would have included *information associated with a service usage or cost*. EX1003, ¶¶157-159. Indeed, it would have been understood that an end-user would have been presented with information such as cost or related information when offered updates that are for a fee. *Id.* Chia also teaches an example in which the mobile device “may be remotely locked...when, for example, the provisioning/billing server [] determines that payment for services is overdue.” EX1004, 12:65-13:2. A POSITA would have understood that an update locking a device includes information associated with service usage (such as, for example, an instruction to lock) because the instruction to lock was generated as a result of service usage. EX1003, ¶¶157-158. Finally, a POSITA would have understood that the *information associated with a service usage or cost* (“billing event information” or “remote lock[]” instruction) would be sent as a part of the same message payload at least because, as mapped, the information communicated to the user’s device is sent in the *message payload*. EX1003, ¶159. Furthermore, a POSITA would have understood that this related information (*e.g.*, the update package and the associated billing event information) would be sent as a single payload to reduce network traffic and latency while providing all of the information to the user at the same time. *Id.*

**D. Claim 5**

Chia teaches that “end-user” of the management console can modify a variety of information that is included in the update package state and that controls the contents of the message. EX1004, 29:1-6. For example, the end-user may be able to set preferences indicating whether the package is downloadable at all or what the download group would be (which would affect, for example, whether that package would be included in a multi-DUP update at all or for which user group it should be included; *see* EX1004, 35:19-29). The end-user can also set a preference indicating what the priority of the update should be. *Id.*, 29:22-23. Chia further states that “In case of multiple matching update packages, then the downloadable update package having the highest priority of state may be used to identify a unique update package to retrieve.” *Id.* 30:48-51. The package priority is thus a *user preference* (because it is set by the end-user) that controls the *message payload* (which downloadable update package is retrieved).

**E. Claim 6**

As discussed above, Chia teaches that the update management system “may be adapted to supply billing event information to an existing billing infrastructure and to offer ‘For Fee’ type updates, for example.” EX1004, 38:10-12; Claim [3]. A POSITA would have understood that such a “For Fee” update would include a transaction offer (sent, for example, by the billing system; *see* EX1004, 38:9-11;

Claim [2]) that would allow a user to purchase the update in exchange for a corresponding fee. EX1003, ¶161. A POSITA would have understood that *at least a portion of the message payload comprises...a transaction offer*. EX1003, ¶¶161-162. A POSITA would have understood that this information would be communicated as *a portion of the message payload* because, as mapped, the information communicated to the user's device is sent in the *message payload*. EX1003, ¶¶162-163. Furthermore, a POSITA would have understood that this would be sent as a single payload with the update to reduce network traffic and latency once the user accepts the transaction offer. *Id.*

#### **F. Claim 7**

Chia teaches that the update package includes instructions (*portion of the message payload*) to be executed by the update agent (*particular device agent*) for converting a first version of firmware or software into a second version (*software update*).

Chia explains “an update package may be defined as a collection of data/metadata and update/upgrade instructions that when bundled and delivered to an electronic device update agent are adapted to facilitate firmware/software updates in the electronic devices.” EX1004, 8:29-37. Further, because the update package “may comprise a set of executable instructions for converting from one version of electronic device firmware/software to another[,]” a POSITA would have

understood *a portion of the message payload* of Chia's update package to comprise *a software update*. EX1003, ¶165. Finally, because the update agent is adapted to employ an appropriate update package, a POSITA would have understood that the *software update* of Chia's update package is *for the particular device agent*. *Id.*

#### **G. Claim 8**

As discussed previously, the update package (including *message payload*) comprises information to update software/firmware. Claim [7]. A POSITA would have understood such information to include *information associated with software or a media file*. EX1003, ¶166.

#### **H. Claim 9**

Chia teaches supporting access to various other applications of the electronic device. EX1004, 11:7-8. Further, Chia teaches a component management module that “may be adapted to manage existing firmware/software components and additional new software components installed upon the electronic device.” *Id.*, 11:12-15. The component management module “may be adapted to facilitate ***license management***, installation, update, upgrade, and removal of software components, software applications, etc.” *Id.*, 11:17-20. A POSITA would have understood Chia's license management to comprise a rule set controlling whether a service (e.g., application or component) may run, based on license validity. EX1003, ¶167. Further, Chia teaches allowing access to applications, which would have indicated

to a POSITA that Chia employs policies to determine which services or applications may be used and/or updated at a given time. EX1003, ¶¶167-168. Thus, Chia's teachings regarding license management, installation, update, and removal of software components/applications teach or render obvious *at least a portion of the message payload comprises information associated with a service policy*. EX1003, ¶¶167-169. A POSITA would have understood that this information would be communicated as *a portion of the message payload* because as mapped, the information communicated to the user's device is sent in the *message payload*. EX1003, ¶169. Furthermore, a POSITA would have understood that this would be sent as a single payload with the update to reduce network traffic and latency associated with sending the *service policy*. *Id.*

#### **I. Claim 10**

Chia teaches the update package may be sent with a catalog (*indication of additional data or information*) comprising all firmware dependencies (*additional data or information available to the particular device agent*). EX1004, 35:30-31. Chia further describes how this catalog can automatically update all missing dependencies or notify the user of dependencies via the user interface. *Id.*, 34:43-49. These missing dependencies are additional packages to be updated, and the catalog is included with the update package payload. Additionally, the update agent retrieves the update package. Thus, a POSITA would have understood that Chia teaches *an*

*indication of additional data or information available to the particular device agent.*

EX1003, ¶¶170-172.

## **J. Claim 11**

In particular, within the context of FIG. 4, Chia teaches displaying (*through a user interface of the first end-user device*) minimum set status and information (*information associated with the at least a portion of the message payload*) from FM 3427 during download of a firmware/software update package.

Chia teaches an electronic device with “an exemplary management console login screen displayable on an electronic device.” EX1004, 5:65-67, FIG. 10. Chia further explains that “[t]he end-user may be notified of dependencies via the electronic device user interface (UI) and may be prompted to also upgrade associated components.” *Id.*, 34:43-49. Thus, Chia teaches *a user interface of the first end-user device*.

Further, Chia teaches that a firmware management agent (FM) may be used “to control negotiation and downloading of firmware/software to the electronic device.” *Id.*, 43:45-48. The FM may include a display handler adapted to “***display downloading progress text messages***, interactive text messages...and other text messages.” *Id.*, 43:65-3, 43:21-24. For example, during a download of a firmware/software update package, the FM may “[d]isplay minimum set status and information.” *Id.*, 43:56-63. Thus, a POSITA would have understood the update

package wherein *at least a portion of the message payload is configured to assist causing the first end-user device to present, through a user interface of the first end-user device, information associated with the at least a portion of the message payload.* EX1003, ¶¶175-176.

**K. Claim 12**

The concepts captured by Claim 12 are duplicative of Claim 1, in particular, limitations [1(a)]–[1(d)]. Claim 12 builds on the concepts from Claim 1 by requiring a *first* and *second* server message (in contrast to a single server message in Claim 1). Because Chia teaches a plurality of workstations/*servers* and a plurality of update packages (*server messages*), Chia teaches Claim 12 for the same reasons discussed for Claim 1. *See* Claims [1(a)]–[1(d)]. Indeed, Chia teaches receiving a plurality of update packages “from a plurality of sources in a secure manner.” EX1004, 7:50-52. Chia further explains that “updating operating system components may also be facilitated by *a first update agent* [], and *a second or the first update agent* [] may facilitate updating software application components.” *Id.*, 13:29-33.

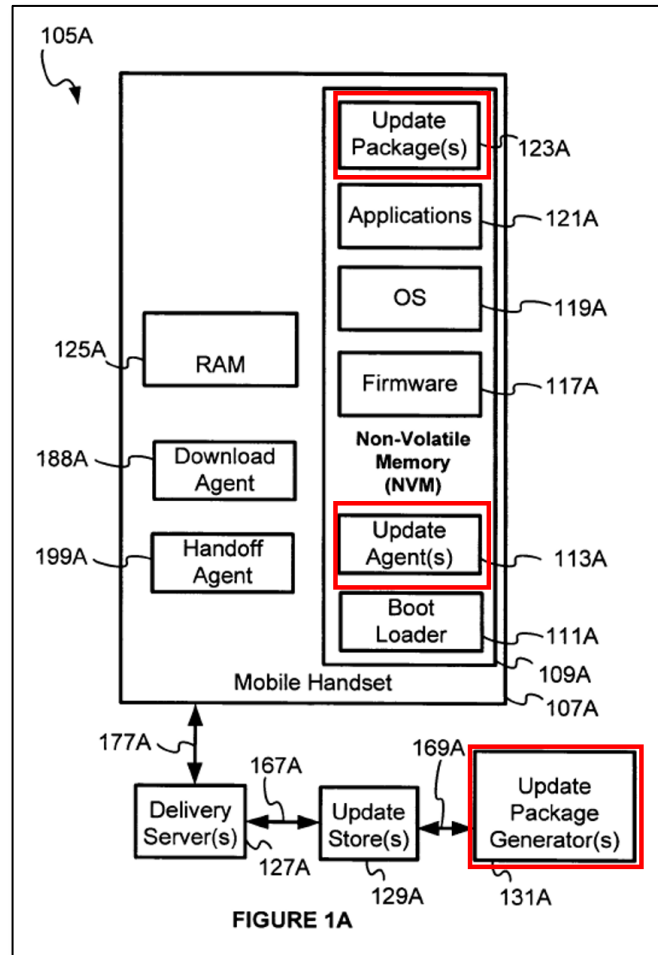
Because Chia teaches a plurality of update packages sent to the same device, Chia teaches Claim 1 *wherein the server message is a first server message, and wherein the message payload is a first message payload, and wherein the identifier is a first identifier.* *See* Claim [1]. Further, where more than one update package is received by the update management system to be sent to a device, Chia teaches

*receiving a second server message.* The second update package (*second server message*) may come from the same server as the first server message (EX1004, 9:1-3; 14:8-10; 15:4-6), or *from another server of the plurality of servers communicatively coupled to the network system* (EX1004, 20:20-23; 9:59-10:3). Because the second update package is for a second update, the second update package further comprises a second message payload where the second message payload is for a different or subsequent update from the first. EX1003, ¶¶178-181. A POSITA would have understood that the second update package would be transmitted from the respective workstation and received in the same manner as the first update package. EX1003, ¶¶179-180. Like the first update package, a POSITA would have understood the unique device value (*second identifier*) would have *assist[ed] in delivering... the second message payload to a second device agent. Id.* Indeed, because the *second device agent* can be the same as the update agent, or *particular device agent*, from the first update package delivery, the unique device value would serve the same purpose of ensuring only the appropriate update package is received. EX1004, 42:43:31-34; *see* Claim [1(d)]; EX1003, ¶¶148-150. Finally, Chia teaches that multiple individual package updates can be sent in a single “multi-DUP” package. EX1004, 35:23-29. Thus, in the Chia-Cunningham system, a POSITA would have understood that the entire multi-DUP package would be

combined and encrypted together into the same encrypted message by the delivery module. Claim [1(d)]; EX1003, ¶¶181, 131-147.

**L. Claim 13**

Chia teaches multiple “update package generator(s)” on multiple workstations (*first server* and *second server*) that provide multiple “update package(s)” (*first server message* comprising *first message payload* and *second server message* comprising *second message payload*) for multiple “update agent(s)” (*first device agent* and *second device agent*) on a single mobile device, as shown in FIG. 1A and described at 9:61-10:12 and 20:20-24.



EX1004, FIG. 1A. See Claim [1(c)], [1(c)(i)], [1(d)], [1(d)(i)], [1(e)] [1(d)]; EX1003, ¶182. Each update package is received, processed, and sent to the device by the update management system as discussed in Claim 1.

#### M. Claim 14

Chia-Cunningham teaches *supporting asynchronous transmissions* by the update management system (*network system*) via the HTTPS communications link (*first service control link*).

**1. Chia's Teachings**

Chia teaches communication of update packages from the workstation/server to the update management system to the mobile device. *See* Claim [1]. This communication occurs via HTTPS communication link. *Id.*

**2. Cunningham's Teachings**

Cunningham teaches an asynchronous hypertext messaging system. EX1005, Abstract. Indeed, Cunningham is directed to “electronic messaging methods and more particularly asynchronous hypertext messaging between clients and servers with [HTTP] capability.” *Id.*, [0002]. Cunningham further contemplates employing HTTPS for asynchronous communications between a server and client. *Id.*, [0066].

**3. Motivation to Combine**

A POSITA would have found it obvious to support asynchronous transmission using the HTTPS link of Chia to provide the many benefits described in Cunningham that are associated with the asynchronous hypertext messaging techniques. EX1003, ¶¶186-189. Namely, utilizing asynchronous hypertext messaging (1) enables the server to force real-time updateable information; (2) allows all data transfers to be encoded to appear as HTTP messages; (3) enables the server to distinguish between the asynchronous hypertext messaging and standard HTTP requests; (4) improves overall efficiency; and (5) enables data encryption as specified by the server encryption components. EX1005, [0006]-[0010]. A POSITA would have recognized that the proposed combination would improve Chia's system

in the same way Cunningham's similar system benefits from asynchronous messaging via HTTPS. EX1003, ¶144 (establishing that Chia and Cunningham describe similar systems). More specifically, a POSITA would have been motivated to implement asynchronous messaging in Chia to enable the server to force real-time updateable information without polling, pass information through firewalls without lowering security, increase efficiency, and to enable data encryption and provide a connection without compromising security. EX1003, ¶¶186-187.

Further, a POSITA would have had a reasonable expectation of success when modifying Chia according to Cunningham's teachings. EX1003, ¶¶188-189. Cunningham's asynchronous messaging technique requires simple components that are commonly integrated in systems like Chia's. *Id.* Chia's networking system already includes the necessary elements for Cunningham's asynchronous communication, such as HTTPS communication links. EX1003, ¶189. Further, asynchronous communication over HTTPS in client-server environments was known at the time for use with electronic devices and network systems, as supported by Cunningham's teachings. *Id.*

#### **N. Claim 15**

Chia teaches that "to protect the integrity of the update package [] and to guarantee the source, an encrypted signature scheme may be supported in the update package generator [] and the update agent." EX1004, 50:61-65. Chia further teaches

that when the update agent receives the update package, containing the encrypted signature, it “validates the encrypted signature” to determine where the update package came from and ensure the package wasn’t tampered during transport. *Id.*, 50:67-51:4. Thus, Chia teaches *sending a credential* in the form of an encrypted signature from the update management system *to the first end-user device*. EX1003, ¶190.

Further, Chia teaches that a specific method of protecting the content of the update package can be achieved by “send[ing] a unique device value to the delivery module” from the download agent of the mobile device to facilitate encryption of the update package on the fly. EX1004, 51:5-10. The update agent is then adapted to “only open an update package [] intended for the specific electronic device that the update agent [] is running on.” *Id.*, 51:10-13. As such, Chia also teaches *obtaining the credential...from the first end-user device during a service authorization sequence*. EX1003, ¶193.

#### **O. Claim 16**

As previously discussed, Chia-Cunningham teaches sending a unique device value (*device identifier*) from the mobile device to the delivery module for purposes of encryption. *See* Claims [1(d)], [15].

**P. Claim 17**

Chia teaches that the update agent is software. EX1004, 1:60:61 (“Updating *the software (update agent)* in a wireless mobile electronic device may be challenging.”). In particular, Chia teaches that the update agent (*particular device agent*) may run on top of an electronic device operating system (OS)... compiled and linked separately.” *Id.*, 47:20-29. Thus, a POSITA would have understood that because the update agent is software, Chia teaches *the particular device agent comprises software*. EX1003, ¶193.

**Q. Claim 18**

Chia-Cunningham teaches sending an HTTPS refresh command (*triggering a transmission to maintain the first service control link*).

**1. Chia’s Teachings**

Chia teaches transmitting communications via an HTTPS communication link (*first service control link*). *See* Claim [1(a)]. More specifically, Chia teaches that its electronic devices are “communicatively coupled” via the HTTPS communications link to a server. *Id.*; EX1004, 8:63-66., FIG. 34.

**2. Cunningham’s Teachings**

Cunningham similarly teaches transmitting information via an HTTPS communication link. *See* Claim [14]. Cunningham further describes sending a refresh command to prevent the HTTPS connection from being closed after a certain period of time. EX1005, [0056]. Cunningham explains that “[t]ypical web browsers

feature time-out provisions to close HTTP connections when the web servers do not respond after a prespecified time interval.” *Id.* Thus, “[t]o prevent the connection from being closed...due to possible gaps between real-time data transmission...a refresh command is issued.” *Id.* In response to the refresh command, the server sends a new HTTP header message to the client causing a new virtual connection to be established. *Id.*, [0058]. Thus, Cunningham teaches *triggering a transmission* in the form of the refresh command to maintain the communication link after a particular time interval has passed. Furthermore, Cunningham teaches that a time since sending the encrypted message to the first end-user device would otherwise cause the first service control link to terminate. *Id.* [0061] (“If no heartbeats are received during a period equivalent to this second threshold then the physical communication stream is dropped.”); EX1003, ¶¶196-197.

### 3. *Motivation to Combine*

Chia-Cunningham teaches the update management system *triggering a transmission* of a refresh command to *maintain* the HTTPS communication link (*first service control link*) *when a time since sending* the update package (*encrypted message*) to the electronic device (*first end-user device*) *would otherwise cause* the HTTPS link *to terminate*.

A POSITA would have found it obvious and been motivated to modify Chia to implement a refresh command to avoid dropping the HTTPS link between the

electronic device and update management system between update package transmissions. EX1003, ¶¶199-201. A POSITA would have recognized the value in keeping the secure session established and avoiding the cost or risk of re-establishing it. EX1003, ¶199. Indeed, re-establishing the HTTPS communication link would require a full TCP handshake and TLS handshake again. *Id.* Thus, a POSITA would have been motivated to implement Cunningham’s refresh signal teachings in Chia to avoid issues such as increased performance overhead, degraded user experience, session discontinuity, and increased security risks. *Id.*

A POSITA would have also had a reasonable expectation of success implementing Cunningham’s refresh transmission teachings in Chia’s system. EX1003, ¶¶200-201. Implementing a refresh command over HTTPS was well-known prior to the ’571 Patent and was included by default in the 1.1 version of the HTTP protocol utilized by Chia’s system. EX1003, ¶200. Thus, a POSITA would have understood that Chia’s system is already equipped to implement Cunningham’s refresh transmission teachings, which would therefore create a reasonable expectation of success for a POSITA for the proposed combination. EX1003, ¶201.

#### **R. Claim 19**

Chia teaches that the update package (*encrypted message*) can be downloaded from the update management system by the download agent of the mobile device via HTTPS (*first server control link*). EX1004, 43:20-28, 45:8-11. As described

above, the *particular agent* is mapped to Chia's update agent. After the download agent downloads the update package to the mobile device, Chia explains that the package can then be stored for later use (for example, in a subsequent session or after device reboot). *Id.*, 45:27-30; 53:51-53 (explaining that the handoff agent may reboot the device, causing initiation of the update agent). Thus, the update package is downloaded by the **download** agent completely independent of the **update** agent (*particular device agent*) and is agnostic as to whether the update agent *is running on the* mobile device (*first end-user device*). EX1003, ¶202.

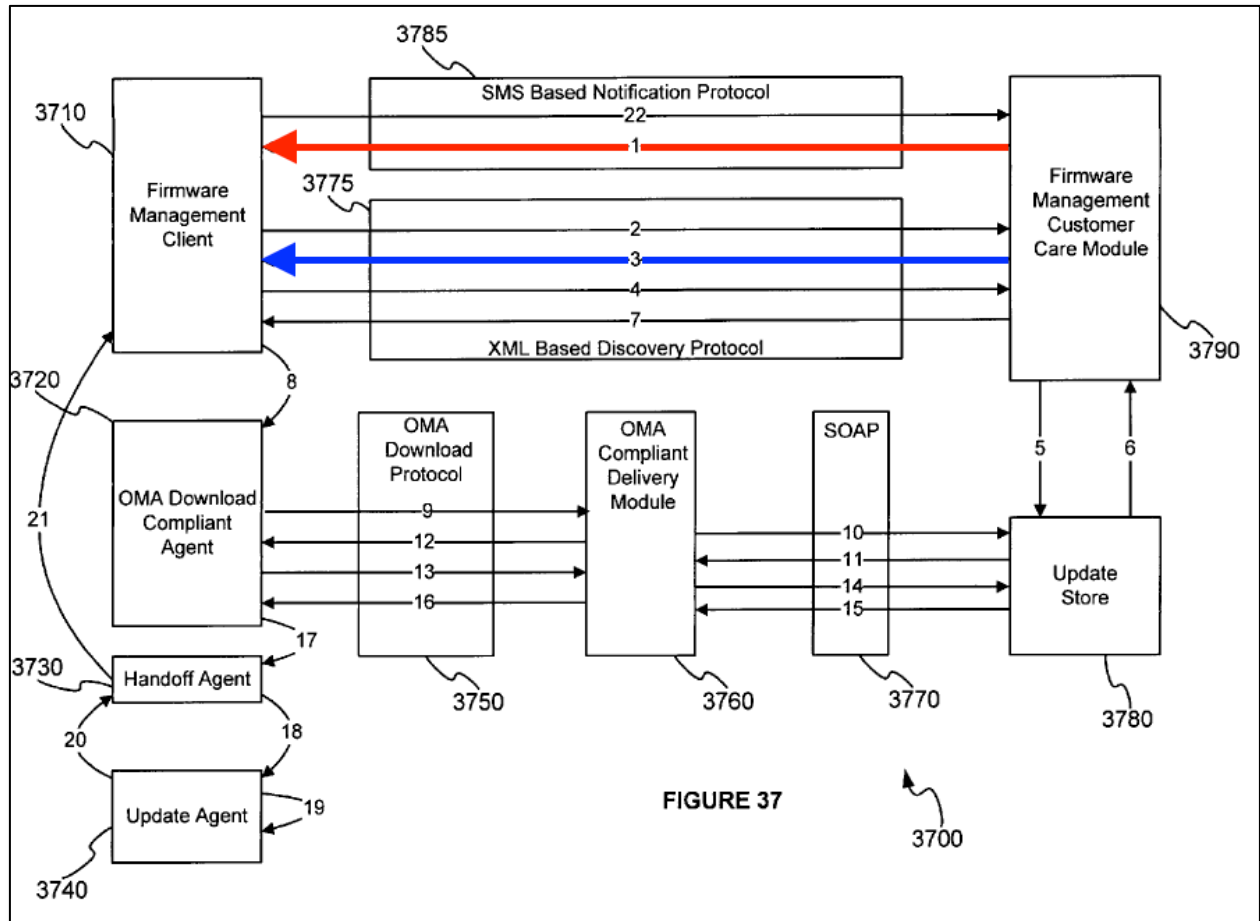
#### S. Claim 21

Chia teaches *sending a credential, a certificate, or a token* in the form of an encrypted signature from the update management system to the electronic device (*first end-user device*). *See* Claim [15]. More specifically, Chia teaches sending the encrypted signature to the update agent (*particular device agent*) on the electronic device. *Id.*; EX1004, 51:10-13 (explaining that the update agent is adapted to only open an update package intended for a specific device that the update agent is running on.). Indeed, Chia teaches that the update agent “may be adapted to complement the authentication functionality by providing means *to decrypt and verify the update package.*” EX1004, 41:67-42:2, 46:4-13 (describing the update agent as providing support for “*digital signature decryption*, authentication, and verification”). A POSITA would have understood that *a certificate* and/or *a*

*credential* would include a digital signature that can be verified by the end device to authenticate the package and/or a signing key identifier that could be used to verify the package. EX1003, ¶203. Thus, a POSITA would have understood that the encrypted signature (*credential/certificate*) is *sen[t] ...to the particular device agent*. EX1003, ¶¶203-204.

#### **T. Claim 23**

Chia teaches pushing updates to a group of end-users. First, Chia's system employs a push architecture whereby the server affirmatively notifies the devices of available updates. EX1004, 52:52-56; EX1003, ¶205 (distinguishing push architectures, where the server notifies clients of new data, from poll architectures, where the client must periodically check for new data even when none is actually available). Once the mobile device is notified via the update push notification (message 1 in FIG. 37), the update itself is pushed via the HTTPS link (message 3 in FIG. 37). Thus, the HTTPS link (*first service control link*) enables Chia's workstation (*particular server*) to push updates (*message payload*) to the update agent (*particular device agent*).



EX1004, FIG. 37 (depicting the update push notification (red arrow) and the message payload being pushed via the HTTPS link (blue arrow)).

To the extent that Patent Owner argues that the push notification message itself (in addition to the message payload) must be sent via the HTTPS connection (*first service control link*), Chia provides an example in the context of FIG. 38, where all communications (including the update notification) occur via HTTPS. *Id.*, FIG. 38. In particular, Chia teaches that the update store (in the update management system) “may be integrated with and communicatively coupled” to DM servers in DM server cluster modules. EX1004, 37:63-67. Chia teaches that a DM Server

within a DM server cluster may be configured to permit an administrator the ability to view a list of customers/subscribers with associated customer/subscriber parameters from a database. *Id.*, 39:30-36. With this ability, “[e]lectronic device clients may also choose one or a group of end-users *to push updates to.*” *Id.*, 39:36-39. The update notifications are sent upon initiating the update environment. *Id.*, 39:39-42. Chia further describes this process occurring via the DM protocol. 54:13-15. Thus, at least within the context of Chia’s FIG. 38 embodiment, a POSITA would have understood Chia’s push notifications to be transmitted via HTTPS, or *the first service control link*, using the DM protocol. EX1003, ¶¶206-208.

Thus, to the extent Chia’s other embodiments (e.g., FIGs. 34 and 37) fail to explicitly disclose transmitting its push notifications via HTTPS, a POSITA would have otherwise been motivated to do so in light of Chia’s other teachings. EX1003, ¶¶206-208. Modifying the embodiment to Chia’s FIG. 34 and 37 to send the update push notifications through the HTTPS channel would have benefited that embodiment, as doing so would have eliminated the requirement that the firmware manager of FIG. 34 include an SMS message handler (*see* EX1004, 43:65-44:4), reducing cost and simplifying design. Sending all communications through the HTTPS channel would additionally have been the use of a known technique (sending update push notifications via the same channel as the update payload) to improve a similar system in the same way. A POSITA would have had a reasonable expectation

of success when modifying Chia's FIG. 34 and 37 to send the update push notifications via HTTPS, since all the components needed are already present in Chia's system.

**U. Claim 24**

Chia teaches providing the HTTPS communication link (*first service control link*) to the mobile device (*first end-user device*) by providing the HTTPS communication link to an OMA download agent (*service control device link agent*) on the mobile device. The download agent then communicates via the application program interface (API) (*agent communication bus*) to at least the update agent (*particular device agent*). Because the update package is sent to the OMA download agent via HTTPS, a POSITA would have understood that providing the HTTPS communication link from the update management system to the mobile device *comprises providing the first service control link to a service control device link agent*. EX1003, ¶¶209-211. A POSITA would have further understood that because the OMA download agent is configured to download the update packages to the mobile device and the update agent is configured to execute the update instructions, Chia teaches *the service control device link agent for delivering agent messages over an agent communication bus to at least the particular device agent. Id.*

**V. Claim 26**

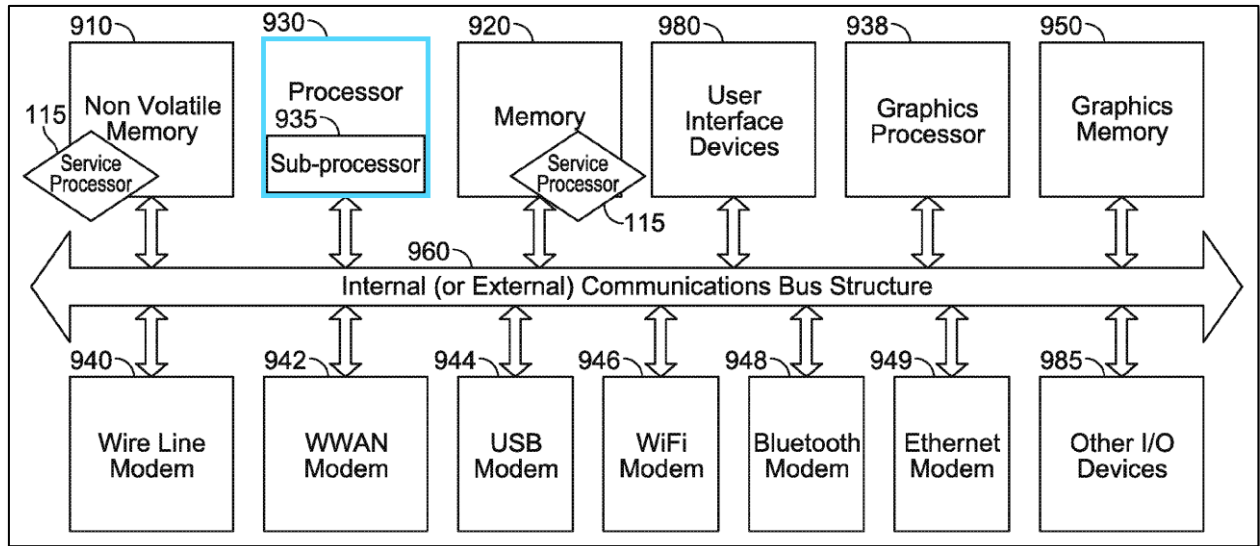
Petitioners apply the corresponding means-plus-function constructions from Section III.C for this Claim.

**1. Claim [26(Pre)]**

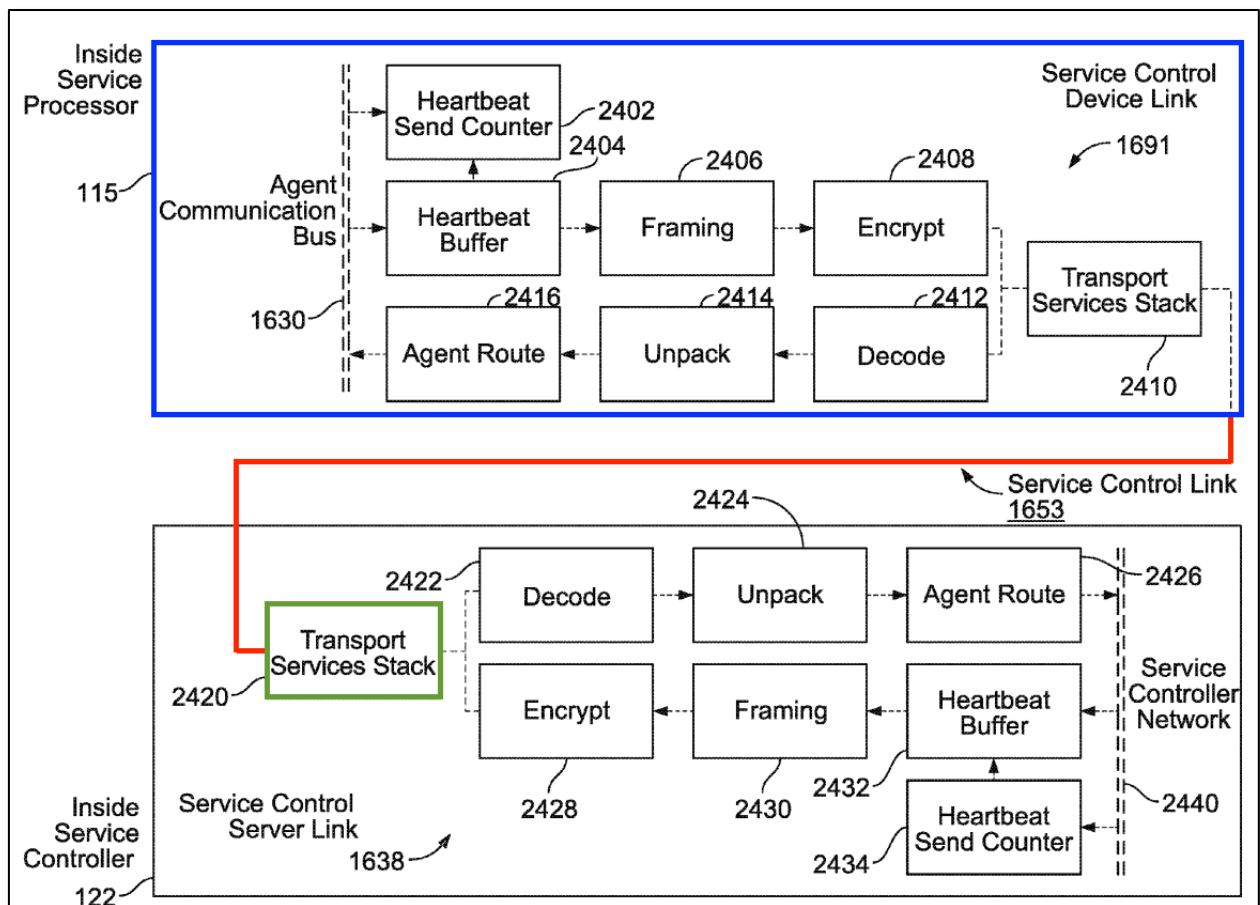
To the extent the preamble is limiting, *a network system*. See Claim [1(Pre)].

**2. Claim [26(a)]**

The '571 Patent describes “the communication link between the service control server link 1638 of service controller 122 and the service control device link 1691 of the service processor 115 can provide ... a service control link 1653 as shown in FIG. 16.” EX1001, 68:18-23. Further, a “control plane communication link [that] provides for a secure (e.g., encrypted) communications link for providing secure, bidirectional communications between the service processor 115 and the service controller 122.” *Id.*, 68:22-27. As depicted below, the '571 Patent discloses structure corresponding to this claim limitation in the form of a processor in a service processor (EX1001, FIG. 9, light blue box) that executes software including a transport services stack (EX1001, FIG. 24, green box). The processor of the '571 Patent, executing the transport services stack, is the structure that establishes the first service control link (EX1001, FIG. 24, red line) with the mobile device (EX1001, FIG. 24, dark blue box line).

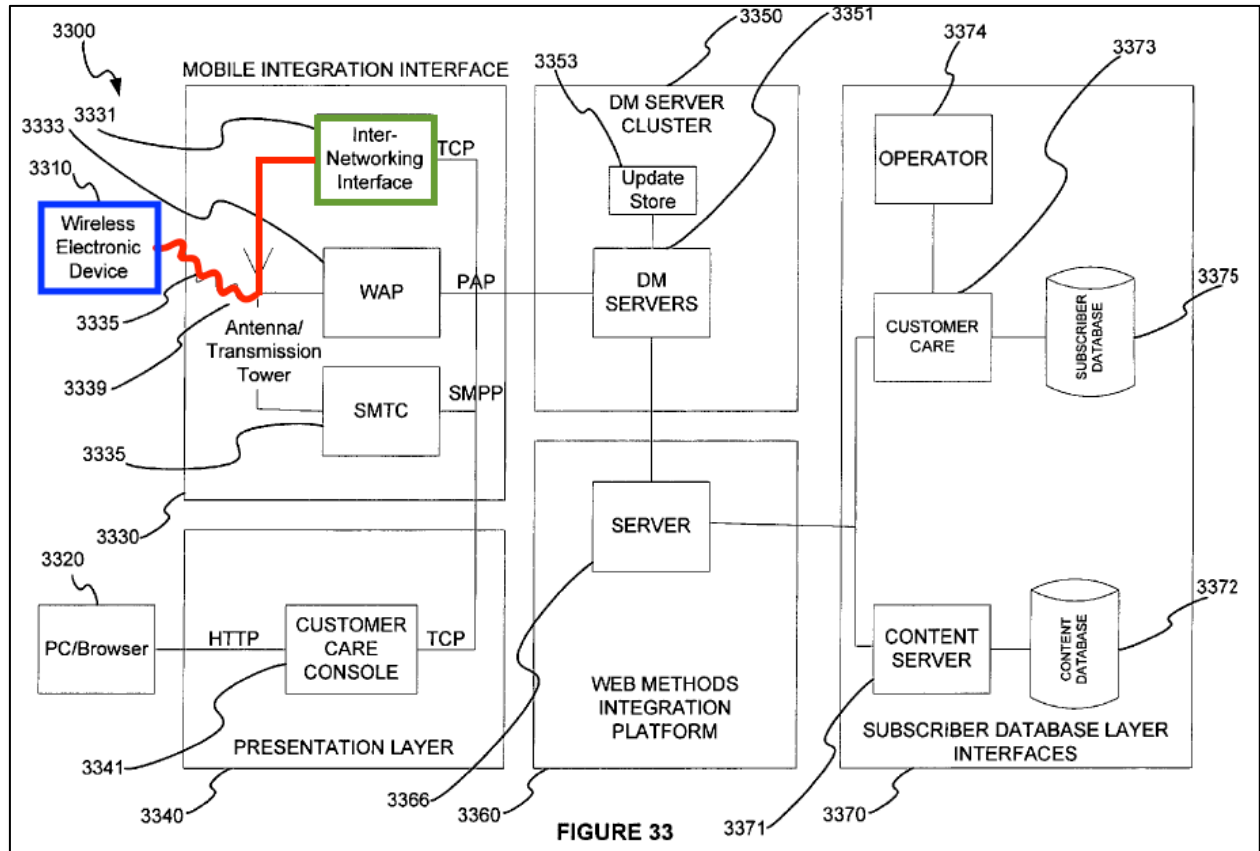


EX1001, FIG. 9.



Ex. 1001, FIG. 24; EX1003, ¶¶215-216.

Chia teaches analogous structure for performing this claim limitation. First, Chia's update management system 3433 includes a processor running software. EX1004, 46:57-62 (giving "64-bit Solaris hardware" and "Intel 32-bit processors" as exemplary hardware platforms). As shown below, Chia's "exemplary electronic device network operator deployment" depicted in FIG. 33 (EX 1004, 7:8-9) includes an "inter-networking interface" (EX1004, FIG. 33, green box) that establishes a wireless communication link 3335 (EX1004, FIG. 33, red line) with Chia's inter-networking interface and is analogous to the transport services stack of the '571 Patent. *Cf.* EX1001, 87:55-62 (discussing how the transport services [stack] can be implemented with "open internet protocols such as TLS or TCP") *with* EX1004, 36:41-42 ("inter-networking interface 3331 may comprise a transmission control protocol (TCP)."); EX1003, ¶217.



EX1004, FIG. 33.

A POSITA would have understood that the inter-networking software in Chia intermediates all TCP communications with the mobile device, including the HTTPS communication described above with respect to claim 1. EX1003, ¶218. Furthermore, the embodiment of FIG. 33 is the same as that cited above with respect to FIG. 34. EX1004, 37:13-17; 38:48-54; EX1003, ¶¶218-219.

A POSITA would thus have understood that the structure comprising Chia’s processors running software, including Chia’s inter-networking interface software, performs the claimed function of *providing a first service control link to a first end-*

*user device communicatively coupled to the network system over a first set of one or more wireless networks* consistent with the mapping discussed in Claim 1(a).

EX1003, ¶¶215-220; Claim [1(a)], EX1003, ¶214.

**3. Claim [26(a)(i)]**

*See* Claim [1(a)(i)].

**4. Claim [26(a)(ii)]**

*See* Claim [1(a)(ii)].

**5. Claim [26(a)(iii)]**

*See* Claim [1(a)(iii)].

**6. Claim [26(a)(iv)]**

*See* Claim [1(a)(iv)].

**7. Claim [26(b)]**

*See* Claims [26(a)], [1(a)].

**8. Claim [26(b)(i)]**

*See* Claim [1(b)(i)].

**9. Claim [26(b)(ii)]**

*See* Claim [1(b)(ii)].

**10. Claim [26(b)(iii)]**

*See* Claim [1(b)(iii)].

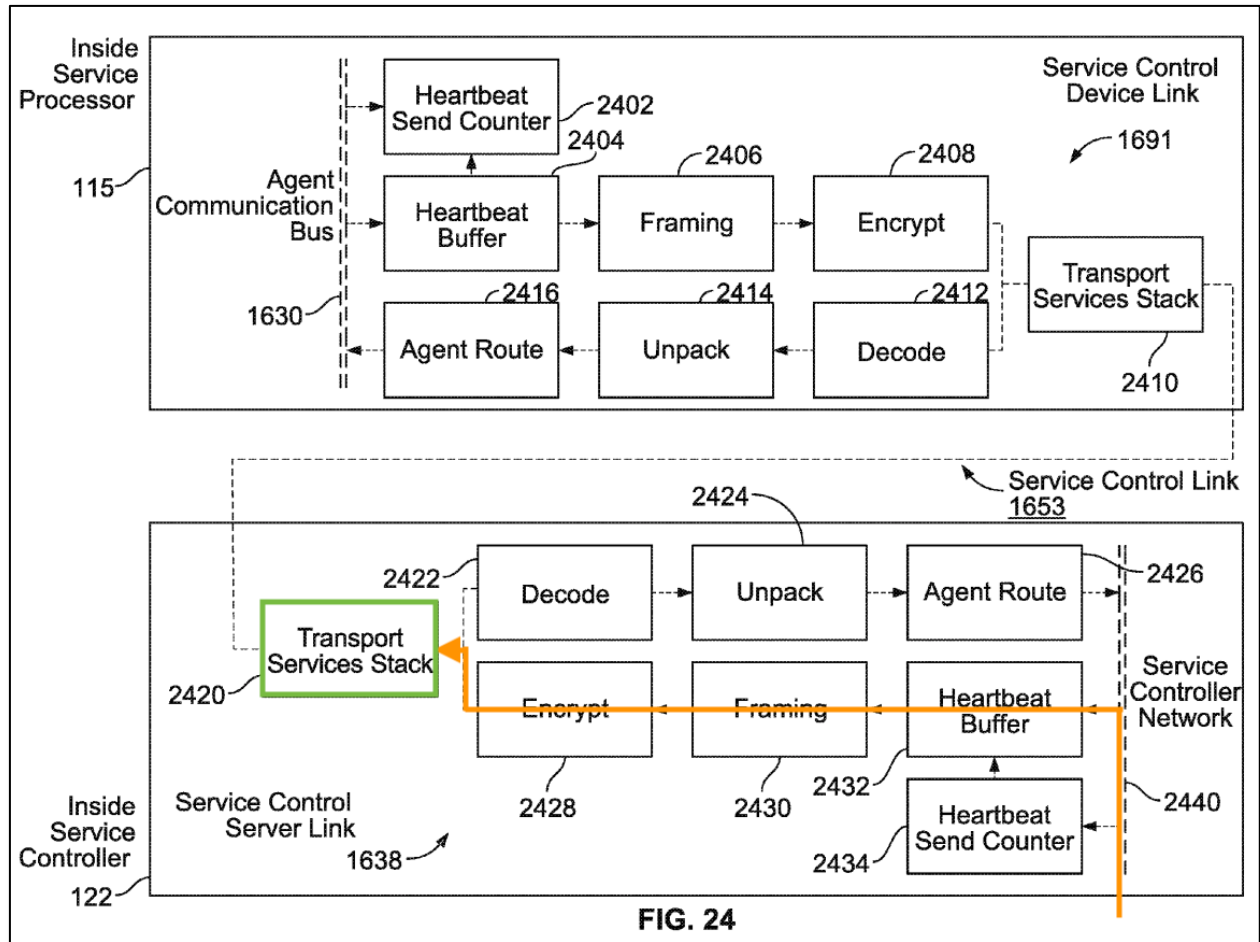
**11. Claim [26(b)(iv)]**

*See* Claim [1(b)(iv)].

**12. Claim [26(c)]**

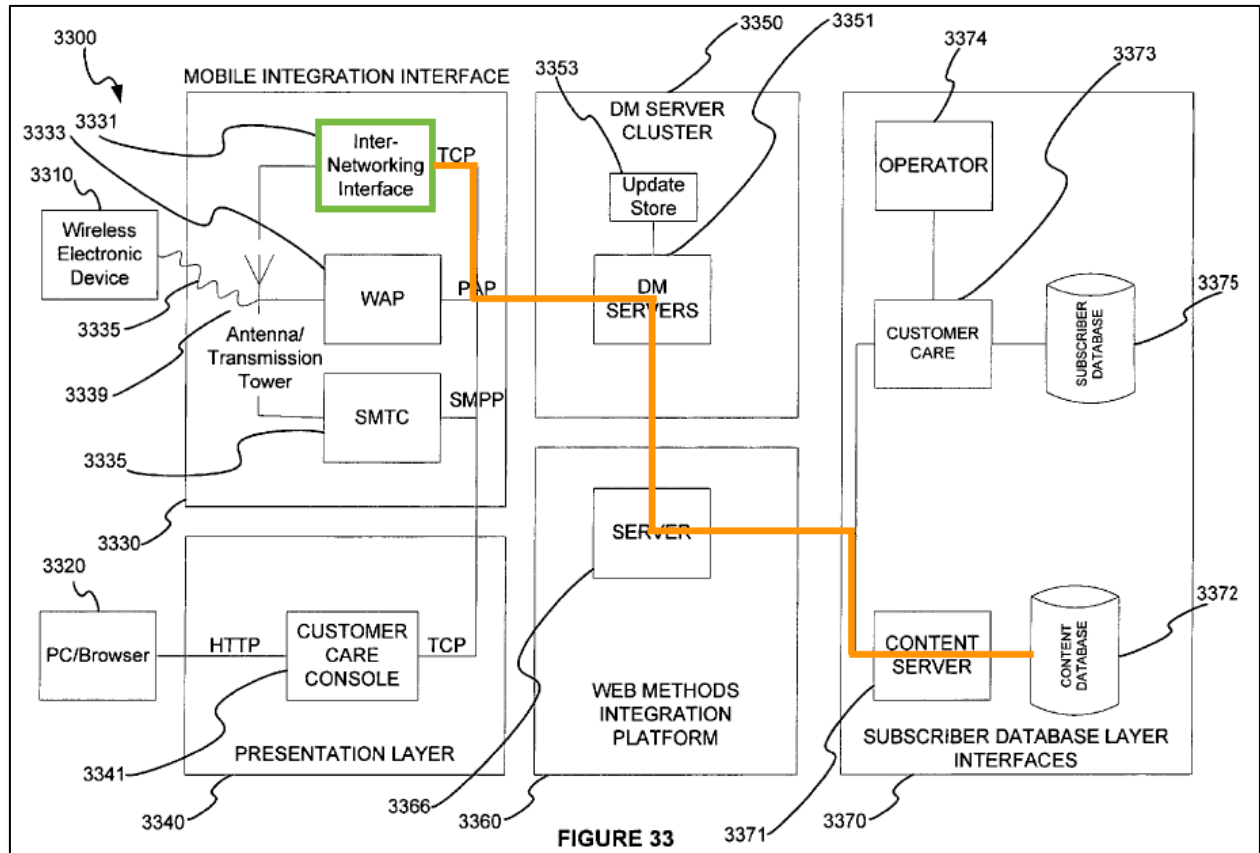
The '571 Patent describes transmitting server messages asynchronously at the service control server link 1638 as they arrive. EX1001, 68:60-64. Further, “the service control server link 1638 can perform collection or buffering of server messages between transmission.” *Id.*

As discussed above, the '571 Patent discloses structure corresponding to this claim limitation in the form of a processor in a service processor (EX1001, FIG. 9, light blue box) that executes software including a transport services stack (EX1001, FIG. 24, green box). The processor of the '571 Patent, executing the transport services stack, is the structure that receives a server message from a particular server (EX1001, FIG. 24, orange line).



EX1001, FIG. 24.

Chia teaches analogous structure for performing this claim limitation. As described above, Chia teaches a processor running software including a transport services stack. *See* Claim [26(a)]. Also as described above, a POSITA would have understood that inter-networking software in Chia intermediates all TCP communications with the mobile device. EX1003, ¶232. As shown below, Chia's processor, executing the inter-networking interface, is the structure that receives a server message from a particular server (EX1004, FIG. 33, orange line).



EX1004, FIG. 33.

The communication pathway depicted in orange above shows *a server message from a particular server*. EX1003, ¶233. In particular, the update store, depicted above as the content database, intermediates communication with the workstation (*particular server*), as Chia teaches that the update store may handle “[u]ploading, **retrieving**, and managing update packages” from the workstation. EX1004, 42:35-46. Chia further teaches the update store may “[s]tor[e] update packages.” *Id.*, 42:38.

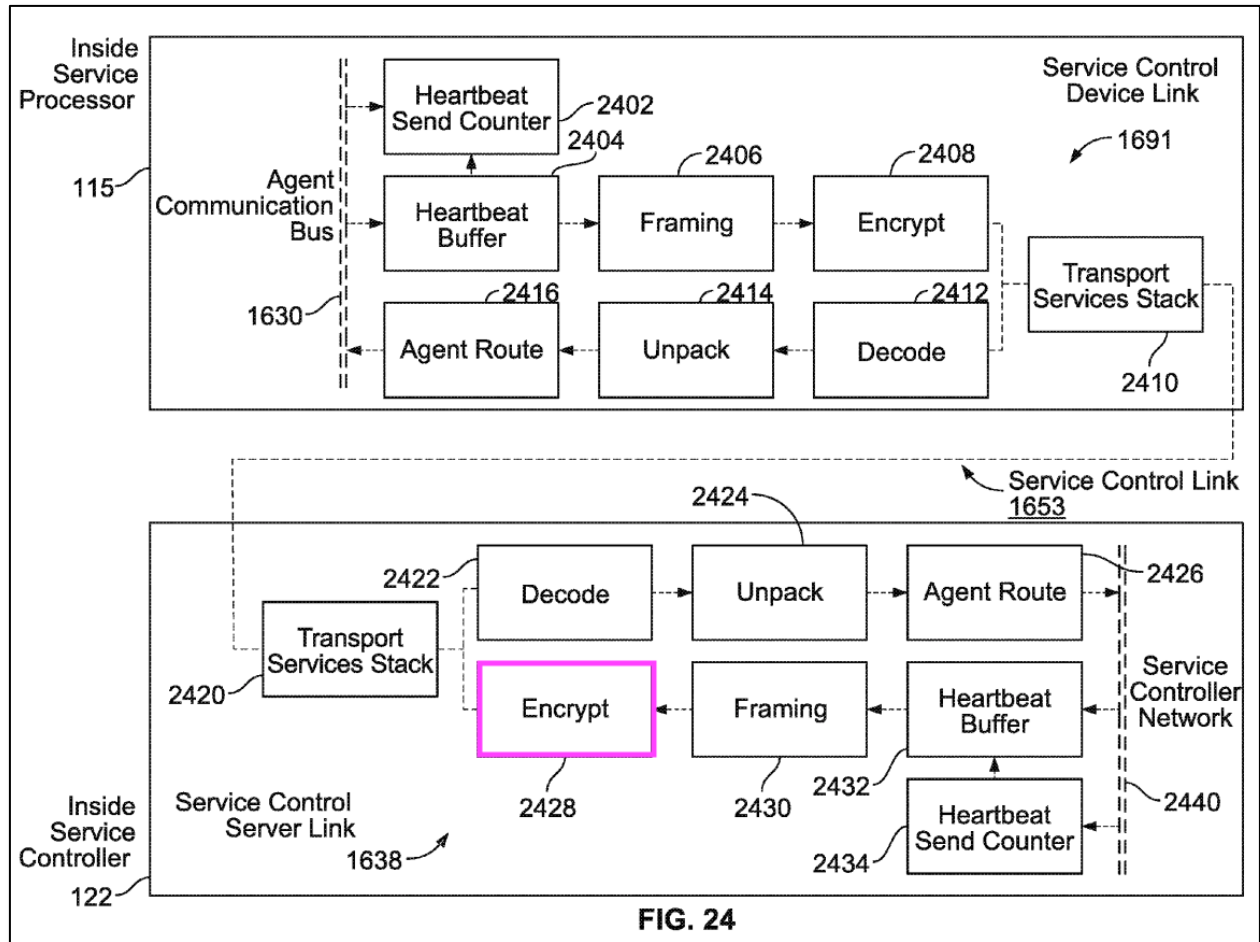
A POSITA would thus have understood that the structure comprising Chia's processors, running software including Chia's inter-networking interface software, performs the claimed function of *receiving a server message from a particular server of a plurality of servers communicatively coupled to the network system* consistent with the mapping discussed in Claim 1(c). EX1003, ¶234; *see* Claim [1(c)].

**13. Claim [26(c)(i)]**

*See* Claim [1(c)(i)].

**14. Claim [26(d)]**

The '571 Patent describes using various elements within the service control server link 1638 of the service controller 122, such as the encryption element 2428 and transport services stack 2420. *See* EX1001, 87:46-62, 89:3-8, FIG. 24. The '571 Patent further describes "various known security encryption techniques" within the context of encrypt functions. *Id.*, 87:46-62. The '571 Patent discloses structure corresponding to this claim limitation in the form of a processor in a service processor (EX1001, FIG. 9, light blue box) that executes software including an encryption protocol (EX1001, FIG. 24, magenta box). The processor of the '571 Patent, executing the encryption protocol, is the structure that generates an encrypted message.



*Id.*, FIG. 24.

Chia-Cunningham teaches analogous structure for performing this claim limitation. As described above, Chia teaches a processor running software. *See* Claim [26(a)]. Cunningham teaches data encryption via “server encryption components.” EX1005, [0010]; EX1003, ¶237. In the Chia-Cunningham combination, the structure for performing this claim limitation would be Chia’s processor running software including Cunningham’s “server encryption

components” to perform the function generating an encrypted message “on the fly” at the modified Chia.

A POSITA would thus have understood that the structure comprising Chia’s processors, running software including Cunningham’s server encryption components, performs the claimed function of *generating an encrypted message comprising the at least a portion of the message payload and an identifier*, consistent with the mapping discussed in Claim 1(d). *See* Claim [1(d)]; EX1003, ¶¶237-239.

**15. Claim [26(d)(i)]**

*See* Claim [1(d)(i)].

**16. Claim [26(e)]**

As previously discussed, the ’571 Patent discloses structure corresponding to this claim limitation in the form of a processor in a service processor (EX1001, FIG. 9, light blue box) that executes software including a transport services stack (EX1001, FIG. 24, green box). *See* Claim [26(a)]. The processor of the ’571 Patent, executing the transport services stack, is the structure that communicates via the first service control link (EX1001, FIG. 24, red line) with the mobile device (EX1001, FIG. 24, dark blue box line.), including communication to send the encrypted message.

As discussed above, Chia teaches analogous structure for performing this claim limitation, including a processor running inter-networking interface software

and that Chia's inter-networking software intermediates all TCP communications with the mobile device. EX1003, ¶¶242-243; Claim [26(a)].

A POSITA would thus have understood that the structure comprising Chia's processors, running software including Chia's inter-networking interface software, performs the claimed function of *sending the encrypted message to the first end-user device over the first service control link*, consistent with the mapping above. Claim [1(e)]; EX1003, ¶¶242-243.

**W. Claim 27**

*See* Claims [26], [10].

**X. Claim 28**

*See* Claims [26], [11].

**Y. Claim 29**

As previously discussed, the '571 Patent discloses structure corresponding to this claim limitation in the form of a processor in a service processor (EX1001, FIG. 9, light blue box) that executes software including a transport services stack (EX1001, FIG. 24, green box). *See* Claim [26(a)]. The processor of the '571 Patent, executing the transport services stack, is the structure that communicates via the first service control link (EX1001, FIG. 24, red line) with the mobile device (EX1001, FIG. 24, dark blue box line), including communication to send or receive credentials, certificates, and/or tokens.

As discussed above, Chia teaches analogous structure for performing this claim limitation, including a processor running inter-networking interface software and that Chia's inter-networking software intermediates all TCP communications with the mobile device. EX1003, ¶¶247-248; Claim [26(a)].

A POSITA would thus have understood that the structure comprising Chia's processors, running software including Chia's inter-networking interface software, performs the claimed function of *sending/obtaining a credential, a certificate, or a token to/from the particular end-user device*, consistent with the mapping discussed in Claim 15. Claim [15]; EX1003, ¶¶247-249.

**Z. Claim 30**

Chia-Cunningham teaches Claim 30. *See* Claims [26], [24].

**VI. GROUND 2: CLAIMS 4 AND 22 ARE OBVIOUS OVER CHIA, CUNNINGHAM, AND CLONTZ**

**A. Claim 4**

Chia-Cunningham-Clontz teaches *information associated with a service usage...compris[ing] a service usage value*.

**1. Chia's Teachings**

As previously discussed, Chia's update management system "may be adapted to supply billing event information to an existing billing infrastructure and to offer 'For Fee' type updates, for example." EX1004, 38:9-14; *see* Claim [3]. Via these

updates, Chia teaches *information associated with a service usage or cost*. Claim [3].

## **2. Clontz's Teachings**

Like Chia, Clontz teaches communicating information, such as service usage, from a server. EX1006, p. 10 (“[the server] also provides a means for fast-access to critical information such as *service usage* and the like.”). Additionally, Clontz teaches that usage data is sent to a mobile-wireless interface system. *Id.*, p. 7. Clontz explains that the usage data used in a pay-per-use system (i.e., for-fee type system) is required to compile an accurate bill. *Id.* Thus, Clontz teaches *service usage compris[ing] a service usage value*. EX1003, ¶253.

## **3. Motivation to Combine**

Chia-Cunningham-Clontz teaches *service usage or cost* in the form of billing event information or “For Fee” updates, which comprises a *service usage value*. A POSITA would have understood that this information would be communicated as *a portion of the message payload* because as mapped, the information communicated to the user’s device is sent in the *message payload*. EX1003, ¶254. Furthermore, a POSITA would have understood that this would be sent as a single payload with the update to reduce network traffic and latency for the *service usage value*. *Id.*

A POSITA would have been motivated to implement Clontz’s teachings regarding transmission of service usage values to “compile an accurate bill” for

Chia's "For Fee" type updates and billing event information. EX1003, ¶¶255-258. Specifically, a POSITA would have recognized the "For Fee" type update system of Chia as a "pay-per-use system." EX1003, ¶255. Therefore, a POSITA would have understood that using Clontz's known service usage technique would have benefited Chia's system in the same way by compiling an accurate bill for the user. EX1003, ¶¶255-256 (establishing Chia and Clontz as similar systems). Indeed, a POSITA would have recognized that including service usage values would have improved auditing and enabled usage-based pricing models.

Further, a POSITA would have had a reasonable expectation of success in modifying Chia to include service usage value, consistent with Clontz's teachings. EX1003, ¶257. Obtaining and sending service usage value in the context of "For Fee" or "Pay-per-use" updates was well-known in client-server systems before the alleged invention. EX1003, ¶¶257-258. Chia already teaches necessary elements to record and send service usage values such as client IDs, billing infrastructure, and memory. EX1003, ¶258. Thus, implementing Clontz's teachings would have been achieved with a reasonable expectation of success. EX1003, ¶¶257-258.

## **B. Claim 22**

Chia-Cunningham-Clontz teaches *the first service control link being within an ambient service*. The '571 Patent describes access to an *ambient service* as "an initial service access in which service access is in some manner limited[,]" such as

“limited duration access before which a service plan must be purchased to maintain service or have service suspended/disabled or throttled or otherwise limited/reduced/downgraded, and/or any other time based...limited initial access for the network enabled device.” EX1001, 49:16-26. The ’571 Patent further describes that ambient services include “free transaction services” and “[a]fter initiation services with the free ambient service discussed above, the user may later choose a post-pay monthly Internet, email and SMS service.” *Id.*, 67:34-51.

### ***1. Clontz’s Teachings***

Clontz describes a method for providing internet access to a wireless device over a wireless network. EX1006, pp. 1-2. Clontz teaches that “an initial free trial access is given [to] the user to try out the wireless network[,]” wherein “[t]he free trial could be time-limited, for example, a 15-minute free trial.” *Id.*, p. 6. The user “will only need to open a web browser or equivalent network or Internet accessing software on a wireless device such as a laptop before logging in a walled garden[,]” wherein the walled garden “allows any user to login to the hotspot, but not go beyond the boundaries of the hotspot[,]” and “all World Wide Web (HTTP) requests are redirected to a ‘landing page’ which will allow access to the internet if conditions are met.” *Id.*, pp. 11-12, 1-2. The user may then obtain Internet access by entering, into the login interface via a “secure browser,” the identification and corresponding

PIN code that had previously been transmitted to the user's mobile phone via SMS.

*Id.*, pp. 6, 14–15.

When the user is connected to the mobile network, notifications sent between the wireless service gateway and the server are transmitted through an HTTPS communication link. *Id.*, pp. 16-17. If the user leaves the mobile network, “the user’s web browser could be immediately diverted to a page informing the user of the deregistration.” *Id.*, p. 17. While connected, a duration notification is indicated on the user’s device through a web browser window. *Id.*, p. 20. The system will also provide a warning before terminating access upon expiration of the time limit, allowing the user to “consider payment options” or log out of any secure websites they are using. *Id.*, p. 15.

## **2. Motivation to Combine**

Chia-Cunningham modified to provide a user with Internet access via a free, time-limited trial teaches an *ambient service being provided at no cost to a user or a subscriber associated with the first end-user device*. Chia-Cunningham-Clontz further teaches a user requesting and accessing Internet content through a web browser (sending and receiving *a transmission*) via the free Internet service (*ambient service*) using their mobile device (*first end-user device*), whereby access through the web browser is established via an HTTPS communication link (*first service control link*).

A POSITA would have found it obvious and been motivated to modify Chia-Cunningham's network system to implement Clontz's method of providing free, time-limited Internet access to mobile users. EX1003, ¶¶263-267. Clontz's free, time-limited network trial would benefit the user by allowing them to "try out the wireless network" to test the quality of the Internet service at no initial cost to the user. EX1006, p. 6; EX1003, ¶263. Additionally, the free trial would provide the user with internet accessibility in the case of emergencies. *Id.* For example, the free trial would be used to download a critical update to software or firmware on the mobile device when no other suitable internet connection is available.

The service provider would also benefit from increased customer acquisition and revenue when their users pay for extended access after their free trial has ended. EX1003, ¶264. Specifically, a POSITA would have understood that by encouraging "the user to at least sample the wireless service that is available," the service provider would increase the likelihood of converting trial users into paying customers. EX1006, p. 6; EX1003, ¶264. Furthermore, the free trial would allow service providers to collect valuable user data, as Clontz explains: "where the free trial period expires, usage data is sent to the mobile-wireless interface system[, and] then stored in a database to keep track of users that have used the wireless network." EX1006, p. 7; EX1003, ¶¶264-265.

A POSITA would have had a reasonable expectation of success when modifying Chia-Cunningham according to Clontz’s teachings. EX1003, ¶¶266-267. Clontz’s method of providing a free trial of Internet service for a user’s mobile device utilizes network capabilities that are commonly integrated in network systems like that of Chia-Cunningham. *Id.* Chia-Cunningham’s electronic device also includes the necessary elements for Clontz’s free trial Internet access, such as the ability to connect to a cellular network, receive SMS messages, and access the Internet through an HTTPS communication link. *Id.*

## **VII. GROUND 3: CLAIM 20 IS OBVIOUS OVER CHIA, CUNNINGHAM, AND HAN**

Chia-Cunningham in view of Han teaches a *content transaction server*.

### **A. Chia’s Teachings**

As previously discussed, Chia teaches offering “For Fee” type updates along with supplying billing event information to an existing billing infrastructure.” *See* Claim [3]. More specifically, Chia explains that its system “may comprise information to be exported to peripheral billing systems.” EX1004, 38:9-14.

### **B. Han’s Teachings**

Han teaches server-client communications, like Chia, where the server is a “payment processing server.” EX1007, p. 9. Han’s server “may comprise any server capable of processing information corresponding to transferring funds between two parties.” *Id.* Han further explains that the payment processing server “may comprise

one or more payment modules including a secured web-service based interface to integrate with micropayment, online payment, mobile payment or legacy payment systems.” *Id.* The payment processing server may also be used “to collect revenue associated with one or more *purchases of access to a media file.*” *Id.*

For example, Han’s payment processing server may receive payments for users trying to download a movie, content publications, and audio files. *Id.* To facilitate the transaction, the payment processing server may collect a fee from a client and transfer all or some of the fee to an account held by the distributor of the media. *Id.* Han further explains that “users may *deposit a given amount of money* in an account, and have the account *deducted for purchases* relating to the system.” *Id.*

### **C. Motivation to Combine**

Chia-Cunningham-Han teaches a payment processing server (*content transaction server*) configured to provide “For Fee” updates (*an electronic commerce offering*) and *transaction platform* to the electronic device (*first end-user device*).

A POSITA would have been motivated to modify Chia with Han’s payment processing server teachings to facilitate supplying billing event information and handling transactions for fee updates, as described in Chia at 38:9-14. EX1003, ¶¶273-276. While Chia explicitly contemplates offering updates for a cost, Chia

does not describe how this functionality is implemented. EX1003, ¶¶273-274 (discussing Chia 38:9-14). Han provides a detailed description of the payment process for implementing “For Fee” type updates. EX1007, p. 9. Because payment processing servers and “For Fee” type updates were well known and commonplace as of the ’571 Patent’s application, a POSITA would have been motivated to look to Han as a guide for implementing “For Fee” updates in Chia’s system. EX1003, ¶¶273-274.

Furthermore, a POSITA would have had a reasonable expectation of success when modifying Chia according to Han’s teachings. EX1003, ¶¶275-276. Han’s payment processing server requires simple components that are commonly integrated in servers like those disclosed in Chia. *Id.* In the combination, Chia’s billing/provisioning server would be modified to include the functionality of Han’s payment processing server and teaches “the particular server” for the reasons discussed above with respect to Claim 2. Han’s payment processing server merely implements comparable servers to Chia’s in a manner specific for transactions related to client-server dynamics. EX1003, ¶¶275-276. Thus, Chia’s system already includes necessary elements for Han’s payment processing server. *Id.* Furthermore, modifying Chia’s billing server to include the functionality of Han’s payment processing server would have been the simple substitution of one known element for

another to obtain predictable results or the use of a known technique to improve similar devices (Chia's network system) in the same way.

**VIII. GROUND 4: CLAIM 25 IS OBVIOUS OVER CHIA, CUNNINGHAM, AND QUMEI**

Chia-Cunningham-Qumei teaches a *second encrypted message comprising the at least a portion of the message payload*.

**A. Chia-Cunningham's Teachings**

Chia-Cunningham teaches generating an encrypted message comprising an identifier in the form of a unique device value. *See* Claim [1(d)]. Chia-Cunningham further teaches that the unique device value (*identifier*) is for assisting in delivering the portion of the message payload to the update agent (*particular device agent*). *See* Claim [1(d)(i)].

**B. Qumei's Teachings**

Like Chia-Cunningham, Qumei teaches an "electronic device [] adapted to retrieve secure encrypted updates from an update delivery server to update at least one of the firmware and the software application selected for updating resident in the electronic device." EX1008, 3:48-52. Further, Qumei teaches a mobile handset comprising an update agent adapted to decipher (decrypt) code and/or data segments. *Id.*, 7:5-17.

Qumei explains that a client within the mobile electronic device is responsible for downloading the updates and, in conjunction with enciphering and deciphering

tools, performs a fault-tolerance process on the update to ensure that the update can be backed up. *Id.*, 9:61-10:6, 10:41-53. The fault-tolerance process involves taking original, decrypted firmware components and update-related components from the software update package, combining the two, and re-encrypting them for storage. *Id.*, 10:34-38. Qumei teaches a variety of encryption/decryption techniques to achieve these fault-tolerance techniques. 8:1-16.

### **C. Motivation to Combine**

Chia-Cunningham-Qumei teaches a second encryption by a device agent after receipt at the mobile device. In particular, the proposed combination teaches receiving the update package (*encrypted message*) at the download agent (*service control device link agent*) of the electronic device where it is decrypted, verified, updated, and re-encrypted (*second encrypted message*) before being transmitted to the update agent (*particular device agent*).

A POSITA would have found it obvious and been motivated to apply the teachings of Qumei regarding fault-tolerant update process to the teachings of Chia to provide a second encrypted message on the mobile device. EX1003, ¶¶281-285. A POSITA would have recognized several benefits attributed to the fault-tolerant update process. EX1003, ¶¶282-285.

First, a POSITA would have understood that the fault-tolerant update of Qumei would be used to ensure proper and continued system operation in the case

of component failures or errors. EX1003, ¶283. Specifically, fault-tolerant updates, as taught by Qumei, would provide redundancy such that a backup update package would be stored in case of a failure during the update process. The preservation of the data update package, as taught by Qumei, allows for the re-initiation of the update process in the event of a failure. EX1003, ¶283 (discussing EX1008, 10:41-52). Because this backup update package provides for a fault-tolerant, redundant update process, a POSITA would have understood that the backup update package would include *at least a portion of the message payload*. *Id.*

Second, a POSITA would have understood that the encrypted backup storage of Qumei would provide enhanced security for the stored update package by storing the update package in encrypted form even while at rest on the end-user mobile device. EX1003, ¶284.

A POSITA would have further had a reasonable expectation of success in the proposed combination. EX1003, ¶285. Specifically, a POSITA would have recognized that Qumei's fault-tolerance techniques would have fit squarely within Chia's express teachings supporting fault-tolerant updates. EX1003, ¶285; EX1004, 45:57-63 ("update agent 3421 may support *fault-tolerant updates*"). Indeed, Chia's system already contains necessary elements required for Qumei's fault-tolerance technique including memory and encryption/decryption means. EX1003, ¶285.

## IX. CONCLUSION

For the foregoing reasons, Petitioners respectfully request *inter partes* review of the Challenged Claims.

Respectfully submitted,

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COUNSEL FOR PETITIONERS

**X. MANDATORY NOTICES UNDER 37 C.F.R. § 42.8(A)(1)**

**A. Real Party-In-Interest**

Petitioners are the real parties-in-interest, along with Amazon.com, Inc. 37 C.F.R. § 42.8(b)(1).

**B. Related Matters**

Patent Owner has filed approximately 75 lawsuits involving patents related to the Challenged Patent, most of which remain pending. Defendants in those lawsuits have filed a number of IPRs challenging claims for asserted patents. Petitioner has filed pending IPR2025-01572, challenging the claims of U.S. Patent No. 10,064,055, which is owned by Patent Owner and asserted against Apple in the Litigation set forth below. Petitioner submits with this Petition an Appendix of Related Matters identifying (1) a subset of the litigations involving patents related to the '571 Patent (i.e., in the same family and claiming priority to at least one common priority document) and asserted against each Petitioner; and (2) a list of the litigations filed by Patent Owner involving family members of the Challenged Patent and IPRs challenging asserted patents. The Appendix of Related Matters includes the list of all IPRs and non-dismissed lawsuits.

**C. Lead and Back-Up Counsel**

Petitioners provide the following designation and service information for lead and back-up counsel. 37 C.F.R. § 42.8(b)(3) and (b)(4).

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**D. 37 C.F.R. § 42.8(b)(4) – Service Information**

Please address all correspondence to the lead and back-up counsel as shown above. Petitioners consent to electronic service by e-mail at the e-mail addresses provided above.<sup>7</sup>

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<sup>7</sup> For purposes of this IPR, the Petitioner parties have designated a lead counsel as a commitment to act as a single entity in the proceeding. Counsel for each party will coordinate and act through the designated lead counsel. This designation is not a representation of an attorney-client relationship.

**CLAIM LISTING APPENDIX**  
**U.S. Patent No. 8,667,571 for Claims 1-30**

| <b>Claim Designation</b> | <b>Claim Language</b>                                                                                                                                                                                                                           |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Claim 1[P]               | 1. A method performed by a network system, the method comprising:                                                                                                                                                                               |
| Claim 1(a)               | providing a first service control link to a first end-user device communicatively coupled to the network system over a first set of one or more wireless networks,                                                                              |
| Claim 1(a)(i)            | the first service control link secured at least in part by at least a first encryption protocol,                                                                                                                                                |
| Claim 1(a)(ii)           | the first service control link for supporting first control-plane communications between the network system and the first end-user device,                                                                                                      |
| Claim 1(a)(iii)          | the first end-user device comprising a first set of two or more device agents,                                                                                                                                                                  |
| Claim 1(a)(iv)           | the first set of two or more device agents including a particular device agent;                                                                                                                                                                 |
| Claim 1(b)               | providing a second service control link to a second end-user device communicatively coupled to the network system over a second set of one or more wireless networks,                                                                           |
| Claim 1(b)(i)            | the second set of one or more wireless networks being the same as or different from the first set of one or more wireless networks,                                                                                                             |
| Claim 1(b)(ii)           | the second service control link secured at least in part by at least a second encryption protocol,                                                                                                                                              |
| Claim 1(b)(iii)          | the second encryption protocol being the same as or different from the first encryption protocol, the second service control link for supporting second control-plane communications between the network system and the second end-user device, |
| Claim 1(b)(iv)           | the second end-user device comprising a second set of two or more device agents;                                                                                                                                                                |
| Claim 1(c)               | receiving a server message from a particular server of a plurality of servers communicatively coupled to the network system,                                                                                                                    |
| Claim 1(c)(i)            | the server message comprising message payload, at least a portion of the message payload for delivery to the first end-user device;                                                                                                             |

| <b>Claim Designation</b> | <b>Claim Language</b>                                                                                                                                                                                                                                                                                                                                                                                   |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Claim 1(d)               | generating an encrypted message comprising the at least a portion of the message payload and an identifier,                                                                                                                                                                                                                                                                                             |
| Claim 1(d)(i)            | the identifier identifying the particular device agent, the identifier for assisting in delivering the at least a portion of the message payload to the particular device agent; and                                                                                                                                                                                                                    |
| Claim 1(e)               | sending the encrypted message to the first end-user device over the first service control link.                                                                                                                                                                                                                                                                                                         |
| Claim 2                  | 2. The method of claim 1, wherein the particular server comprises a service usage server, a policy management server, an access control integrity server, a network traffic analysis server, a beta test server, a service download control server, a billing event server, an activation server, a transaction server, an authentication server, or a content management server.                       |
| Claim 3                  | 3. The method of claim 1, wherein the at least a portion of the message payload comprises information associated with a service usage or cost.                                                                                                                                                                                                                                                          |
| Claim 4                  | 4. The method of claim 3, wherein the information associated with a service usage or cost comprises a service usage value, a projected service usage value, a service plan limit, a projected service usage overage warning, a projected service cost overage warning, a service plan period time duration, a service plan time remaining before end of period, or information about a service overage. |
| Claim 5                  | 5. The method of claim 1, wherein the at least a portion of the message payload is based, at least in part, on a user preference.                                                                                                                                                                                                                                                                       |
| Claim 6                  | 6. The method of claim 1, wherein the at least a portion of the message payload comprises at least an aspect of: a service offer, an advertisement, or a transaction offer.                                                                                                                                                                                                                             |
| Claim 7                  | 7. The method of claim 1, wherein the at least a portion of the message payload comprises an instruction for a first device agent in the first set of two or more device agents, a setting, a configuration for the first device agent in the first set of two or more device agents, or a software update for the particular device agent.                                                             |
| Claim 8                  | 8. The method of claim 1, wherein the at least a portion of the message payload comprises information associated with software or a media file.                                                                                                                                                                                                                                                         |

| Claim Designation | Claim Language                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Claim 9           | 9. The method of claim 1, wherein the at least a portion of the message payload comprises information associated with a service policy.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Claim 10          | 10. The method of claim 1, wherein the at least a portion of the message payload comprises an indication of additional data or information available to the particular device agent.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Claim 11          | 11. The method of claim 1, wherein the at least a portion of the message payload is configured to assist in causing the first end-user device to present, through a user interface of the first end-user device, information associated with the at least a portion of the message payload.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Claim 12          | 12. The method of claim 1, wherein the server message is a first server message, and wherein the message payload is a first message payload, and wherein the identifier is a first identifier, and further comprising receiving a second server message from the particular server or from another server of the plurality of servers communicatively coupled to the network system, the second server message comprising second message payload, and wherein the encrypted message further comprises at least a portion of the second message payload and a second identifier, the second identifier for assisting in delivering the at least a portion of the second message payload to a second device agent of the first set of two or more device agents, the second device agent being the particular device agent or another device agent of the first set of two or more device agents. |

| Claim Designation | Claim Language                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Claim 13          | 13. The method of claim 1, wherein the server message is a first server message, and wherein the particular server is a first server, and wherein the message payload is first message payload, and wherein the particular device agent is a first device agent, and wherein the encrypted message is a first encrypted message, and wherein the identifier is a first identifier, and further comprising: receiving a second server message from a second server of the plurality of servers communicatively coupled to the network system, the second server message comprising second message payload, at least a portion of the second message payload for delivery to the first end-user device; generating a second encrypted message comprising the at least a portion of the second message payload and a second identifier, the second identifier for assisting the first end-user device in delivering the at least a portion of the second message payload to a second device agent of the first set of two or more device agents; and sending the second encrypted message to the first end-user device over the first service control link. |
| Claim 14          | 14. The method of claim 1, wherein the first service control link supports asynchronous transmissions by the network system.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Claim 15          | 15. The method of claim 1, further comprising sending a credential, a certificate, or a token to the first end-user device or obtaining the credential, the certificate, or the token from the first end-user device during a service authorization sequence.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Claim 16          | 16. The method of claim 15, wherein the credential comprises a phone number, an identification number, a security signature, a security credential, a subscriber identity module (SIM) identifier, a mobile equipment identifier (MEID), or a device identifier.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Claim 17          | 17. The method of claim 1, wherein the particular device agent comprises software.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Claim 18          | 18. The method of claim 1, further comprising: triggering a transmission to maintain the first service control link when a time since sending the encrypted message to the first end-user device would otherwise cause the first service control link to terminate.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

| Claim Designation | Claim Language                                                                                                                                                                                                                                                                                                                                                                |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Claim 19          | 19. The method of claim 1, wherein the sending the encrypted message to the first end-user device over the first service control link is not based on whether the particular device agent is running on the first end-user device.                                                                                                                                            |
| Claim 20          | 20. The method of claim 1, wherein the particular server comprises a content transaction server configured to provide an electronic commerce offering and transaction platform to the first end-user device.                                                                                                                                                                  |
| Claim 21          | 21. The method of claim 1, further comprising sending a credential, a certificate, or a token to the particular device agent or obtaining the credential, the certificate, or the token from the particular device agent during a service authorization sequence.                                                                                                             |
| Claim 22          | 22. The method of claim 1, wherein a transmission over the first service control link is within an ambient service, the ambient service being provided at no cost to a user or a subscriber associated with the first end-user device.                                                                                                                                        |
| Claim 23          | 23. The method of claim 1, wherein the first service control link enables the particular server to push the at least a portion of the message payload to the particular device agent.                                                                                                                                                                                         |
| Claim 24          | 24. The method of claim 1, wherein providing the first service control link to the first end-user device comprises providing the first service control link to a service control device link agent on the first end-user device, the service control device link agent for delivering agent messages over an agent communication bus to at least the particular device agent. |
| Claim 25          | 25. The method of claim 24, wherein the encrypted message is a first encrypted message, and wherein the identifier is configured to assist the service control device link agent in generating a second encrypted message for delivery to the particular device agent, the second encrypted message comprising the at least a portion of the message payload.                 |
| Claim 26[P]       | 26. A network system, comprising:                                                                                                                                                                                                                                                                                                                                             |
| Claim 26(a)       | means for providing a first service control link to a first end-user device communicatively coupled to the network system over a first set of one or more wireless networks,                                                                                                                                                                                                  |
| Claim 26(a)(i)    | the first service control link secured at least in part by at least a first encryption protocol,                                                                                                                                                                                                                                                                              |

| <b>Claim Designation</b> | <b>Claim Language</b>                                                                                                                                                                                                                           |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Claim 26(a)(ii)          | the first service control link for supporting first control-plane communications between the network system and the first end-user device,                                                                                                      |
| Claim 26(a)(iii)         | the first end-user device comprising a first set of two or more device agents,                                                                                                                                                                  |
| Claim 26(a)(iv)          | the first set of two or more device agents including a particular device agent;                                                                                                                                                                 |
| Claim 26(b)              | means for providing a second service control link to a second end-user device communicatively coupled to the network system over a second set of one or more wireless networks,                                                                 |
| Claim 26(b)(i)           | the second set of one or more wireless networks being the same as or different from the first set of one or more wireless networks,                                                                                                             |
| Claim 26(b)(ii)          | the second service control link secured at least in part by at least a second encryption protocol,                                                                                                                                              |
| Claim 26(b)(iii)         | the second encryption protocol being the same as or different from the first encryption protocol, the second service control link for supporting second control-plane communications between the network system and the second end-user device, |
| Claim 26(b)(iv)          | the second end-user device comprising a second set of two or more device agents;                                                                                                                                                                |
| Claim 26(c)              | means for receiving a server message from a particular server of a plurality of servers communicatively coupled to the network system,                                                                                                          |
| Claim 26(c)(i)           | the server message comprising message payload, at least a portion of the message payload for delivery to the first end-user device;                                                                                                             |
| Claim 26(d)              | means for generating an encrypted message comprising the at least a portion of the message payload and an identifier,                                                                                                                           |
| Claim 26(d)(i)           | the identifier identifying the particular device agent, the identifier for assisting in delivering the at least a portion of the message payload to the particular device agent; and                                                            |
| Claim 26(e)              | means for sending the encrypted message to the first end-user device over the first service control link.                                                                                                                                       |
| Claim 27                 | 27. The network system recited in claim 26, wherein the message payload comprises an indication of additional data or information available to the particular device agent.                                                                     |

| <b>Claim Designation</b> | <b>Claim Language</b>                                                                                                                                                                                                                                                                                                                                                                          |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Claim 28                 | 28. The network system recited in claim 26, wherein the message payload is configured to assist in causing the first end-user device to present, through a user interface of the first end-user device, information associated with the at least a portion of the message payload.                                                                                                             |
| Claim 29                 | 29. The network system recited in claim 26, further comprising means for sending a credential, a certificate, or a token to the particular end-user device or obtaining the credential, the certificate, or the token from the particular end-user device during a service authorization sequence.                                                                                             |
| Claim 30                 | 30. The network system recited in claim 26, wherein providing the first service control link to the first end-user device comprises providing the first service control link to a service control device link agent on the first end-user device, the service control device link agent for delivering agent messages over an agent communication bus to at least the particular device agent. |

## APPENDIX OF EXHIBITS

|                     |                                                                                                                                                                                                                                                                         |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Exhibit 1001</b> | U.S. Patent No. 8,667,571 (“’571 Patent”)                                                                                                                                                                                                                               |
| <b>Exhibit 1002</b> | File History of U.S. Patent No. 8,667,571 ( <i>’571 Patent FH</i> )                                                                                                                                                                                                     |
| <b>Exhibit 1003</b> | Declaration of Dr. Charles D. Creusere, Ph. D.                                                                                                                                                                                                                          |
| <b>Exhibit 1004</b> | U.S. Patent No. 8,555,273 to Chia et al. (“ <i>Chia</i> ”)                                                                                                                                                                                                              |
| <b>Exhibit 1005</b> | U.S. Patent Application Publication No. US2007/0185975 to Cunningham et al. (“ <i>Cunningham</i> ”)                                                                                                                                                                     |
| <b>Exhibit 1006</b> | International Publication No. WO2005/094011 to Clontz et al. (“ <i>Clontz</i> ”)                                                                                                                                                                                        |
| <b>Exhibit 1007</b> | International Publication No. WO2008/060300 to Han et al. (“ <i>Han</i> ”)                                                                                                                                                                                              |
| <b>Exhibit 1008</b> | U.S. Patent No. 7,975,147 to Qumei (“ <i>Qumei</i> ”)                                                                                                                                                                                                                   |
| <b>Exhibit 1009</b> | Leiner et al. <i>ISOC History of the Internet</i> . 1997. <a href="https://www.internetsociety.org/resources/doc/2017/brief-history-internet/">https://www.internetsociety.org/resources/doc/2017/brief-history-internet/</a> (“ <i>Leiner</i> ”)                       |
| <b>Exhibit 1010</b> | U.S. Patent Application Publication No. US2008/0316963 to Huang et al. (“ <i>Huang</i> ”)                                                                                                                                                                               |
| <b>Exhibit 1011</b> | U.S. Patent Application Publication No. US2006/0143701 to Dos Santos et al. (“ <i>Dos Santos</i> ”)                                                                                                                                                                     |
| <b>Exhibit 1012</b> | U.S. Patent Application Publication No. US2003/0120822 to Langrind et al. (“ <i>Langrind</i> ”)                                                                                                                                                                         |
| <b>Exhibit 1013</b> | Lehman et al. “Control Plane Architecture and Design Considerations for Multi-Service, Multi-Layer, Multi-Domain Hybrid Networks.” May 2007. (“ <i>Lehman</i> ”)                                                                                                        |
| <b>Exhibit 1014</b> | Harold, Elliott Rusty. <i>Java Network Programming</i> . Third Edition. October 2004. (“ <i>Harold</i> ”)                                                                                                                                                               |
| <b>Exhibit 1015</b> | U.S. Patent No. 7,627,532 to Randle et al. (“ <i>Randle</i> ”)                                                                                                                                                                                                          |
| <b>Exhibit 1016</b> | U.S. Patent No. 8,429,081 to Dronamraju et al. (“ <i>Dronamraju</i> ”)                                                                                                                                                                                                  |
| <b>Exhibit 1017</b> | U.S. Patent Application Publication No. US2008/0008116 to Buga et al. (“ <i>Buga</i> ”)                                                                                                                                                                                 |
| <b>Exhibit 1018</b> | 3GPP TS 23.140. Version 6.9.0. March 2005. <a href="https://www.etsi.org/deliver/etsi_ts/123100_123199/123140/06.09.00_60/ts_123140v060900p.pdf">https://www.etsi.org/deliver/etsi_ts/123100_123199/123140/06.09.00_60/ts_123140v060900p.pdf</a> (“ <i>TS-23.140</i> ”) |
| <b>Exhibit 1019</b> | U.S. Patent No. 5,625,877 to Dunn et al. (“ <i>Dunn</i> ”)                                                                                                                                                                                                              |
| <b>Exhibit 1020</b> | U.S. Patent Application Publication No. US2008/0194233 to Henry (“ <i>Henry</i> ”)                                                                                                                                                                                      |

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|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Exhibit 1021</b> | Singhal et al. <i>NIST Guide to Secure Web Services</i> . August 2007. <a href="https://nvlpubs.nist.gov/nistpubs/legacy/sp/nistspecialpublication800-95.pdf">https://nvlpubs.nist.gov/nistpubs/legacy/sp/nistspecialpublication800-95.pdf</a> (“ <i>NIST</i> ”) |
| <b>Exhibit 1022</b> | Chimeh et al. “Traffic Capacity of UMTS System in Reverse Link.” <i>Wireless Personal Communications</i> . 51(2):303-316. October 2008. (“ <i>Traffic</i> ”)                                                                                                     |
| <b>Exhibit 1023</b> | Holly Lynne McKinley. <i>SSL and TLS: A Beginners’ Guide</i> . 2003. <a href="https://www.giac.org/paper/gsec/2766/ssl-tls-beginners-guide/104699">https://www.giac.org/paper/gsec/2766/ssl-tls-beginners-guide/104699</a> (“ <i>SSL and TLS</i> ”)              |
| <b>Exhibit 1024</b> | Robert Richards. <i>Pro PHP XML and Web Services</i> . 2006.(“ <i>Pro PHP</i> ”)                                                                                                                                                                                 |
| <b>Exhibit 1025</b> | U.S. Patent Application Publication No. US2007/0165622 to O’Rourke et al. (“ <i>O’Rourke</i> ”)                                                                                                                                                                  |
| <b>Exhibit 1026</b> | U.S. Patent Application Publication No. US2007/0033273 to White et al. (“ <i>White</i> ”)                                                                                                                                                                        |
| <b>Exhibit 1027</b> | U.S. Patent Application Publication No. US2008/0072035 to Johnson et al. (“ <i>Johnson</i> ”)                                                                                                                                                                    |
| <b>Exhibit 1028</b> | U.S. Patent Application Publication No. US2006/0098678 to Tan (“ <i>Tan</i> ”)                                                                                                                                                                                   |
| <b>Exhibit 1029</b> | U.S. Patent No. 7,120,429 to Minear et al. (“ <i>Minear</i> ”)                                                                                                                                                                                                   |
| <b>Exhibit 1030</b> | Frei et al. “Large-Scale Vulnerability Analysis.” September 2006. (“ <i>Frei</i> ”)                                                                                                                                                                              |
| <b>Exhibit 1031</b> | U.S. Patent Application Publication No. US2008/0288599 to Kutchmark et al. (“ <i>Kutchmark</i> ”)                                                                                                                                                                |
| <b>Exhibit 1032</b> | RFC 2068 Specification. January 1997. <a href="https://www.rfc-editor.org/rfc/pdf/rfc2068.txt.pdf">https://www.rfc-editor.org/rfc/pdf/rfc2068.txt.pdf</a> (“ <i>RFC</i> ”)                                                                                       |
| <b>Exhibit 1033</b> | International Publication No. WO2007/059628 to Grigoriev et al. (“ <i>Grigoriev</i> ”)                                                                                                                                                                           |
| <b>Exhibit 1034</b> | Rob Mattison. <i>The Telco Revenue Assurance Handbook</i> . 2005. (“ <i>Telco</i> ”)                                                                                                                                                                             |
| <b>Exhibit 1035</b> | U.S. Patent Application Publication No. US2001/0027449 to Wright (“ <i>Wright</i> ”)                                                                                                                                                                             |
| <b>Exhibit 1036</b> | Bawa et al. “The Effects of Free Sample Promotions on Incremental Brand Sales.” <i>Marketing Science</i> . 23(3):345-363. August 2004. (“ <i>Free Samples</i> ”)                                                                                                 |
| <b>Exhibit 1037</b> | U.S. Patent No. 6,763,479 to Herbet (“ <i>Herbet</i> ”)                                                                                                                                                                                                          |
| <b>Exhibit 1038</b> | U.S. Patent No. 6,651,117 to Wilson et al. (“ <i>Wilson</i> ”)                                                                                                                                                                                                   |
| <b>Exhibit 1039</b> | U.S. Patent Application Publication No. US2010/0088235 to Chatfield et al. (“ <i>Chatfield</i> ”)                                                                                                                                                                |

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| <b>Exhibit 1040</b> | Downing et al. <i>Barron's Dictionary of Computer and Internet Terms</i> . Tenth Edition. 2009. (“ <i>Barron's</i> ”)                                                                                                                                                                                                                                               |
| <b>Exhibit 1041</b> | Gateway. <i>PC Basics – Get a Great Start</i> . 2002. (“ <i>Gateway</i> ”)                                                                                                                                                                                                                                                                                          |
| <b>Exhibit 1042</b> | U.S. Patent Application Publication No. US2005/0198257 to Gupta et al. (“ <i>Gupta</i> ”)                                                                                                                                                                                                                                                                           |
| <b>Exhibit 1043</b> | U.S. Patent No. 8,037,295 to Lin (“ <i>Lin</i> ”)                                                                                                                                                                                                                                                                                                                   |
| <b>Exhibit 1044</b> | U.S. Patent Application Publication No. US2006/0274743 to Yegin et al. (“ <i>Yegin</i> ”)                                                                                                                                                                                                                                                                           |
| <b>Exhibit 1045</b> | U.S. Patent No. 7,702,107 to Messing (“ <i>Messing</i> ”)                                                                                                                                                                                                                                                                                                           |
| <b>Exhibit 1046</b> | Mackie-Mason et al. “Some Economics of the Internet.” February 1994.<br><a href="https://people.ischool.berkeley.edu/~hal/Papers/UM/Economics_of_Internet.pdf">https://people.ischool.berkeley.edu/~hal/Papers/UM/Economics_of_Internet.pdf</a> (“ <i>MacKie-Mason</i> ”)                                                                                           |
| <b>Exhibit 1047</b> | Microsoft Server 2003 Datasheet. 2003.<br><a href="https://download.microsoft.com/download/a/1/4/a143262c-4912-460c-9c88-d797c749a05f/WS03_Partner_Salessheet.pdf">https://download.microsoft.com/download/a/1/4/a143262c-4912-460c-9c88-d797c749a05f/WS03_Partner_Salessheet.pdf</a>                                                                               |
| <b>Exhibit 1048</b> | Microsoft Server 2008 Datasheet.<br><a href="https://my.avnet.com/wcm/connect/e42e7469-1994-4d2c-b28d-146afa772feb/WS08_Datasheet.pdf?MOD=AJPERES&amp;CVID=oSI3y8n">https://my.avnet.com/wcm/connect/e42e7469-1994-4d2c-b28d-146afa772feb/WS08_Datasheet.pdf?MOD=AJPERES&amp;CVID=oSI3y8n</a>                                                                       |
| <b>Exhibit 1049</b> | Sudhansu Pati. “EJB Development Using Borland JBuilder 8 and BEA WebLogic Server 7.0.” December 2002. (“ <i>Borland</i> ”)<br><a href="https://web.archive.org/web/20070226071411/http://dn.codegear.com/article/images/29528/ejbdevjbweblogic.pdf">https://web.archive.org/web/20070226071411/http://dn.codegear.com/article/images/29528/ejbdevjbweblogic.pdf</a> |

**CERTIFICATION OF WORD COUNT**

The undersigned certifies pursuant to 37 C.F.R. §42.24 that the foregoing Petition for *Inter Partes* Review, excluding any table of contents, mandatory notices under 37 C.F.R. §42.8, certificates of service or word count, or appendix of exhibits, contains 13934 words according to the word-processing program used to prepare this document (Microsoft Word).

Dated: October 13, 2025

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**CERTIFICATE OF SERVICE ON PATENT OWNER  
UNDER 37 C.F.R. § 42.105**

Pursuant to 37 C.F.R. §§ 42.6(e) and 42.105(b), the undersigned certifies that on October 14, 2025, a complete and entire copy of this Petition for *Inter Partes* Review and Exhibits were provided via Federal Express to the Patent Owner by serving the correspondence address of record for the '055 Patent:

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Further, a courtesy copy of this Petition for *Inter Partes* Review was sent via email to Patent Owner's litigation counsel:

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## **APPENDIX OF RELATED MATTERS**

### **RELATED APPLE MATTERS**

| <b>Litigation Matter</b>                                                                    | <b>Patents-In-Suit</b>                                                         | <b>Related Patents</b>                                                                                                                                                         |
|---------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Headwater Research LLC v. Apple Inc.</i> , U.S. Dist. Ct. W.TX No. 7:25-cv-00318         | 10,064,055<br>8,667,571                                                        | 10,064,055 –<br>8,667,571 – Family Member                                                                                                                                      |
| <i>Headwater Research LLC v. Apple Inc.</i> , U.S. Dist. Ct. W.TX, No. 7:25-cv-00370        | 9,973,930<br>11,096,055<br>11,405,429<br>11,966,464<br>11,985,155<br>9,609,510 | 9,973,930 – Family Member<br>11,096,055 – Family Member<br>11,405,429 – Family Member<br>11,966,464 – Family Member<br>11,985,155 – Family Member<br>9,609,510 – Family Member |
| <i>Headwater Research LLC v. Apple Inc.</i> , U.S. Dist. Ct. W.TX., No. 7:25-cv-00371       | 9,615,192<br>10,321,320                                                        | 9,615,192 – Family Member<br>10,321,320 – Family Member                                                                                                                        |
| <i>Headwater Research LLC v. Apple Inc.</i> , U.S. Dist. Ct., W.TX., No. 7:25-cv-00373      | 9,154,428<br>9,277,445<br>9,392,462<br>9,866,642                               | 9,154,428 – Family Member<br>9,277,445 – Family Member<br>9,392,462 – Family Member<br>9,866,642 – Family Member                                                               |
| <i>Headwater Research LLC v. Apple Inc.</i> , U.S. Dist. Ct., W.TX, Case No. 7:25-cv-00375  | 8,631,102<br>8,799,451<br>8,023,425                                            | 8,631,102 – Family Member<br>8,799,451 – Family Member<br>8,023,425 – Family Member                                                                                            |
| <i>Headwater Research LLC v. Apple Inc.</i> , U.S. Dist. Ct., W.TX, Case No. 7:25-cv-00377  | 8,635,335<br>10,237,757<br>10,791,471                                          | 8,635,335 – Family Member<br>10,237,757 – Family Member<br>10,791,471 – Family Member                                                                                          |
| <i>Headwater Research LLC v. Apple Inc.</i> , U.S. Dist. Ct., W.TX., Case No. 7:25-cv-00379 | 9,143,976<br>9,179,359<br>9,647,918<br>8,666,364                               | 9,143,976 – Family Member<br>9,179,359 – Family Member<br>9,647,918 – Family Member<br>8,666,364 – Family Member                                                               |
| <i>Headwater Research LLC v. Apple Inc.</i> , U.S. Dist. Ct., W.TX., Case No. 7:25-cv-00407 | 9,232,403<br>9,491,564<br>8,639,935                                            | 9,232,403 – Family Member<br>9,491,564 – Family Member<br>8,639,935 – Family Member                                                                                            |

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| <i>Apple Inc. v. Headwater Research LLC</i> , U.S. Dist. Ct., N.D.Cal., Case No. 3:25-cv-07591   | 9,232,403<br>9,491,564<br>8,639,935 | 9,232,403 – Family Member<br>9,491,564 – Family Member<br>8,639,935 – Family Member |
| <i>Headwater Research LLC v. Apple Inc. et al.</i> , Unified Patent Ct., Case No. ACT 23132/2025 | EP3107243                           |                                                                                     |
| <i>Apple Inc. v. Headwater Research LLC</i> , IPR2025-01572                                      | 10,064,055                          | 10,064,055 – Family Member                                                          |

### RELATED AMAZON MATTERS

| <b>Litigation Matter</b>                                                                                | <b>Patents-In-Suit</b>  | <b>Related Patents</b>                                   |
|---------------------------------------------------------------------------------------------------------|-------------------------|----------------------------------------------------------|
| <i>Headwater Research LLC v. Amazon.com, Inc. et al.</i> , U.S. Dist. Ct. W.TX., Case No. 7:25-cv-00286 | 9,615,192<br>10,321,320 | 9,615,192 – Family Member<br>10,321,320 – Family Member  |
| <i>Headwater Research LLC v. Amazon.com, Inc. et al.</i> , U.S. Dist. Ct. E.TX., Case No. 2:25-cv-00897 | 8,667,571<br>9,198,117  | 8,667,571 – Patent at Issue<br>9,198,117 – Family Member |

**RELATED NON-APPLE OR NON-AMAZON MATTERS**

| <b>Litigation Matter</b>                                                                                                                 | <b>Patents-In-Suit</b>                                                                      |
|------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| <i>Headwater Research LLC v. AT&amp;T Inc., et al.</i> , U.S. Dist. Ct. E.TX., Case No. 2:23-cv-00397                                    | 8,589,541<br>9,215,613                                                                      |
| <i>Headwater Research LLC v. Charter Communications Inc., et al.</i> , U.S. Dist. Ct. E.TX., Case No. 2:25-cv-00901                      | 9,973,930<br>9,609,510<br>8,639,935<br>11,985,155<br>11,966,464<br>11,405,429<br>11,096,055 |
| <i>Headwater Research LLC v. Charter Communications Inc., et al.</i> , U.S. Dist. Ct. E.TX., Case No. 2:25-cv-00904                      | 9,179,359<br>9,277,445<br>9,609,544                                                         |
| <i>Headwater Research LLC v. Charter Communications Inc., et al.</i> , U.S. Dist. Ct. E.TX., Case No. 2:25-cv-00906                      | 8,666,364<br>9,143,976<br>9,647,918                                                         |
| <i>Headwater Research LLC v. Charter Communications Inc., et al.</i> , U.S. Dist. Ct. E.TX., Case No. 2:25-cv-00916                      | 8,635,335<br>10,791,471<br>10,237,757                                                       |
| <i>Headwater Research LLC v. Charter Communications Inc., et al.</i> , U.S. Dist. Ct. E.TX., Case No. 2:25-cv-00919                      | 8,023,425<br>8,631,102<br>8,799,451                                                         |
| <i>Headwater Research LLC v. Comcast Cable Communications, LLC, d/b/a Xfinity, et al.</i> , U.S. Dist. Ct. E.TX., Case No. 2:25-cv-00903 | 9,973,930<br>9,609,510<br>8,639,935<br>11,985,155<br>11,966,464<br>11,405,429<br>11,096,055 |
| <i>Headwater Research LLC v. Comcast Cable Communications, LLC, d/b/a Xfinity, et al.</i> , U.S. Dist. Ct. E.TX., Case No. 2:25-cv-00908 | 8,666,364<br>9,143,976<br>9,647,918                                                         |
| <i>Headwater Research LLC v. Comcast Cable Communications, LLC, d/b/a Xfinity, et al.</i> , U.S. Dist. Ct. E.TX., Case No. 2:25-cv-00909 | 9,179,359<br>9,277,445<br>9,609,544                                                         |

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| <i>Headwater Research LLC v. Comcast Cable Communications, LLC, d/b/a Xfinity, et al.</i> , U.S. Dist. Ct. E.TX., Case No. 2:25-cv-00914 | 8,023,425<br>8,631,102<br>8,799,451                                                         |
| <i>Headwater Research LLC v. Comcast Cable Communications, LLC, d/b/a Xfinity, et al.</i> , U.S. Dist. Ct. E.TX., Case No. 2:25-cv-00917 | 8,635,335<br>10,791,471<br>10,237,757                                                       |
| <i>Headwater Research LLC v. Dish Network, Corp, et al.</i> , U.S. Dist. Ct. E.TX., Case No. 2:25-cv-00902                               | 11,096,055<br>11,405,429<br>11,966,464<br>11,985,155<br>8,639,935<br>9,609,510<br>9,973,930 |
| <i>Headwater Research LLC v. Dish Network, Corp, et al.</i> , U.S. Dist. Ct. E.TX., Case No. 2:25-cv-00905                               | 9,179,359<br>9,277,445<br>9,609,544                                                         |
| <i>Headwater Research LLC v. Dish Network, Corp, et al.</i> , U.S. Dist. Ct. E.TX., Case No. 2:25-cv-00907                               | 8,666,364<br>9,143,976<br>9,647,918                                                         |
| <i>Headwater Research LLC v. Dish Network, Corp, et al.</i> , U.S. Dist. Ct. E.TX., Case No. 2:25-cv-00920                               | 8,635,335<br>10,791,471<br>10,237,757                                                       |
| <i>Headwater Research LLC v. Dish Network, Corp, et al.</i> , U.S. Dist. Ct. E.TX., Case No. 2:25-cv-00921                               | 8,023,425<br>8,631,102<br>8,799,451                                                         |
| <i>Headwater Research LLC v. Google LLC</i> , U.S. Dist. Ct. W.TX., Case No. 7:25-cv-00231                                               | 10,321,320<br>9,615,192                                                                     |
| <i>Headwater Research LLC v. Google LLC</i> , U.S. Dist. Ct. W.TX., Case No. 7:25-cv-00367                                               | 9,198,117                                                                                   |
| <i>Headwater Research LLC v. Google LLC</i> , U.S. Dist. Ct. W.TX., Case No. 7:25-cv-00369                                               | 11,096,055<br>11,405,429<br>11,966,464<br>11,985,155<br>8,639,935<br>9,609,510<br>9,973,930 |
| <i>Headwater Research LLC v. Google LLC</i> , U.S. Dist. Ct. W.TX., Case No. 7:25-cv-00372                                               | 9,179,359<br>9,277,445<br>9,609,544                                                         |

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| <i>Headwater Research LLC v. Google LLC</i> , U.S. Dist. Ct. W.TX., Case No. 7:25-cv-00374                          | 8,666,364<br>9,647,918                           |
| <i>Headwater Research LLC v. Google LLC</i> , U.S. Dist. Ct. W.TX., Case No. 7:25-cv-00376                          | 8,023,425<br>8,631,102<br>8,799,451              |
| <i>Headwater Research LLC v. Google LLC</i> , U.S. Dist. Ct. W.TX., Case No. 7:25-cv-00378                          | 10,237,757<br>10,791,471<br>8,635,335            |
| <i>Headwater Research LLC v. Google LLC</i> , U.S. Dist. Ct. W.TX., Case No. 7:25-cv-00380                          | 9,143,976                                        |
| <i>Google LLC v. Headwater Research LLC</i> , U.S. Dist. Ct. N.D. Ca., Case No. 3:25-cv-07453                       | 9,232,403<br>9,491,564                           |
| <i>Samsung Electronics Co., Ltd. et al. v. Headwater Research LLC</i> , PTAB Case No. IPR2024-01337                 | 8,588,110                                        |
| <i>Headwater Research LLC v. T-Mobile US Inc., et al.</i> , U.S. Dist. Ct. E.TX., Case No. 2:23-cv-00377            | 8,589,541<br>9,215,613                           |
| <i>Headwater Research LLC v. T-Mobile US Inc., et al.</i> , U.S. Dist. Ct. E.TX., Case No. 2:23-cv-00379            | 8,924,543<br>9,198,042                           |
| <i>Headwater Research LLC v. Verizon Communications Inc., et al.</i> , U.S. Dist. Ct. E.TX., Case No. 2:23-cv-00352 | 8,589,541<br>8,924,543<br>9,198,042<br>9,215,613 |
| <i>Verizon Corporate Services Group Inc. et al. v. Headwater Research LLC</i> , PTAB Case No. IPR2024-00809         | 9,198,042                                        |
| <i>Verizon Corporate Services Group Inc. et al. v. Headwater Research LLC</i> , PTAB Case No. IPR2024-01041         | 8,924,543                                        |
| <i>Verizon Corporate Services Group Inc. et al. v. Headwater Research LLC</i> , PTAB Case No. IPR2024-01042         | 8,924,543                                        |
| <i>Headwater Research LLC v. Walmart, Inc.</i> , U.S. Dist. Ct. E.TX., Case No. 2:25-cv-00961                       | 9,198,117<br>10,321,320<br>9,615,192             |
| <i>Headwater Research LLC v. Uber Technologies, Inc. et al.</i> , U.S. Dist. Ct. E.TX., Case No. 2:25-cv-00962      | 9,198,117<br>10,321,320<br>9,615,192             |
| <i>Headwater Research LLC v. Target Corp.</i> , U.S. Dist. Ct. E.TX., Case No. 2:25-cv-00963                        | 9,198,117<br>10,321,320<br>9,615,192             |
| <i>Headwater Research LLC v. Supercell Oy</i> , U.S. Dist. Ct. E.TX., Case No. 2:25-cv-00964                        | 9,198,117<br>10,321,320                          |

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|                                                                                                                 | 9,615,192                            |
| <i>Headwater Research LLC v. Amazon.com, Inc. et al.</i> , U.S. Dist. Ct. W.TX., Case No. 7:25-cv-00286         | 9,615,192<br>10,321,320              |
| <i>Headwater Research LLC v. Amazon.com, Inc. et al.</i> , U.S. Dist. Ct. E.TX., Case No. 2:25-cv-00897         | 8,667,571<br>9,198,117               |
| <i>Headwater Research LLC v. Tencent Holdings Ltd.</i> , U.S. Dist. Ct. E.TX., Case No. 2:25-cv-00965           | 9,198,117<br>10,321,320<br>9,615,192 |
| <i>Headwater Research LLC v. Samsung Elecs. France S.A.S.</i> , Unified Patent Ct., Case No. UPC CFI 822/2025   | EP2391947                            |
| <i>Headwater Research LLC v. Samsung Elecs. France S.a.i.</i> , Unified Patent Ct., Case No. UPC CFI 823/2025   | EP2391947                            |
| <i>Headwater Research LLC v. Samsung Elecs. France S.A.S.</i> , Unified Patent Ct., Case No. UPC CFI 833/2025   | EP3110069                            |
| <i>Headwater Research LLC v. Samsung Elecs. GmbH</i> , Unified Patent Ct., Case No. UPC CFI 820/2025            | EP3110069                            |
| <i>Headwater Research LLC v. Flextronics Int'l Europe B.V.</i> , Unified Patent Ct., Case No. UPC CFI 29/2025   | EP3110072                            |
| <i>Headwater Research LLC v. Motorola Mobility Germany GmbH</i> , Unified Patent Ct., Case No. UPC CFI 482/2024 | EP3110072                            |
| <i>Headwater Research LLC v. Motorola Mobility LLC</i> , Unified Patent Ct., Case No. UPC CFI 127/2024          | EP3110072                            |
| <i>Headwater Research LLC v. Flextronics Int'l Europe B.V.</i> , Unified Patent Ct., Case No. UPC CFI 28/2025   | EP3110069                            |
| <i>Headwater Research LLC v. Motorola Mobility Germany GmbH</i> , Unified Patent Ct., Case No. UPC CFI 494/2024 | EP3110069                            |
| <i>Headwater Research LLC v. Motorola Mobility LLC</i> , Unified Patent Ct., Case No. UPC CFI 149/2024          | EP3110069                            |
| <i>Headwater Research LLC v. Samsung Elecs. Co.</i> , Unified Patent Ct., Case No. UPC CFI 496/2025             | EP3110072                            |