

Petition for *Inter Partes* Review of U.S. Patent No. 8,477,762
Claims 1–10, 12–21

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CISCO SYSTEMS, INC.
Petitioner

v.

DYNAMIC MESH NETWORKS, INC.
D/B/A MESH DYNAMICS
Patent Owner

Case No. IPR2026-00127
U.S. Patent No. 8,477,762

PETITION FOR *INTER PARTES* REVIEW OF
U.S. PATENT NO. 8,477,762

CHALLENGING CLAIMS 1–10, 12–21
UNDER 35 U.S.C. § 312 AND 37 C.F.R. § 42.104

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PETITIONER’S TABLE OF EXHIBITS

Exhibit No.	DESCRIPTION
1001	U.S. Patent No. 8,477,762 (“762 Patent”)
1002	Declaration of Dr. Christopher Hansen
1003	U.S. Patent Publication No. 2005/0138119 to <i>Saridakis</i> (“Saridakis”)
1004	U.S. Patent Publication No. 2008/0098121 to <i>Wu</i> (“Wu”)
1005	U.S. Patent Publication No. 2007/0140239 to <i>Bauer et al.</i> (“Bauer”)
1006	U.S. Patent Publication No. 2006/0126611 to <i>Kelly et al.</i> (“Kelly”)
1007	File History of U.S. Patent No. 8,477,762
1008	File History of U.S. Patent No. 7,583,648
1009	U.S. Patent Publication No. 2008/0198873 to <i>Huang et al.</i> (“Huang”)
1010	U.S. Patent No. 7,120,136 to <i>Upp et al.</i> (“Upp”)
1011	U.S. Patent Publication No. 2011/0199953 to <i>Seok</i> (“Seok”)
1012	U.S. Patent No. 7,454,171 to <i>Palin et al.</i> (“Palin”)
1013	U.S. Patent Publication No. 2006/0143304 to <i>Bodlaender et al.</i> (“Bodlaender”)
1014	Curriculum Vitae of Dr. Christopher Hansen

Throughout the Petition, all annotations, coloring, and emphases have been added unless indicated otherwise.

LISTING OF CLAIMS

[1Pre] A VoIP-capable network comprising:

[1A] one or more VoIP client devices;

[1B] two or more VoIP nodes forming an isolated cluster wherein the two or more VoIP nodes in the isolated cluster are in communication with one another;

[1C] wherein each of the VoIP client devices communicates with at least one VoIP node;

[1D] wherein each of the VoIP nodes further comprises a local SIP registry built by exchanging SIP information with the remaining VoIP nodes in the isolated cluster; and

[1E] wherein a first VoIP client device in communication with a first VoIP node establishes a communication with a second VoIP device in communication with a second VoIP node using the local SIP registries of the first VoIP node and the second VoIP node.

[2] The VoIP-capable network of claim 1, wherein the local SIP registries of the isolated VoIP nodes are updated as the VoIP nodes and the VoIP client devices begin communication with the isolated cluster and end communication with the isolated cluster.

[3] The VoIP-capable network of claim 1, wherein updates to the local SIP registry of a VoIP node are communicated to remaining VoIP nodes in the isolated

cluster by broadcasting one or more information packets containing local SIP registry information of the VoIP node.

[4] The VoIP-capable network of claim 1, wherein the local SIP registry of a VoIP node is updated according to information received from another VoIP nodes in the isolated cluster in special information packets that each contain local SIP registry information of another VoIP node.

[5] The VoIP-capable network of claim 1, wherein each VoIP node has the ability to function as a DHCP server to assign IP addresses to clients in communication with the VoIP node.

[6] The VoIP-capable network of claim 5, wherein the IP addresses are assigned from a range of IP addresses produced by a random number generator on each VoIP node.

[7] The VoIP-capable network of claim 1, further comprising means of connecting the isolated cluster to an external network, wherein upon connection to an external network, the SIP registry of an external SIP server connected to the external network is updated to include SIP registry information from the VoIP nodes.

[8] The VoIP-capable network of claim 1 wherein said nodes comprise mesh nodes.

[9] The VoIP-capable network of claim 8 wherein said mesh nodes provide VoIP optimized services within said mesh nodes.

[10Pre] A method of maintaining VoIP capabilities within a network comprising:

[10A] forming a cluster of two or more initially isolated network nodes

[10B] establishing communications between two or more client devices by way of the initially isolated network nodes, wherein in a first configuration, at least two of said initially isolated network nodes are in communication with each other but not in communication with an external SIP server, and wherein each of said at least two initially isolated network nodes supports VoIP communications based on a local SIP registry contained in each of the said nodes according to the method of:

[10B-1] communicating with at least one other initially isolated node to exchange SIP registry information;

[10B-2] updating the local SIP registry in said node as new information is acquired;

[10B-3] sending and receiving VoIP packets from a sender isolated node to one or more recipient isolated nodes based on said local SIP registry functionality when a client device in communication with the sender node establishes communication with a client device in communication with the recipient node.

[12] The method of claim 10, further comprising updating the local SIP registries of the isolated nodes as nodes and clients join and leave the isolated cluster.

[13] The method of claim 10, wherein updates to the local SIP registry of each node is communicated to remaining nodes in the cluster by broadcasting an information packet containing the local SIP registry information.

[14] The method of claim 10, wherein each node functions as a DHCP server to assign IP addresses to clients connected to the node.

[15Pre] A VoIP capable network comprising:

[15A] a first initially isolated network node in communication with at least two VoIP clients, wherein the first isolated node further comprises a local SIP registry wherein said SIP registry contains address identifiers for each VoIP clients in communication with the first node; and

[15B] wherein VoIP communication between said at least two VoIP clients are initiated by utilizing the local SIP registry, wherein the first isolated node further comprises communications means with other isolated nodes wherein the first isolated node broadcasts its SIP registry information to other nodes in communication with the first node.

[16] The VoIP capable network of claim 15, wherein the local SIP registry of the first isolated node is updated as the VoIP clients establish or terminate a network connection with the first isolated node.

[17] The VoIP capable network of claim 15, wherein first isolated node comes into communication with other isolated nodes to form a cluster, and the local SIP

registry information of each isolated node in the cluster is updated according to information received from other isolated nodes in the cluster.

[18] The VoIP capable network of claim 15, wherein the first isolated node further comprises a DHCP server to assign IP addresses to clients in communication with the first node.

[19] The VoIP-capable network of claim 18, wherein the IP addresses are assigned from a range of IP addresses produced by a random number generator on the first isolated node.

[20] The VoIP capable network of claim 18, wherein each node in the cluster has the ability to function as a DHCP server to assign IP addresses to clients connected to that node.

[21] The VoIP-capable network of claim 20, wherein each node in the cluster assigns IP addresses from a range of IP addresses produced by a random number generator on that node.

Petitioner respectfully requests *inter partes* review and cancellation of claims 1–10, 12–21 in U.S. Patent No. 8,477,762 (“762 Patent”).

I. MANDATORY NOTICES

A. Real Party-In-Interest (37 C.F.R. § 42.8(b)(1))

Cisco Systems, Inc., the Petitioner, identifies itself as a real party-in-interest.

B. Related Matters (37 C.F.R. § 42.8(b)(2))

On June 6, 2025, Patent Owner Dynamic Mesh Networks filed a patent infringement suit against Petitioner, asserting U.S. Patent Nos. 8,514,852; 9,049,000; and **8,477,762**. *Dynamic Mesh Networks, Inc. d/b/a MeshDynamics v. Cisco Systems, Inc. et al.*, No. 2:25-cv-00606 (E.D. Tex.). Then, on July 31, 2025, Patent Owner voluntarily dismissed the case without prejudice.

On July 31, 2025, Petitioner Cisco filed an action for declaratory judgment of non-infringement on the following patents: U.S. Patent Nos. 11,368,537; 7,420,952; 7,885,243; 7,894,385; **8,477,762**; 8,514,852; 8,520,691; 9,049,000. *Cisco Systems Inc. v. Dynamic Mesh Networks, Inc. d/b/a/ MeshDynamics et al.*, No. 5-25-cv-06441 (N.D. Cal.). On August 12, 2025, Patent Owner Dynamic Mesh Networks filed a patent infringement suit against Petitioner, asserting U.S. Patent Nos. 11,368,537; 7,420,952; 7,885,243; 7,894,385; and 8,520,691. *Dynamic Mesh Networks, Inc. d/b/a MeshDynamics v. Cisco Systems, Inc. et al.*, No. 2-25-cv-00781 (E.D. Tex.). That same day, Patent Owner Dynamic Mesh Networks filed another

patent infringement suit against Petitioner, asserting U.S. Patent Nos. 8,514,852; 9,049,000; and **8,477,762**. *Dynamic Mesh Networks, Inc. d/b/a MeshDynamics v. Cisco Systems, Inc. et al.*, No. 2-25-cv-00783 (E.D. Tex.).

C. Lead And Back-up Counsel (37 C.F.R. § 42.8(b)(3))

Petitioner is filing a Power of Attorney appointing the practitioners associated with Customer Number 132,593. Petitioner designates the following lead and back-up counsel:

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

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II. FEES

Petitioner is concurrently electronically submitting the required fees for this Petition. The Board is authorized to charge Desmarais LLP’s deposit account, No. 50-6822, for any fee deficiency.

III. CERTIFICATION OF GROUNDS FOR STANDING

Petitioner certifies that the ’762 Patent is available for *inter partes* review and that Petitioner is not barred or estopped from requesting *inter partes* review.

IV. OVERVIEW OF CHALLENGE AND RELIEF REQUESTED

Under 37 C.F.R. §§ 42.22(a)(1) and 42.104(b)(1)-(2), Petitioner requests *inter partes* review and cancellation of claims 1–10, 12–21 of the ’762 Patent.

A. Identification of Prior Art

The priority date of the ’762 Patent is its actual filing date, January 12, 2009. See Section V.B. This Petition applies pre-AIA provisions of 35 U.S.C. §§ 102, 103.

The following references are pertinent to the grounds of unpatentability:

Pat. Pub. No.	Publication/ Priority Date	Prior Art Under At Least (35 U.S.C.)
US2005/0138119 (“Saridakis”) (EX1003)	published June 23, 2005	102(b)
US2008/0098121 (“Wu”) (EX1004)	filed October 19, 2007	102(e)
US2007/0140239 (“Bauer”) (EX1005)	published June 21, 2007	102(b)

Pat. Pub. No.	Publication/ Priority Date	Prior Art Under At Least (35 U.S.C.)
US2006/0126611 ("Kelly") (EX1006)	published June 15, 2006	102(b)

B. Statutory Grounds of Unpatentability

Petitioner requests cancellation of Claims 1–10, 12–21 under 35 U.S.C. § 103 based on the following Grounds.

Ground	Claims	References
I	1-4, 8-9	Saridakis, Wu
II	1-4, 7-10, 12-13, 15-17	Saridakis, Wu, Bauer
III	5, 6, 9, 14, 18-21	Saridakis, Wu, Bauer, Kelly

This Petition demonstrates that there is a reasonable likelihood that Petitioner would prevail with respect to at least one of the challenged claims. 35 U.S.C. § 314(a).

V. OVERVIEW OF THE '762 PATENT

The '762 Patent is directed to a “data network that supports VoIP [(Voice over Internet Protocol)] communications.” EX1001, 1:19-26, 1:36-40. Conventional VoIP systems relied on a “central registry which acts like a ‘phone book’ for the VoIP devices.” EX1001, 1:36-40, 1:56-57. The '762 Patent purports to eliminate this dependency on centralized servers using distributed Session Initiation Protocol (SIP) registries: each VoIP node within a cluster maintains its own *local* SIP registry and is capable of acting as an “autonomous SIP server.” EX1001, 5:65-6:21. Each

node exchanges SIP registration information (such as IP and MAC addresses) with its directly connected clients and peer nodes, thereby building and updating a “distributed SIP registry” across the cluster. EX1001, Abstract, 3:3-8, 4:19-37, 8:43-52. When a connection to an external SIP server is lost, the nodes can establish VoIP calls internally using their locally stored SIP registry information. EX1001, Abstract, 6:3-5. EX1002, ¶¶27-28.

A. Prosecution History

The '762 Patent originated from U.S. Patent Application No. 12/352,457, filed January 12, 2009, which is a continuation-in-part of U.S. Patent Application No. 11/266,884 (“’884 Application”), filed November 4, 2005, and issued as U.S. Patent No. 7,583,648. EX1007, 154-155; EX1008. EX1002, ¶29.

On May 2, 2012, the Examiner issued the First Office Action noting that original claims 1-13 are allowed, claims 14 and 15 are rejected over prior art, and claims 16-22 are objected to for depending from rejected claim 14. EX1007, 62-63. EX1002, ¶30.

On May 29, 2012, the Applicant cancelled claim 14, amended claim 16 to include all limitations of claim 14, and amended claim 15 to depend from claim 16. EX1007, 82-88. The Examiner thereafter issued a notice of allowance on June 12, 2012. EX1007, 92. EX1002, ¶ 30.

On September 6, 2012, the Applicant requested the Examiner to belatedly enter a priority claim to the '884 Application. EX1007, 106-107. In response, on November 2, 2012, the Examiner rejected the request, finding that this application “is not entitled to benefit of the earlier filing date” because the '884 Application does not disclose “a self-forming VoIP connection or isolated cluster capability for exchanging SIP information between nodes in each isolated cluster using a local SIP registry or server.” EX1007, 132. EX1002, ¶31.

On January 25, 2013, the Applicant traversed the rejection, stating: “Whether the claims of the present application are entitled to the benefit of the filing date of the parent application is irrelevant to the determination of whether the present application properly claims status as a continuation-in-part of the parent application.” EX1007, 145. The Examiner subsequently entered the priority claim. EX1007, 154-155. EX1002, ¶31.

B. Effective Priority Date

The effective priority date of the '762 Patent is its actual filing date, *January 12, 2009*. As the Examiner correctly noted during prosecution (EX1007, 132), the claims of the '762 Patent are not entitled to the filing date of the '884 Application: the '884 Application does not provide written description support for numerous limitations in independent claims relating to the session initiation protocol (“SIP”),

including “SIP information,” “local SIP registry,” or “SIP registry information.”
EX1002, ¶32.

VI. LEVEL OF ORDINARY SKILL IN THE ART

A Person of Ordinary Skill in the Art (“POSITA”), as of the priority date of January 12, 2009, would have had: (1) a bachelor’s degree in computer science, computer engineering, electrical engineering, or equivalent training, (2) approximately two years of experience working in the field of communications network, and (3) knowledge of Voice over Internet Protocol (VoIP) standards such as RFC 3261 (Session Initiation Protocol (SIP)). EX1002, ¶26.

VII. CLAIM CONSTRUCTION

Aside from the term identified below, no additional terms require construction in this IPR. EX1002, ¶¶33-37.

A. “means of connecting the isolated cluster to an external network” (Claim 7)

This term should be interpreted under 35 U.S.C. § 112 ¶6. The claimed function is “connecting the isolated cluster to an external network.” The structure corresponding to the function is, at best, “software and/or hardware elements” that support the function. *See* EX1001, 3:33-47. EX1002, ¶¶38-40.

B. “VoIP optimized services” (Claim 9)

This term is interpreted to include a SIP Server Service or DHCP Server service. During prosecution, Applicant stated that “[s]upport for adding VoIP

optimized services to a mesh node is found in the instant application ¶37 which provides for the addition of a ***SIP Server Service*** ‘within the network node 101.’ In ¶41, the instant application further discusses the addition of a ***DHCP Server service***: ‘the node may also incorporate DHCP server capability...’.” EX1007, 145-146 (underlined emphasis in original; bold-italics emphasis added). Thus, although the full extent of this term is unclear¹, this term includes a SIP Server Service or DHCP Server service. EX1002, ¶¶41-42.

C. “communications means” (Claim 15)

This term should be given its plain and ordinary meaning—a component for communication. To the extent the use of the word “means” in “communications

¹ Petitioner reserves the right to challenge the definiteness of the term “*VoIP optimized services*” because a POSITA would not have understood with reasonable certainty what additional services would be considered “*VoIP optimized*.” The indefiniteness of the term “*VoIP optimized services*” does not preclude review here under the proposed interpretation because, as explained in Ground I and III, Saridakis and Kelly independently disclose the examples of “*VoIP optimized services*” provided in the prosecution history. *Samsung Elecs. Am. v. Prisia Eng'g Corp.*, 948 F.3d 1342, 1355 (Fed. Cir. 2020).

means” creates a presumption that § 112 ¶ 6 applies, that presumption is overcome. EX1002, ¶¶43-44.

Claim 15 recites “the first isolated node further comprises *communications means* with other isolated no[d]es.” EX1001, Claim 15. Nothing in claim 15 requires the “communications means” to perform any specific function; rather, it is merely a component that facilitates communication with other isolated nodes. Such term should be given its plain and ordinary meaning. *See Sage Prods., Inc. v. Devon Indus., Inc.*, 126 F.3d 1420, 1427–28 (Fed. Cir. 1997) (“the presumption is not conclusive. For example, where a claim uses the word ‘means,’ but specifies no corresponding function for the ‘means,’ it does not implicate section 112.”); *Skky, Inc. v. Mindgeek, S.A.R.L.*, 859 F.3d 1014, 1021 (Fed. Cir. 2017) (“wireless device means” without a corresponding function does not invoke § 112 ¶(6)). EX1002, ¶¶45-47.

VIII. GROUNDS

A. **Ground I: Saridakis In View Of Wu Renders Obvious Claims 1-4, 8, And 9.**

1. **Saridakis (EX1003)**

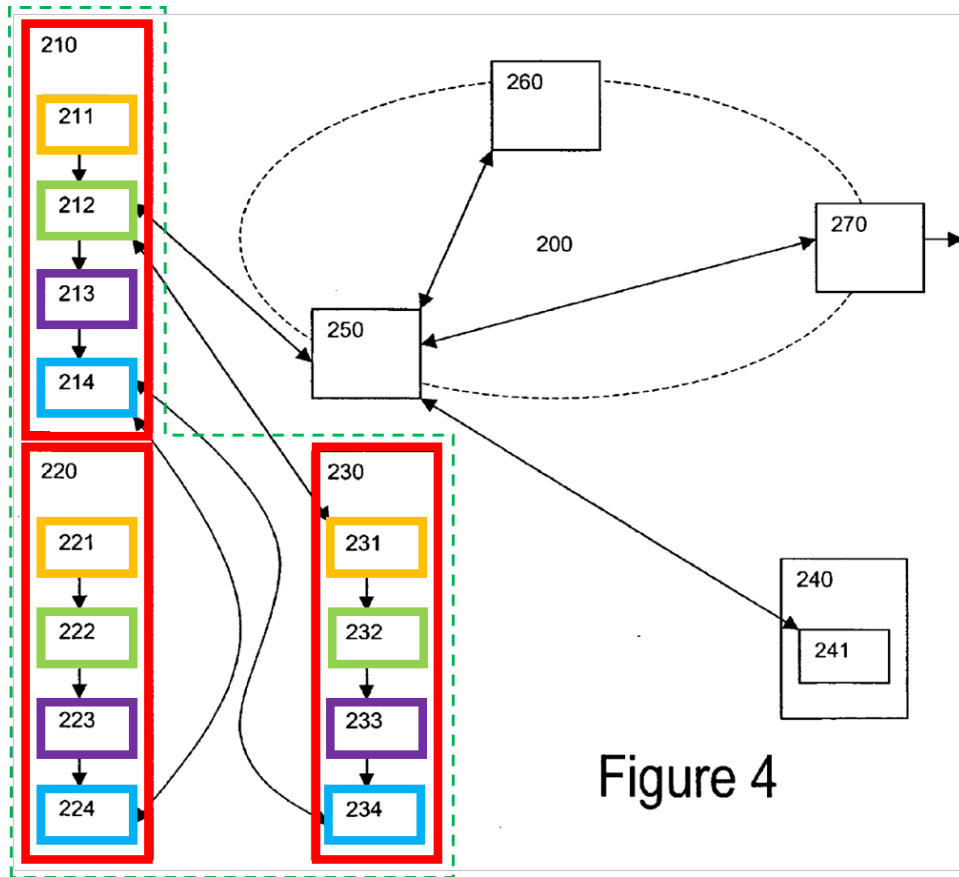
Saridakis relates to locating users in an ad hoc, peer-to-peer network (e.g., Bluetooth or WLAN networks) where no centralized SIP registrar infrastructure is available. EX1003, [0001], [0004]. Saridakis explains that traditional directory services relied on centralized entities, such as SIP registrars, to map a user address

(e.g., SIP or e-mail addresses) to a “network address where the specified user can be contacted.” EX1003, [0004], [0026]. This dependence makes traditional directory services “unsuitable for ad hoc, peer-to-peer networks” (EX1003, [0004]), which lack a stable infrastructure and where nodes can join or leave freely (EX1003, [0002]). EX1002, ¶48.

Saridakis eliminates the need for a centralized server in ad hoc networks by introducing a “distributed user-location service (DULS) fit for ad hoc, peer-to-peer networks.” EX1003, [0014]. “The DULS is based on local repositories in terminals present in an ad hoc, peer-to-peer network, which store mappings of user-addresses to network addresses of the terminals present in the network.” EX1003, [0014]. Because the mappings of user addresses to network addresses are stored locally, the DULS enables user-location identification without requiring “a central facility for user-location.” EX1003, [0015]. EX1002, ¶49.

Figure 4 of Saridakis (reproduced below) illustrates a system that provides SIP services in an ad hoc network. The ad hoc network—shown in dotted green line—includes “**mobile phones** 210, 220, and 230.” EX1003, [0078]. Each **mobile phone** includes “a **SIP UA** (211, 221, and 231 respectively), a **local SIP Proxy** (212, 222, and 232 respectively), a **local SIP Registrar** (213, 223, and 233 respectively) and a **DULS instance** (214, 224, and 234 respectively).” EX1003, [0078]. The ad hoc network can communicate with a SIP proxy server 250 in a cellular network 200

that permits the mobile phones to communicate with other entities and devices on the cellular network 200. EX1003, [0078]. EX1002, ¶50.



EX1003, Figure 4².

When device 210 initiates SIP communication with device 230, “the SIP UA 211 sends a SIP request to the SIP UA 231.” EX1003, [0079]. To that end, the components in device 210 perform the following operations: “First, the **local Proxy 212** receives the SIP request, extracts the SIP address of the intended recipient and

² All annotations are added unless stated otherwise.

tries to resolve it with the **local Registrar 213**, which, in turn, retrieves the correct mapping from the **DULS instance 214**. Having resolved the SIP address of the intended recipient, the local Proxy 212 forwards over the ad hoc network ... the SIP request to the SIP UA 231.” EX1003, [0079]. EX1002, ¶¶51-52.

Saridakis teaches that DULS instances can be synchronized using two protocols: (1) the “distributed synchronization protocol” or (2) the “lazy update protocol.” EX1003, [0037], [0052]. Under the distributed synchronization protocol, one peer (e.g., device 210 in Figure 4) acts as a coordinating peer that maintains an updated view of the network and multicasts information in its DULS instance to all other peers in the network whenever a peer joins or leaves the ad hoc network. *See* EX1003, [0038]-[0051], Figure 1. Under the lazy update protocol, a peer updates its DULS instance when its DULS instance cannot resolve a user address—by initiating a discovery process to discover other mobile terminals in the network and querying the discovered terminals for updated information for the DULS instance. *See* EX1003, [0052]-[0067], Figure 2. EX1002, ¶¶53-56.

2. Wu (EX1004)

Wu is directed to a “multimedia network communication system” that integrates SIP functionality in a peer-to-peer network. EX1004, [0001], [0005], [0060]. In Wu’s system, SIP functionality is distributed among peers in a peer-to-peer overlay network. EX1004, [0003], [0040]. EX1002, ¶57.

Figure 6 of Wu, below, the P2P SIP-enabled network, which includes “two different entities, APs (Access Points) and user terminals (MH, Mobile Host).” EX1004, [0058], [0059]. “Rather than a traditional SIP architecture where many SIP UAs connect to a central proxy server, the APs (peers) connect directly to a few other APs (peers), forming a virtual network of peers referred to as a P2P network.” EX1004, [0059]. The APs “perform the roles of *registrar*, redirection server and *location server* in traditional SIP networks.” EX1004, [0060]. In contrast, “[u]ser terminals only act as *SIP user agents*.” EX1004, [0061], [0072]. EX1002, ¶58.

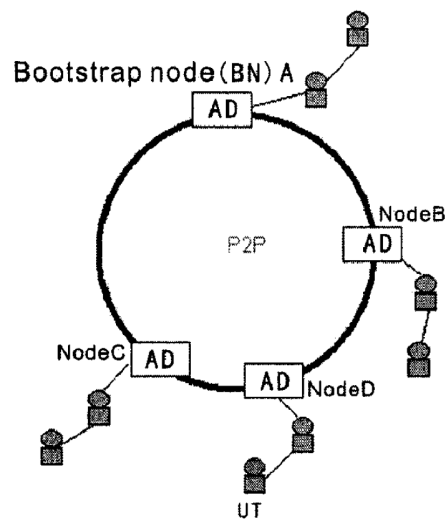


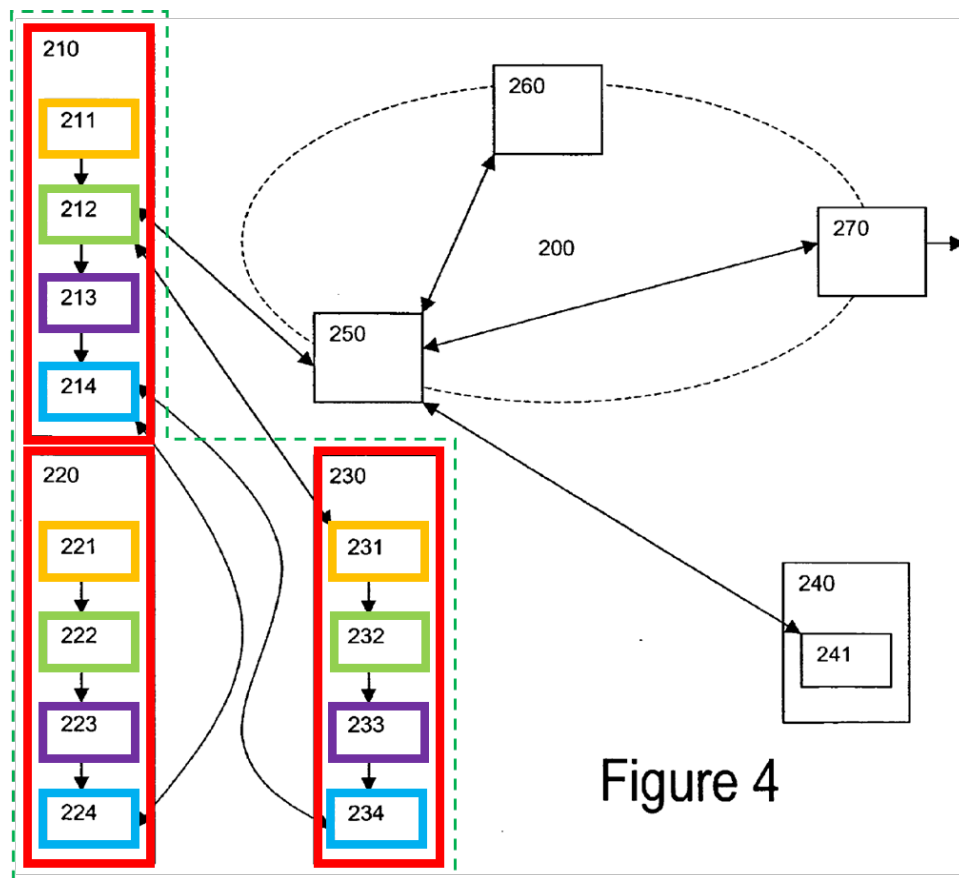
FIG. 6

EX1004, Figure 6.

3. Saridakis In View Of Wu (“Saridakis-Wu Combination”)

a) Separate VoIP Client Device And VoIP Node In View Of Wu

As explained in Section VIII.A.1 [Saridakis], the peer-to-peer network disclosed in Saridakis is formed using mobile phones, each including a SIP UA, a local SIP proxy, a local SIP registrar, and a DULS instance. EX1003, [0078]. EX1002, ¶59.



EX1003, Figure 4.

As explained in Section VIII.A.2 [Wu], Wu teaches that the peer-to-peer SIP network may be implemented using *APs* that “act as traditional SIP outbound *proxy*

servers for user terminals ... [and] perform the roles of *registrar*, redirection server and *location server* in traditional SIP networks,” with *user terminals* containing *SIP user agents* communicating through their respective APs. EX1004, [0059]-[0061]. EX1002, ¶60.

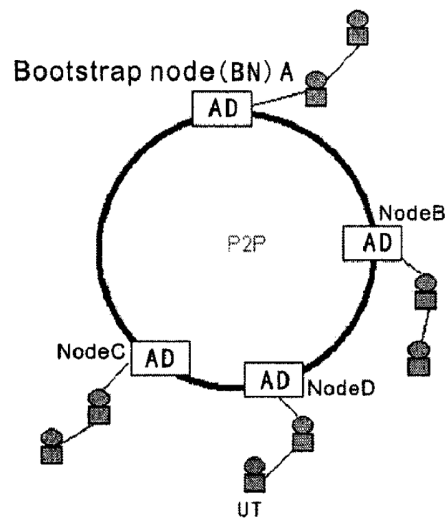
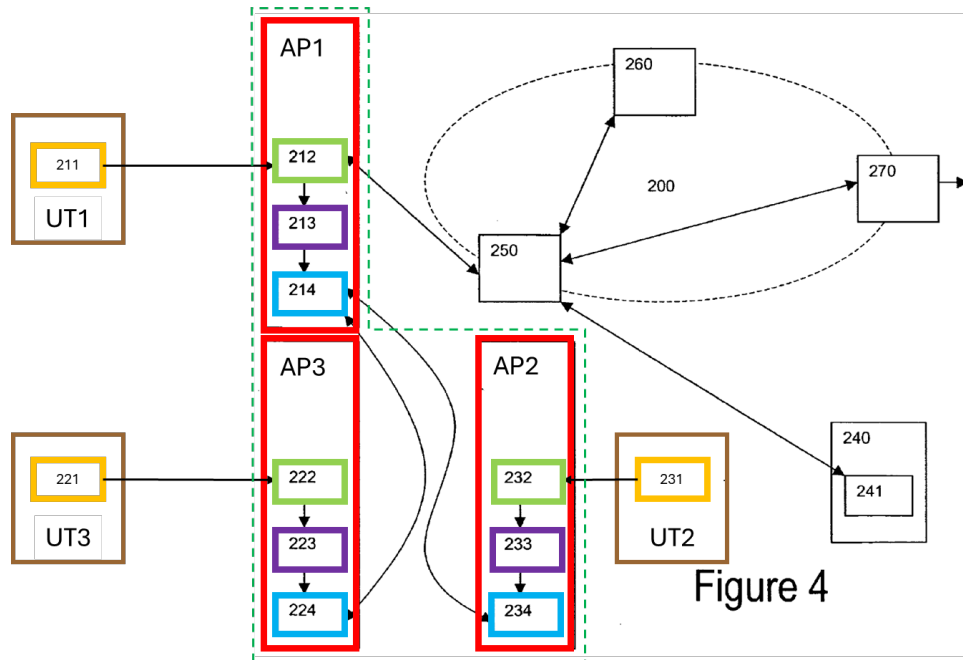


FIG. 6

EX1004, Figure 6.

It would have been obvious to modify the ad hoc network of Saridakis in view of Wu so that it is formed using **APs** that each include a **local proxy**, a **local SIP registrar**, and a **DULS instance**, with **user terminals (UTs)** containing a **SIP UA** communicating through their corresponding **APs**, as shown below. EX1002, ¶61.

Saridakis-Wu Combination



EX1003, Figure 4.

A POSITA would have found it obvious to combine Saridakis and Wu as described above because it would have merely amounted to replacing a peer device in Saridakis with two components as taught by Wu—i.e., AP and user terminal—that collectively perform the functionality of the peer device. For example, Wu’s APs “perform the roles of *registrar*, *redirection server* and *location server* in traditional SIP networks.” EX1004, [0060]. Those are the very functionalities performed by the local registrar (e.g., 213 in Figure 4), the local Proxy (e.g., 212 in Figure 4), and the DULS (e.g., 214 in Figure 4), respectively. EX1003, [0026], [0027]. Similarly, in Wu, “[u]ser terminals only act as *SIP user agents*” (EX1004, [0061]), just like the “SIP User agents (UAs)” in Saridakis. EX1003, [0069].

Accordingly, a POSITA would have found it straightforward to implement Saridakis’s local SIP Proxy, local registrar and DULS instance in APs, and to implement Saridakis’s SIP UA in user terminals, as taught by Wu. This modification would have been a predictable variation and design choice within the knowledge of a POSITA. EX1002, ¶¶62-63.

A POSITA would have been motivated to combine Saridakis and Wu as provided above for two reasons. EX1002, ¶64.

First, the modification would have enabled an ordinary mobile device with a standard SIP UA—without DULS instance or local registrar—to take advantage of Saridakis’s distributed SIP functionality that operates without a central SIP server. EX1003, [0014]-[0015]; EX1004, [0072]-[0074]. Accordingly, the system, as modified, would have provided a more scalable ad hoc network. EX1002, ¶65.

Second, the modification would have allowed multiple mobile devices to share a single AP, thereby reducing the cost and complexity of deploying the ad hoc network. For example, Wu’s Figure 6 (see above) shows that a single AP can serve multiple mobile devices. Accordingly, a POSITA would have understood that in the modified system, more mobile devices would benefit from Saridakis’s distributed SIP functionality, even with a limited number of APs. EX1002, ¶66.

A POSITA would have had a reasonable expectation of success in combining Saridakis with Wu. **First**, the teachings of Saridakis and Wu are highly compatible.

Both Saridakis and Wu are based on the same SIP signaling framework and provide a peer-to-peer communication environment. *See* EX1003, [0001], [0018]; EX1004, [0001], [0040]. In fact, both Saridakis and Wu are directed to distributing the SIP functionalities across peer nodes so that SIP operations do not depend on a centralized server. *See* EX1003, [0001], [0014]-[0015]; EX1004, [0058], [0059]. EX1002, ¶¶67-68.

Second, as explained above, the functions of Saridakis’s local registrar and DULS instance are substantially similar to the functions of Wu’s APs, and the functions of Saridakis’s SIP UAs are substantially similar to the functions of Wu’s user terminals. Thus, the modification would have simply amounted to separating a single peer device in Saridakis into two separate devices (AP and UT) as taught by Wu, to perform the same functions taught by Saridakis. Accordingly, a POSITA would have had a reasonable expectation of success in implementing Saridakis’s local registrar and DULS instance within APs, and placing Saridakis’s SIP UA within user terminals, as in the proposed combination. EX1002, ¶69.

The combination would have merely amounted to using a known technique (forming a SIP-enabled peer-to-peer network using APs and user terminals, as taught by Wu) improve a similar system (to improve scalability and reduce costs of Saridakis’s SIP-enabled peer-to-peer network) to yield predictable results (allowing the network to provide distributed SIP services to user terminals). EX1002, ¶70.

b) Voice SIP Session In View Of Wu

Saridakis teaches that the SIP UA uses the SIP protocol to set up a session. *See* EX1003, [0026], [0068]. It would have been obvious to use Saridakis’s SIP session for voice communication in view of Wu. Wu teaches that “SIP ... is a general protocol for establishing and controlling multimedia sessions and can establish *voice sessions*.” EX1004, [0002], Claim 17. Using Saridakis’s SIP session for voice communication would have merely amounted to a simple substitution of Saridakis’s SIP session with Wu’s voice SIP session to obtain predictable results of providing voice communication over Saridakis’s ad hoc network. A POSITA would have been motivated to use Saridakis’s SIP session for voice communication, as taught by Wu, because SIP sessions were widely used for voice communication. EX1004, [0002]. *See, e.g.*, EX1009, [0002]. And a POSITA would have had a reasonable expectation of success because both Saridakis and Wu form their sessions using SIP, and are thus highly compatible. EX1002, ¶¶71-72.

Saridakis-Wu Combination

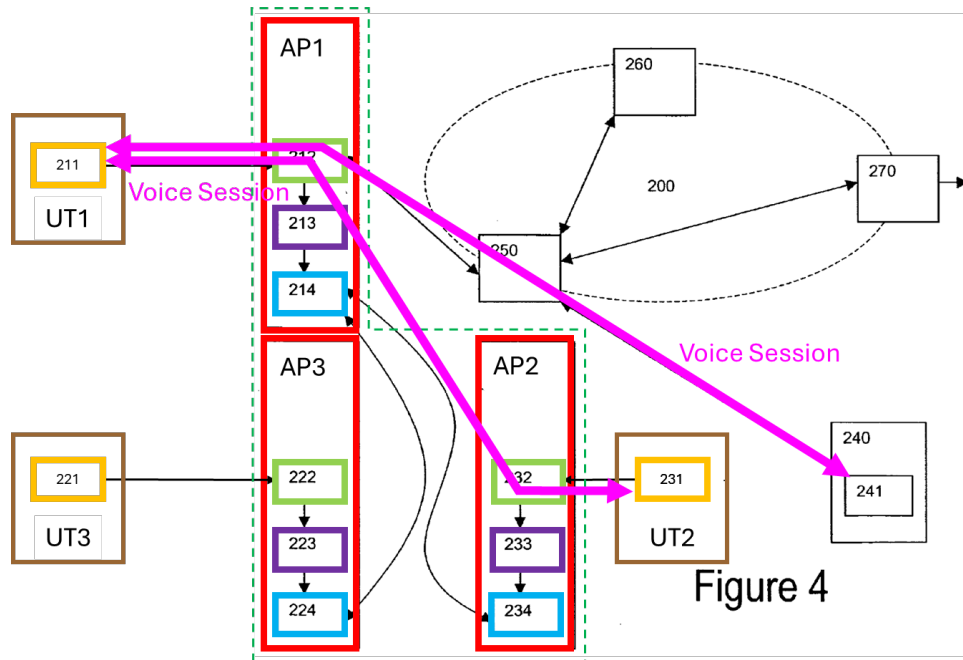


Figure 4

EX1003, Figure 4.

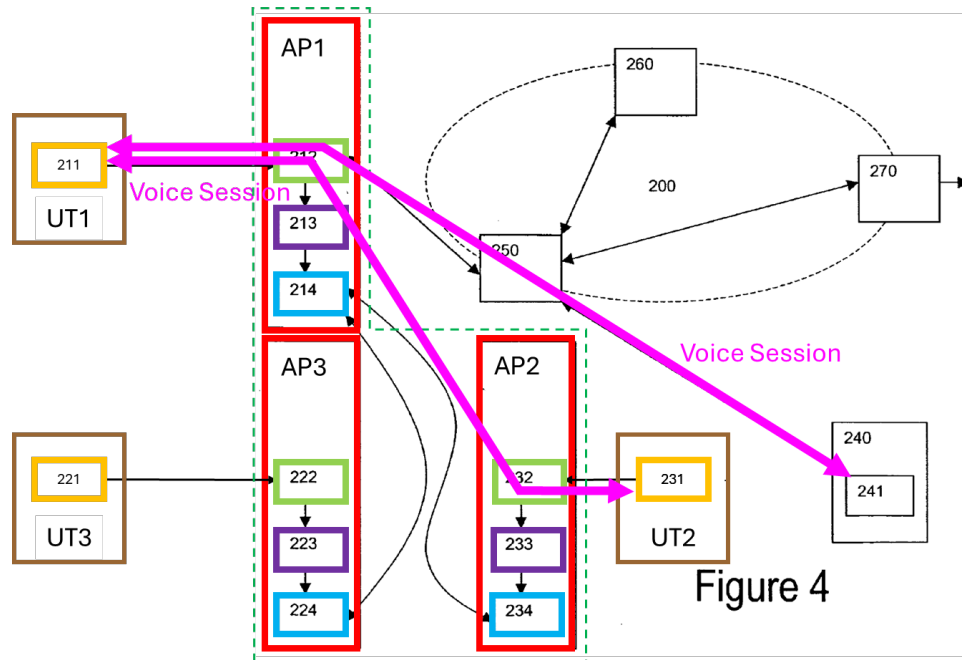
4. Claim 1

a) [1Pre] A VoIP-capable network comprising:

To the extent the preamble is limiting, Saridakis-Wu teaches [1Pre]. EX1002, ¶¶73-77.

First, Saridakis discloses a “*network*” because it discloses a system including “an ad hoc, peer-to-peer *network*” (the green-dotted line below) and a “cellular *network* 200.” EX1003, [0068], [0077]-[0078], Figure 4. *See also* EX1003, [0001], [0007], [0014]. EX1002, ¶74.

Saridakis-Wu Combination



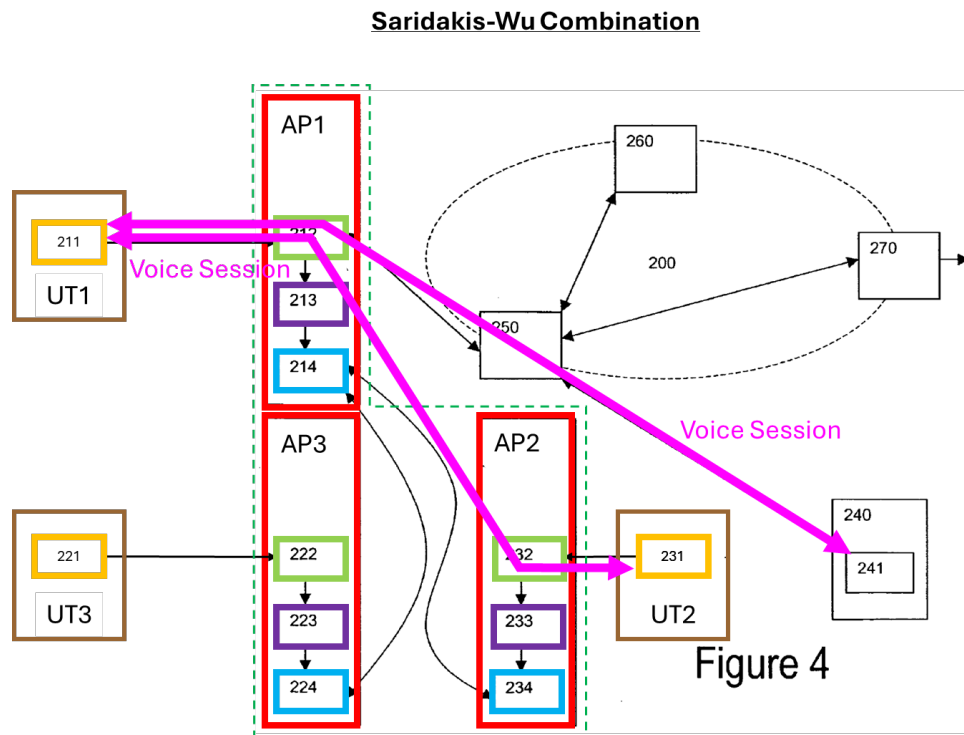
EX1003, Figure 4.

Second, Saridakis-Wu teaches that the network is “*VoIP-capable*.” The “ad hoc network” and “cellular network” in Saridakis-Wu are capable of forming a *SIP session*. Saridakis discloses “a novel way of deploying the entities specified in the *SIP protocol among peers in an ad hoc network* and combining the SIP Registrar with the DULS in order to allow the use of *SIP in ad hoc, peer-to-peer networks*.” EX1003, [0018]. See also EX1003, [0034]. And the ad hoc network can also facilitate a SIP session with a device on the cellular network. EX1003, [0080]. EX1002, ¶75.

Furthermore, as explained in Section VIII.A.3.b) [Saridakis-Wu], it would have been obvious to use Saridakis’s SIP session for voice communication in view

of Wu. See EX1004, [0002] (“SIP ... can establish *voice sessions*.”); Claim 17. EX1002, ¶76.

Lastly, Saridakis’s ad hoc network is a WLAN that operates using *Internet Protocol*. EX1003, [0001] (“ad hoc, peer-to-peer networks ... created over ... *WLAN*.”); [0036] (“802.11 (WLAN) MAC addresses and *IP* addresses.”). See also EX1010, 2:45-50. Accordingly, the voice session established by Saridakis-Wu is a voice-over-IP (“*VoIP*”) session. EX1002, ¶77.



EX1003, Figure 4.

b) [1A] one or more VoIP client devices;

Saridakis-Wu teaches [1A]. EX1002, ¶¶78-79.

The user terminals in Saridakis-Wu teach “*one or more VoIP client devices.*”

The '762 Patent states that “[a] VoIP ‘client’ may be any user I/O device capable of sending or receiving VoIP (IP phone, cell phone with network connectivity, PC/laptop which includes sound recording and output means, and other devices) conversations.” EX1001, 2:62-66. Just like VoIP clients in the '762 Patent, the user terminals in Saridakis-Wu are user I/O devices capable of sending or receiving VoIP conversations. For example, as explained in Section VIII.A.3 [Saridakis-Wu], the *user terminals* include SIP UAs. EX1004, [0021], [0061], [0072], Claim 15. The SIP UAs are “for sending/receiving a SIP request message/SIP response message to/from the access AD thereof, in order to ... establish a session between the user terminals” (EX1004, [0021]), such as a “*voice session*[.]” (EX1004, [0002]). See Section VIII.A.3.b) [Saridakis-Wu]. EX1002, ¶79.

Saridakis-Wu Combination

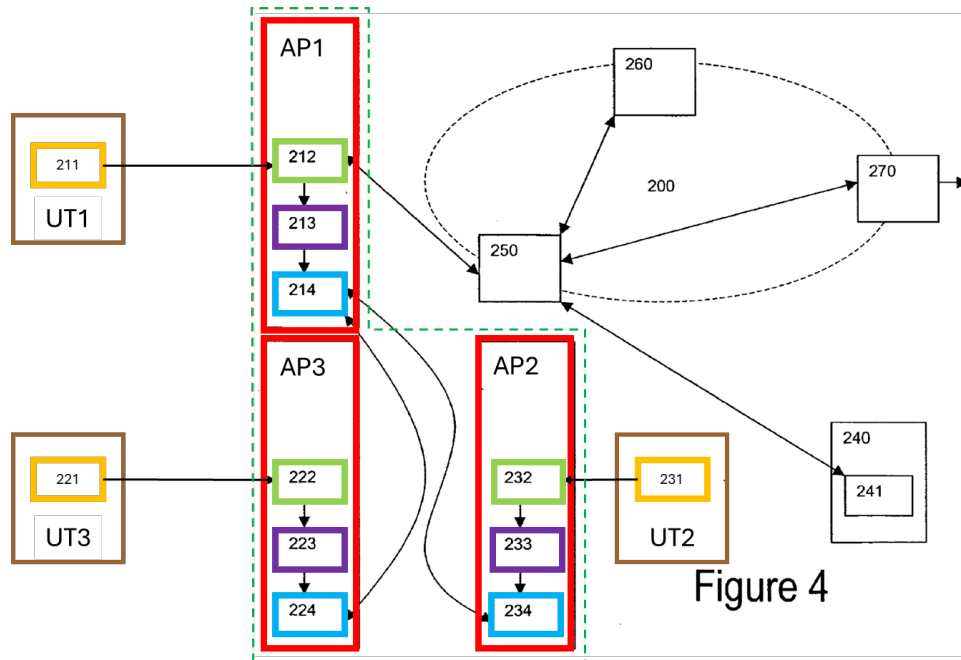


Figure 4

EX1003, Figure 4.

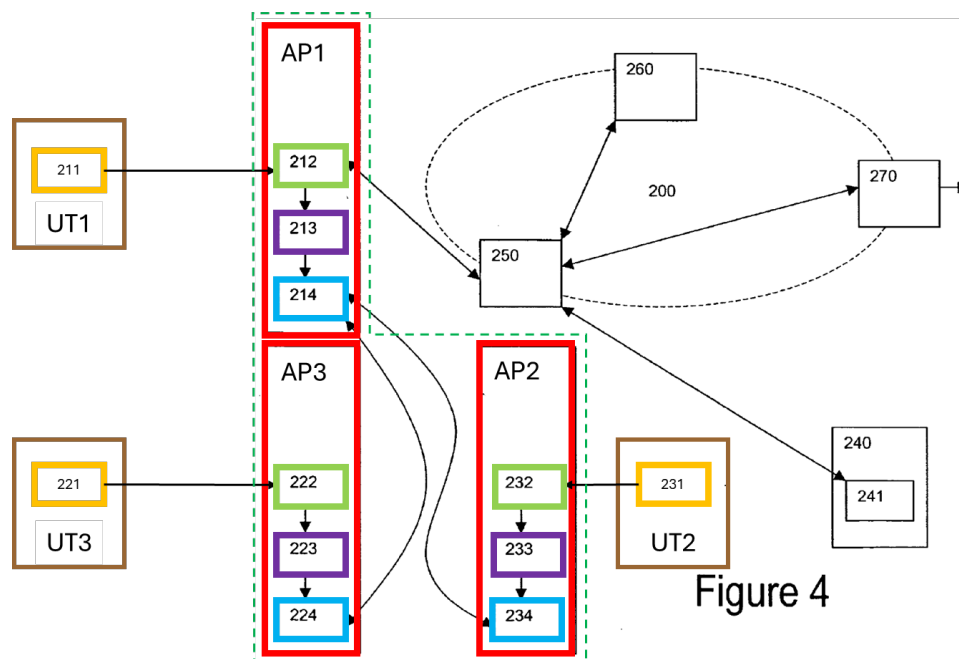
- c) [1B] two or more VoIP nodes forming an isolated cluster wherein the two or more VoIP nodes in the isolated cluster are in communication with one another;

Saridakis-Wu teaches [1B]. EX1002, ¶¶80-86.

First, Saridakis-Wu teaches “two or more VoIP nodes.” The ’762 Patent states that “a ‘node’ may include any of a number of network connectivity elements.” EX1001, 2:56-57. It also states that “[i]f [the network is] wireless, the node could be an access point.” EX1001, 2:59-60. Just like the access points in the ’762 Patent, the access points (APs) in Saridakis-Wu teach “two or more VoIP nodes.” EX1002, ¶81.

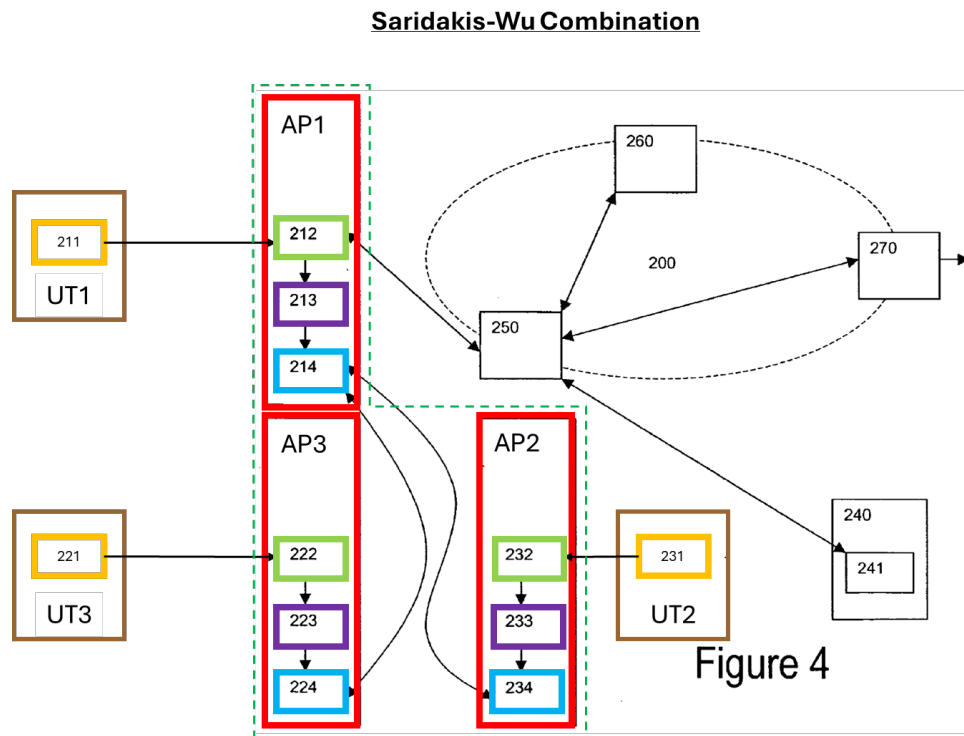
More specifically, as explained in Section VIII.A.3 [Saridakis-Wu], the ad hoc network is formed by *access points (APs)* that includes the **local SIP proxy**, **local SIP registrar**, and the **DULS instance**. EX1004, [0059] (“[T]he network based on ‘SIP using P2P’ includes two different entities, *APs (Access Points)* and user terminals (MH, Mobile Host) ... the APs (peers) connect directly to a few other APs (peers.)”; [0066]. The user terminals (“*VoIP client devices*”) in Saridakis-Wu gains connectivity to a network through communication with a nearby AP, just like a node in the ’762 Patent. EX1004, [0023] (“And each of the user terminals is connected to the P2P network by an *access device* thereof.”); [0030] (“The P2P network comprises a plurality of *access devices acting as nodes* thereof.”); [0060]; [0066]. EX1002, ¶¶82-83.

Saridakis-Wu Combination



EX1003, Figure 4.

Second, Saridakis-Wu teaches that the APs “form[] an isolated cluster.” Saridakis-Wu teaches a networked system that includes: (1) a “cellular network 200” with centralized SIP entities 250, 260; and (2) an ad hoc network formed by AP1, AP2, and AP3. EX1003, [0078], Figure 4. Saridakis teaches distributing, in the ad hoc network, the “repositories [which] facilitate[] the joining and leaving of terminals in the network *without the need to locate a central facility for user-location.*” EX1003, [0015]. See also EX1003, [0079]. Since the ad hoc network supports SIP operations isolated from the cellular network 200 that provides a central facility, the ad hoc network forms an “*isolated cluster.*” EX1002, ¶84.

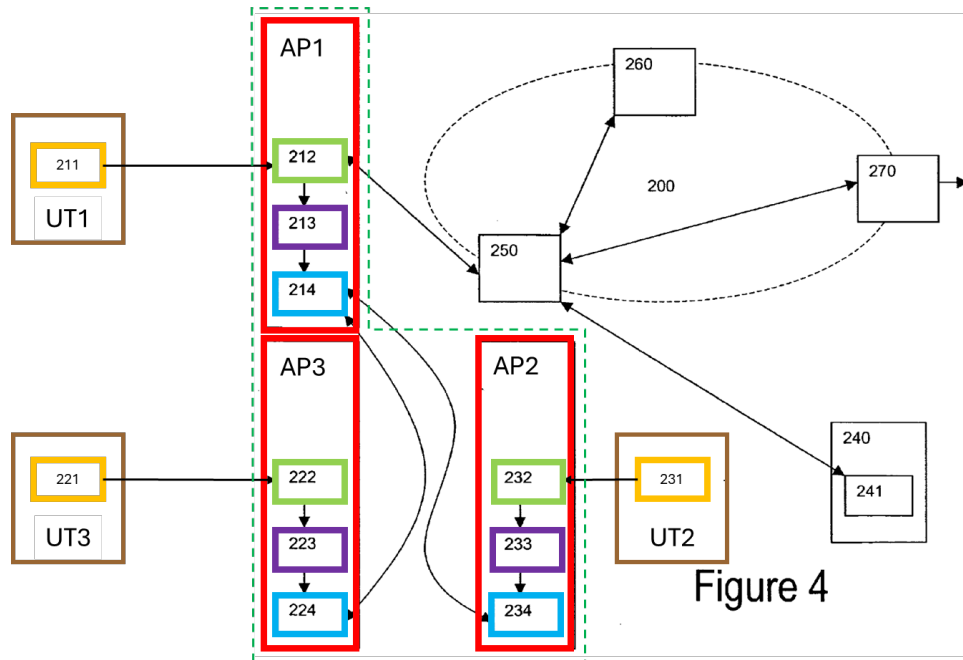


EX1003, Figure 4.

Third, the APs in Saridakis-Wu “*are in communication with one another.*”

As explained in Section VIII.A.3.a) [Saridakis-Wu], each AP includes a DULS instance. During operation, the DULS instances in the APs are synchronized. EX1003, [0017], [0020]. For example, the DULS instances use a “lazy update protocol” to synchronize their content. EX1003, [0054], Figure 2. As part of the lazy update protocol, “the DULS instance sends to ALL devices [i.e., APs] discovered in STEP 2d an update request that contains the user address that needs to be resolved (multicast can be used if available).” EX1003, [0059]. *See also* EX1003, [0058]. That communication is illustrated in Figure 4 of Saridakis as arrows between the DULS instances 214, 224, and 234. Since the DULS instances are part of APs, the APs in the ad hoc network (“*two or more VoIP nodes in the isolated cluster*”) “*are in communication with one another.*” EX1002, ¶¶85-86.

Saridakis-Wu Combination



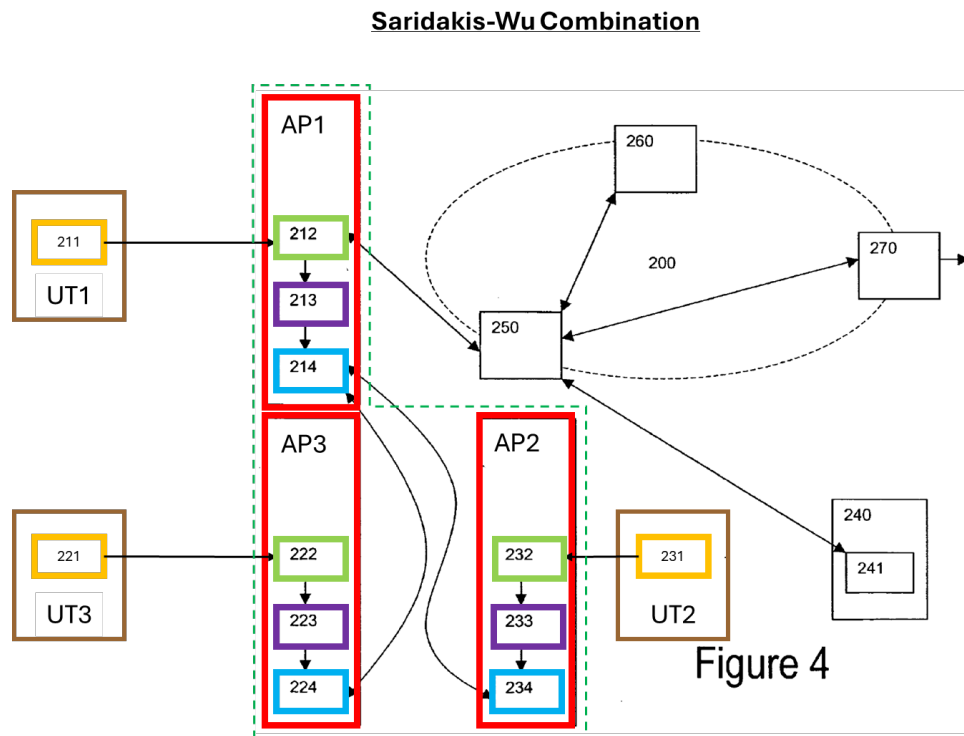
EX1003, Figure 4.

- d) [1C] wherein each of the VoIP client devices communicates with at least one VoIP node;

Saridakis-Wu teaches [1C]. EX1002, ¶¶87-88.

Saridakis teaches that a SIP UA communicates with the associated local SIP Proxy to route SIP requests. EX1003, [0076] (“a *SIP UA* is configured to contact the local *SIP Proxy* residing on the same terminal.”); [0079]. As explained in Section VIII.A.3.a) [Saridakis-Wu], in Saridakis-Wu, the SIP UA resides in a user terminal (“*VoIP client device*”) having a SIP UA communicates with a corresponding AP (“*VoIP*

node”) having a SIP proxy (as well as a local registrar and a DULS instance). See also EX1004, [0069]. EX1002, ¶88.



EX1003, Figure 4.

- e) [1D] wherein each of the VoIP nodes further comprises a local SIP registry built by exchanging SIP information with the remaining VoIP nodes in the isolated cluster; and

Saridakis-Wu teaches [1D]. EX1002, ¶¶89-90.

First, Saridakis-Wu teaches “each of the VoIP nodes further comprises a local SIP registry.” As explained in Section VIII.A.3.a) [Saridakis-Wu], each AP (“VoIP node”) includes a local Registrar and a DULS instance. The local Registrar uses the DULS instance in the same AP to initiate and maintain a SIP session. For example,

the DULS instance “includes a local Repository that contains mappings of user addresses to network addresses.” EX1003, [0038]. The user address may be a SIP address, and the network address may be a MAC address or IP address. *See* EX1003, [0004]

(“a *user address*, usually expressed as a URI [IETF RFC2396] like a *SIP address*”); [0039] (“if *MAC addresses* are used as network addresses ...”; “if *IP addresses* are used as network addresses”). Saridakis further explains:

When the *SIP UA* sends a SIP request, it is received by the local Proxy, which in turn requests from the *local Registrar* to resolve the SIP address. The *local Registrar* uses *DULS* to *find the network address* that corresponds to the given SIP address.

EX1003, [0077]. EX1002, ¶90.

The DULS instance shows the claimed “*local SIP registry*.” First, the DULS instance is “*local*” to the AP because the DULS instance is local to the AP. EX1003, [0079]; Figure 4. Furthermore, the DULS instance includes the mapping of the MAC or IP addresses, and other information needed to initiate a SIP session, and those are precisely the examples that ’762 Patent provides for the claimed SIP registry. *See* EX1001, 3:3-8 (“‘SIP registry information’ ... may include... the hardware (commonly-referred to as a device’s ‘*MAC address*’) and *IP addresses*, and/or other information that is required in order to initiate and maintain VoIP communications.”). EX1002, ¶91.

Second, Saridakis teaches that the DULS instance are “*built by exchanging SIP information with the remaining VoIP nodes in the isolated cluster.*” Saridakis teaches that the DULS instance can be built using “a lazy update protocol” described in Figure 2, copied below. EX1003, [0053]. The lazy update protocol assumes that all local Repositories of DULS instances are properly initialized: “when a DULS instance is activated ..., it loads to the local Repository the entries that contain the mappings of the current user addresses ... to the current network address of the device.” EX1003, [0039], [0055], Figure 2 (step 2a). EX1002, ¶¶92-93.

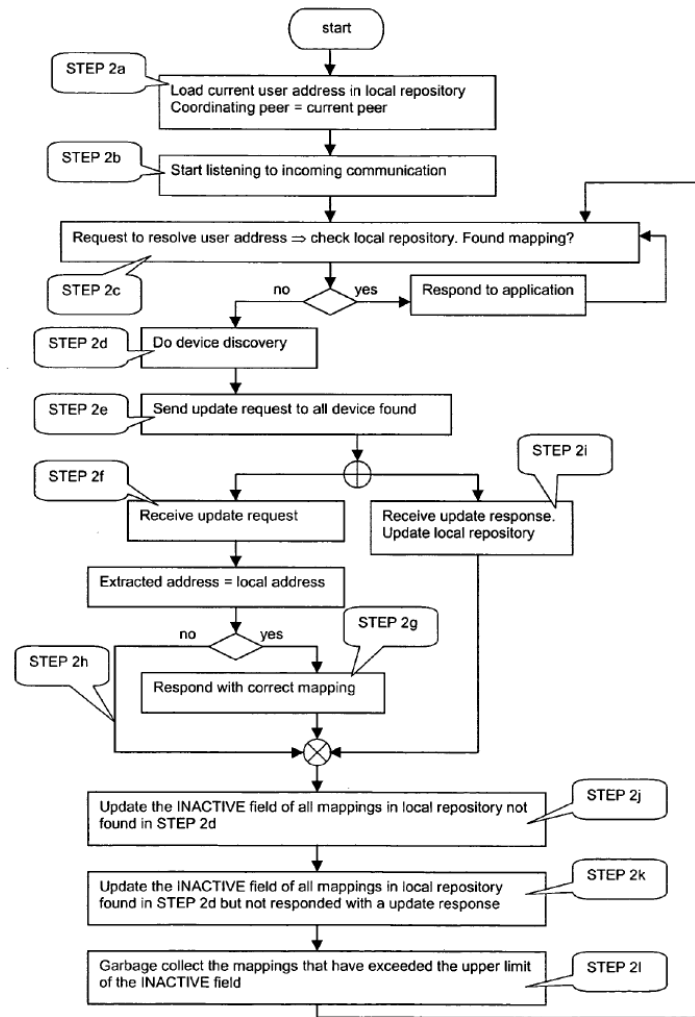


Figure 2

EX1004, Figure 2.

During operation, when a DULS instance receives “a request to resolve a user address, it checks the local Repository.” EX1003, [0057], Figure 2 (step 2c). “If the user address is NOT in the local Repository” (EX1003, [0057]), that requesting DULS instance: (1) discovers other peers (*i.e.*, APs in Saridakis-Wu) in the ad hoc network (EX1003, [0058], Figure 2 (step 2d)); and (2) sends to all discovered peers “an update request that contains the user address that needs to be resolved” and

“fragments of [its own] local Repository” (EX1003, [0059], Figure 2 (step 2e)).
EX1002, ¶¶93-94.

When a DULS instance in another peer (*i.e.*, AP) receives the update request, that responding DULS instance “parses [the update request] and extracts the user address that needs to be resolved.” EX1003, [0060], Figure 2 (step 2f). If the extracted user address “is one of those initially loaded to the local Repository” of the responding DULS instance, the responding DULS instance “MUST send back to the requesting DULS instance *an update response ... contain[ing] the mapping of the user address extracted from the update request to the network address of the present device.*” EX1003, [0061]. The responding DULS instance can also include, in the update response, “a second part that contains *fragments of [its] local Repository, e.g. the most up-to-date or the most recently acquired.*” EX1003, [0061], [0062]. EX1002, ¶¶95-98.

When the requesting DULS instance receives the update response, it “extracts the mapping of user address to network address” and “[t]he corresponding mapping is placed in [its] local Repository.” EX1003, [0063]. “If the update response has a second part (this is optional), then the DULS instance MUST parse it and use its contents to update the local Repository.” EX1003, [0063]. In other words, the requesting DULS instance builds its local Repository by exchanging update requests and responses with other peers (APs) in the ad hoc network. As explained above,

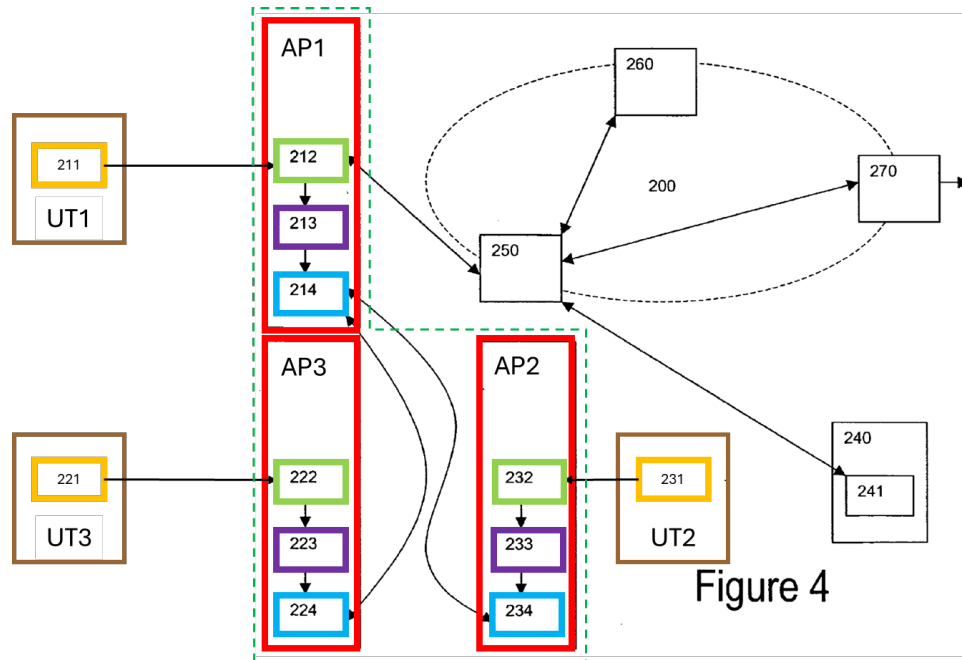
update requests and responses include “a user address” such as a “SIP address” (EX1003, [0004], [0059], [0061]) and fragments of local Repositories which, as explained above, correspond to SIP registry information. Accordingly, the requesting DULS instance (“*local SIP registry*”) is built by exchanging “a user address” and fragments of local Repositories (“*SIP information*”) with the remaining peers in the ad hoc network (“*the remaining VoIP nodes in the isolated cluster*”). EX1002, ¶99.

- f) [1E] wherein a first VoIP client device in communication with a first VoIP node establishes a communication with a second VoIP device in communication with a second VoIP node using the local SIP registries of the first VoIP node and the second VoIP node.**

Saridakis-Wu teaches [1E]. EX1002, ¶¶100-106.

First, Saridakis-Wu teaches “*a first VoIP client device in communication with a first VoIP node*” and “*a second VoIP device in communication with a second VoIP node*.” As shown below, the user terminal 1 (UT1) (“*first VoIP client device*”) is in communication with the access terminal 1 (AP1) (“*first VoIP node*”), and the user terminal 2 (UT2) (“*second VoIP client device*”) is in communication with the access terminal 2 (AP2) (“*second VoIP node*”). See also EX1003, [0078]-[0079] (“when the SIP UA 211 [in UT1] sends a SIP request ... the local Proxy 212 [in AP1] receives the SIP request.”); [0027]. EX1002, ¶101.

Saridakis-Wu Combination



EX1003, Figure 4.

Second, Saridakis-Wu teaches that UT1 “establishes a communication” with UT2. Saridakis explains that “SIP UA *handles SIP communication*” by exchanging SIP requests and responses with other SIP UAs. EX1003, [0026] (“The SIP UA handles SIP communication, i.e. it creates SIP requests/responses to be sent to other peers and parses SIP requests/responses sent by other peers.”). And Saridakis specifically teaches that “SIP UA 211 sends a SIP request to the SIP UA 231” “over the ad hoc network.” EX1003, [0079]. EX1002, ¶102.

Third, Saridakis teaches that the “communication” is established “using the local SIP registries of the first VoIP node and the second VoIP node.” Saridakis

explains that “when the SIP UA 211 sends a SIP request to the SIP UA 231, the following sequence of interaction happens”:

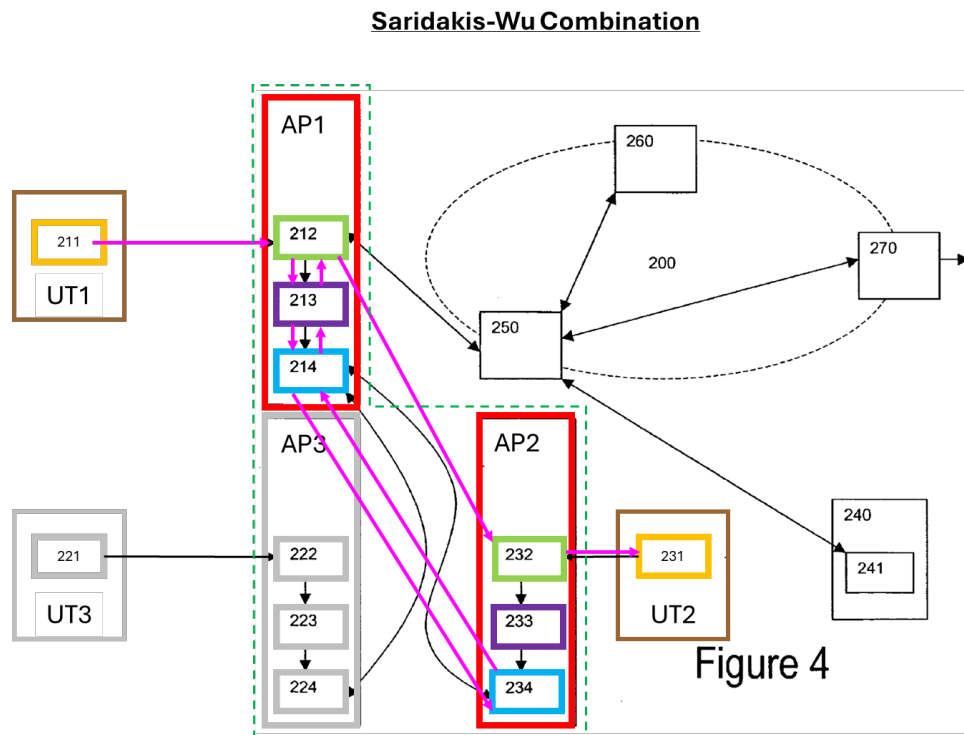
First, the local Proxy 212 receives the SIP request, extracts the SIP address of the intended recipient and tries to resolve it with the local Registrar 213, which, in turn, *retrieves the correct mapping from the DULS instance 214*. Having resolved the SIP address of the intended recipient, the local Proxy 212 forwards over the ad hoc network (e.g. a Bluetooth piconet) the SIP request to the SIP UA 231.

EX1003, [0079]. EX1002, ¶¶103-104.

If, however, the DULS instance 214 cannot resolve the SIP address of the intended recipient (UT2), it would execute the lazy update protocol as described in Section VIII.A.4.e) [1D]. For example, in Saridakis-Wu Combination, a DULS instance in an AP is initialized with the SIP address and network address of UTs assigned to the AP. EX1003, [0039], [0055]. During operation, when the DULS instance 214 cannot resolve the SIP address associated with UT2, it would send an update request to all other peers in the ad hoc network (*i.e.*, AP2 and AP3). EX1003, [0059]. Because “the requested user address [of UT2] ... is one of those initially loaded to the local Repository [of DULS instance 234 in AP2], the DULS instance [234 in AP2] MUST send back to the requesting DULS instance [214] an update response ... contain[ing] the mapping of the user address extracted from the update request to the network address of [UT2].” EX1003, [0061]. The requesting DULS

instance 214 would then use the update response to update its local Repository and resolve the SIP address associated with UT2. EX1003, [0063], [0067]. EX1002, ¶105.

Such exchange of messages is illustrated using the pink arrows in the illustration below. As shown, the communication between UT1 and UT2 is established using the DULS instances 214 and 234 of AP1 and AP2 (“using the local SIP registries of the first VoIP node and the second VoIP node”). EX1002, ¶106.



EX1003, Figure 4.

5. Claim 2

- a) **[2] The VoIP-capable network of claim 1, wherein the local SIP registries of the isolated VoIP nodes are updated as the VoIP nodes and the VoIP client devices begin communication with the isolated cluster and end communication with the isolated cluster.**

Saridakis-Wu teaches the additional limitation of claim 2. EX1002, ¶¶107-115.

First, Saridakis-Wu teaches that “*the VoIP nodes and the VoIP client devices begin communication with the isolated cluster and end communication with the isolated cluster.*” Saridakis teaches that an ad hoc network (“*isolated cluster*”) is “created with the spontaneous *join* [(i.e., *begin communication with*)] *or leave* [(i.e., *end communication with*)] *of their constituent nodes* and they operate without relying on any network infrastructure.” EX1003, [0002]. *See also* EX1003, [0035]. And in the context of Saridakis-Wu, APs (“*VoIP nodes*”) are the peers joining and leaving the ad hoc network. *See* EX1004, [0059] (“the APs (peers) connect directly to a few other APs (peers), forming a virtual network of peers”). Furthermore, the UTs (“*VoIP client devices*”) would also begin and end the communication with the ad hoc network when the corresponding APs join and leave the ad hoc network. *See* EX1004 [0060] (“The APs participating in this overlay act as traditional SIP outbound proxy servers for user terminals and allow user terminals to place and receive calls”). *See also* EX1004, [0078], [0086]. EX1002, ¶108.

Second, Saridakis-Wu teaches “*wherein the local SIP registries of the isolated VoIP nodes are updated*” as the APs and UTs join and leave the ad hoc network. As explained in Section VIII.A.1 [Saridakis], DULS instances may also be synchronized using the “distributed synchronization protocol.” EX1003, [0037]. Under that protocol, one peer acts as a coordinating peer that maintains an updated view of the network and multicasts DULS-information updates ***whenever nodes join or leave the ad hoc network***. EX1003, [0038]-[0051] (“the contents of local Repositories [in DULS instances] are synchronized, reacting to network events (i.e. ***join and leave of peers***)”), Figure 1. *See also* EX1003, [0023]. EX1002, ¶¶109-110.

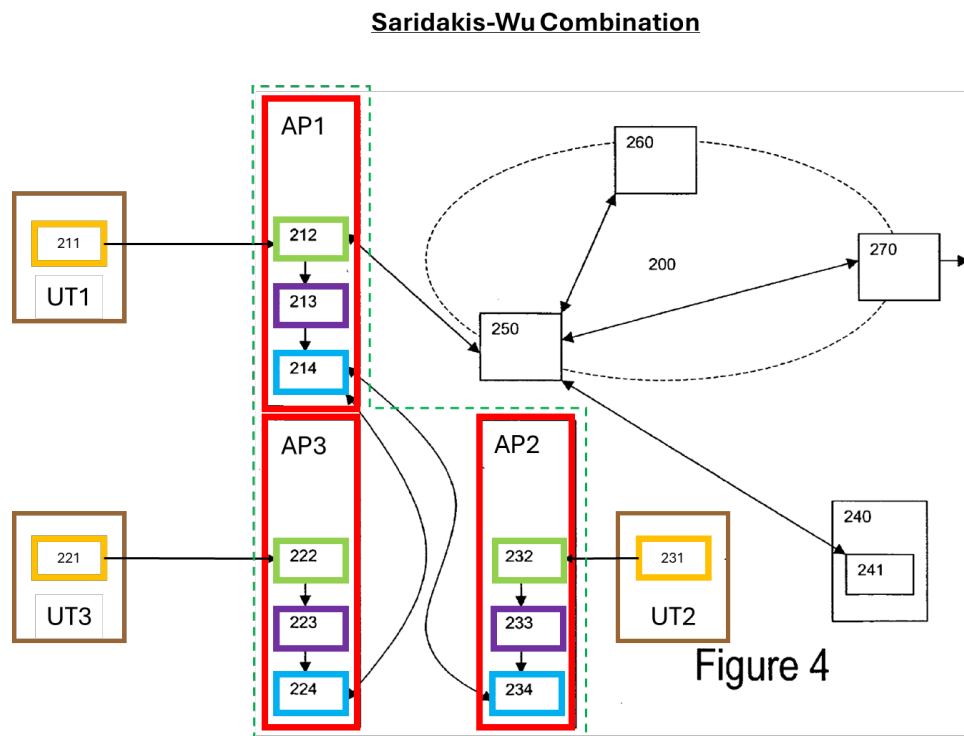
In the context of Saridakis-Wu, the peers in the ad hoc network are formed by APs. Thus, Saridakis-Wu teaches that the DULS instances in the APs are updated as the APs (i.e., peers) join or leave the ad hoc network. EX1003, [0038]-[0051]. EX1002, ¶111.

Saridakis-Wu also teaches that the DULS instances in the APs are updated as the ***UTs*** join or leave the network. Saridakis explains that DULS updates are triggered when peers containing SIP UAs join or leave the network, and in Saridakis-Wu, the SIP UAs reside in the UTs. Thus, a POSITA would have understood that in Saridakis-Wu, the DULS synchronization is triggered also when the UTs join or leave the network. Such understanding would have been consistent with Wu as well.

EX1004, [0086] (“Once a node (AP) has joined the P2P network, the user (in user terminal) that node is responsible for must be registered with the P2P network.”).

EX1002, ¶112.

Accordingly, when the distributed synchronization protocol is implemented in Saridakis-Wu, the DULS instances of the APs would be updated as the APs and/or UTs join and leave the ad hoc network. EX1002, ¶113.



EX1003, Figure 4.

It would have been obvious to implement Saridakis-Wu to be capable of both the “distributed synchronization protocol” and the “lazy update protocol.” As Saridakis explains, each protocol has its own advantage. For example, the distributed synchronization protocol is “suitable for applications that are interested

in monitoring such network events” as “joins and leaves of peers” (EX1003, [0023]), whereas “[t]he advantage of the lazy update protocol ... is that it produces network traffic only when this is necessary” (EX1003, [0067]). Accordingly, a POSITA would have been motivated to implement Saridakis-Wu such that it uses the “distributed synchronization protocol” when the applications call for monitoring network events such as joining and leaving of peers, and alternatively the “lazy update protocol” when reducing the amount of network traffic is important. EX1002, ¶114.

A POSITA would have had a reasonable expectation of success in implementing both the “distributed synchronization protocol” and the “lazy update protocol” in Saridakis-Wu because Saridakis discloses both protocols, and the modification would have merely amounted to alternating between two protocols (e.g., by changing the settings in software) to adapt to network conditions and applications. The combination would have resulted in predictable results of using one update protocol at one point in time and using another update protocol at another point in time. Thus, the combination would have merely amounted to applying a known technique (the “distributed synchronization protocol”) to a known ad hoc network (an ad hoc network implementing the “lazy update protocol”) to alternate between the protocols ready for improvement (to accommodate “applications interested in monitoring such network events” such as “joins and leaves of peers”

(EX1003, [0023])) to yield predictable results (using one update protocol at one point and using another update protocol at another point in time). EX1002, ¶115.

6. Claim 3

- a) **[3] The VoIP-capable network of claim 1, wherein updates to the local SIP registry of a VoIP node are communicated to remaining VoIP nodes in the isolated cluster by broadcasting one or more information packets containing local SIP registry information of the VoIP node.**

Saridakis-Wu teaches or renders obvious the additional limitation of claim 3. EX1002, ¶¶116-121.

As explained in Section VIII.A.4.e) [1D], under the lazy update protocol in Saridakis-Wu, when an AP cannot resolve a user address locally (EX1003, [0057]), it “sends to ALL devices” discovered on the ad hoc network “an update request that contains the user address that needs to be resolved” and “*fragments* of [its own] local Repository, e.g. the most up-to-date or the *most recently acquired*.” (EX1003, [0059], Figure 2 (step 2e)). Saridakis teaches that the update request can be sent using “*multicast* ... if available.” EX1003, [0059]. EX1002, ¶117.

Alternatively, as explained in Section VIII.A.5.a) [Claim 2], under the distributed synchronization protocol, one peer (e.g., AP in Saridakis-Wu) acts as a coordinating peer that maintains an updated view of the network. When a DULS instance in a peer “receives indication ... that a given network address is not

responding ... it sends to the coordinating peer a *synchronize request* including the network address that is not responding.” EX1003, [0047]. Subsequently, “if the DULS instance of the coordinating peer receives a synchronize request, *it removes the non-responding network address (and the associated user addresses) from its local Repository* and sends to ALL remaining network addresses in the local Repository *a synchronize response with the [updated] contents of the local Repository (multicast can be used if available)*” so that the rest of the peers can update their local Repositories. EX1003, [0048]-[0049]. EX1002, ¶118.

Under either protocol, Saridakis teaches that information may be distributed to all nodes in the ad hoc network as a “multicast.” *See* EX1003, [0048]-[0049], [0059]. Saridakis also teaches that such multicasting to all other nodes in the network would be performed by broadcasting. For instance, Saridakis explains in the specification that in step 1j, “multicast can be used” to distribute information. EX1003, [0048]. And in the corresponding figure (Figure 1) showing step 1j, Saridakis teaches “*broadcast[ing]* its contents to all network addresses in it.” EX1003, Figure 1 (1j). Accordingly, a POSITA would have understood that Sardakis’s disclosure of multicasting to all nodes teaches broadcasting. That is indeed consistent with how the term broadcast is used in the art. *See* EX1011, [0008] (“broadcast is special multicast in which the multicast group address specifies all terminals”). At a minimum, it would have been obvious to use broadcasting, as

opposed to multicasting if there is any difference, to send the information to all receiving terminals broadcasting to all other devices achieves the same goal as multicasting to all other devices in a predictable manner. EX1002, ¶119.

Furthermore, since Saridakis teaches that the ad hoc network may be a WLAN (EX1003, [0001], [0036]), updates to the local Repository are multicast to all other APs using “*one or more information packets.*” EX1012, 3:37-38 (describing sending “VoIP packet ... to the mobile terminal ... using the WLAN link”). EX1002, ¶120.

Accordingly, Saridakis-Wu teaches that updates to the local Repository in the DULS instance (“*updates to the local SIP registry of a VoIP node*”) are communicated to the rest of the peers in the ad hoc network (“*remaining VoIP nodes in the isolated cluster*”) by multicasting the contents of the local Repository to all other VoIP nodes (“*broadcasting ... local SIP registry information of the VoIP node*”). Since Saridakis teaches that the ad hoc network may be a WLAN (EX1003, [0001], [0036]), Saridakis teaches that the updated contents of the local Repository are multicast using “*one or more information packets.*” EX1002, ¶121.

7. **Claim 4**

- a) **[4] The VoIP-capable network of claim 1, wherein the local SIP registry of a VoIP node is updated according to information received from another VoIP nodes in the isolated cluster in special information packets that each contain local SIP registry information of another VoIP node.**

Saridakis-Wu teaches the additional limitation of Claim 4. EX1002, ¶¶122-124.

As explained in Section VIII.A.4.e) [1D], a DULS instance in an AP can be updated by: (1) sending an “update request that contains the user address that needs to be resolved” to other APs in the ad hoc network (EX1003, [0059], Figure 2 (step 2e)); (2) receiving an update response from one of the APs “contain[ing] the mapping of the user address extracted from the update request to the network address of the present device” obtained from its local Repository (EX1003, [0061]); and (3) from the received update response, “extract[ing] the mapping of user address to network address” and placing “[t]he corresponding mapping ... in [its] local Repository” (EX1003, [0063]). And over time, the DULS instance can perform this operation multiple times to resolve multiple user addresses—thereby receiving update responses from multiple APs in the ad hoc network. Further, the update responses are received by the AP in packets because the ad hoc network may be a WLAN. EX1003, [0001], [0036]; EX1012, 3:37-38. EX1002, ¶123.

Accordingly, the DULS instance of the AP that sent the update request (“*local SIP registry of a VoIP node*”) is updated according to update responses received from other APs in the ad hoc network (“*information received from another VoIP nodes in the isolated cluster*”). Further, the update responses are received from peer APs in packets (“*special information packets*”) that each contains the “mapping of the user address extracted from the update request to the network address of the present device” obtained from its local Repository (“*local SIP registry information of another VoIP node*”). EX1002, ¶124.

8. Claim 8

- a) **[8] The VoIP-capable network of claim 1 wherein said nodes comprise mesh nodes.**

Saridakis-Wu teaches the additional limitation of claim 8. EX1002, ¶¶125-126.

The APs in Saridakis-Wu are “*mesh nodes*.” For example, as shown below, AP2 can communicate with the cellular network 200 in a multi-hop manner, using AP1 as a relay node in a mesh configuration. Indeed, Wu expressly teach the APs form a “wireless *mesh* network.” EX1004, [0011]. EX1002, ¶126.

Saridakis-Wu Combination

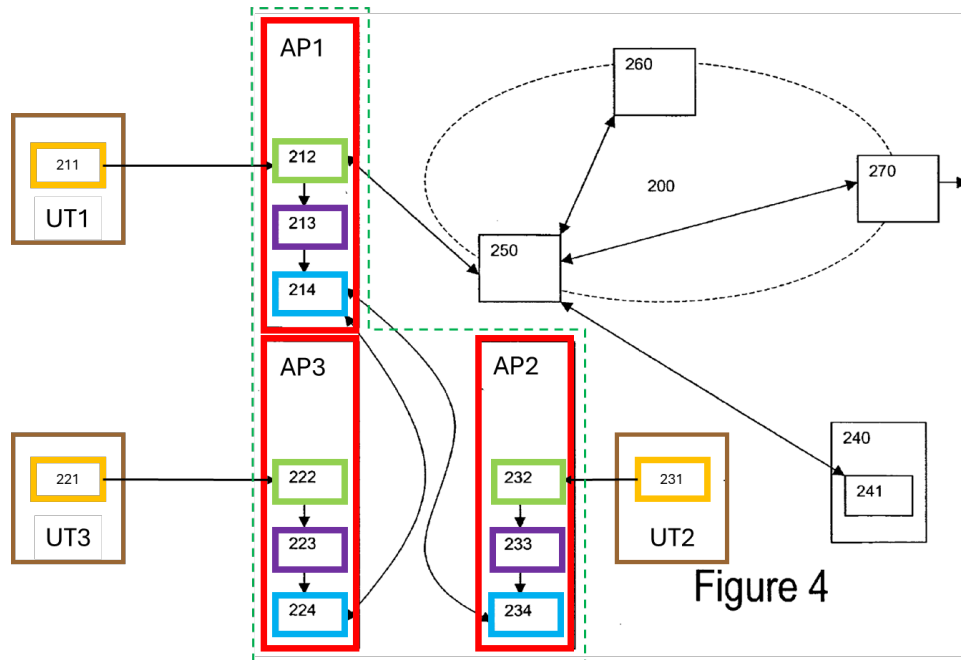


Figure 4

EX1003, Figure 4.

9. Claim 9

- a) [9] The VoIP-capable network of claim 8 wherein said mesh nodes provide VoIP optimized services within said mesh nodes.

Saridakis-Wu teaches the additional limitation of claim 9. As explained in Section VII.B [Claim Construction], “*VoIP optimized services*” include a SIP server service. As explained in Section VIII.A.4.a) [1Pre], Saridakis provides an ad hoc network with APs that support a SIP server service, such as a local SIP Proxy, local SIP Registrar, and a DULS instance (EX1003, [0018], [0034], [0078]), and Wu teaches that “SIP ... can establish *voice sessions*” (EX1004, [0002]). Accordingly,

the APs (“*said mesh nodes*”) provide a SIP server service within them. EX1002, ¶127.

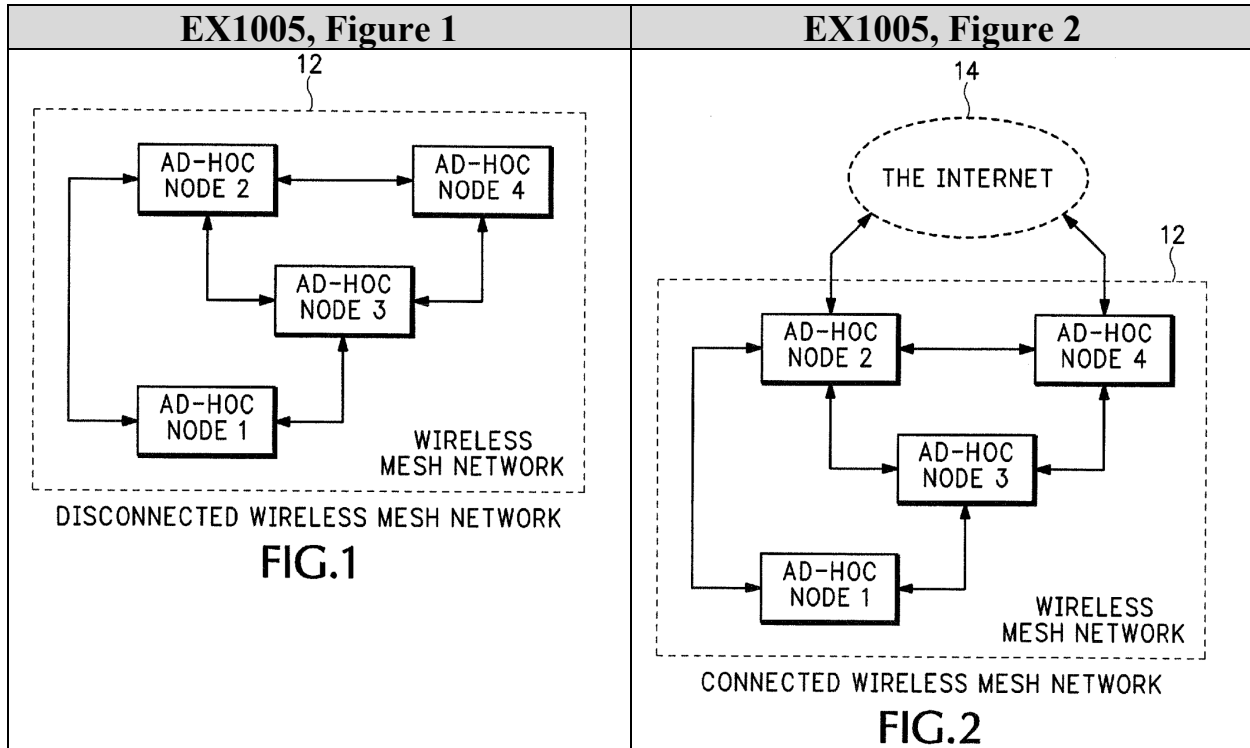
B. Ground II: Saridakis In View Of Wu And Bauer Renders Obvious Claims 1-4, 7-10, 12-13, And 15-17.

1. Bauer (EX1005)

Bauer describes a mesh network in which nodes “access centralized Internet Protocol (IP) services whenever the Internet infrastructure is accessible and then dynamically switch to providing the IP services locally in the mesh network when the Internet infrastructure is not accessible.” EX1005, Abstract. Specifically, Bauer enables mesh nodes to “*dynamically switch to providing the IP services locally* in the mesh network when the Internet infrastructure is not accessible.” EX1005, [0005]. EX1002, ¶¶128-129.

For example, Figure 1 of Bauer “shows a mesh network 12 that is currently disconnected from an Internet infrastructure,” and Figure 2 “shows the same wireless mesh network 12, now connected to an IP infrastructure 14.” EX1005, [0023]-[0024]. “FIGS. 1 and 2 demonstrate how the mesh network 12 over its lifetime may be connected or disconnected from the Internet 14.” EX1005, [0025]. In such a mesh network, Mesh Distributed Services (MDS) are used to “support any combination of different Internet Protocol (IP) services,” including the Domain Name System (DNS) and the Dynamic Host Configuration Protocol (DHCP), by

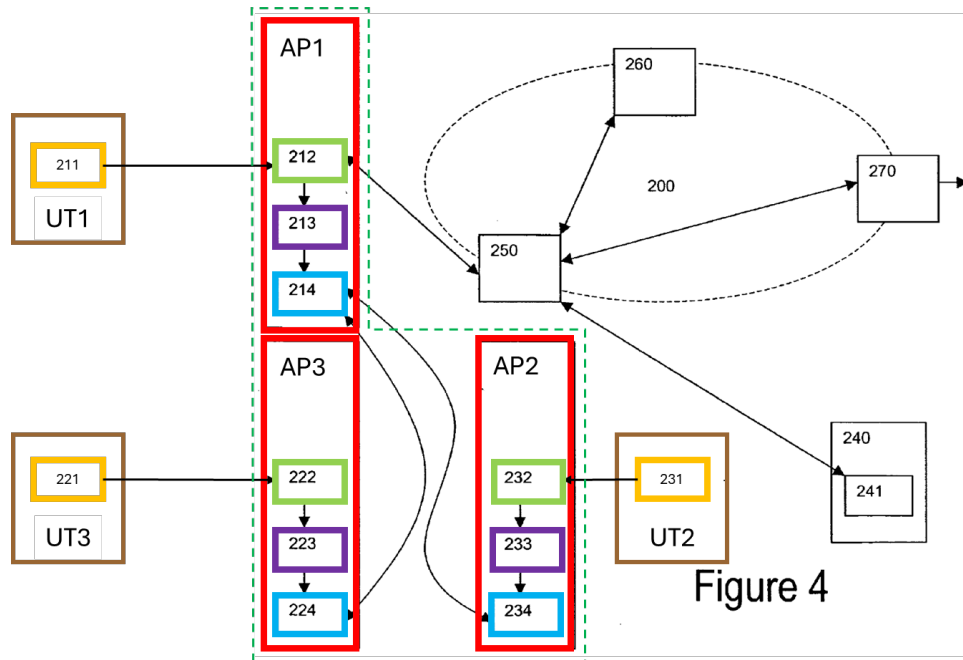
“mimick[ing] centralized Internet services through collaborative cooperation between individual mesh nodes.” EX1005, [0022]. EX1002, ¶129.



2. Saridakis-Wu, Further In View Of Bauer (“Saridakis-Wu-Bauer Combination”)

As explained in Section VIII.A.4.c) [Ground I, 1B], Saridakis-Wu teaches an “*isolated cluster*” because the ad hoc network in Saridakis-Wu supports SIP operations isolated from the cellular network 200. EX1002, ¶¶130-131.

Saridakis-Wu Combination



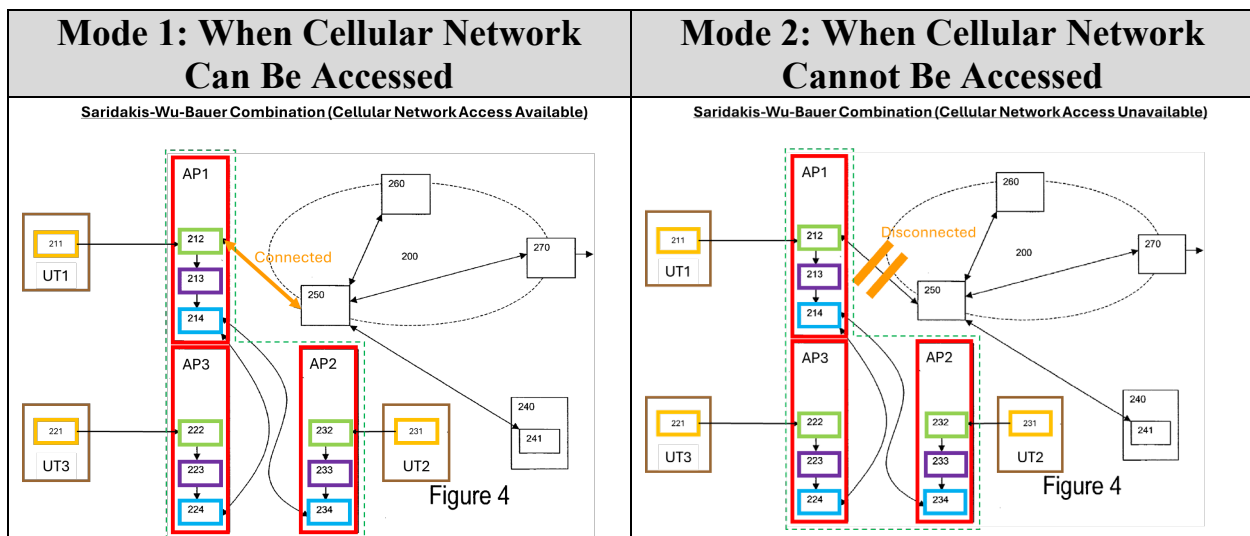
EX1003, Figure 4.

To the extent Saridakis-Wu does not teach the “*isolated cluster*” because Saridakis does not expressly state that its ad hoc network would not communicate with the cellular network 200, it would have been obvious to modify the system in Saridakis-Wu in view of Bauer to operate the ad hoc network in two different modes: one in which the ad hoc network is disconnected from the cellular network 200, and another in which it is connected. EX1002, ¶132.

For example, as explained in Section VIII.B.1 [Bauer], Bauer teaches that “[n]odes in a mesh network are configured to access centralized Internet Protocol (IP) services *when the Internet infrastructure is accessible* and then dynamically

switch to providing the IP services locally in the mesh network *when the Internet infrastructure is not accessible.*” EX1005, [0005]. EX1002, ¶133.

Accordingly, it would have been obvious to modify Saridakis-Wu so that, when the cellular network 200 is accessible, the APs communicate with the centralized SIP entities in the cellular network 200 (for example, as described in Saridakis (EX1003, [0080])); but when the cellular network 200 is not accessible, the APs provide the SIP services locally, without relying on the centralized SIP entities in the cellular network 200. EX1005, [0005]. In this combination, the system would “dynamically switch” between the two modes of operation depending on the availability of cellular network access. EX1005, [0005], [0027], [0058]. Such a modification is illustrated below. EX1002, ¶¶134-135.



A POSITA would have been motivated to combine Saridakis-Wu with Bauer as described above, for three reasons. EX1002, ¶136.

First, Saridakis-Wu contemplates providing the SIP services locally within the ad hoc network isolated from the cellular network 200, i.e., without a central facility. EX1003, [0015], [0079], Section VIII.A.4.c) [Ground I, 1B]. But Saridakis-Wu also contemplates using the central facility in the cellular network 200 when it is available. *See* EX1003, [0080]. Accordingly, a POSITA would have been motivated to implement Saridakis-Wu to permit both modes of operation, by dynamic switching between the modes based on the availability of the cellular network access, as taught by Bauer. The combination would have merely amounted to using a known technique (Bauer’s mode switching based on network availability) to improve similar devices (Saridakis-Wu’s system that can operate with or without access to the cellular network 200) in the same way (by providing SIP services locally or through the cellular network depending on the availability of the cellular network). EX1002, ¶137.

Second, Bauer also motivates the combination. Bauer explains that its technique is applicable for DNS applications that “resolv[es] human readable names such as ‘machine.company.com’ into Internet Protocol (IP) addresses.” EX1005. [0052]. The DNS service is highly similar to the user-location service implemented in Saridakis-Wu, as both resolve human-readable identifiers to network addresses. EX1003, [0004] (“a user-location service provides a mapping of a user address, ... like a SIP address (e.g. sip:titos.saridakis@snokia.com) or an email address (e.g.

mailto:titos.saridakis@nokia.com), to the network address.”). Indeed, Saridakis expressly recognizes as much. EX1003, [0004] (“[A] user-location service is similar to ... the DNS [IETF RFC1034 and RFC1035] that maps machine names to IP addresses.”). Thus, a POSITA would have understood that Bauer’s dynamic switching technique is readily applicable to Saridakis-Wu, and thus would have been motivated to apply Bauer’s technique to the SIP services provided by Saridakis-Wu. EX1002, ¶138.

Third, a POSITA would have understood that the ad hoc network formed by the APs in Saridakis-Wu are substantially similar to a “wireless mesh network” described in Bauer, to which Bauer’s technique applies. As Bauer explains, “[a] wireless mesh network generally refers to a set of wireless devices, referred to as nodes, that join together to form an Internet Protocol (IP) based network.” EX1005, [0002]. Likewise, the APs in Saridakis-Wu are wireless devices that join together to form a WLAN—an IP-based network. EX1003, [0001]; EX1004, [0059]. Accordingly, a POSITA would have understood that Bauer’s dynamic switching technique readily applies to Saridakis-Wu, and thus would have been motivated to apply it. EX1002, ¶139.

A POSITA would have had a reasonable expectation of success in combining Saridakis-Wu with Bauer, for two reasons. EX1002, ¶140.

First, Saridakis-Wu is highly compatible with Bauer. Saridakis, Wu, and Bauer each contemplate providing IP services without relying on centralized entities. *See* EX1003, [0015]; EX1004, [0003], [0040]; EX1005, Abstract, [0022], [0025]. Indeed, as described above, the distributed SIP registry services described in Saridakis and Wu closely parallel the distributed DNS services described in Bauer. EX1002, ¶141.

Second, Saridakis-Wu contemplates operating the ad hoc network isolated from the cellular network, and teaches the necessary components to operate the SIP services locally within the ad hoc network. EX1003, [0014]-[0016], [0078]-[0079]; EX1004, [0011]-[0013]. Accordingly, operating the ad hoc network in Saridakis-Wu in an isolated manner—as contemplated by Bauer—would have merely amounted to detecting whether the ad hoc network is disconnected to the cellular network using well known techniques (EX1005, [0027]), and if so, disabling reliance on the SIP entities in the cellular network 200. That would have yielded the predictable results of providing SIP services locally within the ad hoc network, without relying on a “central facility.” EX1003, [0015]. EX1002, ¶142.

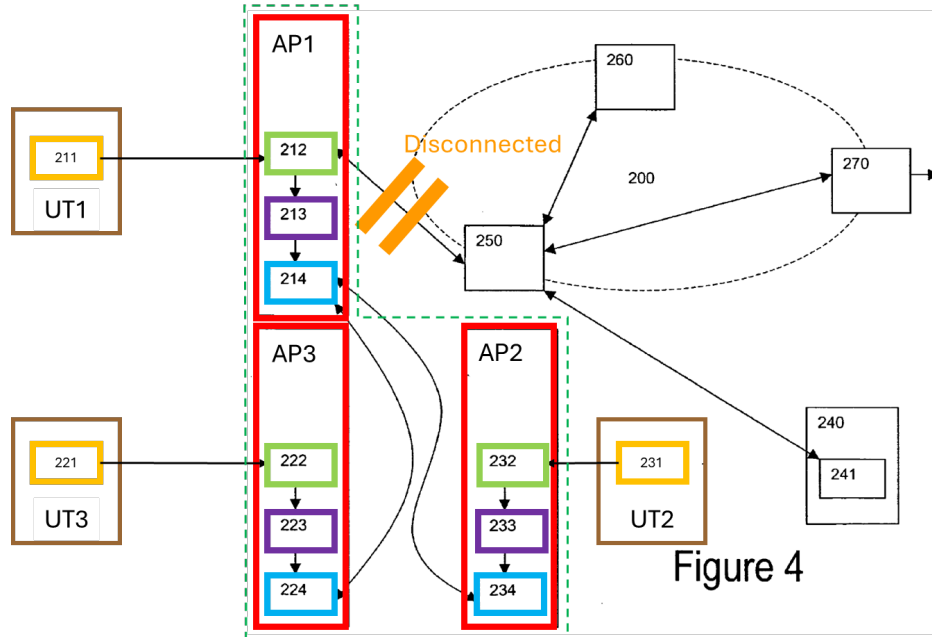
3. Claims 1-4, 8, And 9

As explained in Sections VIII.A.4-VIII.A.9 [Ground I, Claims 1-4, 8, And 9], Saridakis-Wu renders obvious claims 1-4, 8, and 9. However, to the extent Saridakis-Wu is found not to render these claims obvious because its ad hoc network

is determined not to teach an “*isolated cluster*,” claims 1-4, 8, and 9 would nonetheless have been obvious in view of Saridakis-Wu-Bauer Combination. EX1002, ¶143.

Specifically, Saridakis-Wu-Bauer Combination teaches all limitations of claims 1-4, 8, and 9 other than the “*isolated cluster*” as described in Ground I. *See* Sections VIII.A.4-VIII.A.9 [Ground I, Claims 1-4, 8, And 9]. Furthermore, in Saridakis-Wu-Bauer Combination, the ad hoc network is an “*isolated cluster*” because the ad hoc network may be disconnected or isolated from the cellular network 200 and still provide the SIP services entirely by itself, without any communication with the cellular network 200. *See* Section VIII.B.2 [Saridakis-Wu-Bauer Combination]. Such isolated configuration of the ad hoc network is just like the isolated cluster described in the ’762 Patent. *See* EX1001, 4:2-8 (“If one or more network nodes later become *isolated from the path to the external SIP server*, any VoIP clients connected to an isolated node or nodes that form an *isolated cluster* with network connections within the isolated cluster can still initiate and continue VoIP conversations *within the isolated cluster*.”); 5:4-7. EX1002, ¶144.

Saridakis-Wu-Bauer Combination (Cellular Network Access Unavailable)



EX1003, Figure 4.

Accordingly, the ad hoc network in its isolated mode teaches the claimed “*isolated cluster.*” EX1002, ¶145.

4. Claim 7

- a) [7] The VoIP-capable network of claim 1, further comprising means of connecting the isolated cluster to an external network, wherein upon connection to an external network, the SIP registry of an external SIP server connected to the external network is updated to include SIP registry information from the VoIP nodes.

Saridakis-Wu-Bauer Combination teaches the additional limitation of claim 7. EX1002, ¶¶146-149.

First, Saridakis teaches “*means of connecting the isolated cluster to an external network.*” As explained in Section VII.A [Claim Construction], the “*means*

of connecting” should be interpreted as “software and/or hardware elements” for “connecting the isolated cluster to an external network.” Saridakis teaches that the local SIP proxy—which is part of an AP, a hardware element—can communicate with the SIP proxy 250 on the cellular network to connect the ad hoc network (“*isolated cluster*”) to the cellular network (“*external network*”). EX1003, [0080] (“the local Proxy 212 forwards the initial SIP request to the SIP Proxy 250 on the cellular network.”). EX1002, ¶147.

Second, Saridakis-Wu-Bauer Combination teaches “*wherein upon connection to an external network, the SIP registry of an external SIP server connected to the external network is updated to include SIP registry information from the VoIP nodes.*” As explained in Section VIII.B.2 [Saridakis-Wu-Bauer Combination], the APs “are configured to access centralized Internet Protocol (IP) services [on the cellular network] **when the Internet infrastructure is accessible.**” EX1005, [0005]. For example, when a SIP UA (user terminal in Saridakis-Wu-Bauer Combination) wants to register for SIP services, the “SIP UA is configured to contact the local SIP Proxy” in the AP (“*VoIP node*”) assigned to the SIP UA. EX1003, [0076]. The local Proxy then “**forward[s] REGISTER requests** both to the local Registrar and to **the SIP Proxy** residing **on the cellular network**, which further forwards them to **the SIP Registrar** residing on the cellular network” (“*SIP registry of an external SIP server connected to the external network*”). EX1003, [0076]. And the external SIP

Registrar registers the SIP UA using the network address and the SIP address in the REGISTER request. EX1003, [0070] (“A SIP Registrar is an entity that provides a directory service for SIP UAs. SIP UAs are configured with the network address of a Registrar to which they send REGISTER requests in order register the network address where they are located, and which they contact to resolve a SIP address to the network address where a SIP request must be sent.”). EX1002, ¶148.

Accordingly, “when the Internet infrastructure is accessible” (EX1005, [0005]), the SIP Registrar of the cellular network (“*the SIP registry of an external SIP server connected to the external network*”) is updated to include network and SIP address information in the REGISTER requests (“*SIP registry information*”) received from the APs (“*the VoIP nodes*”). EX1002, ¶149.

5. Claim 10

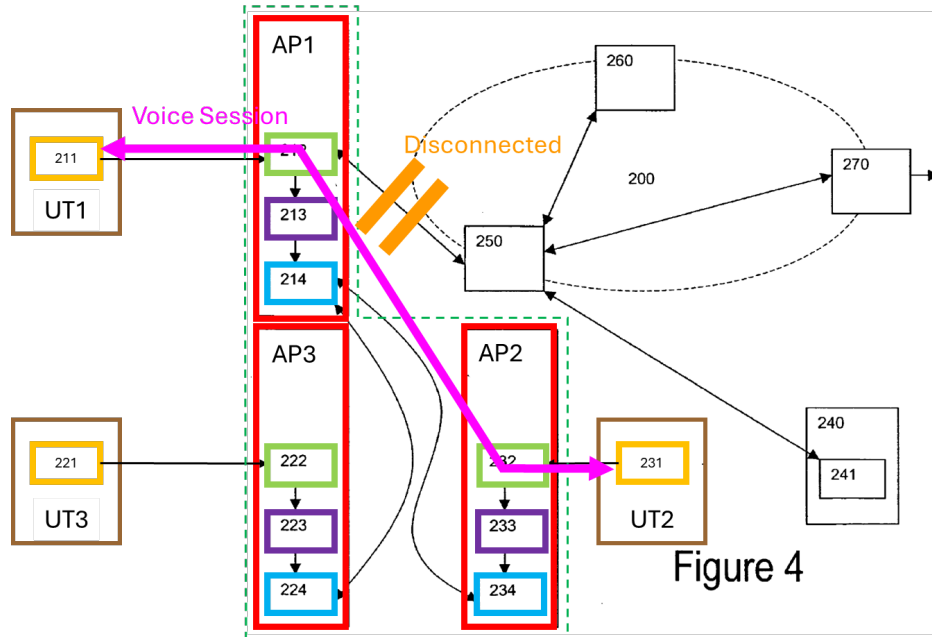
a) [10 Pre] A method of maintaining VoIP capabilities within a network comprising:

Saridakis-Wu-Bauer Combination teaches [10Pre]. EX1002, ¶¶150-151.

For example, Saridakis describes a “*method* [that] allows the use of SIP in ad hoc, peer-to-peer networks.” EX1003, [0034]. Also, as explained in Section VIII.A.4.a) [Ground I, 1Pre], Saridakis-Wu teaches that the SIP service in the ad hoc network can maintain VoIP capabilities. In addition, as described in Section VIII.B.2 [Saridakis-Wu-Bauer Combination], the SIP/VoIP service can be provided

within a system including an ad hoc network (“*within a network*”). EX1005, [0005], [0027], [0058]. EX1002, ¶151.

Saridakis-Wu-Bauer Combination (Cellular Network Access Unavailable)



EX1003, Figure 4.

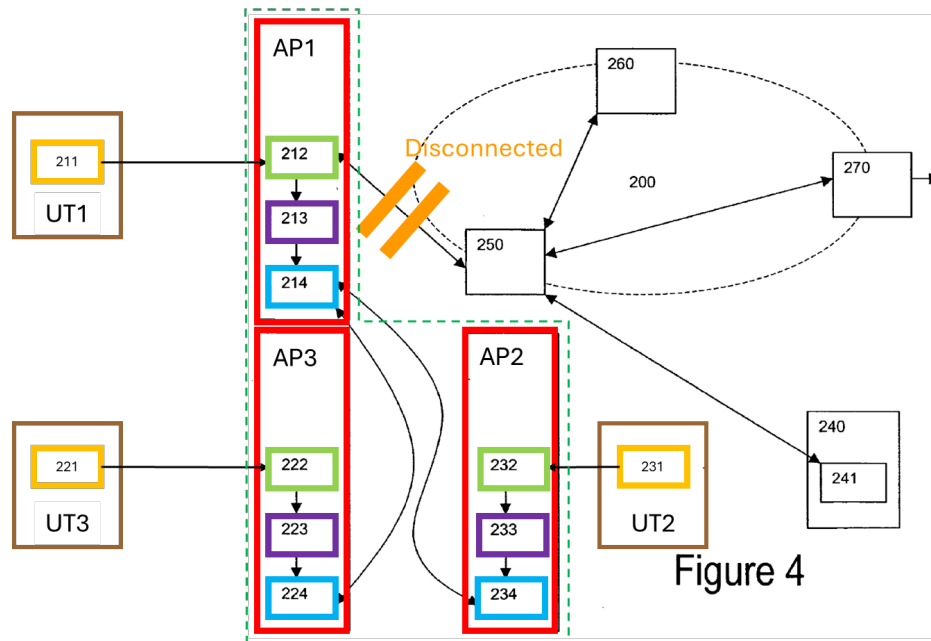
b) [10A] forming a cluster of two or more initially isolated network nodes

Saridakis-Wu-Bauer Combination teaches or renders obvious [10A].
EX1002, ¶¶152-153.

First, Saridakis-Wu-Bauer Combination teaches “forming a cluster of two or more . . . network nodes,” as explained in Section VIII.A.4.c) [Ground I, 1B]. For example, the ad hoc peer-to-peer network is formed by *access points (APs)* that includes the **local SIP registrar** and the **DULS instance**, as shown below by AP1,

AP2, and AP3. EX1004, [0059], [0066]. Just like the “VoIP client devices [that] gain connectivity to a network ... through communication with a nearby ‘node’” in the '762 Patent (EX1001, 3:35-39), the user terminals in Saridakis-Wu (and, hence, in Saridakis-Wu-Bauer Combination) gain connectivity to a network through communication with a nearby AP. EX1004, [0023], [0030], [0060], [0066]. EX1002, ¶153.

Saridakis-Wu-Bauer Combination (Cellular Network Access Unavailable)



Second, Saridakis-Wu-Bauer Combination teaches or renders obvious that “two or more ... network nodes” are “initially isolated,” as explained in Section VIII.B.2 [Saridakis-Wu-Bauer Combination]. For example, Bauer explains that “[n]odes in a mesh network are configured to ... provid[e] the IP services locally in the mesh network *when the Internet infrastructure is not accessible.*” EX1005,

[0005]. Bauer also contemplates “dynamically *switch[ing] back* to using the [Internet entity] when the mesh network reestablishes communication with the Internet infrastructure.” EX1005, Claim 8. Accordingly, Bauer, and thus Saridakis-Wu-Bauer Combination, teaches initially starting the ad hoc network as an isolated cluster and then “dynamically switching” between the modes of operation based on the availability of the external network. EX1005, [0005], [0027], [0058]. EX1002, ¶154.

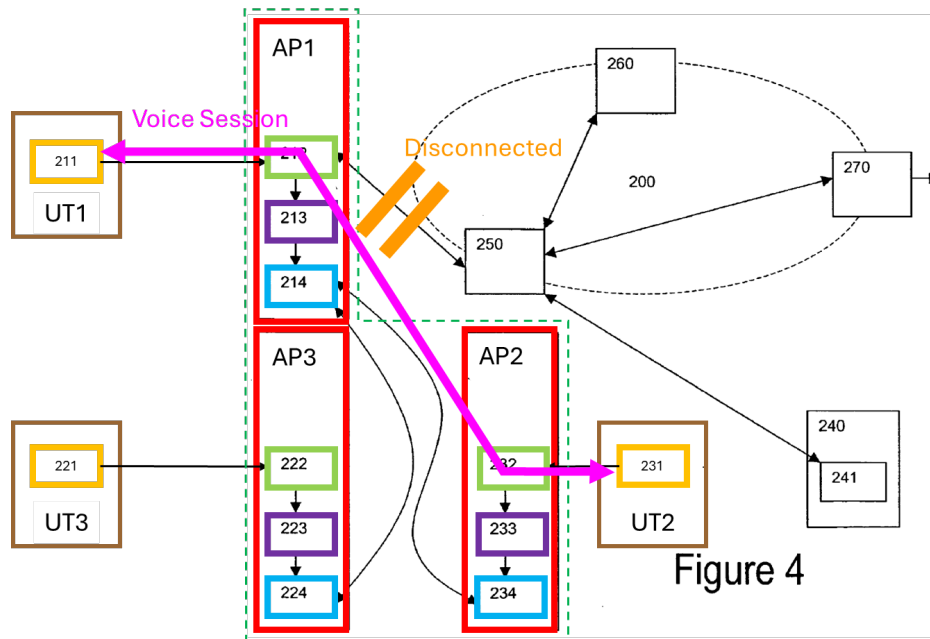
At a minimum, it would have been obvious to configure the ad hoc network initially as an isolated cluster, and then “dynamically switch” between the modes of operation based on the availability of the external network. Such modification would have been a routine design choice since the initial state of the ad hoc network is immaterial to the operation of the system in Saridakis-Wu-Bauer Combination. EX1002, ¶155.

- c) **[10B] establishing communications between two or more client devices by way of the initially isolated network nodes, wherein in a first configuration, at least two of said initially isolated network nodes are in communication with each other but not in communication with an external SIP server, and wherein each of said at least two initially isolated network nodes supports VoIP communications based on a local SIP registry contained in each of the said nodes according to the method of:**

Saridakis-Wu-Bauer Combination teaches [10B]. EX1002, ¶¶156-159.

Second, Saridakis-Wu-Bauer Combination teaches “*wherein in a first configuration, at least two of said initially isolated network nodes are in communication with each other but not in communication with an external SIP server.*” As explained in Section VIII.A.4.c) [Ground I, 1B], AP1 and AP2 (“*at least two of said initially isolated network nodes*”) “*are in communication with each other.*” As further explained in Sections VIII.B.5.b) [Ground II, 10A] and VIII.B.2 [Saridakis-Wu-Bauer Combination], AP1 and AP2 are *not in communication with* either the SIP Proxy 250 or the SIP Registrar 260 (“*external SIP server*”) when the ad hoc network is disconnected from the cellular network 200 (“*in a first configuration*”). EX1003, [0078]; EX1005, [0005], [0027], [0058]. EX1002, ¶158.

Saridakis-Wu-Bauer Combination (Cellular Network Access Unavailable)



EX1003, Figure 4.

Third, Saridakis teaches “each of said at least two initially isolated network nodes supports VoIP communications based on a local SIP registry contained in each of the said nodes.” As explained in Section VIII.A.4.f) [Ground I, 1E], each of AP1 and AP2 (“each of said at least two initially isolated network nodes”) supports a voice SIP session based on the DULS instances (“a local SIP registry”) contained in each of AP1 and AP2. EX1003, [0039], [0055], [0059], [0061], [0079]. EX1002, ¶159.

- a) **[10B-1] communicating with at least one other initially isolated node to exchange SIP registry information; [10B-2] updating the local SIP registry in said node as new information is acquired;**

Saridakis-Wu-Bauer Combination teaches [10B-1] and [10B-2]. EX1002, ¶¶160-163.

As explained in Section VIII.A.4.e) [Ground I, 1D], the DULS instance in an AP can be built using “a lazy update protocol.” EX1003, [0053], Figure 2. Under this protocol, when a DULS instance receives “a request to resolve a user address, it checks the local Repository.” EX1003, [0057], Figure 2 (step 2c). “If the user address is NOT in the local Repository” (EX1003, [0057]), that DULS instance sends to peers in the ad hoc network (*i.e.*, other APs in Saridakis-Wu-Bauer Combination) “*an update request*” (EX1003, [0059], Figure 2 (step 2e)). EX1002, ¶161.

When a DULS instance in another AP (“*at least one other initially isolated node*”) receives the update request, that responding DULS instance may “send back to the requesting DULS instance an update response.” EX1003, [0061]. The update response can include: (1) “the mapping of the user address extracted from the update request to the network address of the present device” and, optionally, (2) “a second part that contains fragments of [its] local Repository, e.g. the most up-to-date or the most recently acquired.” EX1003, [0061]-[0062]. EX1002, ¶162.

When the requesting DULS instance receives the update response, it “extracts the *mapping of user address to network address*” and “[t]he *corresponding mapping is placed in [its] local Repository.*” EX1003, [0063]. “If the update response has a second part (this is optional), the DULS instance MUST parse it and use its contents to *update the local Repository.*” EX1003, [0063]. This way, (1) the requesting DULS instance in a requesting AP and the responding DULS instance in a responding AP exchange information stored in local Repository (“*SIP registry information*”); and (2) the requesting DULS instance updates its local Repository (“*the local SIP registry*”) as new information from the responding AP is acquired. EX1002, ¶163.

- b) **[10B-3] sending and receiving VoIP packets from a sender isolated node to one or more recipient isolated nodes based on said local SIP registry functionality when a client device in communication with the sender node establishes communication with a client device in communication with the recipient node.**

Saridakis-Wu-Bauer Combination teaches [10B-3]. EX1002, ¶¶164-167.

First, Saridakis-Wu-Bauer Combination teaches “*sending and receiving VoIP packets from a sender isolated node to one or more recipient isolated nodes.*”

Saridakis explains that “SIP UA *handles SIP communication*” by exchanging SIP requests and responses with other SIP UAs. EX1003, [0026] (“The SIP UA handles SIP communication, i.e. it creates SIP requests/responses to be sent to other peers and parses SIP requests/responses sent by other peers.”). In Saridakis-Wu-Bauer Combination, “SIP UA 211 sends a SIP request to the SIP UA 231” “over the ad hoc network” formed by APs, as shown below. EX1003, [0079]. And as explained in Section VIII.A.4.a) [Ground I, 1Pre], the SIP session established by the SIP requests/responses supports voice communication over an IP network (which was known to carry packets). EX1012, 3:37-38. Thus, Saridakis-Wu-Bauer Combination teaches that APs in the ad hoc network (“*a sender isolated node*” and “*one or more recipient isolated nodes*”) “*send[] and receiv[e] VoIP packets*” carrying SIP requests/responses and, subsequently, voice communication. EX1002, ¶165.

Saridakis-Wu-Bauer Combination (Cellular Network Access Unavailable)

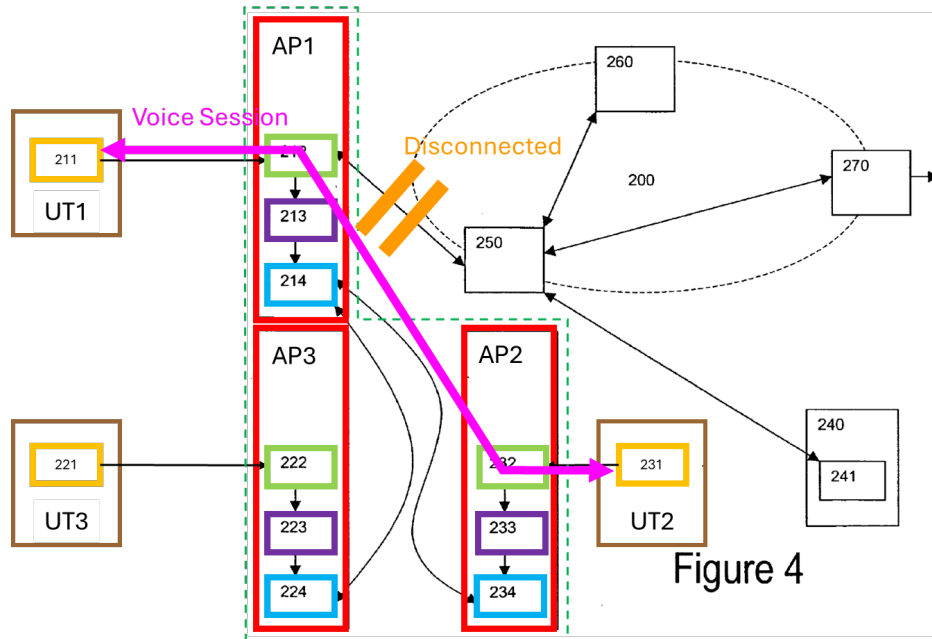


Figure 4

EX1003, Figure 4.

Second, Saridakis-Wu-Bauer Combination teaches sending and receiving VoIP packets “based on said local SIP registry functionality” as described in Section VIII.A.4.f) [Ground I, 1E]. For example, “when the SIP UA 211 sends a SIP request to the SIP UA 231, the following sequence of interaction happens”:

First, the local Proxy 212 receives the SIP request, extracts the SIP address of the intended recipient and tries to resolve it with the *local Registrar 213*, which, in turn, *retrieves the correct mapping from the DULS instance 214*. Having resolved the SIP address of the intended recipient, *the local Proxy 212 forwards over the ad hoc network (e.g. a Bluetooth piconet) the SIP request to the SIP UA 231*.

EX1003, [0079]. EX1002, ¶166.

Third, Saridakis teaches that the VoIP packets are sent and received “*when a client device in communication with the sender node establishes communication with a client device in communication with the recipient node*” as described in Section VIII.A.4.f) [Ground I, 1E]. Saridakis explains that “SIP UA handles SIP communication” by exchanging SIP requests and responses with other SIP UAs. EX1003, [0026] (“The SIP UA handles SIP communication, i.e. it creates SIP requests/responses to be sent to other peers and parses SIP requests/responses sent by other peers.”). And “SIP UA 211 sends a SIP request to the SIP UA 231” “over the ad hoc network” comprising APs. EX1003, [0079]. EX1002, ¶167.

6. Claim 12

- a) **[12] The method of claim 10, further comprising updating the local SIP registries of the isolated nodes as nodes and clients join and leave the isolated cluster.**

Saridakis-Wu-Bauer Combination teaches the additional limitation of claim 12 as described in Section VIII.A.5.a) [Ground I, Claim 2]. EX1002, ¶168.

7. Claim 13

- a) **[13] The method of claim 10, wherein updates to the local SIP registry of each node is communicated to remaining nodes in the cluster by broadcasting an information packet containing the local SIP registry information.**

Saridakis-Wu-Bauer Combination teaches the additional limitation of claim 13 as described in Section VIII.A.6.a) [Ground I, Claim 3]. EX1002, ¶169.

8. Claim 15

a) [15Pre] A VoIP capable network comprising:

Saridakis-Wu-Bauer Combination teaches [15Pre] as described in Section VIII.A.4.a) [Ground I, 1Pre]. EX1002, ¶170.

b) [15A] a first initially isolated network node in communication with at least two VoIP clients, wherein the first isolated node further comprises a local SIP registry wherein said SIP registry contains address identifiers for each VoIP clients in communication with the first node; and

Saridakis-Wu-Bauer Combination teaches [15A]. EX1002, ¶¶171-177.

First, Saridakis-Wu-Bauer Combination teaches or renders obvious “*a first initially isolated network node in communication with at least two VoIP clients.*” As explained in Section VIII.B.5.b) [Ground II, 10A], each AP in Saridakis-Wu-Bauer Combination may be “*initially isolated,*” or at a minimum, it would have been obvious to configure the ad hoc network initially as an isolated cluster of isolated nodes. EX1002, 172.

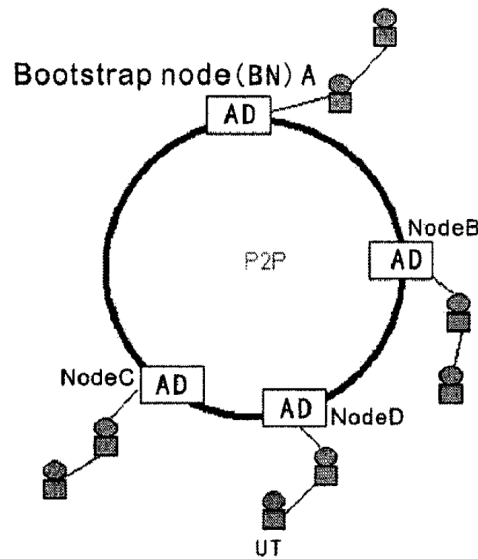


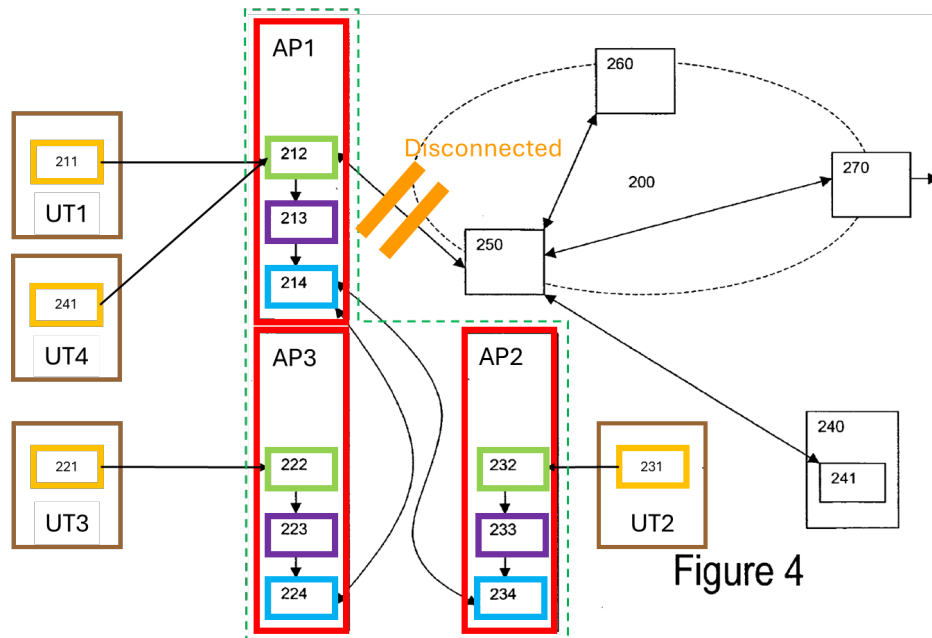
FIG. 6

EX1004, Figure 6.

Accordingly, a POSITA would have understood Saridakis-Wu-Bauer Combination to teach a configuration in which multiple UTs are served by a single AP, as shown below. At a minimum, it would have been obvious to provide a configuration in which multiple UTs are served by a single AP because Wu expressly teaches the configuration (EX1004, Figure 6), and the APs in Saridakis-Wu-Bauer Combination have local Registrar and DULS instance that can support multiple user terminals. *See* EX1003, [0014] (“The DULS is based on local repositories in terminals present in an ad hoc, peer-to-peer network, which store mappings of user-addresses to network addresses of the terminals present in the network.”); [0026]. Accordingly, the configuration illustrated below would have merely amounted to

combining prior art elements (the system in Saridakis-Wu-Bauer Combination provided in Section VIII.B.2 and multiple user terminals in Wu) according to known methods (registering the multiple user terminals using the local Registrar and DULS instance in an AP) to yield predictable results (using a single AP to provide SIP services to multiple user terminals). EX1002, ¶174.

Saridakis-Wu-Bauer Combination (Cellular Network Access Unavailable)



EX1003, Figure 4.

Thus, Saridakis-Wu-Bauer Combination teaches or renders obvious AP1 (“a first initially isolated network node”) in communication with UT1 and UT4 (“at least two VoIP clients”). EX1002, ¶175.

Second, Saridakis-Wu-Bauer Combination teaches “*the first isolated node further comprises a local SIP registry*” as explained in Section VIII.A.4.e) [Ground I, 1D]. EX1002, ¶176.

Third, Saridakis-Wu-Bauer Combination teaches “*wherein said SIP registry contains address identifiers for each VoIP clients in communication with the first node.*” For example, in Saridakis-Wu-Bauer Combination, the SIP UAs register with the ad hoc network and resolve SIP address using the local registrar and DULS instance present in the AP. EX1003, [0076] (“The local Proxy is responsible for forwarding REGISTER requests both to *the local Registrar and to the SIP Proxy* ...[and] the local Registrar uses the *DULS to store and to obtain mappings of SIP addresses to network addresses.*”); [0070]. Accordingly, the local Registrar and the DULS instance (“*SIP registry*”) contain the network addresses and SIP addresses (“*address identifiers*”) for the registered user terminals (i.e., “*each VoIP clients in communication with the first node*”). EX1002, ¶177.

- c) **[15B] wherein VoIP communication between said at least two VoIP clients are initiated by utilizing the local SIP registry, wherein the first isolated node further comprises communications means with other isolated nodes³ wherein the first isolated node broadcasts its SIP registry information to other nodes in communication with the first node.**

Saridakis-Wu-Bauer Combination teaches [15B]. EX1002, ¶¶178-181.

First, Saridakis-Wu-Bauer Combination teaches “*wherein VoIP communication between said at least two VoIP clients are initiated by utilizing the local SIP registry*” as described in Section VIII.A.4.f) [Ground I, 1E]. Wu specifically contemplates that “the user terminal can establish a session with *any* user terminals that have registered with the network.” EX1004, [0073]. *See also* EX1004, [0064], [0095]. Accordingly, Saridakis-Wu-Bauer Combination teaches setting up the VoIP communication between two VoIP clients assigned to the same AP. EX1002, ¶179.

Second, Saridakis-Wu-Bauer Combination teaches “*wherein the first isolated node further comprises communications means with other isolated nodes.*” As explained in Section VII.B [Claim Construction], “*communications means*” refers to a component for communication. And each AP includes a local Proxy and a DULS

³ The term “notes” appears to be a typo. For the purpose of this Petition only, Petitioner interprets the term “notes” as “nodes.” EX1002, ¶180.

instance that communicates with other APs in the ad hoc network. *See* EX1003, [0042]-[0043], [0059]-[0060], [0078]-[0079]. EX1002, ¶180.

Third, Saridakis-Wu-Bauer Combination teaches “*wherein the first isolated node broadcasts its SIP registry information to other nodes in communication with the first node*” as explained in Section VIII.A.6.a) [Ground I, Claim 3]. EX1002, ¶181.

9. Claim 16

- a) **[16] The VoIP capable network of claim 15, wherein the local SIP registry of the first isolated node is updated as the VoIP clients establish or terminate a network connection with the first isolated node.**

Saridakis-Wu-Bauer Combination teaches the additional limitation of claim 16 as described in Section VIII.A.5.a) [Ground I, Claim 2]. EX1002, ¶182.

10. Claim 17

- a) **[17] The VoIP capable network of claim 15, wherein first isolated node comes into communication with other isolated nodes to form a cluster, and the local SIP registry information of each isolated node in the cluster is updated according to information received from other isolated nodes in the cluster.**

Saridakis-Wu-Bauer Combination teaches the additional limitation of claim 17. EX1002, ¶¶183-185.

First, Saridakis-Wu-Bauer Combination teaches “*wherein first isolated node comes into communication with other isolated nodes to form a cluster.*” As

explained in Section VIII.B.3 [Ground II, Claim 1], an AP in the ad hoc network (e.g., AP1) comes into communication with other APs (e.g., AP2, AP3) to form an isolated cluster. EX1002, ¶184.

Second, Saridakis-Wu-Bauer Combination teaches “*the local SIP registry information of each isolated node in the cluster is updated according to information received from other isolated nodes in the cluster*” as explained in Section VIII.A.4.e) [Ground I, 1D]. EX1002, ¶185.

C. Ground III: Saridakis In View Of Wu, Bauer, And Kelly Renders Obvious Claims 5, 6, 9, 14, And 18-21.

1. Saridakis-Wu-Bauer, Further In View Of Kelly (“Saridakis-Wu-Bauer-Kelly Combination”)

In Saridakis-Wu-Bauer Combination, network components (e.g., APs and UTs) are assigned a network address, such as an IP address. *See* EX1003, [0036] (“IP addresses”), [0039]. But, it was well known in the art that the “service to set IP addresses and other relevant network parameters”—called the Dynamic Host Configuration Protocol (“DHCP”)—is a “centralized IP service[.]” that is provided by an external Internet infrastructure. EX1005, [0002]-[0004]. Since Saridakis explains that such external infrastructure is “unsuitable for ad hoc, peer-to-peer networks” (EX1003, [0004]), a POSITA would have looked to prior art solutions for assigning IP addresses to the network components, including client devices (UTs) connected to the peers (APs). EX1002, ¶186.

Implementing a DHCP service in an ad hoc network, as in Saridakis-Wu-Bauer Combination, was well known in the art. For example, Kelly teaches “distributing the address space management of an ad-hoc network across multiple computing devices included on the network.” EX1006, [0030]. *See also* EX1006, Abstract. EX1002, ¶187.

Figure 4 of Kelly, below, illustrates the distributed DHCP service. It shows a system that includes “peer-to-peer (P2P) network 402, peer-to-peer (P2P) computing devices (e.g., mesh boxes) 404, 406, 408, client subnets 410, 420, and client computing devices 412, 414, 416, 420, 422, 426.” EX1006, [0033]. In this system, “[t]he devices (e.g., 406) that self-form to create P2P network 402, also *provide DHCP services to their client computing devices (e.g., 412).*” EX1006, [0034]. Specifically, “[e]ach mesh box (e.g., 406) supplies IP (Internet Protocol) addresses to its clients (e.g., 412).” EX1006, [0034]. EX1002, ¶188.

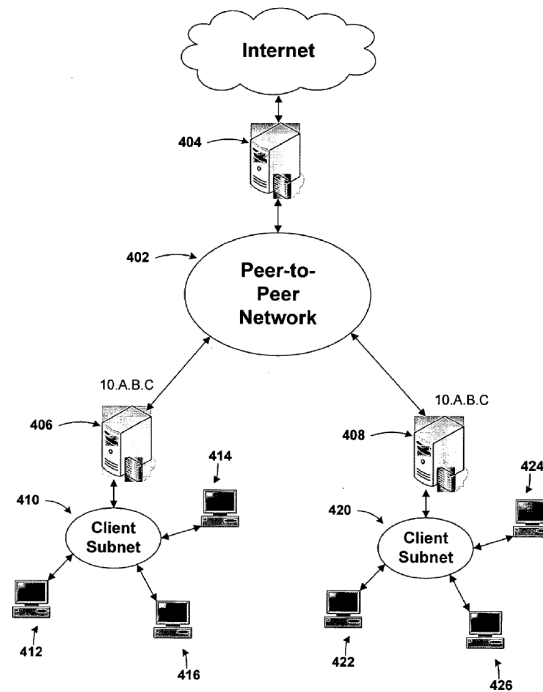


Fig. 4

EX1006, Figure 4.

Specifically, Kelly explains that each mesh box assigns an IP address to its client in two steps: (1) randomly assigning a range of IP addresses to the client subnet attached to the mesh box; and (2) assigning one of the addresses within that range to the client. EX1002, ¶189.

For example, Kelly explains that the mesh box assigns IP addresses to the clients “from the private network *10.B.C.D space*.” EX1006, [0035]-[0036], [0061]. The mesh node randomly selects a range of IP addresses for its client subnet by choosing all 8 bits for B and C, and 4 bits for D at random. For example:

When the database for a mesh sub-network [of clients] is created,
a value is chosen at random for the second position [of the

address space, i.e., B]. All nodes within that mesh sub-network use that randomly chosen value in the second position [i.e., B].

For example, if the value 213 is chosen, then *all nodes in the mesh sub-network have addresses starting with 10.213.* A subnet mask for this example is 255.255.0.0.

EX1006, [0035]. EX1002, ¶190.

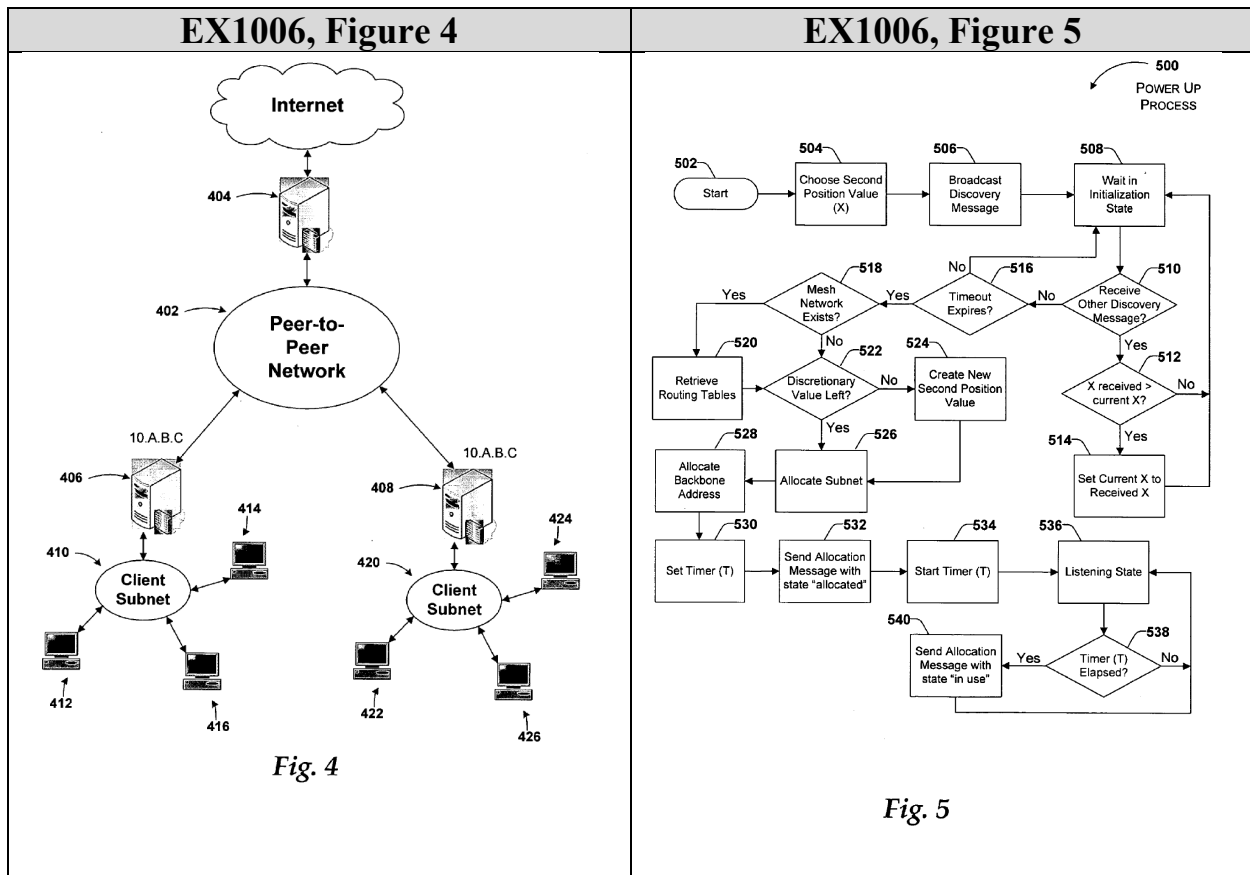
Kelly also assumes that the client subnet has at most “16 hosts” (i.e., 16 user terminals). The mesh box randomly selects the 8 bits for C and 4 bits for D in the 10.X.C.D address space to define the IP address range for that subnet:

For example, a 4 bit space [] may be used for each client subnet, allowing 16 hosts. With the 4 bit space example, *the remaining 12 bits [i.e., in the 10.X.C.D private address space, 8 bits for C and 4 bits for a portion of D] that comprise an IP address are randomly chosen values.* Stated differently, the mesh box is free to choose a random value in this range when allocating a subnet.

EX1006, [0036]. This random selection of 8 bits in B and C and 4 bits for D amounts to randomly assigning a range of IP addresses to the client subnet—just as in the embodiment of the '762 Patent. *See* EX1001, 11:21-44. EX1002, ¶191.

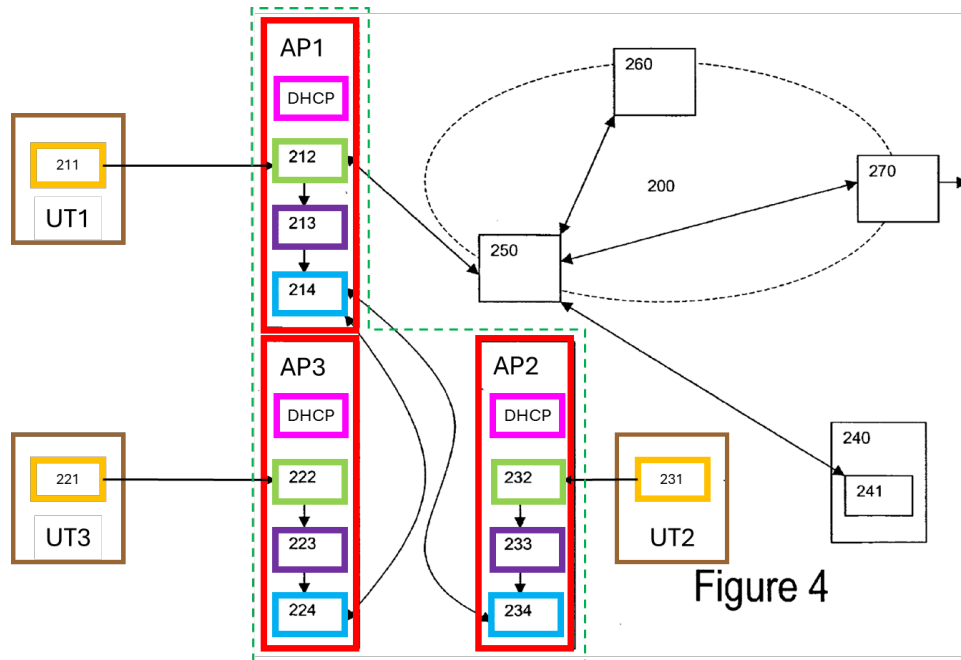
Finally, Kelly teaches that the mesh box assigns a unique IP address to each of the 16 hosts in the subnet using the last four bits of D. EX1006, [0061]. EX1002, ¶192.

So, in sum, when allocating an IP address to a client, the mesh box: (1) randomly selects an address range for the client subnet by randomly selecting the 8 bits in X, the 8 bits in C, and the 4 bits in D in the 10.X.C.D private address space; and (2) assigns each client a unique IP address within that address range using the remaining four bits of D. EX1002, ¶193.



It would have been obvious to modify Saridakis-Wu-Bauer Combination in view of Kelly to implement distributed DHCP services using APs forming the ad hoc network, as shown below. EX1006, [0035]–[0036]. EX1002, ¶194.

Saridakis-Wu-Bauer-Kelly Combination



EX1003, Figure 4.

A POSITA would have been motivated to implement distributed DHCP as taught by Kelly using Saridakis-Wu-Bauer’s APs, for two reasons. EX1002, ¶195.

First, Saridakis recognizes the need to assign IP addresses to terminal devices in its ad hoc peer-to-peer network. Saridakis teaches that an IP address—a type of network address—identifies “where the specified user can be contacted” (EX1003, [0004]), and that an IP address is assigned to a device when it connects to a new network (EX1003, [0039]). However, Saridakis also teaches that its ad hoc network “operate[s] without relying on any network infrastructure.” EX1003, [0002]. Accordingly, a POSITA would have looked to prior art that teaches mechanisms to

assign IP addresses “without relying on any network infrastructure.” EX1003, [0002]. EX1002, ¶196.

A POSITA would have recognized that Kelly’s distributed DHCP service—which enables IP address assignment by peers within the ad hoc network without reliance on a centralized entity—is a suitable candidate. EX1006, Abstract, [0035]-[0036]. Kelly likewise acknowledges that “[t]raditional models, such as a network using standard DHCP, fail when no infrastructure yet exists” (EX1006, [0002]) and teaches a “distributed DHCP database” that operates solely through peers in the network. EX1006, [0034]. Thus, a POSITA would have been motivated to implement Kelly’s distributed DHCP functionality within the Saridakis-Wu-Bauer Combination. EX1002, ¶197.

Second, Saridakis-Wu-Bauer Combination and Kelly are highly compatible. The ad hoc network in Saridakis-Wu-Bauer Combination is formed using peers (APs) that implement distributed SIP services. *See* Section VIII.B.2 [Saridakis-Wu-Bauer Combination]. Similarly, the peer-to-peer networks in Kelly are formed using peers (mesh boxes) that implement distributed DHCP services. EX1006, [0035]-[0036]. Accordingly, a POSITA would have been motivated to implement the DHCP services in APs that operate just like Kelly’s mesh boxes. EX1002, ¶198.

Adding distributed DHCP service in Saridakis-Wu-Bauer’s ad hoc network would have merely amounted to combining one prior art element (Kelly’s distributed

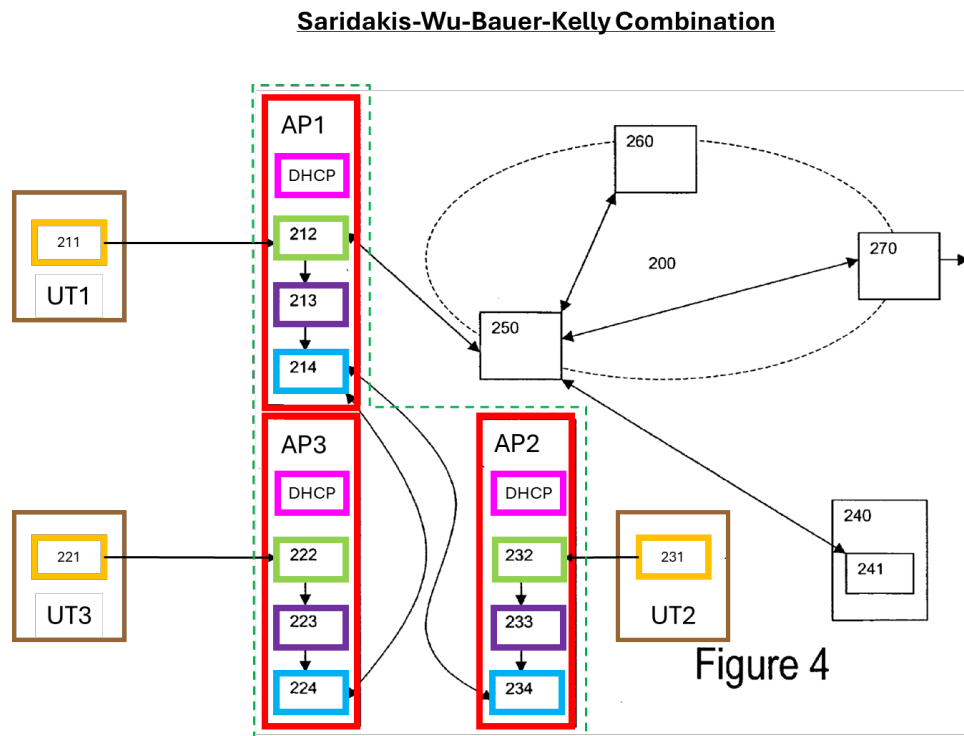
DHCP servers operating in peer nodes) with another prior art element (Saridakis-Wu-Bauer Combination’s peer-to-peer network) according to known methods (deploying distributed IP services in ad hoc networks through peer nodes, as taught by Kelly) to achieve predictable results—distributed DHCP services in an ad hoc network without reliance on any network infrastructure. EX1002, ¶199.

A POSITA would have had a reasonable expectation of success in providing Saridakis-Wu-Bauer-Kelly Combination, for two reasons. EX1002, ¶200.

First, as explained in Section VIII.B.2 [Saridakis-Wu-Bauer Combination], Saridakis, Wu, and Bauer are each directed to providing IP services without relying on centralized entities. *See* EX1003, [0015]; EX1004, [0003], [0040]; EX1005, Abstract, [0022], [0025]. Kelly likewise is directed to providing IP services without centralized infrastructure. *See* EX1006, [0002], [0035]-[0036]. Both Saridakis-Wu-Bauer Combination and Kelly achieve this through peer devices operating within an ad hoc peer-to-peer network (e.g., APs in Saridakis-Wu-Bauer Combination; mesh boxes in Kelly). Accordingly, the combination of Saridakis-Wu-Bauer Combination and Kelly would have yielded predictable results of providing distributed DHCP services as described in Kelly. EX1002, ¶201.

Second, Kelly’s distributed DHCP service would have operated predictably within the Saridakis-Wu-Bauer Combination. Kelly’s distributed DHCP service would be implemented by logic within the peer node of Saridakis-Wu-Bauer

Combination as illustrated below, without requiring any modification to the rest of the components in the peer. Accordingly, the resulting system would have predictably provided distributed DHCP services to assign IP addresses without reliance on external network infrastructure. EX1003, [0039]; EX1004, [0055]. EX1002, ¶202.



EX1003, Figure 4.

2. Claim 5

- a) **[5] The VoIP-capable network of claim 1, wherein each VoIP node has the ability to function as a DHCP server to assign IP addresses to clients in communication with the VoIP node.**

Saridakis-Wu-Bauer-Kelly Combination teaches or renders obvious the additional limitation of claim 5. EX1002, ¶¶203-204.

As explained in Section VIII.C.1 [Saridakis-Wu-Bauer-Kelly Combination], each AP in the ad hoc network includes DHCP functionality. EX1006, [0032] (“Each mesh box implements a DHCP server”); [0034]-[0035]. These APs with distributed DHCP functionality collectively form “[a] logical distributed server [] for managing []Internet Protocol (IP) address allocation for an ad-hoc, self-forming peer-to-peer (P2P) network” (EX1006, Abstract) and “supplies IP (Internet Protocol) addresses to its clients (e.g., 412)” (EX1006, [0034]). *See also* EX1006, [0035]. Accordingly, each AP (“*each VoIP node*”) has the ability to function as a DHCP server to assign IP addresses to clients in communication with the AP. *See also* Section VIII.B.8.b) [Ground II, 15A]. EX1002, ¶204.

3. Claim 6

- a) **[6] The VoIP-capable network of claim 5, wherein the IP addresses are assigned from a range of IP addresses produced by a random number generator on each VoIP node.**

Saridakis-Wu-Bauer-Kelly Combination teaches the additional limitation of claim 6. EX1002, ¶¶205-206.

As explained in Section VIII.C.1 [Saridakis-Wu-Bauer-Kelly Combination], Kelly teaches that a peer in an ad hoc network assigns an IP address to its client by: (1) randomly selecting an IP address range for the subnet to which the client device belongs—by randomly choosing the 8 bits in X, the 8 bits in C, and the 4 bits in D within the 10.X.C.D private address space; and (2) assigning the client a unique IP address using the remaining four bits of D. *See* EX1006, [0034]-[0036], [0061]. A POSITA would have understood that the random values for X, C, and D would be generated by a random number generator, as it was conventional. *See* EX1013, [0020]. Accordingly, Saridakis-Wu-Bauer-Kelly Combination teaches or suggests that the IP addresses of user terminals are assigned from a range of IP addresses randomly generated by the random number generator on the corresponding AP. EX1002, ¶206.

4. Claim 9

- a) **[9] The VoIP-capable network of claim 8 wherein said mesh nodes provide VoIP optimized services within said mesh nodes.**

Saridakis-Wu-Bauer-Kelly Combination teaches the additional limitation of claim 9. As explained in Section VII.B [Claim Construction], “*VoIP optimized services*” include a DHCP server service. As explained in Section VIII.C.1 [Saridakis-Wu-Bauer-Kelly Combination], Saridakis-Wu-Bauer-Kelly provides an ad hoc network with APs that support a DHCP server service. *See* EX1006, [0030], [0034]. Accordingly, the APs (“*said mesh nodes*”) provide a DHCP server service within them. EX1002, ¶207.

5. Claim 14

- a) **[14] The method of claim 10, wherein each node functions as a DHCP server to assign IP addresses to clients connected to the node.**

Saridakis-Wu-Bauer-Kelly Combination teaches the additional limitation of claim 14 as described in Section VIII.C.2.a) [Ground III, Claim 5]. EX1002, ¶208.

6. Claim 18

- a) **[18] The VoIP capable network of claim 15, wherein the first isolated node further comprises a DHCP server to assign IP addresses to clients in communication with the first node.**

Saridakis-Wu-Bauer-Kelly Combination teaches the additional limitation of claim 18 as described in Section VIII.C.2.a) [Ground III, Claim 5]. EX1002, ¶209.

7. Claim 19

- a) **[19] The VoIP-capable network of claim 18, wherein the IP addresses are assigned from a range of IP addresses produced by a random number generator on the first isolated node.**

Saridakis-Wu-Bauer-Kelly Combination teaches the additional limitation of claim 19 as described in Section VIII.C.2.a) [Ground III, Claim 6]. EX1002, ¶210.

8. Claim 20

- a) **[20] The VoIP capable network of claim 18, wherein each node in the cluster has the ability to function as a DHCP server to assign IP addresses to clients connected to that node.**

Saridakis-Wu-Bauer-Kelly Combination teaches the additional limitation of claim 20 as described in Section VIII.C.2.a) [Ground III, Claim 5]. EX1002, ¶211.

9. Claim 21

- a) **[21] The VoIP-capable network of claim 20, wherein each node in the cluster assigns IP addresses from a range of IP addresses produced by a random number generator on that node.**

Saridakis-Wu-Bauer-Kelly Combination teaches the additional limitation of claim 21 as described in Section VIII.C.3.a) [Ground III, Claim 6]. EX1002, ¶212.

IX. CONCLUSION

Petitioner respectfully requests that the Director institutes *inter partes* review and the Board cancels the challenged claims.

Petition for *Inter Partes* Review of U.S. Patent No 8,477,762
Claims 1–10, 12–21

Dated: November 21, 2025

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Cisco Systems, Inc.

CERTIFICATION UNDER 37 C.F.R. § 42.24(d)

I hereby certify that this Petition for *Inter Partes* Review of U.S. Patent No. 8,477,762 has, excluding the portions exempted under 37 C.F.R. § 42.24(a), 13,932 words as counted by the word-processing system used to prepare this document, in compliance with 37 C.F.R. § 42.24(d).

Dated: November 21, 2025

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CERTIFICATE OF SERVICE

Under 37 C.F.R. §§ 42.6(e) and 42.105, the undersigned certifies that on November 21, 2025, complete copies of the foregoing and any accompanying exhibits were caused to be served by sending them via Federal Express Priority Overnight shipping, which is at least as fast and reliable as U.S. Priority Mail Express, to the correspondence address of record for U.S. Patent No. 8,477,762 as indicated in Patent Center:

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