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(54) **MERGING MULTIPLE EMERGENCY CALLS AND INFORMATION THEREFROM AT EMERGENCY SYSTEMS**

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H04M 3/51	(2006.01)
H04M 3/42	(2006.01)
H04W 4/02	(2009.01)
H04W 4/22	(2009.01)

(52) **U.S. Cl.**
CPC ***H04M 3/5116*** (2013.01); ***H04M 3/42357*** (2013.01); ***H04W 4/023*** (2013.01); ***H04W 4/22*** (2013.01)

(58) **Field of Classification Search**
CPC H04M 3/5235; H04M 3/5116; H04M 2201/16; H04W 4/22
USPC 455/404.1, 404.2
See application file for complete search history.

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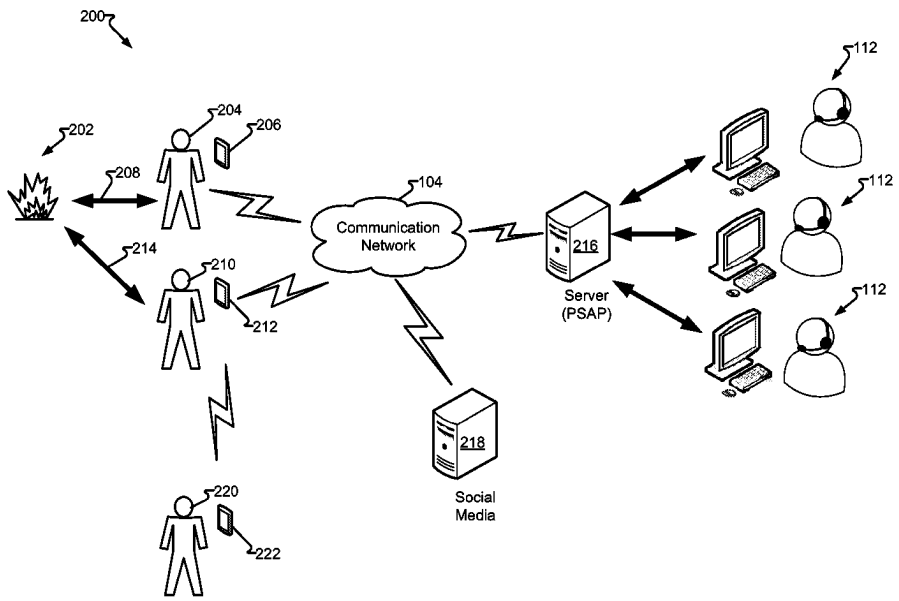
(57) **ABSTRACT**

Public safety access points (PSAP), such as 911 and e911 service providers, are often overwhelmed with information coming from a number of callers. As part of an initial assessment, a determination is often made as to whether two or more callers are calling about the same emergent event. If two or more callers are calling about the same emergent event, the callers and PSAP may interact at the same time via a data channel operable to convey one or more of text, voice, video, still images, video images, location information, and social media content. As a benefit, PSAP resource may obtain a more complete knowledge of the emergent situation and better coordinate mitigation activities for the emergent event.

20 Claims, 5 Drawing Sheets



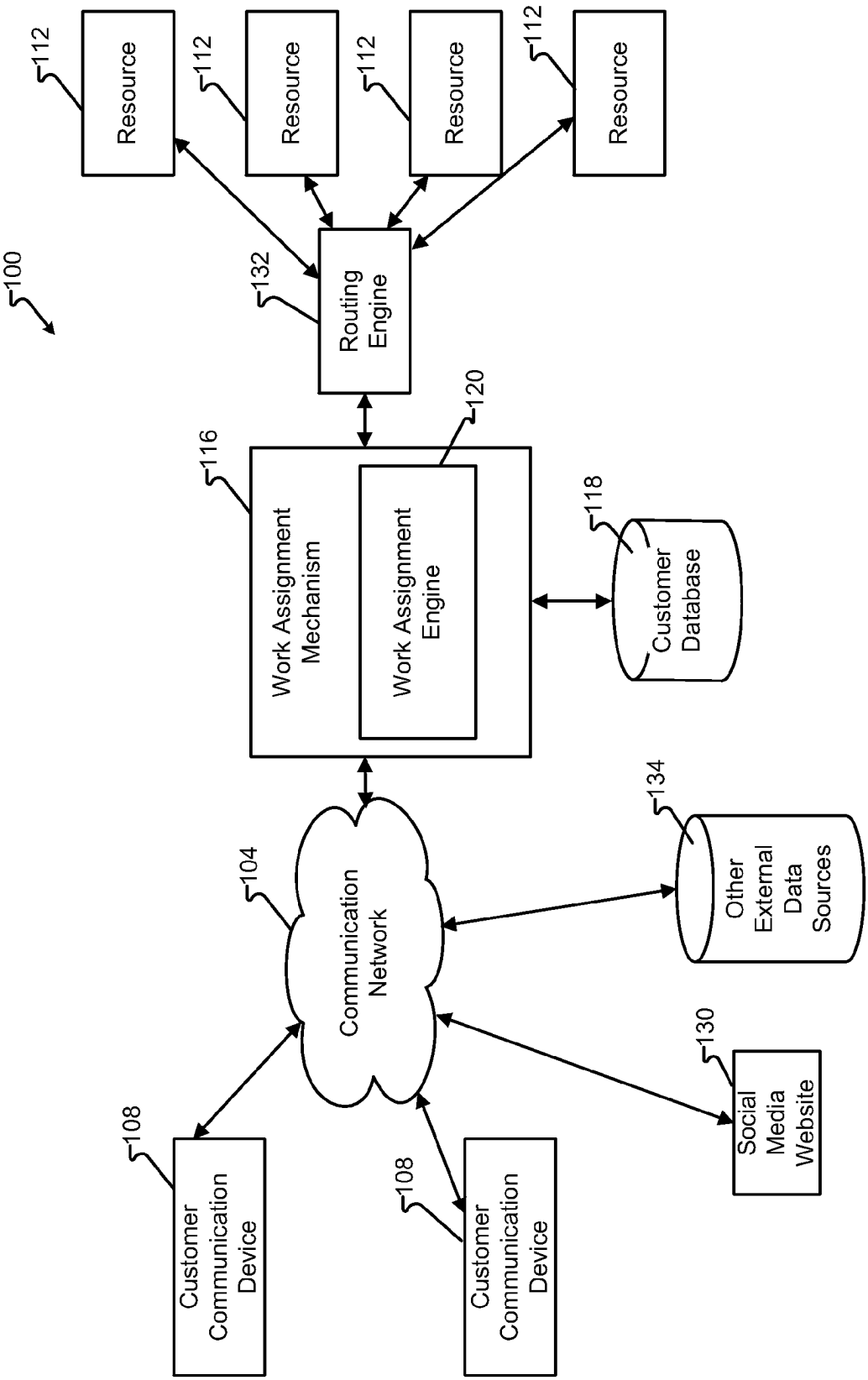

100
112
Resource
112
Resource
112
Resource
112
Resource
132
Routing Engine
116
Work Assignment Mechanism
120
Work Assignment Engine
118
Customer Database
104
Communication Network
134
Other External Data Sources
130
Social Media Website
108
Customer Communication Device
108
Customer Communication Device

FIG. 1

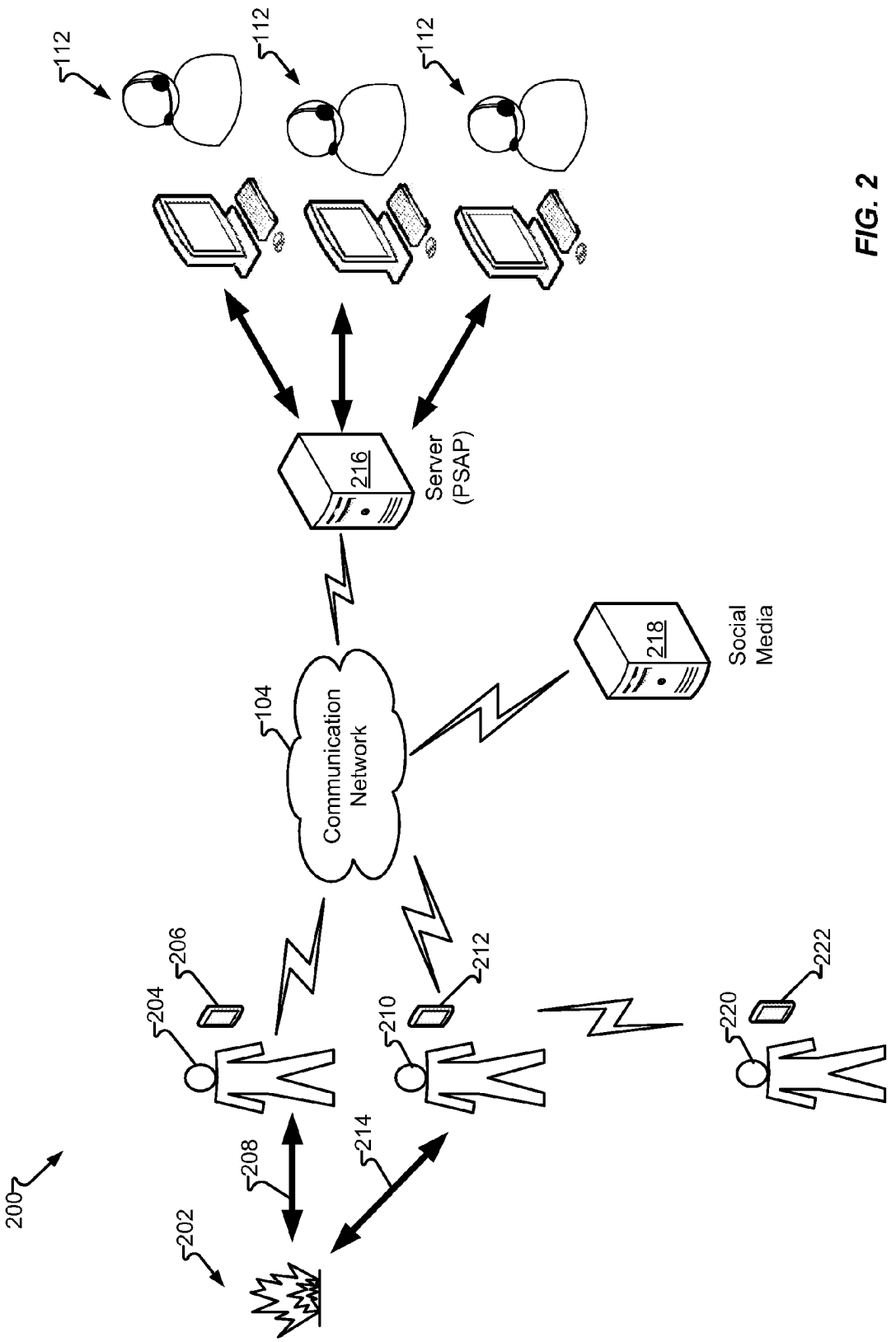

112
112
112
216
Server (PSAP)
104
Communication Network
218
Social Media
204
206
210
212
220
222
200
202
208
214

FIG. 2

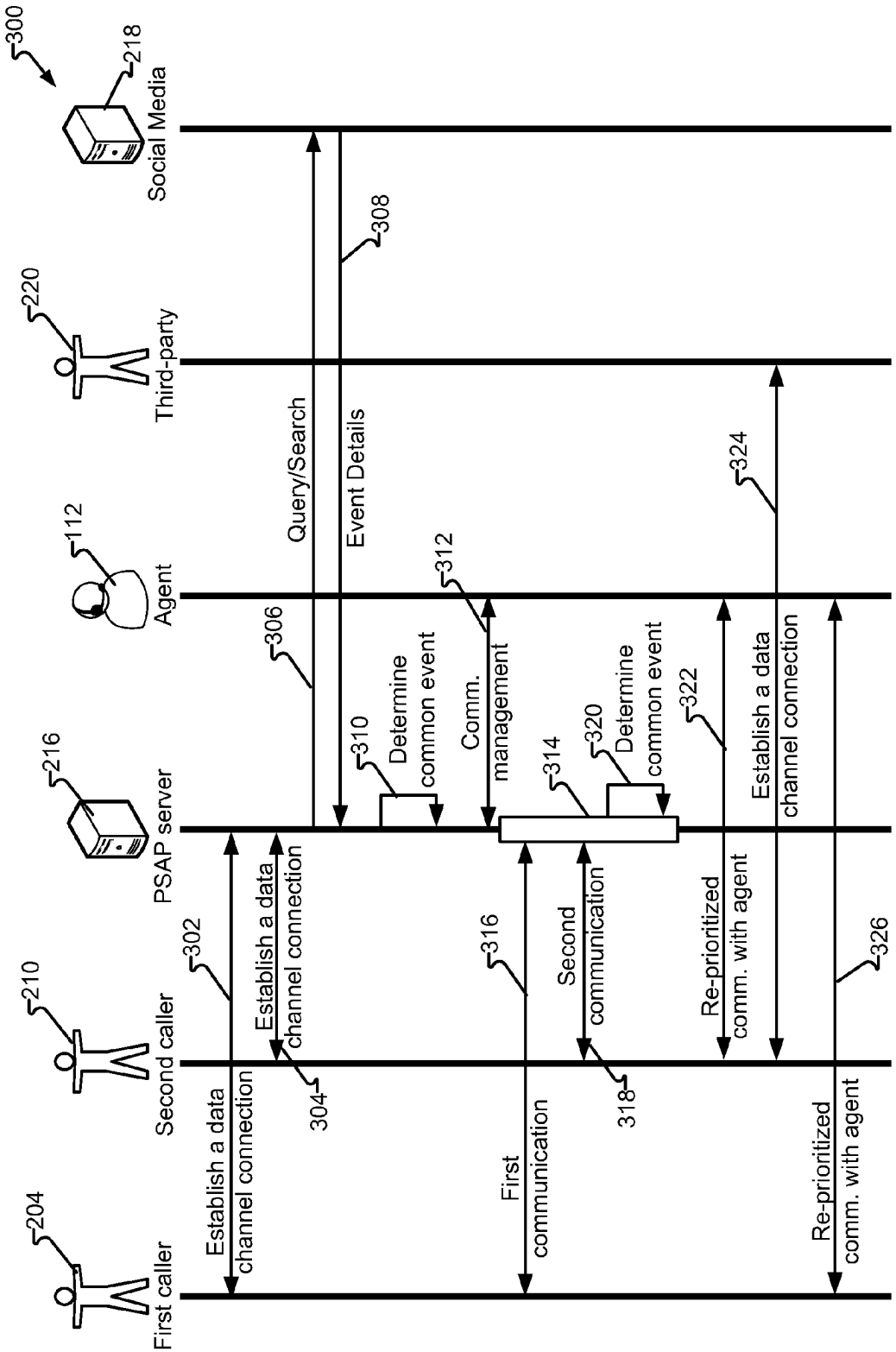

300
218
Social Media
220
Third-party
112
Agent
216
PSAP server
210
Second caller
204
First caller
Query/Search
Event Details
308
306
312
Comm. management
310
Determine common event
314
320
Determine common event
322
324
Establish a data channel connection
302
Establish a data channel connection
304
316
First communication
Second communication
318
Re-prioritized comm. with agent
326
Re-prioritized comm. with agent

FIG. 3

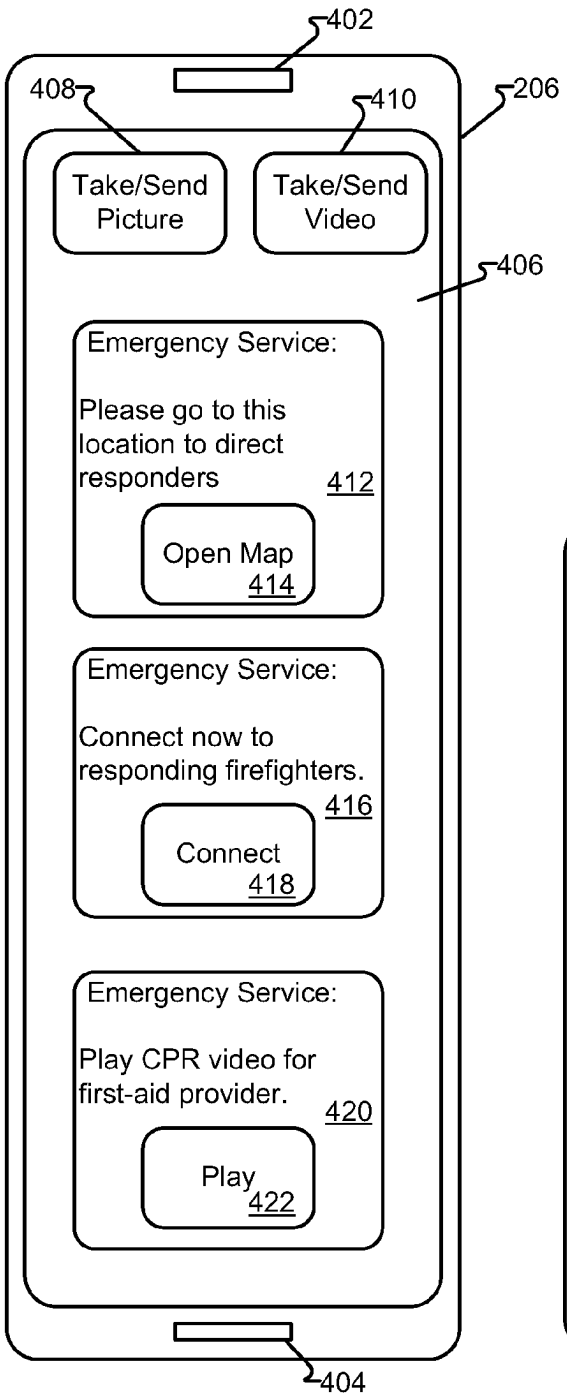

402
408
410
206
Take/Send Picture
Take/Send Video
406
Emergency Service:
Please go to this location to direct responders
412
Open Map
414
Emergency Service:
Connect now to responding firefighters.
416
Connect
418
Emergency Service:
Play CPR video for first-aid provider.
420
Play
422
404

FIG. 4

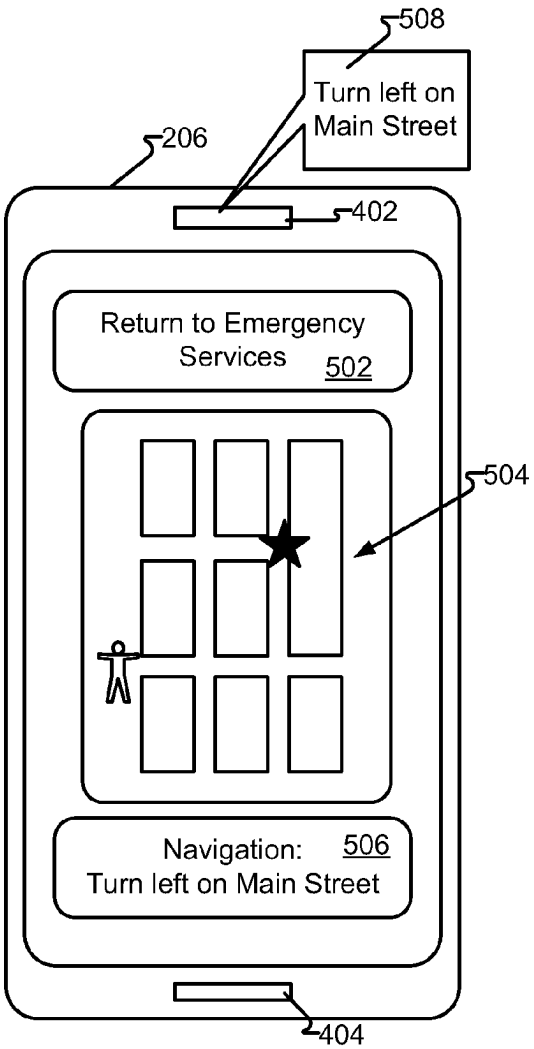

508
Turn left on Main Street
206
402
Return to Emergency Services
502
504
Navigation:
506
Turn left on Main Street
404

FIG. 5

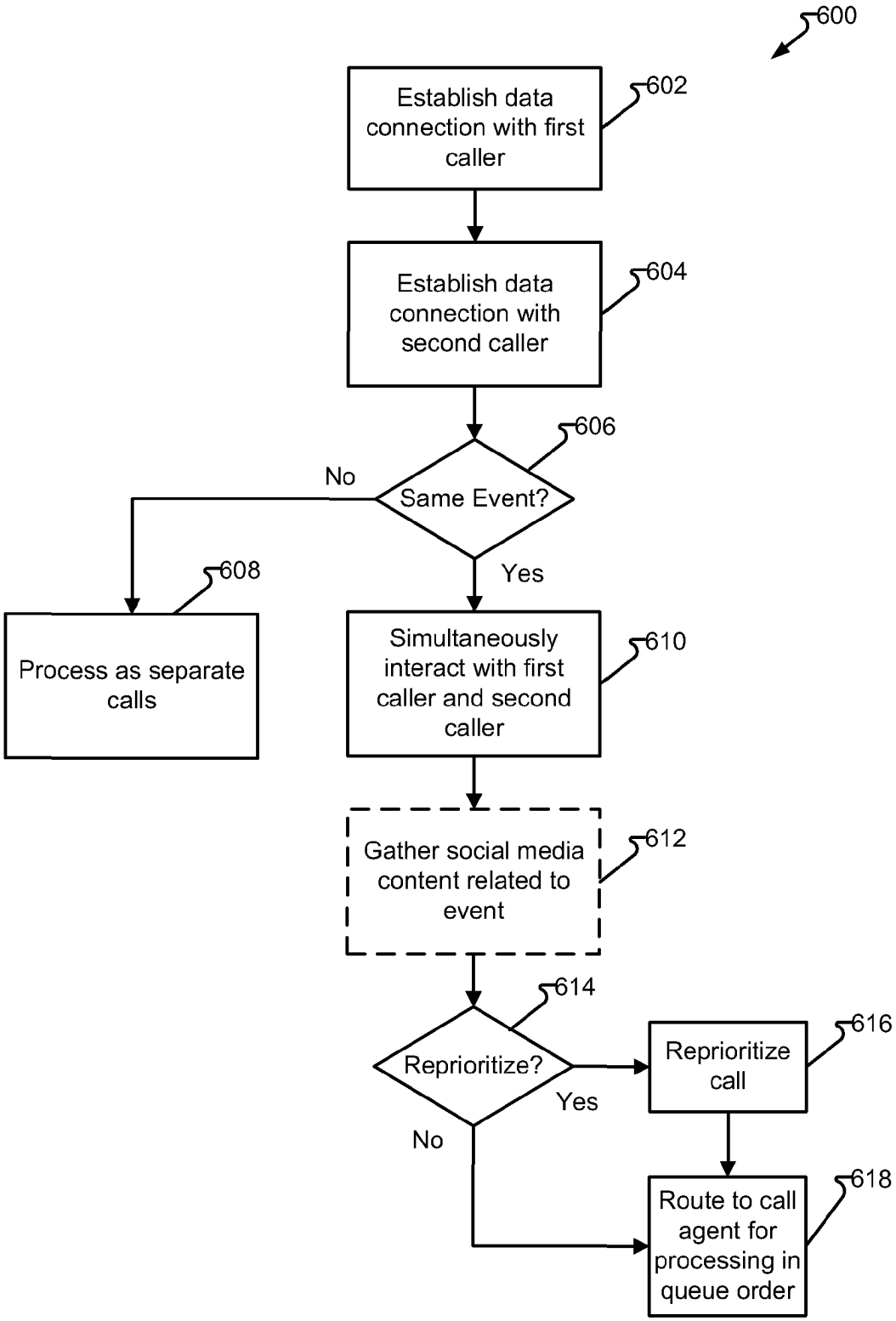

600
Establish data connection with first caller
602
Establish data connection with second caller
604
606
Same Event?
No
Yes
608
Process as separate calls
Simultaneously interact with first caller and second caller
610
Gather social media content related to event
612
614
Reprioritize?
Yes
No
Reprioritize call
616
Route to call agent for processing in queue order
618

FIG. 6

MERGING MULTIPLE EMERGENCY CALLS AND INFORMATION THEREFROM AT EMERGENCY SYSTEMS

FIELD OF THE DISCLOSURE

The present disclosure is generally directed toward the management of callers reporting an emergent event.

BACKGROUND

A common problem in public safety access points, such as E911 call centers, Public Safety Answering Points (PSAPs), and similar types of call centers, is the spikes in resource demands. Specifically, when a large emergency event occurs, there are often multiple simultaneous calls entering the E911 call center at once. Problematically, the E911 call center usually only has a limited number of trained staff on hand at any given time. The reason why more resources are not made available is due to the burden of having more resources and except for large emergency event, most of the resources would be idle or underutilized. Staffing an E911 call center for a worst case scenario is not economically efficient nor is it common practice.

Practically speaking, when an E911 call center experiences a sudden influx of calls, the system tries to prioritize which of the calls will make it to an agent first (e.g., call triage). Utilization of audio information alone can make call prioritization very difficult. It would be advantageous to use information other than audio content or traditional first-in-first-out (FIFO) prioritization rules to help manage multiple calls in an E911 call center.

SUMMARY

It is with respect to the above issues and other problems that the embodiments presented herein were contemplated.

In one embodiment, a secondary channel (e.g., a data channel) is utilized as a mechanism for merging multiple calls, managing multiple calls simultaneously, and/or prioritizing calls in a contact center. An emergency caller is asked to establish a trusted data channel (e.g., a WebRTC call) with a PSAP system and then provide their perspective about the event via the data channel. The PSAP can use information incoming from each of the data channels (e.g., pictures, videos, text information, etc.) to help determine information about the event (e.g., to build a picture of the scenario) as well as determine which caller gets through to the PSAP agent first and which callers wait.

Alternatively or additionally, the establishment of the data channel with more than one caller may trigger the PSAP to search social media channels for reports of the same event. As social media is often a de facto first report recipient for emergent events, the PSAP can use information from appropriately-selected social media channels to further build an understanding of the emergent event, such as the location, severity, who is involved, who is nearby, etc. All of this information obtained from the various data channels may then help the PSAP resources to determine which calls are a priority and which calls can be ignored.

The prioritization of calls can be based solely on data received via the data channel, audio channel, or a combination thereof. The prioritization can occur dynamically and at predetermined intervals. Furthermore, priorities of calls can change as new data is received. For example, a first caller may be placed at a third priority position in the queue, but if the first caller later provides pictures or video that help increase the PSAP's ability to assess and/or respond to the emergent event, the priority of the first caller relative to other callers waiting in queue may be changed.

In one embodiment, a system is disclosed, comprising: a public safety access point (PSAP), comprising: a first PSAP resource; and a PSAP server that enables the PSAP resource to simultaneously interact with a first PSAP caller and a second PSAP caller over a data channel upon determining that the first and second PSAP caller are calling the PSAP with respect to a common emergent event.

In another embodiment, a method is disclosed comprising: establishing a data channel connection between a public safety access point (PSAP) and a first and second customer device associated with a first and second PSAP callers, respectively; determining, by a PSAP server, whether the first and second PSAP callers are reporting the same emergent event; and upon determining the first and second PSAP callers are reporting a common emergent event, causing a PSAP resource to simultaneously interact via a data channel with the first caller and second caller with respect to the emergent event.

In another embodiment, a non-transitory computer readable medium is disclosed that when read by a computer causes the computer to perform: establishing a data channel connection between a public safety access point (PSAP) and a first and second customer device associated with a first and second PSAP callers, respectively; determining, by a PSAP server, whether the first and second PSAP callers are reporting the same emergent event; and upon determining the first and second PSAP callers are reporting a common emergent event, causing a PSAP resource to simultaneously interact via a data channel with the first caller and second caller with respect to the emergent event.

The phrases "at least one," "one or more," and "and/or" are open-ended expressions that are both conjunctive and disjunctive in operation. For example, each of the expressions "at least one of A, B and C," "at least one of A, B, or C," "one or more of A, B, and C," "one or more of A, B, or C" and "A, B, and/or C" means A alone, B alone, C alone, A and B together, A and C together, B and C together, or A, B and C together.

The term "a" or "an" entity refers to one or more of that entity. As such, the terms "a" (or "an"), "one or more" and "at least one" can be used interchangeably herein. It is also to be noted that the terms "comprising," "including," and "having" can be used interchangeably.

The term "automatic" and variations thereof, as used herein, refers to any process or operation done without material human input when the process or operation is performed. However, a process or operation can be automatic, even though performance of the process or operation uses material or immaterial human input, if the input is received before performance of the process or operation. Human input is deemed to be material if such input influences how the process or operation will be performed. Human input that consents to the performance of the process or operation is not deemed to be "material."

The term "computer-readable medium" as used herein refers to any tangible storage that participates in providing instructions to a processor for execution. Such a medium may take many forms, including but not limited to, non-volatile media, volatile media, and transmission media. Non-volatile media includes, for example, NVRAM, or magnetic or optical disks. Volatile media includes dynamic memory, such as main memory. Common forms of computer-readable media include, for example, a floppy disk, a flexible disk, hard disk, magnetic tape, or any other magnetic medium, magneto-

optical medium, a CD-ROM, any other optical medium, punch cards, paper tape, any other physical medium with patterns of holes, a RAM, a PROM, and EPROM, a FLASH-EPROM, a solid state medium like a memory card, any other memory chip or cartridge, or any other medium from which a computer can read. When the computer-readable media is configured as a database, it is to be understood that the database may be any type of database, such as relational, hierarchical, object-oriented, and/or the like. Accordingly, the disclosure is considered to include a tangible storage medium and prior art-recognized equivalents and successor media, in which the software implementations of the present disclosure are stored.

The terms "determine," "calculate," and "compute," and variations thereof, as used herein, are used interchangeably and include any type of methodology, process, mathematical operation or technique.

The term "module" as used herein refers to any known or later developed hardware, software, firmware, artificial intelligence, fuzzy logic, or combination of hardware and software that is capable of performing the functionality associated with that element. Also, while the disclosure is described in terms of exemplary embodiments, it should be appreciated that other aspects of the disclosure can be separately claimed.

BRIEF DESCRIPTION OF THE DRAWINGS

The present disclosure is described in conjunction with the appended figures:

FIG. **1** depicts a communication system in accordance with embodiments of the present disclosure;

FIG. **2** illustrates a system in accordance with at least some embodiments of the present disclosure;

FIG. **3** illustrates interaction in accordance with at least some embodiments of the present disclosure;

FIG. **4** illustrates a first view of user device in accordance with at least some embodiments of the present disclosure;

FIG. **5** illustrates a second view of a first user device in accordance with at least some embodiments of the present disclosure; and

FIG. **6** illustrates a process in accordance with at least some embodiments of the present disclosure.

DETAILED DESCRIPTION

The ensuing description provides embodiments only, and is not intended to limit the scope, applicability, or configuration of the claims. Rather, the ensuing description will provide those skilled in the art with an enabling description for implementing the embodiments. It being understood that various changes may be made in the function and arrangement of elements without departing from the spirit and scope of the appended claims.

Any reference in the description comprising an element number, without a subelement identifier when a subelement identifiers exist in the figures, when used in the plural is intended to reference any two or more elements with a like element number. When such a reference is made in the singular form, it is intended to reference one of the elements with the like element number without limitation to a specific one of the elements. Any explicit usage herein to the contrary or providing further qualification or identification shall take precedence.

The exemplary systems and methods of this disclosure will also be described in relation to analysis software, modules, and associated analysis hardware. However, to avoid unnecessarily obscuring the present disclosure, the following description omits well-known structures, components and devices that may be shown in block diagram form, and are well known, or are otherwise summarized.

For purposes of explanation, numerous details are set forth in order to provide a thorough understanding of the present disclosure. It should be appreciated, however, that the present disclosure may be practiced in a variety of ways beyond the specific details set forth herein.

With reference now to FIG. **1**, communication system **100** is discussed in accordance with at least some embodiments of the present disclosure. The communication system **100** may be a distributed system and, in some embodiments, comprises a communication network **104** connecting one or more communication devices **108** to a work assignment mechanism **116**, which may be owned and operated by an enterprise administering a contact center in which a plurality of resources **112** are distributed to handle incoming work items (in the form of contacts) from customer communication devices **108**. Additionally, social media website **130** and/or other external data sources **134** may be utilized to provide one means for a resource **112** to receive and/or retrieve contacts and connect to a customer of a contact center. Other external data sources **134** may include data sources, such as service bureaus, third-party data providers (e.g., credit agencies, public and/or private records, etc.). Customers may utilize their respective customer communication device **108** to send/receive communications utilizing social media website **130**.

In accordance with at least some embodiments of the present disclosure, the communication network **104** may comprise any type of known communication medium or collection of communication media and may use any type of protocols to transport messages between endpoints. The communication network **104** may include wired and/or wireless communication technologies. The Internet is an example of the communication network **104** that constitutes an Internet Protocol (IP) network consisting of many computers, computing networks, and other communication devices located all over the world, which are connected through many telephone systems and other means. Other examples of the communication network **104** include, without limitation, a standard Plain Old Telephone System (POTS), an Integrated Services Digital Network (ISDN), the Public Switched Telephone Network (PSTN), a Local Area Network (LAN), a Wide Area Network (WAN), a Session Initiation Protocol (SIP) network, a Voice over IP (VoIP) network, a cellular network, and any other type of packet-switched or circuit-switched network known in the art. In addition, it can be appreciated that the communication network **104** need not be limited to any one network type, and instead may be comprised of a number of different networks and/or network types. As one example, embodiments of the present disclosure may be utilized to increase the efficiency of a grid-based contact center. Examples of a grid-based contact center are more fully described in U.S. Patent Publication No. 2010/0296417 to Steiner, the entire contents of which are hereby incorporated herein by reference. Moreover, the communication network **104** may comprise a number of different communication media such as coaxial cable, copper cable/wire, fiber-optic cable, antennas for transmitting/receiving wireless messages, and combinations thereof.

The communication devices **206** (see FIG. **2**) may correspond to customer communication devices **108**. In accordance with at least some embodiments of the present disclosure, a customer may utilize their communication device **108** to initiate a work item, which is generally a request for a processing resource **112**. Illustrative work items include, but are not limited to, a contact directed toward and received at a

contact center, a web page request directed toward and received at a server farm (e.g., collection of servers), a media request, an application request (e.g., a request for application resources location on a remote application server, such as a SIP application server), and the like. The work item may be in the form of a message or collection of messages transmitted over the communication network **104**. For example, the work item may be transmitted as a telephone call, a packet or collection of packets (e.g., IP packets transmitted over an IP network), an email message, an Instant Message, an SMS message, a fax, and combinations thereof. In some embodiments, the communication may not necessarily be directed at the work assignment mechanism **116**, but rather may be on some other server in the communication network **104** where it is harvested by the work assignment mechanism **116**, which generates a work item for the harvested communication, such as social media server **130**. An example of such a harvested communication includes a social media communication that is harvested by the work assignment mechanism **116** from a social media network or server. Exemplary architectures for harvesting social media communications and generating work items based thereon are described in U.S. patent application Ser. Nos. 12/784,369, 12/706,942, and 12/707,277, filed Mar. 20, 1010, Feb. 17, 2010, and Feb. 17, 2010, respectively, each of which is hereby incorporated herein by reference in its entirety.

The format of the work item may depend upon the capabilities of the communication device **108** and the format of the communication. In particular, work items are logical representations within a contact center of work to be performed in connection with servicing a communication received at the contact center (and more specifically the work assignment mechanism **116**). The communication may be received and maintained at the work assignment mechanism **116**, a switch or server connected to the work assignment mechanism **116**, or the like until a resource **112** is assigned to the work item representing that communication at which point the work assignment mechanism **116** passes the work item to a routing engine **132** to connect the communication device **108** which initiated the communication with the assigned resource **112**.

Although the routing engine **132** is depicted as being separate from the work assignment mechanism **116**, the routing engine **132** may be incorporated into the work assignment mechanism **116** or its functionality may be executed by the work assignment engine **120**.

In accordance with at least some embodiments of the present disclosure, the communication devices **108** may comprise any type of known communication equipment or collection of communication equipment. Examples of a suitable communication device **108** include, but are not limited to, a personal computer, laptop, Personal Digital Assistant (PDA), cellular phone, smart phone, telephone, or combinations thereof. In general each communication device **108** may be adapted to support video, audio, text, and/or data communications with other communication devices **108** as well as the processing resources **112**. The type of medium used by the communication device **108** to communicate with other communication devices **108** or processing resources **112** may depend upon the communication applications available on the communication device **108**.

In accordance with at least some embodiments of the present disclosure, the work item is sent toward a collection of processing resources **112** via the combined efforts of the work assignment mechanism **116** and routing engine **132**. The resources **112** can either be completely automated resources (e.g., Interactive Voice Response (IVR) units, processors, servers, or the like), human resources utilizing communication devices (e.g., human agents utilizing a computer, telephone, laptop, etc.), or any other resource known to be used in contact centers.

As discussed above, the work assignment mechanism **116** and resources **112** may be owned and operated by a common entity in a contact center format. In some embodiments, the work assignment mechanism **116** may be administered by multiple enterprises, each of which has its own dedicated resources **112** connected to the work assignment mechanism **116**.

In some embodiments, the work assignment mechanism **116** comprises a work assignment engine **120**, which enables the work assignment mechanism **116** to make intelligent routing decisions for work items. In some embodiments, the work assignment engine **120** is configured to administer and make work assignment decisions in a queueless contact center, as is described in U.S. patent application Ser. No. 12/882,950, the entire contents of which are hereby incorporated herein by reference. In other embodiments, the work assignment engine **120** may be configured to execute work assignment decisions in a traditional queue-based (or skill-based) contact center.

The work assignment engine **120** and its various components may reside in the work assignment mechanism **116** or in a number of different servers or processing devices. In some embodiments, cloud-based computing architectures can be employed whereby one or more components of the work assignment mechanism **116** are made available in a cloud or network such that they can be shared resources among a plurality of different users. Work assignment mechanism **116** may access customer database **118**, such as to retrieve records, profiles, medical history, previous work items, and/or other aspects of a customer known to the contact center. Customer database **118** may be updated in response to a work item and/or input from resource **112** processing the work item.

In one embodiment, a message is generated by customer communication device **108** and received, via communication network **104**, at work assignment mechanism **116**. The message received by a contact center, such as at the work assignment mechanism **116**, is generally, and herein, referred to as a "contact." Routing engine **132** routes the contact to at least one of resources **112** for processing.

FIG. **2** illustrates system **200** in accordance with at least some embodiments of the present disclosure. In one embodiment, emergent event **202** is being reported by first PSAP caller **204** and second PSAP caller **210** utilizing first user device **206** and second user device **212**, respectively. One or more of a number of resources **112** may then process calls via interactions utilizing PSAP server **216**. First user device **206** and second user device **212** may be selected from customer communication devices **108** having at least an ability to communicate using a data channel. Position **208** is the spatial and/or positional relationship between emergent event **202** and first PSAP caller **204**. Position **208** may comprise one or more of distance, direction, height, line of sight, etc. Similarly, position **214** describes a spatial and/or positional relationship between emergent event **202** and second PSAP caller **210** and may comprise one or more of distance, direction, height, line of sight, etc. First user device **206** and second user device **212** each comprise functionality beyond those required for voice-only communications. More specifically, first user device **206** and second user device **212** are each operable to establish a data channel with PSAP server **216** for interactions therewith. Optionally, one or more of first user device **206** and second user device **212** comprise functionality to take photos, take video, capture audio, receive GPS data, send and receive text messages, launch applications, and

otherwise perform functions generally associated with a, "smart phone." However, PSAP server **216** may consider the operational features of first user device **206** and/or second user device **212**, such as when one or both have, or do not have, cameras or operational camera or other features operable to provide meaningful data to PSAP server **216**.

Resources **112** may, as more fully described with respect to FIG. **1**, may be a human agent, automated agent, or a combination (e.g., a human agent utilizing a computer, telephony endpoint, or other device to facilitate interactions comprising speech, text, video, images, data files, location information, URLs, or other content types. First user device **206** and second user device **212** interact with the PSAP server **216** and agent interaction devices connected thereto via the communication network **104**. In some embodiments, the PSAP server **216** enables a single resource **112** to simultaneously interact with multiple users and/or user devices via various communication channels. As an example, PSAP server **216** may initially receive a voice-channel communication (e.g., POTS, cellular-based voice, etc.) or a voice portion of a data channel (e.g., VoIP, SIP, etc.) utilizing first user device **206** and/or second user device **212**. The interaction between a user device (e.g., first user device **206**) and PSAP server **216** may be initiated using a data channel, even if the data channel is initially used only for voice, the data channel may be further utilized for the transfer of multimedia and/or other content as described herein. If the interaction is initiated with a voice-only communication channel, PSAP server **216**, may prompt the user device and/or user to cause the user device to establish a data interaction connection, such as by PSAP server **216** sending a text message with a link to cause the establishment of the data channel. The establishment of a data channel may convey packets, such as Internet Protocol (IP) packets over communication network **104** and may further comprise a WebRTC, HTML5, or other data channel paradigm.

In another embodiment, PSAP server **216** combines calls when they are associated with the same emergent event, such as emergent event **202**. It should be noted that the term "call," as used herein includes, but is not limited to voice-based audio communications and may comprise video, images, text, data, and/or other content. PSAP server **216** may further prioritize calls in a call queue for processing by a resource **112**, herein resource **112**. PSAP server **216** may determine first PSAP caller **204** and second PSAP caller **210** are each reporting emergent event **202** based upon one or more factors, such as commonality between position **208** and position **214**, geospatial coordinates reported from a GPS sensing module within first user device **206** and/or second user device **212**, spoken position determined from a speech to text module, description of emergent event **202**, identification of first PSAP caller **204** by second PSAP caller **210** or vice versa, position related to a landmark, and/or other description of emergent event **202**, position of one of first PSAP caller **204** relative to second PSAP caller **210**, position relative to an actual or potential expansion of emergent event **202**, position relative to an actual or potential extension of emergent event **202**, and/or other position, location, image, sound, etc. that may indicate the same emergent event **202**. For example, first PSAP caller **204** may report emergent event **202** (e.g., a fire) and second PSAP caller **204** may report emergent event **202** (e.g., smoke coming from behind a building situated between second PSAP caller **204** and emergent event **202**). An example of a potential extension may comprise second PSAP caller **204** being able to determine whether an emergent event **202** (e.g., a fire) has spread to a location not visible by first PSAP caller **204**. An example of an extension of an emergent event includes second PSAP caller **210** reporting a suspicious occupant of a parked car while close by, first PSAP caller **204** is reporting the location of an apparent robbery, second PSAP caller **210** may be reporting an extension of emergent event **202**, namely the presence of a potential get-a-way driver for the robbers.

PSAP server **216** may, at any point while engaged in interaction with first user device **206** and/or second user device **212**, obtain information from secondary sources. One secondary source is social media server **218**. Social media server **218** may be prompted, such as by searching for key terms related to emergent event **202** to receive social media content related to emergent event **202**. In another embodiment, social media server **218** may report emergent event **202**, or events similar to emergent event **202**, to PSAP server **216** as a push announcement. Emergent event **202** may comprise a number of issues which must be prioritized and potentially addressed by responders. For example, emergent event **202** may be a fire and warrant a response by firefighters, but also dispatch an appropriate number of ambulances, and/or low-priority responders, such as traffic officers to redirect traffic issues around emergent event **202**. In another embodiment, location information may be associated with a message (e.g., Tweet, SMS, etc.) location, such as with the user's consent. The location could be provided to PSAP server **216**

Resource **112** may engage in interaction with first user device **206** and/or second user device **216** directly, or via an input to PSAP server **216** which provides interactions thereto. Resource **112** may specifically provide data channel content to first PSAP caller **204** and second PSAP caller **210**, comprising instructions, inquiries, or other content at the same time. In a further embodiment, the interaction may be the same (e.g., an announcement for everyone to move away) or different. For example, emergent event **202** may comprise a medical emergency such as a victim suffering a heart attack. In another embodiment, resource **112** may initiate, approve, and/or supervise PSAP server **216** asking questions (e.g., "Are you CPR certified?") and/or issuing instructions to first PSAP caller **204** and/or second caller **210** to play an animation illustrating cardiopulmonary resuscitation (CPR) while at the same time the other of first PSAP caller **204** and second PSAP caller **210** receives instructions to view the video and prepare to begin CPR on the victim. As a benefit, first PSAP caller **204** may position first user device **206**, playing the CPR instructions, such that second PSAP caller **210** is able to see and/or hear (second PSAP caller **210** being unable to use or hold second user device **212** while in the act of performing CPR). As a further example, second user device **212** may present additional audio or video instructions received from medical personnel and/or receive video/audio from first user device **206**. In yet another example, PSAP server **216**, optionally with guidance and/or instructions and/or supervision from resource **112**, may communicate with first user device **206** and second user device **212** to help guide emergency responders.

PSAP server **216** may select one location for first PSAP caller **204** and provide to first PSAP caller **204** instructions as to where first PSAP caller **204** should position themselves, such as by causing first user device **206** to display directions and/or a map. Similarly, PSAP server **216**, with direction and/or supervision of resource **112**, may provide a different location for second PSAP caller **210** to position themselves whereby the instructions are similarly delivered by map, or other instructions delivered to second user device **212**. As a benefit, responders may find the location of emergent event **202** with the assistance of first PSAP caller **204** and a first location and second PSAP caller **210** at a second location.

PSAP server **216** may additionally select one or more of the callers, such as second PSAP caller **210**, to communicate via second user device **212**, with third-party device **222** and thereby establish a direct interaction with third-party **220**. Third party **220** may be an on-site responder or other party who is or may become engaged to mitigate emergent event **202**. In another embodiment, third-party device **222** may be a plurality of third-party devices **222** operable to communicate with a plurality of third parties **220**. A selected party, such as first PSAP caller **204**, second PSAP caller **210**, or one of the plurality of third-parties **220** may then coordinate at least a portion of the responses to emergent event **202**.

FIG. **3** illustrates interaction **300** in accordance with at least some embodiments of the present disclosure. In one embodiment, first PSAP caller **204**, utilizing first user device **206** (not shown), establishes data connection **302** with PSAP server **216**. Second PSAP caller **210**, utilizing second user device **210** (not shown), then establishes a data connection with PSAP server **216** at step **304**. PSAP server may be a standalone component or comprise, be comprised by, or co-processing with components of PSAP server **216**, including but not limited to, one or more of work assignment mechanism **116**, work assignment engine **120**, routing engine **132**, and automated resources **112**. Optionally, PSAP server **216** may query, at step **306**, social media server **218** to receive event details **308** regarding an emergent event, such as emergent event **202**. PSAP server **216** may query social media server **218** or alternatively social media server **218** may provide event details at step **308** as push notifications. Furthermore, query step **306** and/or receiving event details step **308** may be performed prior, during, or after to one or more of step **302** and **304**. Step **310** then determines commonality for the emergent event provided by two or more of first PSAP caller **204**, second PSAP caller **210**, and social media server **218**. If one of first PSAP caller **204**, second PSAP caller **210**, or social media server **218** is reporting a different event, the different event may be processed separately from emergent event **202**.

While automation is obtainable from the embodiments disclosed herein, resource **112** may supplement the interactions established during steps **302**, **304**. For example, interactions step **312**, and optionally at any point until interaction with first PSAP caller **204** and/or second PSAP caller **210** has been terminated may comprise interactions from resource **112** (e.g., images, speech, etc.). In another embodiment, resource **112** may approve, trigger, and/or monitor interactions to or from PSAP server **216** with PSAP server **216** determining the content and/or form of the interactions with each of first user device **206** and second user device **212**, simultaneously at step **314**. Interactions performed at steps **316** and **318** may be the same or differ in terms of content and/or content type and may further differ in terms of content type originating from first user device **206** as compared to second user device **212**. For example first PSAP caller **204** may receive content comprising instructions, such as to go to the corner of First and Main Street to direct emergency responders. Whereas second PSAP caller **210** may receive content comprising instructions, such as to go to the corner of Second and Elm Street to provide additional guidance to emergency responders or direction for a different emergency responder. Content type may differ in terms of audio, video, text, position information, etc. For example first PSAP caller **204** may receive audio instructions via first user device **206** for the performance of CPR and second PSAP caller **210** may receive video instructions, such as to hold in a position visible to first PSAP caller **204** while performing CPR.

Step **320** may execute once, periodically, upon an event, or continually, such as to evaluate information received from one or more of first PSAP caller **204**'s, second PSAP caller **210**, and optionally social media server **218**. For example, PSAP server **216** may already be aware of emergent event **202**. The report by first PSAP caller **204** and second PSAP caller **210** is therefore deprioritized so as to not overwhelm resource **112** with what is likely already known information. Typically, calls are answered by resource **112** in a FIFO queue order. However, step **320** may determine that second interaction **318** provides content to PSAP server **216** that is different and determined, by step **320**, to be more relevant than that of first interaction received at step **316**. For example second PSAP caller **210** may be providing still images or video information regarding the emergent event. Second PSAP caller **210** may then be placed in a higher position in the queue to connect with resource **112**, the content of the still or video may or may not be evaluated for relevancy as it may be assumed that a video feed proximate to emergent event **202** is relevant. Step **322** may then reprioritize the queue order such that second PSAP caller **210** is processed prior to first PSAP caller **204**.

In another embodiment, step **324** provides for the establishment of a data channel connection between second PSAP caller **210** and third-party **220**, utilizing third party device **222** (not shown). Third-party data channel connection at step **324** may be provided in response to a prompt from PSAP server **216** and/or resource **112**. Third-party **220** may be, for example, an on-site responder, en-route responder, or other party selected by PSAP server **216** and/or resource **112**. As a further embodiment, second PSAP caller **210** may establish a non-data channel interaction with third-party **220**, such as when third-party **220** is unable to establish a data channel interaction.

Following step **322**, step **326** provides for the reprioritized interaction of first PSAP caller **204** for interaction with resource **112**. Similar to that described above with respect to step **324**, first PSAP caller **204** may also be prompted to establish a data channel connection with third-party **220** or another party (not shown).

FIG. **4** illustrates a first view of first user device **206** in accordance with at least some embodiments of the present disclosure. In one embodiment, FIG. **4** illustrates first user device **206**, albeit in an exaggerated form to more clearly illustrate potential content displayed thereon, but typically not at the same time, such as when a non-exaggerated form includes a scrolling or paging feature. First user device **206** comprises input and output means such as speaker **402**, microphone **404**, and touch display **406**. Other input and output components, not shown, include antenna to enable cellular, Wi-Fi, and GPS functionality as well as other electromagnetic and/or mechanical signal receivers, transmitters, and processors. First user device **206** may also comprise still and/or video camera, speakerphone, etc.

In one embodiment, first user device **206** has established a data channel interaction with PSAP server **216**. Touch display **406** presents various options for interacting with PSAP server and/or resource **112**. For example, portion **408** prompts the user to take and send a picture of the emergent event for use by PSAP personnel, such as resource **112**, and/or third-party **220**, or other parties operable to mitigate the emergent situation. Portion **410** provides the user with a means to initiate capturing and/or sending video of the emergent event to appropriate personnel. While audio communications may be provided via the data channel and/or a voice-only channel, other content is exchanged via the data channel, content such as messages **412**, **416**, **420**; video; images; and/or position data. In another example, message **412** provides instructions for the user of device **206** to relocate to a certain position.

Button **414**, such as a "soft button," provides a means for first user **204** to launch a map application on first user device **206** (see FIG. **5**). Alternatively, the map application may be automatically launched without receiving any human input to first user device **206**.

In another embodiment, button **418** provides a trigger to initiate a connection with a third-party **220**. For example, PSAP server **216** may provide a telephone number of an on route responder that, upon selecting portion **418**, causes first user device **206** to initiate a telephone call to the responder. In another example, PSAP server causes first user device **206** to connect to third party **220** via data channel and may further initiate the connection without human input to first user device **206**. As can be appreciated by those of ordinary skill in the art, other connections types may also be made with third party **220** (e.g., Bluetooth, near-field radio, infrared, social media, etc.) to convey voice, video, images, data files, position information, and/or other content. PSAP server **216** may monitor and/or supplement the interaction between first user **204** and third party **220**. In another embodiment, interaction content, such as multimedia data, may be captured by first user device **206** and sent to PSAP server **216** and optionally for presentation to resource **112**, interaction content and/or links to obtain the interaction content may also be received from PSAP server **216**. For example, message **420** comprises instructions to play a CPR video which would then be launched upon selecting button **422**.

The multimedia content provided over the data channel may comprise audio, video, datafiles, URLs, GPS coordinates, animations, instructions, and/or other content which may be helpful in mitigating the emergent situation. The data channel may be established as point-to-point (e.g., first user device **206** to/from PSAP server **216**, second user device **212** to/from third party device **222**, etc.), one-to-many (e.g., first user device **206** to/from a combination of PSAP server **216**, third party device **222**, etc.), many-to-one, and/or many-to-many. In another embodiment, the multimedia content comprises a data file, which may include a predetermined file or a non-predetermined file (e.g., a data stream). The data file may include biometric data, such as temperature, respiration, heart rate, blood pressure, or other information. The biometric data may be sensed by a discrete device or by an integrated device incorporating the functionality of at least one of first user device **206**, second user device **212**, or third-party user device **222**.

FIG. **5** illustrates a second view of first user device **206** in accordance with at least some embodiments of the present disclosure. In one embodiment, first user device **206** has launched a map application, such as by the user selecting button **414** or as an automatic response to a signal received from PSAP server **216** to open the map application. In another embodiment, first user device **206** executes mapping application comprising button **502** to return to the emergency services panel, see FIG. **4**, such as when the user needs to provide or receive additional information from/to PSAP server **216** and/or resource **112**. The map application may include a graphical display **504** to assist the user in navigating to the desired location. Map application may also comprise text-based instructions provided in message **506** and as a further option, audio instructions provided by spoken text **508** presented by speaker **402**.

The map application may also report the location of first user device **206**, and thereby first user **204**, to PSAP server **216**, agent **112**, second user **210**, and/or third party **220**. Map application may also receive inputs, such as to enable first user **204** to touch a spot on a map and have the associated location conveyed to another party and/or PSAP server **216**.

FIG. **6** illustrates process **600** in accordance with at least some embodiments of the present disclosure. In one embodiment, process **600** starts as a response to a voice base call. However, establishing a data channel without having first established a voice channel is also provided herein. Step **602** establishes the data channel with first PSAP caller **204**, whether in response to a voice channel or as a first channel of communication. Next, step **604** establishes a data connection with the second PSAP caller **210**. As described with respect to step **602**, step **604** may also be in response to a voice channel connection or omitting the voice channel connection and first connecting via a data channel.

Step **606** determines whether first PSAP caller **204** and/or second PSAP caller **210**, via the data channel(s) established during step **602** and **604** respectively, are reporting the same emergent event (e.g., emergent event **202**). If step **606** determines they are not reporting the same event, processing may continue to step **608** whereby the calls are processed as separate calls. The separate calls may each initiate their own respective process **600**.

Upon step **606** determining first **204** and second PSAP caller **210** are reporting the same emergent event, processing continues to step **610**. Step **610** simultaneously interacts with the first PSAP caller **204** and second PSAP caller **210** as described herein. Optionally, step **612** obtains social media content related to the emergent event. Step **614** determines whether a reprioritization is required. If no, processing continues to step **618** where calls are presented to an agent, such as resource **112**, in the queue order. If yes, processing continues to step **616** whereby the queue is re-prioritized, such as second PSAP caller **210** is moved ahead of first PSAP caller **204**. Upon completion of step **616**, processing continues to **618** where the agent is presented with the callers in the queue order. The reprioritization at step **614** allows for PSAP server **216** to present to PSAP resource **112** the caller having more relevant information. For example, second caller **210** may be in a more relevant (e.g., closer to emergent event **202**, closer to emergency responders, closer to a potential secondary emergent event, etc.). In another embodiment, the content of the data channel may be used to reprioritize the order in which first PSAP caller **204** and second PSAP caller **206** are presented to PSAP resource **112**. For example, a default order is first-in-first-out (FIFO), however if second PSAP caller **210** is able to provide live video of emergent event **202** and first PSAP caller **204** is only able to provide audio, video being more relevant to assessing emergent event **202**, second PSAP caller **210** may be presented to PSAP resource **112** ahead of first PSAP caller **204**. The determination of which content is more revelvant may be a matter of design choice. For example, while video may be generally preferred to still images, an ability to provide high-resolution still images may be determined to be more relevant to a particular emergent event as compared to low-resolution video images.

In the foregoing description, for the purposes of illustration, methods were described in a particular order. It should be appreciated that in alternate embodiments, the methods may be performed in a different order than that described. It should also be appreciated that the methods described above may be performed by hardware components or may be embodied in sequences of machine-executable instructions, which may be used to cause a machine, such as a general-purpose or special-purpose processor (GPU or CPU) or logic circuits programmed with the instructions to perform the methods (FPGA). These machine-executable instructions may be stored on one or more machine readable mediums, such as CD-ROMs or other type of optical disks, floppy diskettes, ROMs, RAMs, EPROMs, EEPROMs, magnetic or

optical cards, flash memory, or other types of machine-readable mediums suitable for storing electronic instructions. Alternatively, the methods may be performed by a combination of hardware and software.

Specific details were given in the description to provide a thorough understanding of the embodiments. However, it will be understood by one of ordinary skill in the art that the embodiments may be practiced without these specific details. For example, circuits may be shown in block diagrams in order not to obscure the embodiments in unnecessary detail. In other instances, well-known circuits, processes, algorithms, structures, and techniques may be shown without unnecessary detail in order to avoid obscuring the embodiments.

Also, it is noted that the embodiments were described as a process which is depicted as a flowchart, a flow diagram, a data flow diagram, a structure diagram, or a block diagram. Although a flowchart may describe the operations as a sequential process, many of the operations can be performed in parallel or concurrently. In addition, the order of the operations may be re-arranged. A process is terminated when its operations are completed, but could have additional steps not included in the figure. A process may correspond to a method, a function, a procedure, a subroutine, a subprogram, etc. When a process corresponds to a function, its termination corresponds to a return of the function to the calling function or the main function.

Furthermore, embodiments may be implemented by hardware, software, firmware, middleware, microcode, hardware description languages, or any combination thereof. When implemented in software, firmware, middleware or microcode, the program code or code segments to perform the necessary tasks may be stored in a machine readable medium such as storage medium. A processor(s) may perform the necessary tasks. A code segment may represent a procedure, a function, a subprogram, a program, a routine, a subroutine, a module, a software package, a class, or any combination of instructions, data structures, or program statements. A code segment may be coupled to another code segment or a hardware circuit by passing and/or receiving information, data, arguments, parameters, or memory contents. Information, arguments, parameters, data, etc. may be passed, forwarded, or transmitted via any suitable means including memory sharing, message passing, token passing, network transmission, etc.

While illustrative embodiments of the disclosure have been described in detail herein, it is to be understood that the inventive concepts may be otherwise variously embodied and employed, and that the appended claims are intended to be construed to include such variations, except as limited by the prior art.

What is claimed is:

1. A system, comprising:

a server;

a network interface enabling communication with the server; and

a public safety access point (PSAP) resource, in communication with the server;

wherein the server receives, via the network interface, a first voice call from a first PSAP caller and a second voice call from a second PSAP caller;

wherein the server, upon determining that both the first PSAP caller and second PSAP caller are calling with respect to a common emergent event, prompts the first PSAP caller and the second PSAP caller to each establish a data communication with the server via a data channel and provide a content of the data channel;

wherein the server routes a work item, comprising the content of the data channel, to the PSAP resource; and

wherein the PSAP resource processes the work item and simultaneously interacts with each of the first PSAP caller and the second PSAP caller over the data channel.

2. The system of claim **1**, wherein:

the server further comprises a prioritization module to:

evaluate the content of the data channel,

determine a relevancy order, in accord with the evaluated content, for the first PSAP caller and the second PSAP caller upon one of the first PSAP caller and the second PSAP caller having a more relevant association with the emergent event; and

cause the server to present to the PSAP resource, the first PSAP caller and the second PSAP caller in the relevancy order prior to the simultaneous interaction.

3. The system of claim **2**, wherein the evaluation of the content of the data channel comprises evaluating a location of the first PSAP caller and a location of the second PSAP caller relative to the emergent event.

4. The system of claim **2**, wherein:

the server further comprises a social media interface configured to receive social media content relevant to the emergent event; and

the prioritization module is further configured to evaluate the content of the data channel comprising the social media content.

5. The system of claim **2**, wherein the prioritization module evaluates the content of the data channel comprising evaluating a media type of content provided by the first PSAP caller and the media type of content provided by the second PSAP caller.

6. The system of claim **5**, wherein the media type comprises at least one of audio, video, data file, still image, location coordinates, movement, and directional orientation content.

7. The system of claim **2**, wherein the prioritization module evaluates the content of the data channel by determining an ability of at least one of the first PSAP caller and the second PSAP caller to maintain an interaction with a third party.

8. The system of claim **2**, wherein the prioritization module evaluates the content of the data channel by determining whether one of the first PSAP caller and the second PSAP caller has a greater opportunity to mitigate the emergent event, a greater opportunity to provide data channel content to a responder to the emergent event, a location more relevant to the emergent event, and a location determined to be more relevant to the responder to the emergent, and whereby the one of the first PSAP caller and the second PSAP caller having the location more relevant is placed in relevancy order to be ahead of the other one of the first PSAP caller and the second PSAP caller.

9. A method, comprising:

receiving, at a PSAP server of a public safety access point (PSAP), a first voice call from a first PSAP caller and a second voice call from a second PSAP caller;

upon determining, by the PSAP server, that the first PSAP caller and the second PSAP callers are reporting the same emergent event, establishing a data channel connection between the PSAP server and a first customer device and a second customer device associated with the first and the second PSAP callers, respectively, and

causing a PSAP resource to simultaneously interact via the data channel, with the first PSAP caller and the second PSAP caller with respect to the emergent event.

10. The method of claim 9, further comprising:

evaluating, by the PSAP server, content of the data channel;

determining, by the PSAP server, a relevancy order, in accord with the evaluated content, for the first PSAP caller and the second PSAP caller upon one of the first PSAP caller and the second PSAP caller having a more relevant association with the emergent event; and

presenting to the PSAP resource, by the PSAP server, the first PSAP caller and the second PSAP caller in the relevancy order prior to the simultaneous interaction.

11. The method of claim 10, wherein the step of evaluating the content of the data channel comprises evaluating, by the PSAP server, a location of the first PSAP caller and a location of the second PSAP caller relative to the emergent event.

12. The method of claim 10, further comprising:

receiving, by the PSAP server, social media content relevant to the emergent event; and

wherein the step of evaluating the content of the data channel further comprises evaluating, by the PSAP server, the social media content.

13. The method of claim 10, wherein the step of evaluating the content of the data channel further comprises evaluating, by the PSAP server, a media type of content provided by the first PSAP caller and the media type of content provided by the second PSAP caller.

14. The method of claim 13, wherein the media type comprises at least one of audio, video, data file, still image, location coordinates, movement, and directional orientation content.

15. The method of claim 10, wherein the step of evaluating the content of the data channel further comprises determining, by the PSAP server, an ability of at least one of the first PSAP caller and the second PSAP caller to maintain an interaction with a third party.

16. The method of claim 10, wherein the step of evaluating the content of the data channel further comprises determining, by the PSAP server, whether one of the first PSAP caller and the second PSAP caller has a greater opportunity to mitigate the emergent event, a greater opportunity to provide data channel content to a responder to the emergent event, a location more relevant to the emergent event, and a location determined to be more relevant to the responder to the emergent event, and whereby the one of the first PSAP caller and the second PSAP caller having the location more relevant is placed in relevancy order to be ahead of the other one of the first PSAP caller and the second PSAP caller.

17. A system, comprising:

means to receive, by a PSAP server of a public safety access point (PSAP), a first voice call from a first PSAP caller and a second voice call from a second PSAP caller;

means to determine, by the PSAP server, whether the first PSAP caller and the second PSAP caller are reporting a same emergent event; and

upon determining that the first and second PSAP callers are reporting the same emergent event, means to establish, by the PSAP server, a data channel connection between the PSAP server and each of a first customer device associated with the first PSAP caller and a second customer device associated with the second PSAP caller, and means to cause a PSAP resource to simultaneously interact via the data channel with the first PSAP caller and the second PSAP caller with respect to the emergent event.

18. The system of claim 17, further comprising:

means to evaluate, by the PSAP server, content of the data channel;

means to determine, by the PSAP server, a relevancy order, in accord with the evaluated content, for the first PSAP caller and the second PSAP caller upon one of the first PSAP caller and the second PSAP caller having a more relevant association with the emergent event; and

presenting, by the PSAP server, to the PSAP resource, the first PSAP caller and the second PSAP caller in the relevancy order prior to the simultaneous interaction.

19. The system of claim 18, further comprising means to evaluate, by the PSAP server, the content of the data channel comprising means to evaluate a location of the first PSAP caller and a location of the second PSAP caller relative to the emergent event.

20. The system of claim 17, further comprising:

means to receive, by the PSAP server, a social media content relevant to the emergent event; and

wherein the means for evaluating the content of the data channel further comprises means for evaluating, by the PSAP server, the social media content.

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