



(51) **International Patent Classification:**
H04W4/00 (2009.01) *H04W 12/06* (2009.01)
H04W 12/00 (2009.01) *H04L 29/06* (2006.01)

(21) **International Application Number:**
PCT/US2017/041215

(22) **International Filing Date:**
07 July 2017 (07.07.2017)

(25) **Filing Language:** English

(26) **Publication Language:** English

(30) **Priority Data:**
62/359,543 07 July 2016 (07.07.2016) US
62/416,344 02 November 2016 (02.11.2016) US

(71) **Applicant:** ESTIMOTE POLSKA SP. Z O. O. [PL/PL];
Krakusa 11, 30-535 Krakow, Poland (PL).

(72) **Inventors:** KRZYCH, Jakub; 35 E 19th St. 3rd Floor,
New York, New York 10003 (US). KOSTKA, Lukasz; 35
E 19th St. 3rd Floor, New York, New York 10003 (US).

(74) **Agent:** SCHOX, Jeffrey; 500 3rd Street, Suite 215, San Francisco, California 94107 (US).

(81) **Designated States (unless otherwise indicated, for every kind of national protection available):** AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) **Designated States (unless otherwise indicated, for every kind of regional protection available):** ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM,

(54) **Title:** METHOD AND SYSTEM FOR CONTENT DELIVERY WITH A BEACON

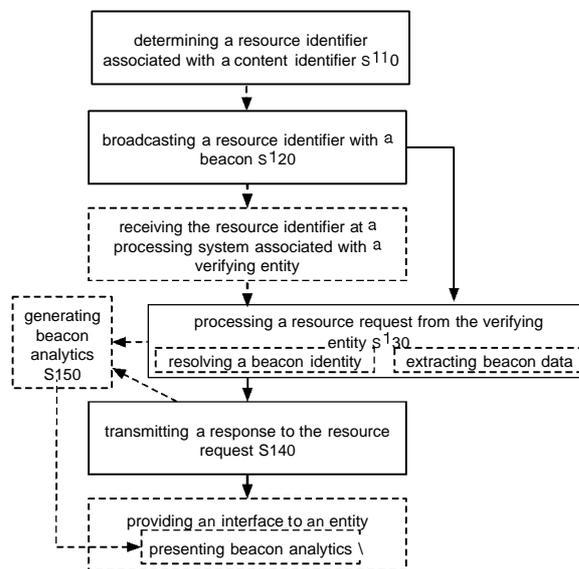


FIGURE 1

(57) **Abstract:** Embodiments of a method and system for improving delivery of content to a user device can include: determining a resource identifier comprising beacon data associated with a beacon, wherein the resource identifier is associated with a content identifier identifying the content; broadcasting the resource identifier from the beacon to the user device; processing a resource request from a verifying entity, the resource request associated with the resource identifier; and transmitting a response to the resource request based on the first content identifier.



TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW,
KM, ML, MR, NE, SN, TD, TG).

Published:

— with international search report (Art. 21(3))

METHOD AND SYSTEM FOR CONTENT DELIVERY WITH A BEACON**CROSS-REFERENCE TO RELATED APPLICATIONS**

[0001] This application claims the benefit of US Provisional Application number 62/416,344 filed 02-NOV-2016 and US Provisional Application number 62/359,543 filed 07-JUL-2016, each of which is incorporated in its entirety by this reference.

[0002] This application is related to US Application number 15/590,939 filed 09-MAY-2017, which claims the benefit of US Provisional Application number 62/334,115 filed 10-MAY-2016 and US Provisional Application number 62/416,395 filed 02-NOV-2016, and which is a continuation in part of US Application number 15/446,165 filed 01-MAR-2017, which is a continuation of US Application number 15/253,376, filed 31-AUG-2016, which claims the benefit of US Provisional Application number 62/213,467 filed 02-SEP-2015, each of which is incorporated in their entireties by this reference.

[0003] This application is additionally related to US Application number 15/620,014 filed 12-JUN-2017, which is a continuation of U.S. Patent No. 15/288,302, filed 07-OCT-2016, which is a continuation of U.S. Patent Application No. 14/956,209, filed 01-DEC-2015, which is a continuation of U.S. Patent Application No. 14/463,582, filed on 19-AUG-2014, now issued as U.S. Patent No. 9,202,245, which claims the benefit of U.S. Provisional Application No. 61/867,493, filed on 19-AUG-2013 and to U.S. Provisional Application No. 61/867,498, filed on 19-AUG-2013, each of which is incorporated in their entireties by this reference.

TECHNICAL FIELD

[0004] This invention relates generally to the wireless communication field, and more specifically to a new and useful method and system for providing content in the wireless communication field.

BRIEF DESCRIPTION OF THE FIGURES

[0005] FIGURE 1 is a schematic representation of a variation of the method.

[0006] FIGURE 2 is a schematic representation of a variation of the method.

[0007] FIGURE 3 is a schematic representation of a variation of the method.

[0008] FIGURE 4 is a schematic representation of a variation of generating beacon analytics.

[0009] FIGURE 5 is a schematic representation of a variation of the method.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0010] The following description of the preferred embodiments of the invention is not intended to limit the invention to these preferred embodiments, but rather to enable any person skilled in the art to make and use this invention.

1. Overview.

[0011] As shown in FIGURES 1-3 and 5, embodiments of a method 100 for delivery of content to a user device can include: determining a resource identifier including beacon data associated with a beacon, where the resource identifier is associated with a content identifier identifying the content S110; broadcasting the resource identifier from the beacon to the user device S120; processing a resource request from a verifying entity, the resource request associated with the resource identifier S130; and transmitting a response to the resource request based on the first content identifier S140. Embodiments of the method 100 can additionally or alternatively include generating beacon analytics S150, providing an interface to an entity, and/or other suitable processes.

[0012] The method 100 functions to leverage beacon technology to facilitate centralized control (e.g., at a remote beacon control system) of content (e.g., contextualized content) delivered to user devices. The method 100 can additionally or alternatively function to dynamically modify resource identifiers (e.g., broadcasted by a beacon) to collect beacon data (e.g., sensor data, traffic data) for generating beacon analytics, to increase security, and/or for other suitable purposes. Further, the method 100 can optionally function to enable a first party (e.g. a beacon manufacturer, an entity developing software executable by a beacon, etc.) to centrally manage content deliverable to user devices in order to ensure compliance with verifying entities (e.g., an entity that verifies the legitimacy of content before delivery to the user, a web browser, a network administrator, an internet service provider, etc.).

[0013] An example of a first party includes Estimote™, or any other suitable entity associated with a system that the content requests are routed through, and/or other suitable entities. An example of a verifying entity is Google™, accessible through Google's Physical Web™. As such, beacon owners (e.g., an entity controlling a beacon, beacon permissions, etc.) can confidently manage deployed beacons and delivered content remotely, such as at a beacon

owner interface. For example, merchants (e.g., Target™) can be a beacon owner and own one or more sets of beacons. Content providers can create and dynamically manage beacon campaigns (e.g., for delivering content) remotely, such as at a content provider interface and/or content provider device. Content providers can include any of: an entity providing content to be served to a user, a beacon owner, a secondary entity (e.g., an entity associated with the beacon owner and serving content by leveraging beacons of the beacon owner), a content provider device, an entity associated with the physical space, merchant, and/or product, and/or any other suitable entity. For example, content providers can include advertising entities, product companies (e.g., Coke™), or other entities. Further, users (e.g., an individual associated with a user device communicating with beacons, a customer interfacing with beacons located at a retail store, etc.) can receive content (e.g., associated with a beacon) at a user device without the user device needing to download any particular application.

[0014] The method 100 is preferably implemented with systems described in U.S. Application No. 15/253,376, filed 31-AUG-2016, and U.S. Application No. 14/463,582, filed 19-AUG-2014, which are incorporated in their entireties by this reference, but can be additionally or alternatively implemented with one or more: beacons, processing systems (e.g., remote systems) associated with first parties, beacon owners, content providers, verifying entities, and/or other suitable entities, and/or any other suitable components. The method 100 and system 200 can optionally be applied to applications independent of beacon technology.

[0015] One or more instances and/or portions of the method 100 and/or processes described herein can be performed asynchronously (e.g., sequentially), concurrently (e.g., in parallel; concurrently on different threads for parallel computing to improve system processing ability; etc.), in temporal relation to a condition, and/or in any other suitable order at any suitable time and frequency by and/or using one or more instances of the system 200, elements, and/or entities described herein. However, the method 100 and/or system 200 can be configured in any suitable manner.

2. Benefits.

[0016] The technology can confer several benefits over conventional systems. First, the technology can include processes necessarily rooted in computer technology for

overcoming problems specifically arising in the realm of computer networks (e.g., Internet technology). In an example, the technology can enable dynamic generation of resource identifiers (e.g., URLs associated with a first party Internet domain, etc.) based on content identifiers (e.g., URLs associated with a content provider Internet domain, etc.) using identifier generation rules configured to improve extraction and analysis of contextual data (e.g., beacon data, user device data, etc.) to overcome issues with tracking and/or personalizing content delivery through a beacon network (e.g., operating in the Physical Web).

[0017] Second, the technology can confer an improvement to the functioning of computer-related technology. For example, the technology can amount to an inventive distribution of functionality across a network of one or more: beacon control systems (e.g., acting as a centralized system including a content database with sets of content identifiers associated with sets of beacons identifiers; determining identifier generation rules for generating resource identifiers enabling dynamic selection of content to be delivered based on contextual data such as beacon sensor data; etc.), beacons (e.g., generating and/or broadcasting a resource identifiers associated with content identifiers for content provided by content providers; supplying contextual data to improve personalized content delivery; etc.), user devices (e.g., acting as a communication intermediary between a beacon, a verifying entity, and a beacon control system; acting as a device where content can be presented; etc.), verifying entities (e.g., acting as a verification intermediary between broadcast of a resource identifier to a user device and presentation of content at the user device; etc.), and/or other suitable components.

[0018] Third, the technology can facilitate performance of functions not previously performable (e.g., improving upon processes). For example, the technology can apply computer-implemented rules (e.g., identifier generation rules; resource request processing rules such as data extraction rules for beacon data extraction from resource identifiers, content identifier selection rules for selecting a content identifier from a set of content identifiers for generating a response to a resource request; user preference rules; storage and retrieval rules in relation to beacon data, identifiers, and/or other suitable data; etc.) to confer improvements in beacon technology (e.g., beacons, beacon control systems, etc.) for delivering content.

[0019] Fourth, the technology can improve beacon network security, such as through applying identifier generation rules to generate resource identifiers including an HTTPS URL to be communicated across a beacon control system, beacons, user devices, verifying entities, and/or other suitable components. In another example, beacons can be associated with beacon communication protocols with enterprise-grade encryption and security algorithms, where the beacon communication protocol associated with communication of a resource identifier can be identified through the resource identifier (e.g., through a protocol identifier included in the resource identifier) for verification.

[0020] Fifth, the technology can improve digital privacy associated with delivering content with a beacon (e.g., operating with the Physical Web), such as by filtering content delivered to a user device based on permission-based user preferences for types of content, type of content identifiers, types of content presentation, and/or through other suitable means.

[0021] Sixth, the technology can transform a particular article to another state or thing. For example, the technology can transform one or more of: beacons (e.g., controlling beacons through wireless digital commands generated and transmitted by a beacon control system; controlling the beacon to disable or activate broadcasts of resource identifiers; controlling the beacon to update firmware and/or software; controlling resource identifier generation, sensor sampling, and/or other beacon processes; managing a set of beacons; controlling a beacon to operate between master and slave modes in different contexts, such as based on beacon data extracted from a resource request; etc.), a user device (e.g., activating the user device to present content, as facilitated by transmission of a corresponding resource identifier from a beacon to the user device; etc.), and/or other suitable components.

[0022] Seventh, the technology can leverage specialized computing devices (e.g., beacons including sensors, wireless communication systems configured to communicate with other beacons and/or a centralized beacon control system, and/or other suitable components) in facilitating improvements in content delivery. However, the technology can provide any other suitable benefits in the context of using non-generalized systems for delivering content.

2. Method.

[0023] Determining a resource identifier including beacon data associated with a beacon S110 functions to determine an identifier to be broadcasted by one or more beacons. A resource identifier is preferably associated with (e.g., redirects to; includes; stored in association with, such as for later retrieval and/or selection amongst a set of a content identifiers; based upon, such as through modifying the content identifier URL; etc.) one or more content identifiers identifying content provided by content providers (e.g., a single content provider; multiple content providers; etc.) and/or other suitable entity. Content identifiers are preferably stored in association with beacon identifiers (e.g., to enable retrieval of the relevant content identifier in response to extracting a beacon identifier from a resource request; etc.), but can be otherwise associated.

[0024] Resource identifiers can include any of a: uniform resource identifier (URI) (e.g., uniform resource locator, universal resource name, etc.), IP address, codes (e.g., bar code, QR code, datamatrix code, UPC code, etc.), titles, descriptions, associated media (e.g., favicons, images, video, audio, etc.), and/or any suitable resource identifying information. Resource identifiers can be used as: a website locator (e.g., for linking to a website), application locator (e.g., for launching an application), a database access resource, a file transfer resource, an email resource, a pointer to content, and/or for any suitable purpose. In variations, the resource identifier can include beacon data (e.g., beacon identifiers, sensor data, traffic data), user device data (e.g., data sampled at a sensor of a user device), random characters, and/or any suitable data. Sensor data (e.g., sampled at beacon sensors, at user device sensors, etc.) can include data from any of: motion sensors (e.g., gyroscopes, accelerometers, magnetometers, etc.), temperature sensors, optical sensors (e.g., image sensors, light sensors, etc.), location sensors, audio sensors, volatile compound sensors, humidity sensors, depth sensors, touch sensors, impedance sensors, biometric sensors (e.g., fingerprint sensors, etc.), power sensors, and/or any other suitable sensors. Resource identifiers can be static or dynamic. Additionally or alternatively, resource identifiers can be configured in any manner analogous to content identifiers and/or other suitable identifiers, and vice versa. In a first specific example, the content identifier can include a first URI associated with a content provider domain, and the resource identifier can include a second URI associated with a first party domain. In a second specific example, a resource identifier URI can be generated for media content submitted through an interface (e.g., where a content

provider uploads the media content directly from their desktop). However, identifiers can be associated with any suitable domains and/or entities, and can be configured in any suitable manner.

[0025] Resource identifiers are preferably generated using one or more rules (e.g., generation rules for identifiers, for other suitable data, etc.) based on one or more of: a temporal indicator (e.g., generating resource identifiers at a time interval, during a time period, etc.), beacon data (e.g., generating a resource identifier in response to sampling a threshold size of sensor data; generating a resource identifier including a beacon identifier, sensor data, associated beacon protocol identifiers, associated identifiers such as user accounts and/or content identifiers, and/or other suitable data; etc.), user device data, identifiers (e.g., beacon identifier, application identifier, content provider identifier, beacon owner identifier, etc.), encryption parameters (e.g., for encrypting portions of the resource identifier), random generators (e.g., for appending random strings), and/or any suitable criteria.

[0026] Different rules can be applied to different beacons, content, user devices, and/or other suitable entities, which can confer improvements to the system 200 by improving content delivery (e.g., through improved personalization of content to users; through improved management of content delivery campaigns with beacons by content providers; etc.), and/or other suitable aspects. For example, a first sensor data encoding rule can be used to determine resource identifiers for a beacon including a plurality of sensor types, and a second sensor data encoding rule can be used to determine resource identifiers for a beacon including a single sensor type (e.g., where different encoding mechanisms can be applied to include and/or select sensor data while complying with a URL size requirement, etc.). The rules can be determined (e.g., obtained, retrieved, generated, executed, etc.), stored (e.g., in association with identifiers, contextual data, etc.), and/or otherwise processed by any suitable component of the system 200.

[0027] In a first variation, the method 100 can include determining a resource identifier including beacon data based on the beacon identifier (e.g., where the resource identifier includes the beacon identifier; where a identifier generation rule associated with the beacon identifier is retrieved based on the beacon identifier and utilized to determine the resource identifier; etc.). In a first specific example, the resource identifier includes a URI

(e.g., web address) including: a first party host (e.g., linking to a first party server system, such as <http://estimote.com>) and a path including a beacon identifier (associated with a beacon on the first party server system). The path, path parameters, and/or path fragment (e.g., named anchor) can optionally include encoded beacon data, such as sensor data, location data, traffic data, or other data. In a specific example, resource identifiers can be generated in a URL form of: "<https://example.info/wxxxxyyzzz>", where *vv* includes a beacon communication identifier (e.g., version, type, associated operating system, etc.), *xxx* includes a beacon identifier, *yyy* includes beacon data (e.g., encoded sensor data, traffic data, etc.), and *zzz* includes random characters, where the number of characters associated with a data type can vary, and/or other suitable aspects of the URL can vary. In a second specific example, the beacon can be associated with a beacon communication protocol identified by a protocol identifier, and determining a resource identifier can include: determining an identifier generation rule based on a resource identifier condition (e.g., a URL restriction limiting URL size to 17 bytes; requiring public URLs; requiring HTTPS URLs; etc.) defined by the beacon communication protocol; generating a resource identifier including the protocol identifier (e.g., based on an identifier generation rule) and/or other suitable beacon data, according to the resource identifier condition. However, determining resource identifiers including beacon data can be performed in any suitable manner.

[0028] In a second variation, resource identifiers can be modified to distinguish from other broadcasted resource identifiers (e.g., to facilitate downstream resource identifier processing). In a specific example, the method 100 can include storing a beacon data rule at a first beacon identified by a first beacon identifier, and applying the beacon data rule to modify the beacon identifier portion of a first resource identifier broadcasted by the first beacon, such as in response to receiving, from a second beacon, a second broadcasted resource identifier including a second beacon identifier matching the first beacon identifier. However, resource identifiers can be generated based on other resource identifiers in any suitable manner.

[0029] In a third variation, a resource identifier can be associated with a content provider domain. For example, determining a resource identifier can include appending and/or otherwise including beacon data, user data, real-time analytics, and/or other suitable data to a content identifier associated with a content provider host (e.g., where the content

provider can extract the data in response to a user accessing the content associated with the resource identifier; etc.). In a specific example, the identifier generation rules can be selected based on content provider preferences for data types to be tracked. However, resource identifiers can be associated with any suitable entity in any suitable manner.

[0030] In a fourth variation, generation rules can include temporal rules controlling the timing (e.g., at noon, during night time, during periods of high user traffic, etc.), frequency (e.g., generate resource identifier and/or append characters every N seconds, etc.), and/or other temporal parameters associated with resource identifier generation.

[0031] Identifier generation rules applied by a beacon and/or beacon control system can be updated by the beacon control system, beacon, and/or other suitable component. In a first example, the method 100 can include: determining a second identifier generation rule at the beacon control system based on beacon data extracted from a resource request associated with a resource identifier generated with a first identifier generation rule; and transmitting the second identifier generation rule to a beacon, where the second identifier generation rule can be applied in any suitable processes (e.g., resource identifier generation for subsequent broadcasting and resource request processing; etc.) of the method 100. In a second example, the method 100 can include, selecting a mode of a set of modes (e.g., selecting a mode where motion sensor data is included in the resource identifier versus temperature sensor data; etc.) for applying an identifier generation rule to determine resource identifiers at the beacon, where selection of a mode can be based on any suitable data, such as data used for determining resource identifiers (e.g., selecting a state of charge data transfer mode in response to the beacon's processing system detecting a state of charge falling below a threshold; etc.). However, updating identifier generation rules can be performed in any suitable manner.

[0032] Generation rules are preferably stored at a beacon (e.g., to generate resource identifiers) and a beacon control system associated with a first party (e.g. to facilitate resolution of beacon data from a resource request comprising the resource identifier; etc.), but can additionally or alternatively be stored at any suitable component. In an example, generation rules can be transmitted to the beacon from a beacon owner device, user device (e.g., through an application in communication with a first party processing system), directly from a beacon control system (e.g., associated with a first party), and/or any component.

Generating a resource identifier is preferably performed by a beacon, but can additionally or alternatively be performed by a beacon control system (e.g., where the beacon control system can transmit resource identifiers directly and/or indirectly to beacons), and/or any suitable component. In an example, a first and second identifier generation rule can be determined by the beacon control system, where the beacon control system can generate a resource identifier using the first identifier generation rule (e.g., https://example.info/I1broadcast_preferences), and the beacon can update the resource identifier using the second identifier generation rule (e.g., https://example.info/Pbroadcast_preferences [beacon ID][sensor data]), where the data types in parenthesis are filled during the resource identifier generation and/or update. However, storage and application of generation rules can be performed by any suitable entity.

[0033] Determining a resource identifier can be performed at predetermined time intervals (e.g., according to a temporal-based generation rule; every second; every minute; every hour; etc.), in temporal relation (e.g., in parallel, serially, substantially concurrently, etc.) to a generation condition (e.g., dynamically determining resource identifiers based on collected beacon data, such as determining a new resource identifier in response to motion data detecting movement of the beacon and/or surrounding entities; determining a resource identifier in response to receiving a content identifier and/or content; determining a new resource identifier in response to a receiving resource request associated with a broadcasted resource identifier; in response to analytics data satisfying a condition, such as an impression or clickthrough associated with a broadcasted resource identifier; etc.) and/or other suitable conditions, and/or at any suitable time and frequency. In an example, different broadcasting beacons can generate resource identifiers corresponding to the same content. In a specific example, the method 100 can include, extracting beacon data for a first beacon from a resource request for a first resource identifier (e.g., https://examplei.info/I1beacon_idi [sensor data_i]) associated with a first content identifier; in response to the beacon data satisfying a threshold condition (e.g., a state of charge below a threshold; user movement, such as in a particular direction towards a section of a merchant store; temperature above a threshold; etc.), determining a second resource identifier (e.g., https://examplei.info/Pbeacon_id2 [sensor data₂]) for broadcast by a second beacon based on the first content identifier (e.g., where the second beacon broadcasts a resource identifier leading to presentation of first content identified by the first content identifier) and a second

beacon identifier (e.g., where the second beacon identifier is associated with the first beacon identifier; where the second beacon is at a distance below a threshold distance from the first beacon; where the first and second beacons are owned by the same beacon owner; where the beacon profiles for the first and the second beacons share historic delivery of content similar to the content identified by the first content identifier; etc.). In this specific example or other examples, the method 100 can optionally include: associating the second beacon identifier with a second content identifier identifying second content (e.g., related to the first content; independent from the first content; default content associated with the second beacon; etc.); determining a supplementary resource identifier based on the second content identifier and the second beacon identifier; and broadcasting the second resource identifier and the supplementary resource identifier (e.g., in alternation; concurrently; serially; at scheduled time periods; based on beacon data; etc.) at the second beacon. However, determining resource identifiers can be performed in any suitable manner.

[0034] As shown in FIGURES 1-3, broadcasting a resource identifier with one or more beacons S120 can function to disseminate one or more resource identifiers associated with content to be verified (e.g., by a verifying entity), and/or presented to a user at a user device. For example, broadcasting can including broadcasting a resource identifier from a beacon to a user device associated with a user proximal the beacon, where the user device is configured to transmit the resource identifier to a verifying entity. Additionally or alternatively, the method 100 can include broadcasting content directly (e.g., without the intermediary of a resource identifier), and/or any other suitable data.

[0035] Broadcasted resource identifiers are preferably transmitted to a user device (e.g., a user device within a threshold distance to the beacon; a user device that subsequently transmits a broadcasted resource identifier to a verifying entity, etc.), but can be directly transmitted to a verifying entity (e.g., a verifying entity device), a beacon control system (e.g., a remote computing system, etc.) associated with a first party and/or third party, and/or to any suitable component. Broadcasting is preferably wireless (e.g., through Bluetooth Low Energy, Bluetooth Long Range, etc.), but can be through any suitable communication means. Broadcasting resource identifiers is preferably continuously performed during operation of a beacon, but can additionally or alternatively be performed in response to satisfaction of broadcasting conditions. Broadcasting conditions can include any one or more of: user device

data (e.g., detection of a user device that has opted in to receive broadcasted resource identifiers, detection of a particular user device type, user device location in relation to beacons, etc.), temporal conditions (e.g., broadcasting resource identifiers during specific time periods, at time intervals, etc.), beacon conditions (e.g., based on beacon sensor data, traffic data, state of charge, etc.) and/or any suitable conditions.

[0036] Any number of resource identifiers can be broadcasted by any number of beacons (e.g., different resource identifiers generated based on different beacon communication protocols, etc.). In a variation, the method 100 can include coordinating the broadcasting of one or more resource identifiers amongst a set of beacons. In an example, coordinating can include communicating a priority resource identifier between beacons for each beacon to broadcast. In another example, coordinating can include disabling broadcasting for a beacon (e.g., to restrict the number and/or type of resource identifiers broadcasted in an area). In a specific example, the method 100 can include disabling a beacon (e.g., through a command transmitted by a beacon control system; through a rule stored at the beacon; etc.) from broadcasting a resource identifier in response to beacon data (e.g., extracted from a resource request; sampled at a beacon sensor) satisfying a threshold condition (e.g., a state of charge below a threshold). In examples, disabling or activating broadcasting can be based on other sensor data, time of day, scheduling of communications (e.g., scheduling communications based on beacon data collected from resource identifiers; scheduling broadcasting in temporal relation with dissemination of firmware updates across the network of beacons; etc.), and/or other suitable data. However, broadcasting resource identifiers can be performed in any suitable manner.

[0037] As shown in FIGURE 1-3, the method 100 can optionally include receiving the resource identifier at a processing system (e.g., remote system) associated with a verifying entity, which can function to facilitate verification of content associated with received resource identifiers. The received resource identifier is preferably a broadcasted resource identifier (e.g., originating at one or more beacons), but can additionally or alternatively be any suitable resource identifier (e.g., a resource identifier transmitted from a first party beacon control system; a different form of the resource identifier; etc.). In variations, the method 100 can include one or more of: transmitting a resource identifier from a beacon to a receiving device (e.g., user device, another beacon, first party processing system, etc.);

transmitting the resource identifier to a client on the receiving device (e.g., an executing application); and/or transmitting the resource identifier to a processing system associated with a verifying entity. In one example, the resource identifier broadcast by the beacon is received by a client (e.g., browser application, operating system application, third party application, etc.) running on a user device, where the client forwards the resource identifier to the verifying entity.

[0038] The method 100 can additionally or alternatively include transmitting a resource request (e.g., an HTTP request from a verifying entity) to access content associated with the resource identifier. Resource requests are preferably transmitted to a first party processing system (e.g., a beacon control system at which content is stored), but can optionally be transmitted to processing systems associated with third parties and/or any entity. In a variation, transmitting a resource request can be based on comparisons with historic resource identifiers. For example, the method 100 can include receiving a resource identifier; comparing the resource identifier with historic resource identifiers (e.g., received from one or more user devices); transmitting a resource request in response to the resource identifier failing to match a historic resource identifier; and returning stored content in response to the resource identifier matching a historic resource identifier. Additionally or alternatively, transmitting resource requests can be based on temporal parameters, user device data (e.g., location, operating system, device type, etc.), and/or other suitable parameters. However, receiving the resource identifier at a processing system associated with a verifying entity can be performed in any suitable manner.

[0039] As shown in FIGURES 1-3 and 4, processing a resource request S130 can function to receive a resource request; resolve a beacon identifier (e.g., based on extracted beacon data); extract beacon data from the resource request; select a content identifier; and/or perform other suitable processes for facilitating content delivery. A resource request preferably includes and/or is associated with one or more resource identifiers (e.g., where the resource request includes passing the resource identifier through a proxy; where the resource request includes data extracted from the resource identifier; etc.), but can additionally or alternatively include: user device information (e.g., user device type, IP address, location, operating system, applications, etc.) for a user device associated with the resource request, user data (e.g., profile information; user account information; preferences, demographic,

location history, purchase history, shopping patterns, temporal patterns, etc.), and/or any suitable information.

[0040] Processing the resource request can be based on: resource identifier generation rules (e.g., used by a beacon control system to resolve beacon data from a resource identifier generated by the rule; etc.), beacon data (e.g., historic beacon data, beacon data across a set of beacons, beacon data extracted from the resource request and/or other requests, such as for selecting a relevant content identifier, etc.), user data (e.g., user profiles stored by the beacon control system and identified based on user device data extracted from the resource request; user account information associated with user devices receiving resource requests; etc.), user device data (e.g., included in the resource request; etc.), and/or any other suitable data. For example, processing can include textually parsing the characters of the resource identifier (e.g., to extract a beacon identifier) based on textual patterns defined by a generation rule (e.g., stored at a beacon and a first party beacon control system). However, processing the resource request can be based on any suitable techniques including natural language processing, machine learning, decryption (e.g., with a private key paired to a public key stored at the beacon associated with the resource request), and/or other suitable approaches.

[0041] Processing a resource request preferably includes receiving the resource request. Subsequent processing operations are preferably performed in response to receiving the resource request, such as in real-time, but can additionally or alternatively be batched, processed at a predetermined frequency (e.g., processing a resource request every N seconds), in response to satisfaction of conditions (e.g., receiving confirmation from a content provider, confirming legitimacy of associated content, etc.), and/or at any suitable time. In a variation, processing a set of resource requests (e.g., associated with multiple user devices, associated with a single user device, etc.) can include generating a resource request ranking (e.g., prioritizing resource requests to process, to deny; temporally sequencing processing operations to perform on resource requests; etc.), which can be based on any one or more of: resource request time (e.g., broadcasting time of the associated resource identifier, receipt time at the processing system associated with the entity processing the resource request, etc.), beacon owner identifier (e.g., associated with beacon owner preferences for content delivery), verifying entity identifier (e.g., prioritizing resource requests from a first verifying entity over

a second verifying entity), content provider identifier (e.g., prioritizing a resource request associated with content from a beacon campaign with the highest bid) user device information (e.g., prioritizing resource requests for content scheduled to be immediately delivered based on user device information; prioritizing based on user device location proximity to the beacons associated with the resource requests; etc.), and/or any suitable criteria. However, receiving and/or ranking resource requests can be performed in any suitable manner.

[0042] Processing a resource request can include resolving a beacon identifier, which can facilitate retrieval of content (e.g., stored in association with the beacon identifier), association of beacon data (e.g., with the beacon identifier), and/or generation of beacon-specific beacon analytics (e.g., based on data associated with the beacon identifier). The resolved beacon identifier is preferably for the beacon that broadcasted the resource identifier associated with the resource request, but a resource request can include any number of beacon identifiers identifying any suitable beacon. In examples, resolving a beacon identifier can include resolving a non-unique beacon identifier (e.g., a beacon identifier associated with and/or broadcasted by multiple beacons; a beacon identifier selected by a beacon owner; a shortened beacon identifier included in a resource identifier compliant with URL restrictions; etc.). Resolving a beacon identifier (e.g., mapping the shared beacon identifier to a manufacturer beacon identifier for the beacon associated with the resource request) is preferably based on one or more identifier generation rules (e.g., used to generate the resource identifier from which the beacon identifier is resolved; etc.) but can additionally or alternatively be based on any one or more of: beacon data (e.g., sensor data, traffic data, etc.), user device information (e.g., location, user device type, associated user account, etc.), beacon communication protocol, and/or any other suitable information.

[0043] In a first example, the method 100 can include: transforming a manufacturer beacon identifier into a shortened beacon identifier based on an identifier generation rule; including the shortened beacon identifier in the resource identifier; receiving a resource request including the resource identifier; extracting the shortened beacon identifier from the resource request; transforming the shortened beacon identifier back into the manufacturer beacon identifier based on the operations used by the identifier generation rule. In examples, resolving a beacon identifier based on identifier generation rules can include extracting

contextual data (e.g., beacon data, user device data) from the resource request based on the identifier generation rules (e.g., used to include the contextual data in the resource identifier); and resolving the beacon identifier based on the contextual data (and/or the non-unique beacon identifier included in the resource identifier). In a second example, resolving a beacon identifier can include comparing extracted beacon data (e.g., from the resource request) to historical beacon data corresponding to the manufacturer beacon identifiers associated with the beacon identifier; and resolving the beacon identifier into the manufacturer beacon identifier corresponding to the historical beacon data with greatest similarity (e.g., in relation to data patterns such as sensor data patterns, values, etc.) to the extracted beacon data. In a specific example, the extracted beacon data can include the beacon location, where the beacon can include a location system (e.g., GPS system). In a third example, resolving a beacon identifier can include determining a location of a user device (e.g., based on location data sampled at the user device and included in the resource request, based on IP address, etc.) associated with the resource request; and resolving the beacon identifier into the manufacturer beacon identifier identifying a beacon (e.g., identified by the beacon identifier) in closest locational proximity to the location of the user device. In a fourth example, resolving a beacon identifier can include resolving a user device identifier (e.g., by receipt in the resource request, by analyzing the resource request, etc.); retrieving a user pattern (e.g., interactions with beacons, location, motion, shopping, user device information, etc.) associated with the user device identifier; and filtering manufacturing beacon identifiers based on the user pattern. However, resolving a beacon identifier can be otherwise performed.

[0044] Processing a resource request can include extracting beacon data (e.g., from a resource identifier in the resource request). Extracted beacon data is preferably associated with the beacon broadcasting the resource identifier associated with the resource request, but can additionally or alternatively be associated with one or more secondary beacons (e.g., where the broadcasting beacon received the secondary beacons' data prior to broadcasting the resource identifier; etc.) and/or can be associated with any other suitable data. In an example, a resource request associated with a beacon can include beacon data for multiple beacons (e.g., a first beacon transmitting first beacon sensor data to a second beacon that is broadcasting resource identifiers, where the second beacon can generate resource identifiers

including sensor data from the first and the second beacons; where the second beacon can broadcast resource identifiers in alternation to alternate between broadcasting first resource identifiers with first beacon sensor data and second resource identifiers with second beacon sensor data; distributing beacon data cross a plurality of beacons for broadcasting to improve beacon network efficiency; etc.). In other examples, extracting the beacon data can include: decoding, associating with a temporal indicator, storing in association with a beacon identifier, and/or any other suitable processing techniques. However, extracting beacon data and/or otherwise processing resource requests can be performed in any suitable manner.

[0045] Processing a resource request can include selecting a content identifier (e.g., where the content identifier can be included in a response to the verifying entity; where the content identifier can be used to retrieve and deliver content to the user device and/or verifying entity; etc.). A content identifier can be selected from a set of content identifiers. For example, the resource identifier included in the resource request can be associated with a plurality of potential content identifiers that can be selected from for delivering different content (e.g., selecting content identifiers to optimize for analytics metrics, for personalization, etc.). The set of content identifiers can be initially received (e.g., at the beacon control system) from one or more content providers, for one or more beacons, for one or more resource identifiers, and/or from any suitable entities. Any number of content identifiers can be selected for any number of beacons and/or resource identifiers. In a first specific example, the method 100 can include receiving a second resource request (e.g., where the first resource request was associated with a first resource identifier corresponding to a first beacon) associated with a second beacon (e.g., identified by a second beacon identifier associated with a set of content identifiers that is additionally associated with a first beacon identifier identifying the first beacon); extracting the second beacon data based on the second resource request; and selecting a second content identifier from the set of content identifiers based on the second beacon data (e.g., where a first content identifier was selected from the set of content identifiers for the first resource request). In a second specific example, multiple content identifiers can be selected from a set of content identifiers (e.g., where a first content identifier, selected based on extracted beacon data, can be used in a response to the resource request, and a second content identifier identifying complementary content can be selected for transmission to a beacon for presentation of the complementary content, such as through

broadcast by the beacon or through presentation at a television display at a merchant store, as shown in FIGURE 3; etc.). Alternatively, a beacon identifier and/or resource identifier can be associated with a single content identifier, where selecting a content identifier can include mapping the beacon identifier (e.g., resolved from the resource request), resource identifier, and/or other suitable data to the content identifier.

[0046] In a first variation, selecting a content identifier can be based on beacon sensor data. In a first example, the method 100 can include: sampling first sensor data at a first sensor of a first beacon; determining a first resource identifier based on the first sensor data; extracting the first sensor data from a resource request associated with the first resource identifier; and selecting a first content identifier from the set of content identifiers based on the first sensor data (e.g., selecting a warm-weather clothing advertisement over a cold-weather clothing advertisement in response to temperature sensor data over a threshold; selecting content with brighter colors in response to ambient light data indicating darkness; selecting content applicable to a wide demographic of users in response to detecting beacon motion based on motion sensor data; etc.).

[0047] In a second example, sensor data from a set of beacons (e.g., beacons proximal each other) can be used in selecting a content identifier (e.g., for a resource request corresponding to a single beacon included or excluded from the set of beacons; etc.). In a specific example, content identifier selection corresponding to a first beacon can be based on motion data from a proximal second beacon being moved towards the first beacon (e.g., where the second beacon is attached to a product, and selected content can include an advertisement for a complementary product; etc.). In another specific example, sensor data of a given type collected across a plurality of beacons can be combined (e.g., average, median, etc.) and used in content identifier selection. In another specific example, approaches (e.g., machine learning approaches) leveraging correlations between historic sensor data and high-performing (e.g., in relation to analytics metrics) content can be used to guide content identifier selection. In an illustration, the method 100 can include determining a set of analytics metrics for the set of content identifiers (e.g., number of clickthroughs for each of the content served, etc.), the set of analytics metrics associated with presentation of the set of content during a time period; determining correlations between the set of analytics metrics and a set of beacon data associated with the time period (e.g., beacon data values when a user

accessed a piece of content); and selecting the content identifier from the set of content identifiers based on the correlations and current beacon data.

[0048] In a third example, selecting a content identifier can be based on location data (e.g., indicating location of a user device in relation to one or more beacons; indicating locations of beacons; etc.). Determining location can be based on signal data (e.g., signal quality; received signal strength indicators; Wi-Fi positioning system parameters; signal angle of arrival with directional sensors associated with the beacons and/or user devices; signal time of arrival; etc.), visual markers (e.g., determining location of a beacon visual marker, determining location of visual markers positioned around a merchant store, determining a location relative visual markers positioned in a room and captured by an optical sensor of the user device; etc.), optical data (e.g., camera data, light sensor data, etc.); audio data, temperature data; inertial measurements (e.g., footsteps tracked by motion sensors of the user devices), magnetic positioning, and/or other suitable location-associated data (e.g., sampled by the beacons, user devices, etc.). In a specific example, determining user device location (e.g., in relation to a beacon) can be based on beacon data from a set of beacons (e.g., motion data, signal data from communications between beacons and/or user devices; etc.). In another specific example, determining user device location in relation to a beacon can include triangulation with a set of beacons, such as through processing resource requests corresponding to resource identifier broadcasts from the set of beacons during a time period (e.g., within a threshold period of time with each other), extracting beacon data from the resource requests, and performing triangulation based on the beacon data. In another specific example, for a beacon associated with a museum exhibit in a museum, a museum map can be selected in response to a user device distance above a distance threshold from the beacon, and specific contextual information about the exhibit can be selected in response to the user device distance below the distance threshold. However, selecting identifiers based on sensor data can be performed in any suitable manner.

[0049] In a second variation, selecting a content identifier can be based on user device data (e.g., selecting content with formatting compatibility with the user device specifications; selecting advertisements prompting download of mobile applications that are executable on the user device operating system; etc.). In a first example, processing a resource request can include extracting user device data (e.g., user device sensor data); and selecting the content

identifier based on the user device data (and/or beacon data) (e.g., processing location sensor data of the user device with sensor data of the beacon to determine location of the user device in relation to the beacon; etc.). In a second example, user device data can include and/or be mapped to user data (e.g., user profiles including purchase history, consumer preferences, etc.) for personalizing content selected for delivery. In a third example, user device data and/or other suitable data can be leveraged in determining a location of a number of users (e.g., proximal one or more beacons, within a geofence, etc.), which can be used in content identifier selection. However, selecting identifiers based on user device data can be performed in any suitable manner.

[0050] In a third variation, selecting a content identifier can be based on content provider preferences (e.g., monetary bids, delivery preferences such as geofences associated with delivery for different content, sensor data conditions for delivery such as proximity of user device to beacon to initiate delivery of a piece of content, etc.). For example, a set of content identifiers can be associated with a set of content providers, where the method 100 can include receiving a set of preferences from the set of content providers; and selecting the set of content identifiers based on the set of preferences (and/or other suitable data such as beacon data) (e.g., using temperature sensor data to rank content identifiers for different types of food based on preferences for content delivery at specified ambient temperature ranges; ranking content identifiers based on associated monetary bids and correlations between content performance and beacon sensor data; etc.). However, selecting content identifiers based on content provider preferences can be otherwise performed.

[0051] In a fourth variation, selecting a content identifier can be based on historic selections of content identifiers. In examples, selected content identifiers can rotate, alternate, and/or be selected in any suitable pattern. In a specific example, selecting a second content identifier (e.g., corresponding to a second beacon associated with a set of content) can be in response to previously selecting a first content identifier (e.g., corresponding to a first beacon associated with the set of content) for a response to a preceding resource request. However, selecting content identifiers based on any suitable data can be performed in any suitable manner.

[0052] Processing a resource request is preferably performed by a processing system (e.g., remote system) associated with the first party, but can additionally or alternatively be

performed by processing systems associated with content providers and/or other suitable entities. The resource request is preferably from a verifying entity (e.g., where content transmitted to the requesting verifying entity can be used by the verifying entity to verify the content), but can be from a content provider (e.g., to preview the content associated with the content provider), a user device, and/or any suitable entity. Processing a resource request can be performed at predetermined time intervals, in temporal relation to a condition (e.g., in response to receiving a resource request; based on resource request ranking; in response to receiving resource requests including certain types of data; etc.), and/or at any suitable time and frequency. However, processing resource requests can be performed in any suitable manner.

[0053] As shown in FIGURE 3, transmitting a response to a resource request S140 can function to facilitate delivery of requested content (e.g., to a verifying entity; directly to a user device; etc.) for presentation to one or more user devices. The response preferably includes a content identifier, but can additionally or alternatively include the content itself (e.g., retrieved based on the content identifier), beacon data, and/or any other suitable data (e.g., data extracted from the content identifier). Transmitted content is preferably identified by one or more content identifiers (e.g., selected during processing of a resource request, such that transmitting a response is based on extracted beacon data and content identifiers selected based on the extracted beacon data), but can be otherwise identified. The content identifier is preferably associated with the beacon identifier and/or the resource identifier corresponding to the resource request, but can be otherwise associated. The content identifier-to-beacon identifier association can be determined by the beacon owner, content provider, or any other suitable entity, such as at a web interface. The association can be stored and managed by the first party, the beacon owner, and/or by any other suitable entity. The content identifier can be the resource identifier, a pointer or filepath for content stored by the system receiving the resource request, an identifier different from the resource identifier (e.g., a URI, URL, and/or other identifier pointing to an external database, such as <http://coke.ad.com/yyy>), and/or be any other suitable identifier. The content identifier is preferably static, but can be dynamic. Content and/or other suitable data can be in any suitable format including: text, verbal, visual, audio, haptic, etc. Content can include any of: content title, description, associated media (e.g., favicons, graphics, video, audio, etc.),

content associated with the content identifier URI, identifier resource identifiers (e.g., a resource identifier redirected to by a broadcasted resource identifier, etc.) and/or other suitable content. Content can be transmitted in any form including: notifications (e.g., text message, push notification, e-mail, in-application notification, etc.), resource identifiers (e.g., linking to the content), and/or any suitable form.

[0054] Transmitting a response is preferably performed by a first party processing system, but can optionally be by a processing system associated with a content provider, verifying entity, and/or other suitable entity. Transmitting a response can be directly to one or more user devices (e.g., using user device identifier received with the resource request), to a verifying entity processing system that can verify and/or otherwise process the content prior to transmission to the user device, to any suitable component prior to the user device, and/or to any suitable endpoint. In a variation, transmitting a response can include retrieving the content associated with the content provider (e.g., based on the content identifier), and transmitting the retrieved content to a suitable endpoint (e.g., user device). The content can be retrieved from first party storage (e.g., a content database storing content in association with one or more beacon identifiers), from a processing system associated with the content provider (e.g., based on a resource identifier from a content provider), and/or otherwise obtained. The content can be retrieved at a predetermined frequency, in response to a resource request, in response to initiation of a beacon campaign, and/or at any suitable time. In an example, storing content for subsequent retrieval can be in response to verifying that a content provider identifier for the content provider is associated with a suitable permissions level (e.g., permitting the content provider to serve content in relation to beacons and/or locations selected by the content provider), but any suitable entity can modify and/or be associated with any suitable permissions level (e.g., denying content delivery, permitting delivery of specific types of content based on content type, permitting content delivery based on beacon identifiers, location, bids, user preferences, etc.).

[0055] In a first variation, transmitting a response can include transmitting personalized content to a user device based on a user profile (e.g., generated from user device data, user data, etc.) for the user associated with the user device. In a second variation, transmitting a response can include transmitting content from multiple content providers to a user device (e.g., for serial presentation based on scheduling parameters, for parallel

presentation, for presentation within a single application executing on the user device, for presentation within multiple applications, etc.). Scheduling parameters can be based on bids by content providers, user preferences, user device data, user data, etc. In a third variation, transmitting a response can be performed according to presentation parameters (e.g., temporal parameters for when to present content, form of content, etc.).

[0056] Transmitted responses can include any number of content identifiers and/or amount of content associated with any number of entities. In a variation, the method 100 can include transmitting a response for each resource request and/or resource identifier received in association with the user device (e.g., transmitting first content for a first resource request, and transmitting second content for a second resource request). In another variation, the method 100 can include transmitting a single instance of content in response to receiving multiple resource requests and/or resource identifiers for the same content within a predetermined time period for a single user device. In another variation, the method 100 can include transmitting a response based on a ranking of a set of resource identifiers and/or a set of content providers. Ranking can be based on bidding, user device location (e.g., in relation to beacons), user preferences, beacon owner preferences, and/or other suitable criteria. For example, the method 100 can include associating a resource identifier with a first and a second content from a first and a second content provider, respectively; receiving a resource request including the resource identifier; and prioritizing transmission of the first content (e.g., sending the first content before the second content; sending only the first content, etc.) based on the first content provider setting a higher bid over the second content provider. However, transmitting a response can be performed in any suitable manner.

[0057] As shown in FIGURE 4, the method 100 can optionally include generating beacon analytics S150, which functions to track user interaction with content and/or beacons, in order to generate analytics for presentation to a suitable entity (e.g., content provider, beacon owner, etc.). Beacon analytics can include any suitable analytics metric types relating to one or more of: impressions (e.g., of content), clickthroughs (e.g., of resource identifiers included in content), conversions (e.g., associated with the content; account signups; product purchases, etc.), geolocation, traffic data (e.g., for a given location, for a given user population, etc.), an estimated number of user devices in an area (e.g., within a threshold distance of a beacon, within an area defined by a set of beacons, etc.), device types, or any other suitable

metric. Generating beacon analytics is preferably performed at a processing system associated with a first party, but can additionally or alternatively be performed at a beacon, at a content provider processing system, and/or at any suitable component.

[0058] In a first variation, tracking number of impressions for a content (e.g., an advertisement) associated with a content provider can be based on number of resource requests for the content, number of transmissions of the content, and/or other suitable criteria. In a second variation, tracking number of clickthroughs for a resource identifier can include transmitting a resource identifier for a first party domain (e.g., for serving content, for redirecting to a content provider domain, etc.); and tracking visits to the domain from the resource identifier. In a third variation, generating beacon analytics can include generating traffic data, which can include any one or more of: user device data (e.g., number of user devices within a threshold distance from a beacon over a time period, geolocation of the user device, types of user devices, etc.), user data (e.g., number of times a user has entered a particular area, etc.) and/or other suitable traffic information. For example, the method 100 can include collecting, at one or more beacons, beacon data based on wireless signals (e.g., Bluetooth Low Energy) received from proximal user devices; and generating traffic data based on the beacon data. In a fourth variation, generating beacon analytics can be based on correlations between metric types and sensor data. For example, beacon analytics can correlate traffic data patterns (e.g., an increased amount of traffic in a retail store) with temperature data (e.g., lower temperatures from using air conditioning) sampled at a beacon located within the retail store.

[0059] In a fifth variation, generating beacon analytics can be for any combination of beacons (e.g., a beacon fleet) and/or locations. For example, beacon analytics can include an average number of content impressions per beacon in a first location versus a second location.

[0060] In a sixth variation, as shown in FIGURE 4, generating beacon analytics can include generating cross-packet type analytics (e.g., comparing metrics for Physical Web broadcasts versus non-Physical Web broadcasts). For example, the method 100 can include: determining a first analytics metric for content based on a first set of beacon broadcasts (e.g., at a first beacon) associated with a first packet type (e.g., including a resource identifier associated with the content); determining a second analytics metric for the content based on a second set of beacon broadcasts (e.g., at a first beacon, at a different beacon, etc.) associated

with the second packet type (e.g., associated with a different resource identifier type; independent from resource identifiers; etc.); and determining a cross-packet type metric for the content based on a comparison between the first and second analytics metrics. However, determining beacon analytics can be performed in any suitable manner.

4. System.

[0061] As shown in FIGURE 3, embodiments of the system 200 include a beacon control system 210 and one or more beacons 220 (e.g., first beacon 220', second beacon 220", etc.), but can additionally or alternatively include an interface 230, a verification system, a content provider system, and/or any other suitable components. Components of the system 200 can be configured in any manner analogous to U.S. Application number 15/590,939 filed 09-MAY-2017 and/or U.S. Application number 15/620,014 filed 12-JUN-2017, each of which are incorporated in its entirety by this reference. The beacon control system 210 functions to determine identifier generation rules, process resource requests, transmit responses to resource requests, and/or perform any suitable portion of the method 100 (e.g., generate resource identifiers). The beacon control system 210 can include a content database (e.g., storing identifiers, rules, beacon data, user device data, and/or other suitable data in optimized associations with each other to improve data storage and retrieval for facilitating content delivery, etc.), computing systems (e.g., a remote computing system), and/or any other suitable components. However, the beacon control system 210 can be configured in any suitable manner. Beacons 220 function to generate and broadcast resource identifiers, and/or perform other suitable portions of the method 100. Beacons 220 can include: a wireless communication system (e.g., for receiving content identifiers, for broadcasting resource identifiers, for receiving rules, etc.), a processing system (e.g., for applying rules to generate resource identifiers, etc.), sensors, power sources, data connectors, housings, and/or any other suitable components. However, beacons 220 can be configured in any suitable manner.

[0062] The system 200 can additionally or alternatively include an interface 230 (e.g., web interface, application, etc.), which can function to enable management of beacon campaigns, presentation resource analytics, receipt and/or presentation content, and/or other suitable processes for facilitating interactions between beacon systems, beacons 220, beacon owners, content providers, users, and/or other suitable entities. In a variation, as shown in FIGURE 4, an interface 230 can include a geographical map including available

location options and/or beacon options (e.g., mapped to location identifiers and/or beacon identifiers, respectively). The options can be selectable by a beacon owner (e.g., to view analytics and/or beacon campaigns associated with the selected location and/or beacon), a content provider (e.g., to identify locations and/or beacons 220 to bid upon for content delivery), a user (e.g., to view content associated with the location and/or beacon), and/or other entity.

[0063] In another variation, the interface 230 can include a beacon owner interface. The beacon owner interface preferably enables a beacon owner and/or authorized entities to set one or more preferences for: content delivery (e.g., preferred content format, prioritizing communications from selected content providers, permissions for content, enabling content delivery based on user location, demographic, device, etc.), beacons 220 (e.g., selecting a custom beacon identifier for broadcasting by the beacon, authorizing content providers to deliver content through selected beacons 220, resource identifier generation rules, etc.), beacon campaign (e.g., bidding rules, etc.), beacon analytics (e.g., metric types to track or transmit, sensor data types to collect or transmit, analytics-related notifications, etc.), content templates, and/or any suitable preferences. In an example, the system 200 can be configured to receive, at a beacon owner interface, a content provider identifier for a content provider; associate the content provider identifier with a beacon identifier for a beacon owned by the beacon owner; and in response to associating the content provider identifier, provide a content provider interface that includes options for the content provider to transmit content to be delivered in association with the beacon. However, a beacon owner interface can be otherwise configured.

[0064] In another variation, the interface 230 can include a content provider interface. The content provider interface preferably enables content providers to manage beacon campaigns, including managing one or more of: associations of content identifiers with beacons 220 (e.g., where the interface 230 can be configured to receive a content identifier at a prompt associated with a beacon), preferences for selection of content identifiers from a set of content identifiers associated with a beacon 220, target user parameters (e.g., based on demographic, location, device, time, beacon sensor data, traffic data, etc.), content delivery parameters (e.g., campaign start time, campaign end triggers such as time money, ending a campaign based on number of impressions, conversions, clickthroughs, other beacon

analytics, etc.), content (e.g., modifying the content to be delivered, personalizing the content based on user location in relation to a beacon 220, beacon sensor data, etc.) and/or any suitable parameters. Any number of beacon identifiers can be associated with any amount or types of content received from any number of content providers. However, a content provider interface can be otherwise configured.

[0065] In another variation, the interface 230 can include a user interface (e.g., provided through an application on the user device, provided as a web interface, etc.). The user interface can facilitate one or more of: filtering content (e.g., based on topic, distance, brand, type, etc.), browsing content, content receipt preferences (e.g., receiving content in the form of text messages, privacy settings, purchase history sharing, etc.), and/or any other suitable activity. The user interface can present content in any suitable format (e.g., notification in a widget, notification through an application, text message, etc.). However, a user interface, and/or other suitable interfaces 230 can be configured in any suitable manner.

[0066] The system 200 and/or components of the system can entirely or partially be executed by, hosted on, communicate with, and/or otherwise include: a remote computing system (e.g., a server, at least one networked computing system, stateless, stateful), a local computing system, user devices, databases, and/or by any suitable component. Communication by and/or between any components of the system and/or other suitable components can include wireless communication (e.g., Bluetooth, Bluetooth Low Energy, WiFi, radiofrequency, etc.) and/or wired communication. Any components of the system, and/or any portions of the method 100 can apply employ machine learning approaches including any one or more of: supervised learning (e.g., using logistic regression, using back propagation neural networks, using random forests, decision trees, etc.), unsupervised learning (e.g., using an Apriori algorithm, using K-means clustering), semi-supervised learning, reinforcement learning (e.g., using a Q-learning algorithm, using temporal difference learning), a regression algorithm (e.g., ordinary least squares, logistic regression, stepwise regression, multivariate adaptive regression splines, locally estimated scatterplot smoothing, etc.), an instance-based method (e.g., k-nearest neighbor, learning vector quantization, self-organizing map, etc.), a regularization method (e.g., ridge regression, least absolute shrinkage and selection operator, elastic net, etc.), a decision tree learning method (e.g., classification and regression tree, iterative dichotomiser 3, C4.5, chi-

squared automatic interaction detection, decision stump, random forest, multivariate adaptive regression splines, gradient boosting machines, etc.), a Bayesian method (e.g., naïve Bayes, averaged one-dependence estimators, Bayesian belief network, etc.), a kernel method (e.g., a support vector machine, a radial basis function, a linear discriminate analysis, etc.), a clustering method (e.g., k-means clustering, expectation maximization, etc.), an associated rule learning algorithm (e.g., an Apriori algorithm, an Eclat algorithm, etc.), an artificial neural network model (e.g., a Perceptron method, a back-propagation method, a Hopfield network method, a self-organizing map method, a learning vector quantization method, etc.), a deep learning algorithm (e.g., a restricted Boltzmann machine, a deep belief network method, a convolution network method, a stacked auto-encoder method, etc.), a dimensionality reduction method (e.g., principal component analysis, partial least squares regression, Sammon mapping, multidimensional scaling, projection pursuit, etc.), an ensemble method (e.g., boosting, bootstrapped aggregation, AdaBoost, stacked generalization, gradient boosting machine method, random forest method, etc.), and/or any suitable form of machine learning algorithm. However, the system 200 can be configured in any suitable manner.

[0067] Although omitted for conciseness, the preferred embodiments include every combination and permutation of the various system components and the various method processes, where the method processes can be performed in any suitable order, sequentially or concurrently.

[0068] The system and method 100 and variations thereof can be embodied and/or implemented at least in part as a machine configured to receive a computer-readable medium storing computer-readable instructions. The instructions are preferably executed by computer-executable components preferably integrated with the system. The computer-readable medium can be stored on any suitable computer-readable media such as RAMs, ROMs, flash memory, EEPROMs, optical devices (CD or DVD), hard drives, floppy drives, or any suitable device. The computer-executable component is preferably a general or application specific processor, but any suitable dedicated hardware or hardware/firmware combination device can alternatively or additionally execute the instructions.

[0069] As a person skilled in the art will recognize from the previous detailed description and from the figures and claims, modifications and changes can be made to the

preferred embodiments of the invention without departing from the scope of this invention defined in the following claims.

CLAIMS

We Claim:

1. A system for improved delivery of first content from a content provider to a user device, the system comprising:
 - a beacon control system configured to:
 - determine a first identifier generation rule for a first beacon identified by a first beacon identifier;
 - transmit the first identifier generation rule to the first beacon; and
 - associate the first beacon identifier with a first content identifier identifying the first content;
 - the first beacon configured to:
 - determine a first resource identifier comprising beacon data based on the first identifier generation rule, wherein the first resource identifier is associated with the first content identifier; and
 - broadcast the first resource identifier to the user device, wherein the user device is configured to transmit the first resource identifier to a verification system;
 - wherein the beacon control system is further configured to:
 - extract the beacon data from a first resource request associated with the first resource identifier based on the first identifier generation rule, wherein the resource request is received from the verification system;
 - select the first content identifier based on the beacon data; and
 - transmit a response to the resource request based on the first content identifier.
2. The system of Claim 1,
 - wherein the first content identifier comprises a first uniform resource identifier (URI) associated with a content provider domain,
 - wherein the first resource identifier comprises a second URI associated with a first party domain,
 - wherein the first beacon is associated with a beacon communication protocol identified by a protocol identifier, and

- wherein the first beacon is configured to generate the second URI comprising the protocol identifier based on the first identifier generation rule.
3. The system of Claim 2,
 - wherein the beacon control system is configured to determine the first identifier generation rule based on a URI condition defined by the beacon communication protocol, and
 - wherein the first beacon is configured to determine the second URI including the beacon data according to the URI condition.
 4. The system of Claim 1, wherein the beacon control system is further configured to:
 - determine a second identifier generation rule based on the beacon data; and
 - transmit the second identifier generation rule to the first beacon,
 - wherein the first beacon is further configured to determine a second resource identifier based on the second identifier generation rule, and
 - wherein the beacon control system is further configured to process a second resource request associated with the second resource identifier based on the second identifier generation rule.
 5. The system of Claim 1, wherein the system is configured to:
 - in response to the beacon data satisfying a threshold condition, determine a second resource identifier based on the first content identifier and a second beacon identifier identifying a second beacon,
 - wherein the second beacon identifier is associated with the first beacon identifier, and
 - wherein the second beacon is configured to broadcast the second resource identifier.
 6. The system of Claim 5, wherein the system is further configured to:
 - associate the second beacon identifier with a second content identifier identifying second content; and
 - determine a supplementary resource identifier based on the second content identifier and the second beacon identifier,
 - wherein the second beacon is further configured to broadcast the second resource identifier in alternation with the supplementary resource identifier.

7. The system of Claim 6, wherein the beacon control system is further configured to disable the first beacon from broadcasting the first resource identifier in response to the beacon data satisfying the threshold condition.
8. The system of Claim 5, wherein the beacon data comprises a state of charge of the first beacon, wherein the threshold condition comprises a threshold state of charge, and wherein the second beacon is configured to broadcast the second resource identifier in response to the state of charge of the first beacon falling below the threshold state of charge.
9. The system of Claim 1,
 - wherein the first content is associated with a first and a second packet type,
 - wherein the beacon control system is further configured to:
 - determine a first analytics metric for the first content based on a first set of beacon broadcasts associated with the first packet type, the first set of beacon broadcasts comprising the broadcast of the first resource identifier at the first beacon;
 - determine a second analytics metric for the first content based on a second set of beacon broadcasts associated with the second packet type; and
 - determine a cross-packet type metric for the first content based on a comparison between the first and second analytics metrics.
10. A method for improving delivery of first content to a user device, the method comprising:
 - associating a first beacon identifier identifying a first beacon to a set of content identifiers identifying a set of content;
 - determining a first resource identifier comprising first beacon data based on the first beacon identifier;
 - broadcasting the first resource identifier to the user device, wherein the user device is configured to transmit the first resource identifier to a verifying entity;
 - receiving a first resource request from the verifying entity, the first resource request associated with the first resource identifier;
 - in response to receiving the first resource request:

- extracting the first beacon data based on the first resource request;
 - selecting a first content identifier from the set of content identifiers based on the first beacon data, wherein the first content identifier identifies the first content; and
 - transmitting a first response to the first resource request based on the first content identifier.
11. The method of Claim 10, further comprising:
- extracting second beacon data from a second resource request, the second beacon data associated with a second beacon proximal the first beacon;
 - determining a location of the user device in relation to the first beacon based on the first and the second beacon data,
 - wherein selecting the first content identifier comprises selecting the first content identifier from the set of content identifiers based on the location.
12. The method of Claim 11, further comprising:
- selecting a second content identifier from the set of content identifiers based on the first beacon data, the second content identifier identifying second content;
 - transmitting a second resource identifier associated with the second content identifier to a third beacon for presentation of the second content.
13. The method of Claim 10, further comprising:
- associating a second beacon identifier identifying a second beacon to the set of content identifiers;
 - broadcasting a second resource identifier at the second beacon, the second resource identifier comprising second beacon data;
 - receiving a second resource request from the verifying entity, the second resource request associated with the second resource identifier;
 - extracting the second beacon data based on the second resource request;
 - selecting a second content identifier from the set of content identifiers based on the second beacon data, wherein the second content identifier identifies second content; and
 - transmitting a second response to the second resource request based on the second content identifier.

14. The method of Claim 10,
 - wherein determining the first resource identifier comprises determining the first resource identifier at a remote beacon control system, the method further comprising:
 - updating the first resource identifier with second beacon data at the first beacon,
 - wherein broadcasting the first resource identifier comprises broadcasting the first resource identifier in response to updating the first resource identifier, and
 - wherein selecting the first content identifier comprises selecting the first content identifier from the set of content identifiers based on the first and the second beacon data.
15. The method of Claim 10, further comprising sampling first sensor data at a first sensor of the first beacon, wherein determining the first resource identifier comprises determining the first resource identifier based on the first sensor data; and wherein selecting the first content identifier comprises selecting the first content identifier from the set of content identifiers based on the first sensor data.
16. The method of Claim 15, further comprising:
 - sampling second sensor data at a second sensor of a second beacon associated with the first beacon;
 - transmitting the second sensor data from the second beacon to the first beacon; and
 - updating the first resource identifier with the second sensor data at the first beacon.
17. The method of Claim 16, wherein selecting the first content identifier comprises selecting the first content identifier from the set of content identifiers based on the first and the second sensor data.
18. The method of Claim 10, further comprising extracting user device data associated with the user device based on the first resource request, wherein selecting the first content identifier comprises selecting the first content identifier from the set of content identifiers based on the user device data and the first beacon data.
19. The method of Claim 10,
 - wherein the set of content identifiers are associated with a set of content providers, the method further comprising:

- receiving a set of preferences from the set of content providers, wherein selecting the first content identifier comprises ranking the set of content identifiers based on the first beacon data and the set of preferences.

20. The method of Claim 10, further comprising:

- determining a set of analytics metrics for the set of content identifiers, the set of analytics metrics associated with presentation of the set of content during a time period; and
- determining a correlation between the set of analytics metrics and a set of beacon data associated with the time period,
- wherein selecting the first content identifier comprises selecting the first content identifier from the set of content identifiers based on the correlation and the first beacon data.

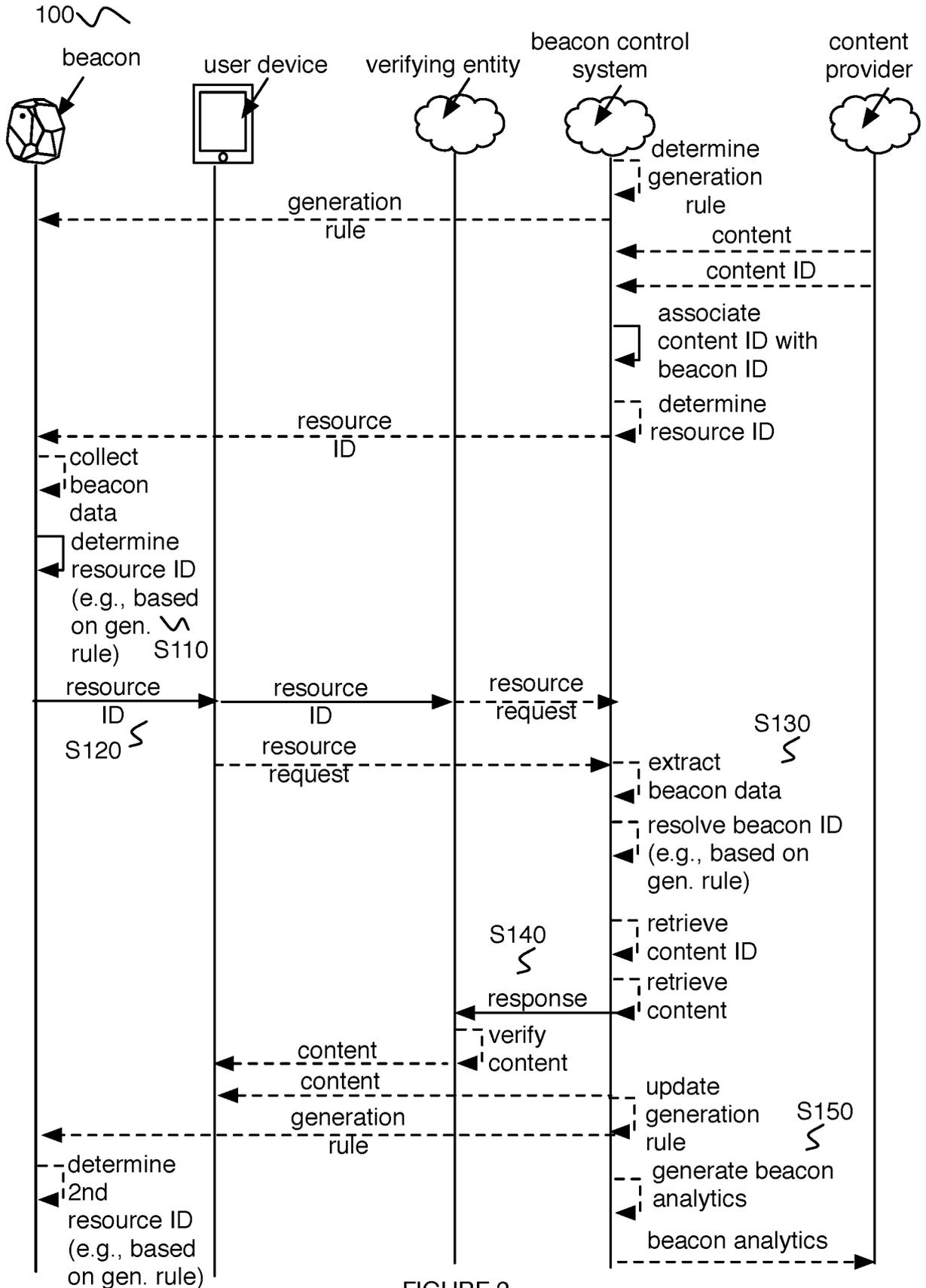


FIGURE 2

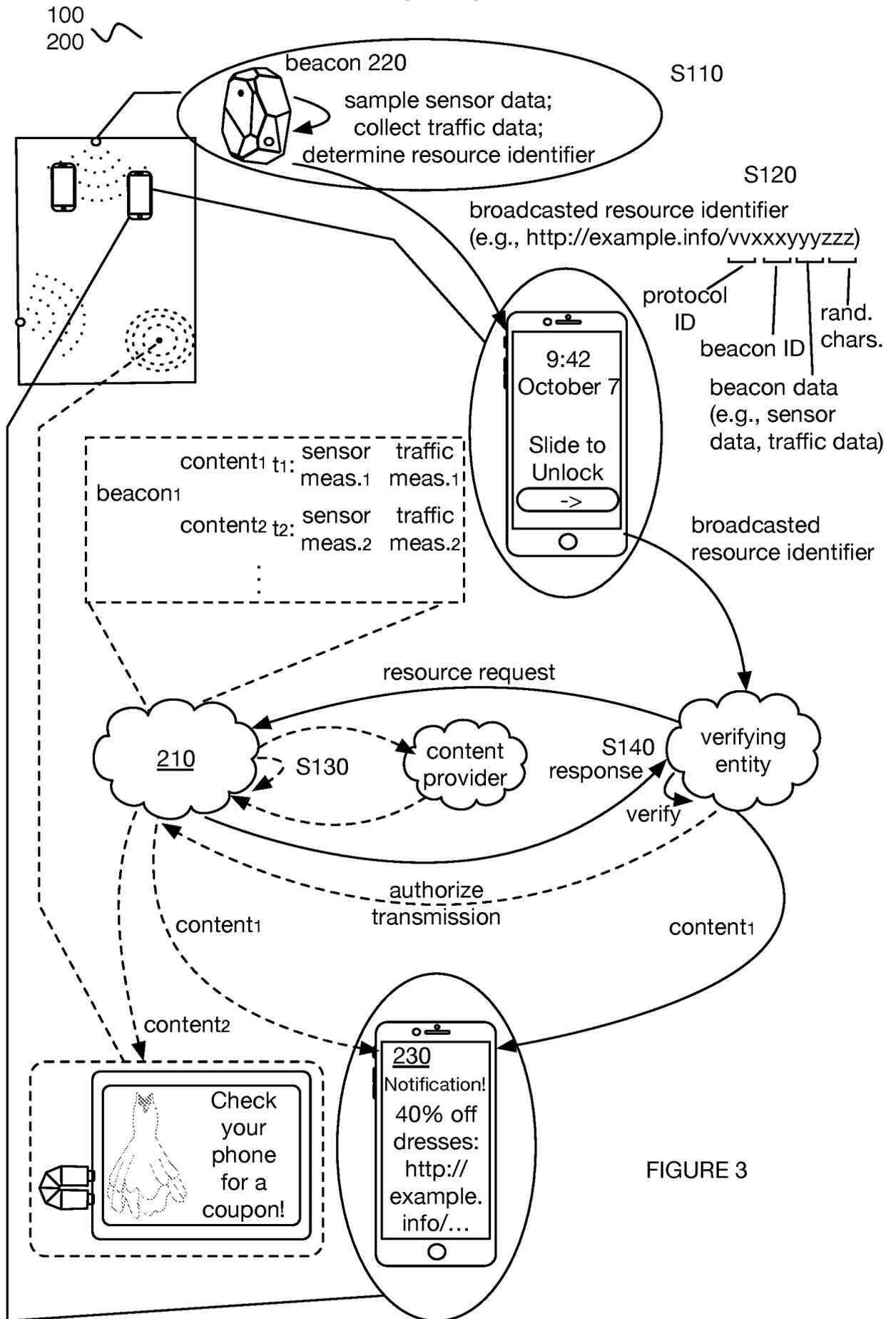


FIGURE 3

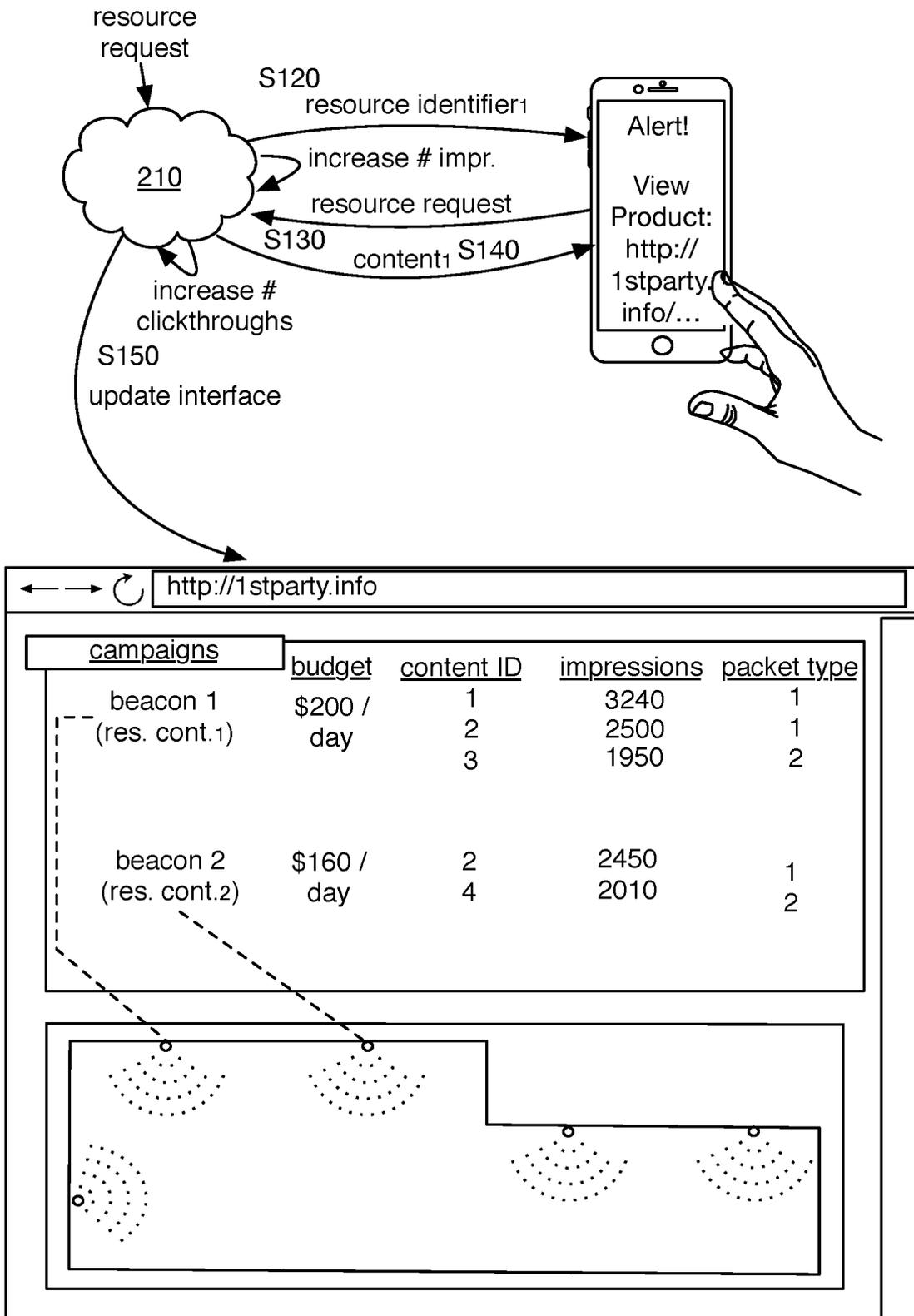


FIGURE 4

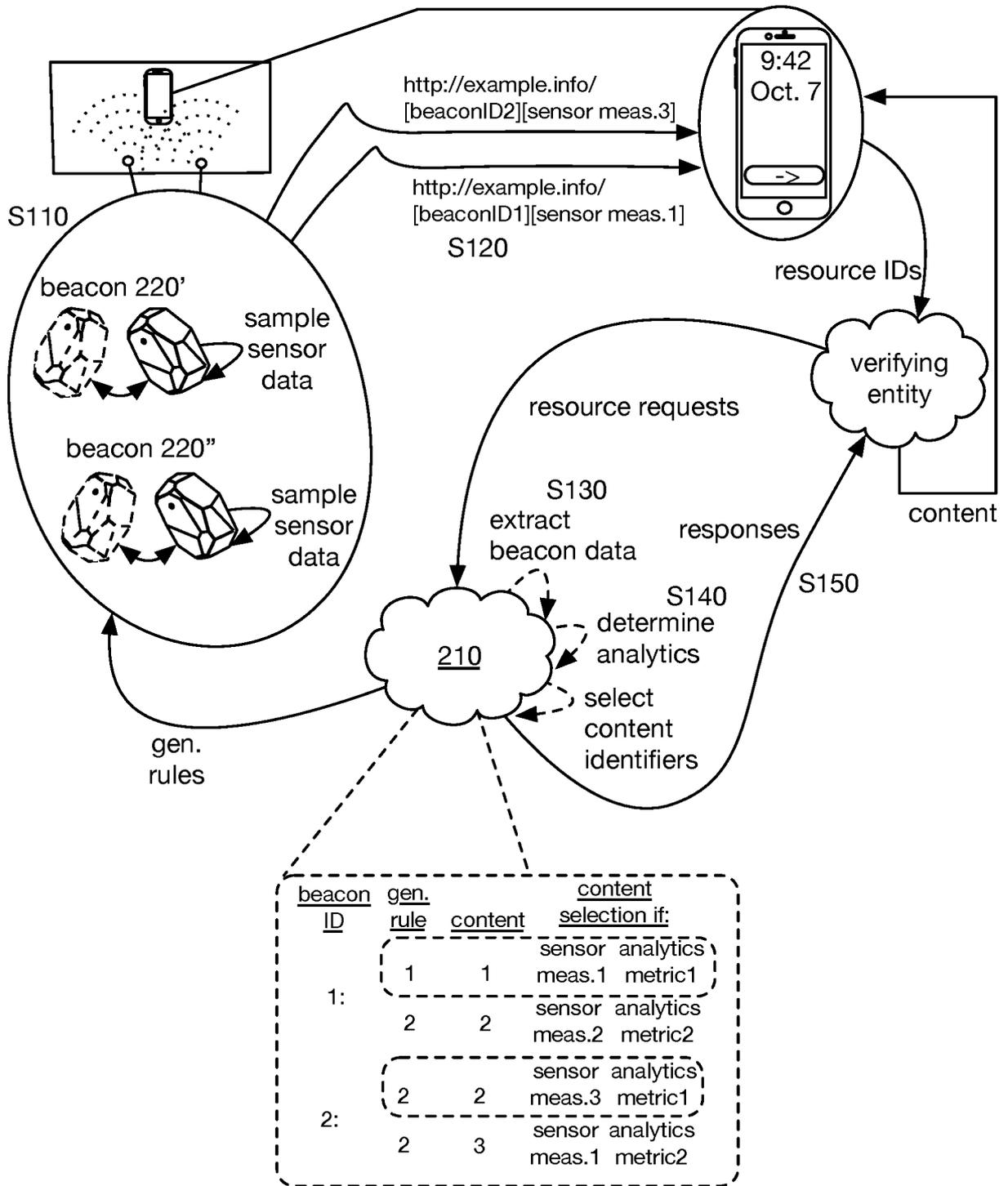


FIGURE 5

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 17/41215

A. CLASSIFICATION OF SUBJECT MATTER
 IPC(8) - H04W 4/00, H04W 12/00, H04W 12/06, H04L 29/06 (2017.01)
 CPC - H04W40/244, H04W4/00.H04L67/1 46, H04W 12/00, H04W 12/06, H04W4/008, H04W4/1 8,
 G01 S5/0289, H04L67/1 0, H04L67/42

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

See Search History Document

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

See Search History Document

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

See Search History Document

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2015/0079942 A1 (Estimote, Inc.) 19 March 2015 (19.03.2015); entire document, especially, FIG. 3, para [0009], [0010], [0012], [0014] - [0016], [0025], [0028], [0040], [0041], [0044] - [0047], [0051] - [0054], [0057], [0060], [0071] - [0073]	1, 10, 11, 14-16
Y		13, 17-20
A		2-9, 12
Y	US 2012/01 10620 A1 (Kilar et al.) 03 May 2012 (03.05.2012); entire document, especially, Abstract, FIG. 3H, para [0125], [0127], [0129], [0139]	13, 17, 18, 20
A		2, 3, 12
Y	US 2014/02191 18 A1 (Swirl Networks, Inc.) 07 August 2014 (07.08.2014); especially, Abstract, FIG. 2A, para [0074], [0090], [0096], [0113], [0130]	19
A	US 2002/0154623 A1 (Hundemer) 24 October 2002 (24.10.2002); especially, Abstract, para [0056],	9
A	US 2016/0086228 A1 (Globesherpa Inc.) 24 March 2016 (24.03.2016); entire document	1-20
A	US 2016/01 10467 A1 (Revolution Technologies, Inc.) 21 April 2016 (21.04.2016); entire document	1-20
A	US 2016/0173643 A1 (Level 3 Communications, LLC.) 16 June 2016 (16.06.2016); entire document	1-20

Further documents are listed in the continuation of Box C. See patent family annex.

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E" earlier application or patent but published on or after the international filing date	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&" document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search
 28 August 2017

Date of mailing of the international search report
 02 OCT 2017

Name and mailing address of the ISA/US
 Mail Stop PCT, Attn: ISA/US, Commissioner for Patents
 P.O. Box 1450, Alexandria, Virginia 22313-1450
 Facsimile No. 571-273-8300

Authorized officer;
 Lee W. Young
 PCT Helpdesk: 571-272-4300
 PCT OSP: 571-272-7774

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 17/41215

C (Continuation). DOCUMENTS CONSIDERED \emptyset BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P, A	US 2016/0277999 A1 (Graves et al.) 22 September 2016 (22.09.2016); entire document	1-20
P, A	US 2016/0337426 A1 (Holo Networks Ltd.) 17 November 2016 (17.11.2016); entire document	1-20