

**IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION**

**RYAN HARDIN AND
ANDREW HILL,**

Plaintiffs,

vs.

**SAMSUNG ELECTRONICS CO., LTD., AND
SAMSUNG ELECTRONICS AMERICA, INC.,**

Defendants.

Civil Action No. 2:21-cv-290

JURY TRIAL

COMPLAINT FOR PATENT INFRINGEMENT

Plaintiffs Ryan Hardin and Andrew Hill file this Complaint for Patent Infringement against Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc. (collectively, “Samsung”), and allege as follows:

THE PARTIES

1. Plaintiff Ryan Hardin is a citizen of Texas with a principal residence in Houston, Texas. Mr. Hardin is a technology professional with over 20 years of experience.
2. Plaintiff Andrew Hill is a citizen of Texas with a principal residence in Houston, Texas. Mr. Hill is a technology professional with over 20 years of experience.
3. Defendant Samsung Electronics Co., Ltd. (“SEC”) is a Korean company with its principal place of business in Suwon, South Korea. SEC has an “Information Technology & Mobile Communications” division that is responsible for the design, manufacture, and sale of

cellular network infrastructure equipment and components thereof around the world and in the United States.

4. Defendant Samsung Electronics America, Inc. (“SEA”) is a New York corporation with its principal place of business in Ridgefield Park, New Jersey and an established place of business in Plano, Texas. SEA is a wholly-owned subsidiary of SEC. SEA imports into the United States and sells in the United States, including in this District, cellular network infrastructure equipment and components thereof.

JURISDICTION AND VENUE

5. This is an action arising under the patent laws of the United States, 35 U.S.C. § 271. This Court has subject matter jurisdiction under 28 U.S.C. §§ 1331 and 1338(a).

6. Venue is proper in this judicial district under 28 U.S.C. §§ 1391 and 1400(b) because Defendant has committed acts of infringement and has a regular and established place of business in this District. SEA, SEC’s wholly-owned subsidiary, maintains an office in Plano, Texas. (See “Where to Find Us,” Samsung, <https://www.sra.samsung.com/locations/>). In 2018, SEA relocated its North Texas-based teams in Richardson to Plano to Legacy Central in Plano. SEA described this new Plano office as its “flagship North Texas campus” and “home to Samsung Electronics America’s second biggest employee population in the U.S. across multiple divisions – Customer Care, Mobile, Mobile R&D and Engineering.” (See “Samsung Electronics America to Open Flagship North Texas Campus,” Samsung Newsroom U.S., <https://news.samsung.com/us/samsung-electronics-america-open-flagship-north-texas-campus/> (last visited July 27, 2021)). In a press release, SEA said its “move to Plano further demonstrates the company’s dedication to Texas and being an invested corporate citizen.” (*Id.*)

7. This Court has personal jurisdiction over Samsung. Samsung has continuous and systematic business contacts with the State of Texas. Samsung, directly and/or through subsidiaries or intermediaries (including distributors, retailers, and others), conducts its business extensively throughout Texas, by shipping, distributing, offering for sale, selling, and advertising (including the provision of an interactive web page) its products and/or services in the State of Texas and the Eastern District of Texas. SEA maintains an office in Plano, Texas and is responsible for importing and selling smartphones, tablets, other mobile devices, and cellular network infrastructure equipment that operate on cellular networks in the United States. SEC and SEA regularly do business or solicit business, engage in other persistent courses of conduct, and/or derive substantial revenue from products and/or services provided to individuals in the State of Texas.

8. SEC and SEA, directly and/or through subsidiaries or intermediaries (including distributors, retailers, and others), have purposefully and voluntarily placed one or more products and/or services in the stream of commerce that practice the Asserted Patents with the intention and expectation that they will be purchased and used by consumers in the Eastern District of Texas. These products and/or services have been and continue to be purchased and used by operators/carriers in the Eastern District of Texas.

9. Upon information and belief, the Samsung products accused of infringement in this case are manufactured by or on behalf of SEC and SEA.

BACKGROUND OF THE INVENTORS

10. Inventors Ryan Hardin and Andrew Hill both grew up in Henderson, Texas. After college, Hardin and Hill started an IT services company called Pronet Solutions Corp. in 2002 in East Texas. Upon establishing the business after a few years, Hardin and Hill began to

investigate and discuss emerging and future business opportunities that would leverage their technological backgrounds and expertise.

11. In the 2006-2007 timeframe, Hardin and Hill were interested in the digital billboard business. At that time, digital billboards were relatively new, and Hardin and Hill saw an opportunity to grow a business for displaying content (e.g., advertisements) on digital billboards, which they could efficiently manage and control remotely. However, Hardin and Hill ultimately saw significant barriers to entry for getting into the digital billboard business, including costs, regulatory considerations, and governmental issues.

12. Then, in late 2007, Hardin was at a meeting in Henderson, and when getting in his car to go to his next appointment, he looked at his phone and thought—why should he and Hill risk the expense to erect digital billboards if much of the public might soon be carrying digital billboards in their pockets? Of course, at that time, smartphones were in a period of rapid development,¹ and while a few phones had GPS, access to the internet, and apps, they were certainly not as commonplace as today. Hardin and Hill were betting on the future. Going forward, Hardin and Hill continued to fine-tune the implementation of their invention and applied for their first patent on May 1, 2009.

13. Separate from the patented invention, not only did Hardin and Hill realize a technical solution was needed—but a platform was also needed for the technology to be marketed to consumers. In this same timeframe, Hardin and Hill coincidentally received a phone call from

¹ For example, upon information and belief, the first version of the Samsung Galaxy smartphone was released in June 2009, and Google launched the Android Market in October 2008 as a way for users to download apps for Android-based phones (e.g., Samsung Galaxy).

the Henderson Area Chamber of Commerce, which requested a website be designed—but as cheaply as possible. Hardin and Hill ultimately saw this as an opportunity for the platform they were looking for. As a result, Hardin and Hill decided they would develop and host the website for free for the Henderson Area Chamber of Commerce, but then ultimately, build free websites for all Chambers of Commerce using the same platform. Then, through the access the chambers had with businesses, the websites could get advertising revenue—which is how Hardin and Hill could ultimately be compensated. Moreover, once setting up this network of chambers of commerce was complete, eventually the patented technology could also be marketed and used to create location-aware content delivery on mobile devices as they envisioned an increased demand from businesses for location-aware apps and from the public for mobile devices. Hardin and Hill called the platform “Chamber Planet.”

14. Hardin and Hill spent years developing Chamber Planet and started to get numerous chambers of commerce on board. At one point, Hardin and Hill were working with the Henderson Area Chamber, Jacksonville Chamber, Bullard Area Chamber, Pittsburgh Camp County Chamber, and the Greater Marshall Chamber of Commerce. In fact, Hardin and Hill negotiated the purchase of the MarshallTexas.com domain from a third party and provided it to the Greater Marshall Chamber of Commerce. As more chambers got on board, more challenges arose, including that the chambers also desired an integrated billing system with their websites—which was complex and took significant time to develop.

15. On or around 2012, however, while Hardin and Hill were still developing and growing the Chamber Planet platform, their separate business Pronet also began to experience some challenges, largely due to the business disruptions created by the financial crisis. Hardin and

Hill had to focus more on Pronet, which was the business that provided revenue to them—and this slowed the growth of Chamber Planet. In addition, numerous members of Hardin’s family began to have serious health issues. Hardin’s wife had medical issues in pregnancies which required multiple surgeries and then she later developed cancer. Around the same time, Hardin’s mother fell and broke her back, and Hardin’s father required a lung transplant. Hardin needed to prioritize his family over the continued development of Chamber Planet for a period of time.

16. During this period of time, however, Hardin and Hill noticed that mobile devices were starting to utilize Hardin and Hill’s invention. Moreover, these companies developing the mobile devices and related software and services had significantly more financial resources that enabled them to commercialize the invention much more quickly than Hardin or Hill could. As a result, Hardin and Hill then decided to focus more on protecting the intellectual property they had developed, while continuing to look out for opportunities to bounce back and continue to build the platform they had invented.

THE ASSERTED PATENTS

17. Plaintiffs are the owners in right, title, and interest in and to multiple United States patents and patent applications, including U.S. Patent No. 9,779,418 (the “’418 Patent”), U.S. Patent No. 10,049,387 (the “’387 Patent”), and U.S. Patent No. 10,984,447 (the “’447 Patent”) (collectively, the “Asserted Patents”). The Asserted Patents are valid and enforceable, and the inventions claimed in the Asserted Patents were novel, non-obvious, unconventional, and non-routine at least as of May 1, 2009.

18. The ’418 Patent, entitled “Exclusive Delivery of Content within Geographic Areas,” was duly and legally issued to inventors Ryan Hardin and Andrew Hill on October 3, 2017.

Plaintiffs own the entire right, title, and interest in the '418 Patent and are entitled to sue for past and future infringement. A true and correct copy of the '418 Patent is attached as Exhibit A.

19. The '387 Patent, entitled "Exclusive Delivery of Content within Geographic Areas," was duly and legally issued to inventors Ryan Hardin and Andrew Hill on August 14, 2018. Plaintiffs own the entire right, title, and interest in the '387 Patent and are entitled to sue for past and future infringement. A true and correct copy of the '387 Patent is attached as Exhibit B.

20. The '447 Patent, entitled "Exclusive Delivery of Content within Geographic Areas," was duly and legally issued to inventors Ryan Hardin and Andrew Hill on April 20, 2021. Plaintiffs own the entire right, title, and interest in the '447 Patent and are entitled to sue for past and future infringement. A true and correct copy of the '447 Patent is attached as Exhibit C.

OVERVIEW OF THE INVENTIONS

21. Mobile applications ("mobile apps" or "apps") are computer programs designed to run on mobile devices. The advent and proliferation of apps for mobile devices significantly increased the opportunities for providing content to device users. In particular, the ability of mobile phones to monitor and make decisions based on the dynamic location of the user created additional opportunities for providing location-based content, including advertisements and other data or information.

22. Apps had no precise analog in physical media such as newspapers or magazines. Nor did physical media have the ability to determine a person's location and proximity to other points of interest at any given time, such as when a user is moving from one location to another, or the length of time that a user spends in a certain location. Indeed, the location of a mobile

device may change rapidly depending on, for example, whether the user is stationary or in a moving vehicle.

23. With these new opportunities came new technological challenges, including how to enable location-dependent features and functionality for apps on a mobile device while constrained by the limited computing power and storage of a mobile device. For instance, location information can be obtained by apps on a mobile device in a number of suitable ways, including using a Global Positioning System (GPS) component on the mobile device. One way would be for each app to communicate with the GPS component to determine the location of the mobile device and deliver location-dependent content. Each app requiring location information would need to be configured to independently obtain location information. As such, if, for example, 10 mobile apps polled a GPS component for a location, the GPS component would need to obtain location information (e.g., through satellites) 10 different times.

24. However, given that mobile devices may include dozens of apps installed and simultaneously running on a mobile device, having apps independently requesting location information would be processor intensive and not scalable, especially for the mobile device to efficiently allow multitasking when several apps are simultaneously running in the foreground/background. This implementation could tie up the limited resources available on the mobile phone and also deplete the mobile phone's battery at a faster rate.

25. Plaintiffs invented a technological solution that solves these technical problems by implementing a centralized service on a mobile device for tracking and monitoring the location of the mobile device on behalf of apps on the mobile device. Apps can register with the centralized service to receive its benefits. The claimed inventions provide a mechanism whereby an app can

register with the centralized service and request to be notified about events relating to a particular geographic area of interest, which is defined by a virtual perimeter. One kind of geographic area of interest is now commonly referred to as a “geofence” (the term is used herein as an exemplary geographic area of interest but not to suggest exact equivalence of the terms). As part of the request to be notified about events relating to a particular geofence, an app provides a unique identifier corresponding to the app and a geofence. The centralized service receives and stores identifiers to keep track of app/geofence pairings for registered apps. The centralized service monitors the location of the mobile device and alerts the appropriate app(s), based on the identifier, when there is an event associated with a particular geofence (e.g., when the mobile device enters or exits a geofence registered to one or more apps on the mobile device, when the mobile device remains in a geofence for a predetermined amount of time). The alert from the centralized service includes the identifier provided by the app. Apps can advantageously limit the frequency of alerts received from the centralized service by increasing the amount of time the mobile device must remain within a particular area before an alert is triggered. In response to the alert, the app can, for example, display location-based information for the user. As such, for example, individual apps are able to customize information that is shown based on the mobile device’s location, including based on the mobile device moving to a different location and/or the duration it remains within a particular area. Notably, defining alerts and triggering content delivery based on geofence events was not feasible for physical media such as newspapers and the like, which cannot respond to dynamic movement.

26. By offloading the polling and monitoring of the mobile device’s location from the individual apps to the centralized service, the claimed inventions improve the overall functioning

of the mobile devices as well as the individual apps. As a result, the claimed inventions improve the overall functioning of the mobile device itself by increasing processing efficiency and reducing battery drain, as well as the functioning of the individual apps, especially when several apps are running simultaneously in the foreground or background. Revisiting the example described above, the centralized service could meet the needs of 10 apps by obtaining location information once for all of the apps. The centralized service, which is separate from the apps on the mobile device, could be a part of the operating system (OS) of the mobile device or it may be a separate component of the mobile device. By using a centralized service, the individual apps can take advantage of any additional information known to the mobile device (e.g., sensor data such as an accelerometer), thereby improving the functionality of the device and apps.

COUNT I: CLAIM FOR PATENT INFRINGEMENT OF THE '418 PATENT

27. Plaintiffs repeat and reallege the allegations in paragraphs 1-26 as if fully set forth herein.

28. Samsung has infringed, contributed to the infringement of, and/or induced infringement of the '418 Patent by making, using, selling, offering for sale, or importing into the United States, or by intending that others make, use, import into, offer for sale, or sell in the United States, products and/or methods covered by one or more claims of the '418 Patent including, but not limited to, mobile devices and components thereof.

29. Upon information and belief, Samsung's mobile devices, including smartphones, tablets, and watches, that infringe one or more claims of the '418 Patent include at least the following products, as well as products with reasonably similar functionality:

- Galaxy S series, Galaxy Note series, Galaxy Z Flip series, Galaxy Fold series, and Galaxy A series smartphones;
- Galaxy Tab S series, Galaxy Tab A series, and Galaxy Book S series tablets; and
- Galaxy Watch 3 series, Galaxy Watch 3 Titanium series, Galaxy Watch Active2 series, Galaxy Watch Active series, Galaxy Watch series, and Galaxy Fit2 series watches.

Upon information and belief, these products are offered in several varieties, including different options for size, display, processor, storage, and battery. The products listed are exemplary, and Plaintiffs will be able to provide a more comprehensive list after discovery. Upon information and belief, Samsung also infringes one or more claims of the '418 Patent through its use of geofencing or location information in its advertising or content delivery efforts or its own applications it develops.

30. For example, upon information and belief, Samsung's mobile devices infringe at least claim 11 of the '418 Patent. Samsung makes, uses, sells, offers for sale, imports, exports, supplies, or distributes within the United States its mobile devices and thus directly infringes the '418 Patent.

31. Samsung indirectly infringes the '418 Patent as provided by 35 U.S.C. § 271(b) by inducing infringement by others, such as manufacturers, resellers, and end-user customers in this District and throughout the United States. For example, direct infringement is the result of activities performed by manufacturers, resellers, or operators/carriers of Samsung's mobile devices, who, upon information and belief, perform each step of the claimed invention as directed

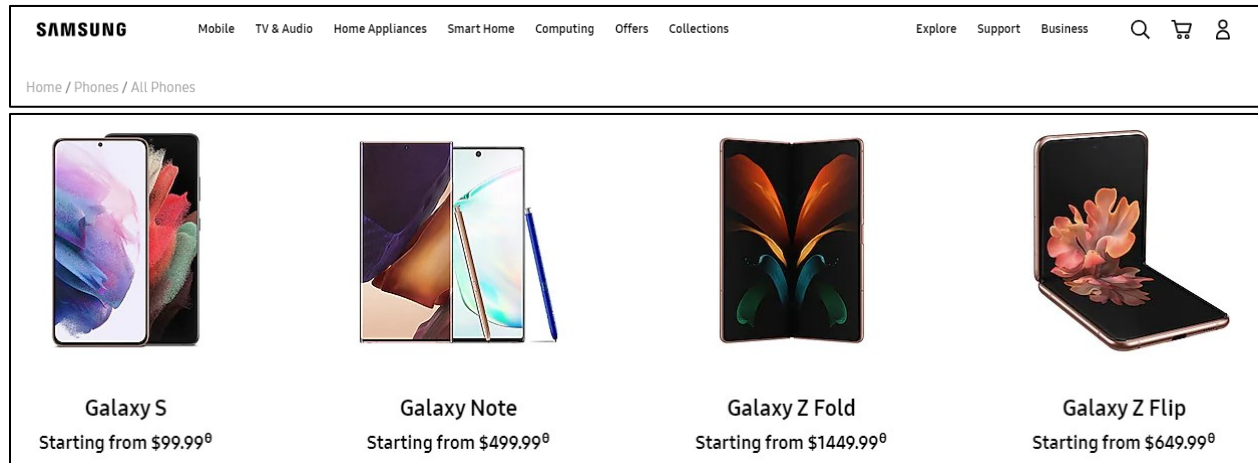
by Samsung. Samsung received actual notice of the '418 Patent at least as early as the filing of this Complaint.

32. Upon information and belief, Samsung's affirmative acts of selling Samsung's mobile devices, causing Samsung's mobile devices to be manufactured, and providing directions, instructions, schematics, diagrams, or designs to its manufacturers, resellers, or operators/carriers to make or use Samsung's mobile devices in a manner that directly infringes the '418 Patent induce infringement by others, such as manufacturers, resellers, or operators/carriers in this District and throughout the United States. Upon information and belief, through its manufacture and sales of Samsung's mobile devices, Samsung performed the acts that constitute induced infringement with knowledge or willful blindness that the induced acts would constitute infringement.

33. Samsung also indirectly infringes the '418 Patent by contributing to infringement by others, such as manufacturers, resellers, manufacturers, and operators/carriers, in accordance with 35 U.S.C. § 271(c) in this District and throughout the United States. Upon information and belief, direct infringement is the result of activities performed by manufacturers, resellers, or operators/carriers of Samsung's mobile devices.

34. Upon information and belief, Samsung's affirmative acts of selling Samsung's mobile devices and causing Samsung's mobile devices to be manufactured and sold contribute to Samsung's manufacturers, resellers, and operators/carriers making or using Samsung's mobile devices in a normal and customary way that infringes the '418 Patent. Upon information and belief, Samsung's mobile devices constitute the material part of Plaintiffs' patented invention, have no substantial non-infringing uses, and are known by Samsung to be especially made or especially adapted for use to infringe the '418 Patent.

35. Samsung provides a mobile device comprising: memory, at least one processor operably coupled to the memory, a location-determination component tangibly embodied in the mobile device for determining the mobile device's physical geographic location, and at least one module stored in the memory and configured for execution by the at least one processor, including as demonstrated in the exemplary text and images below:



<https://www.samsung.com/us/>

SAMSUNG		Galaxy S10e S10 S10+ S10 5G	
		HIGHLIGHTS	SPECS
Memory	Galaxy S10e	• 6GB RAM with 128GB internal storage • 8GB RAM with 256GB internal storage	
	Galaxy S10	• 8GB RAM with 128GB internal storage • 8GB RAM with 512GB internal storage	
	Galaxy S10+	• 8GB RAM with 128GB internal storage • 8GB RAM with 512GB internal storage (Only ceramic models) • 12GB RAM with 1TB internal storage (Only Performance Edition ceramic models)	
	Galaxy S10 5G	• 8GB RAM with 256GB internal storage • 8GB RAM with 512GB internal storage	
SAMSUNG		Galaxy S10e S10 S10+ S10 5G	
		HIGHLIGHTS	SPECS
AP		8nm 64-bit Octa-Core Processor ※ 2.73GHz (Maximum Clock Speed) + 2.31GHz + 1.95GHz 7nm 64-bit Octa-Core Processor ※ 2.84GHz (Maximum Clock Speed) + 2.41GHz + 1.78GHz *May differ by country and carrier.	

SAMSUNG		Galaxy S10e S10 S10+ S10 5G	
		HIGHLIGHTS	SPECS
OS	Android 9 (Pie)		

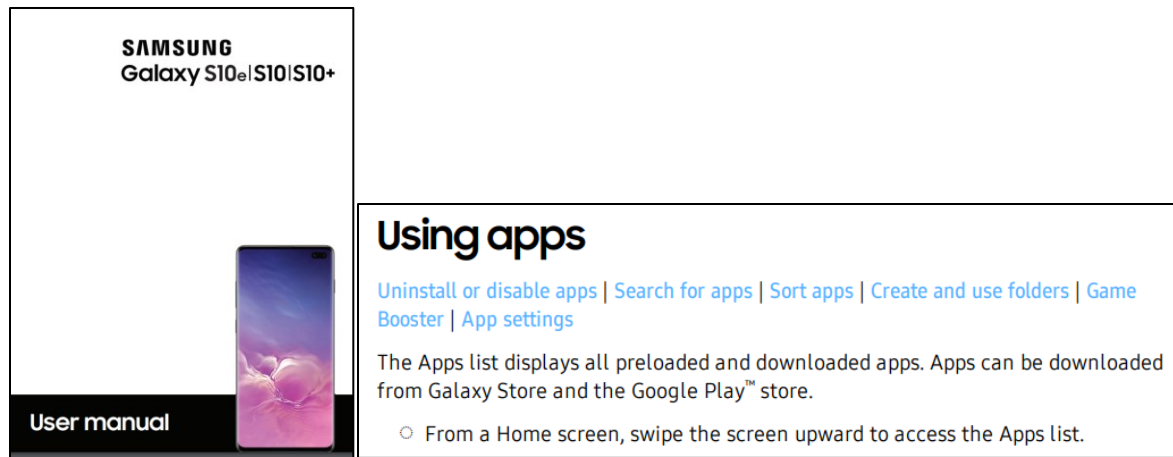
SAMSUNG		Galaxy S10e S10 S10+ S10 5G	
		HIGHLIGHTS	SPECS
Network & Connectivity	Enhanced 4x4 MIMO, Up to 7CA, LAA, LTE Cat.20 Up to 2.0Gbps Download / Up to 150Mbps Upload 5G Non-Standalone (NSA), Sub6 / mmWave (Galaxy S10 5G only) Wi-Fi 802.11 a/b/g/n/ac/ax (2.4/5GHz), VHT80 MU-MIMO, 1024QAM Up to 1.2Gbps Download / Up to 1.2Gbps Upload Bluetooth® v 5.0 (LE up to 2Mbps), ANT+, USB type-C, NFC, Location (GPS, Galileo, Glonass, BeiDou) *Actual speed may vary depending on country, carrier, and user environment. *Depending on country or carrier, 5G connectivity may use Sub6 only, mmWave only, or Sub6 and mmWave together. *Galileo and BeiDou coverage may be limited. BeiDou may not be available for certain countries.		

SAMSUNG		Galaxy S10e S10 S10+ S10 5G	
		HIGHLIGHTS	SPECS
Bixby ↗	Bixby Routines Bixby Bixby Vision Apps Mode • Home décor • Makeup & Hair Dyeing • Styling Lens Mode • Image • Shopping • Translation • Place • Picture play • 3rd party Downloads • Food • Wine • Book • QR Code		

<https://www.samsung.com/global/galaxy/galaxy-s10/specs/>

36. Samsung provides a mobile device, wherein the at least one module comprises instructions for: implementing, on the mobile device, at least one computer readable program

instruction, made available for use by one or more distinct application programs operating on the mobile device, for receiving, from a particular one application program of the one or more distinct application programs during the particular one application program's execution on the mobile device, a request to reserve, for the particular one application program, at least one designated geographic area of interest for having a particular associated identifier exclusively provided for use by the particular one application program after it is determined, by at least use of the at least one processor and of location information representing a physical geographic location of the mobile device as determined by the location-determination component, that the mobile device has at least entered the at least one designated geographic area of interest, wherein the at least one computer readable program instruction comprises at least one input parameter for receiving, from the particular one application program, data representing a) the particular associated identifier as provided content associated with the at least one designated geographic area of interest and exclusively related to the particular one application program, and b) a perimeter definition defining, with at least reference to longitude and latitude, the at least one designated geographic area of interest, and wherein the one or more distinct application programs each comprises a system of executable coded instructions as programmed by at least one developer for execution on the mobile device, including as demonstrated in the exemplary text and images below:



https://downloadcenter.samsung.com/content/UM/202103/20210304004310357/ATT_SM-G970U_G973U_G975U_EN_UM_R_11.0_022221_FINAL.pdf

Create and monitor geofences

Geofencing combines awareness of the user's current location with awareness of the user's proximity to locations that may be of interest. To mark a location of interest, you specify its latitude and longitude. To adjust the proximity for the location, you add a radius. The latitude, longitude, and radius define a geofence, creating a circular area, or fence, around the location of interest.

You can have multiple active geofences, with a limit of 100 per app, per device user. For each geofence, you can ask Location Services to send you entrance and exit events, or you can specify a duration within the geofence area to wait, or *dwell* , before triggering an event. You can limit the duration of any geofence by specifying an expiration duration in milliseconds. After the geofence expires, Location Services automatically removes it.



This lesson shows you how to add and remove geofences, and then listen for geofence transitions using a `BroadcastReceiver`.

Set up for geofence monitoring

The first step in requesting geofence monitoring is to request the necessary permissions. To use geofencing, your app must request the following:

- `ACCESS_FINE_LOCATION`
- `ACCESS_BACKGROUND_LOCATION` if your app targets Android 10 (API level 29) or higher

To learn more, see the guide on how to [request location permissions](#).

If you want to use a `BroadcastReceiver` to listen for geofence transitions, add an element specifying the service name. This element must be a child of the `<application>` element:

```
<application
  android:allowBackup="true">
  ...
  <receiver android:name=".GeofenceBroadcastReceiver"/>
</application>
```

If you want to use a `BroadcastReceiver` to listen for geofence transitions, add an element specifying the service name. This element must be a child of the `<application>` element:

```
<application
  android:allowBackup="true">
  ...
  <receiver android:name=".GeofenceBroadcastReceiver"/>
</application>
```

To access the location APIs, you need to create an instance of the Geofencing client. To learn how to connect your client:

Kotlin Java

```
lateinit var geofencingClient: GeofencingClient

override fun onCreate(savedInstanceState: Bundle?) {
    // ...
    geofencingClient = LocationServices.getGeofencingClient(this)
}
```

Create and add geofences

Your app needs to create and add geofences using the location API's builder class for creating Geofence objects, and the convenience class for adding them. Also, to handle the intents sent from Location Services when geofence transitions occur, you can define a `PendingIntent` as shown in this section.

★ **Note:** On single-user devices, there is a limit of 100 geofences per app. For multi-user devices, the limit is 100 geofences per app per device user.

Create geofence objects

First, use `Geofence.Builder` to create a geofence, setting the desired radius, duration, and transition types for the geofence. For example, to populate a list object:

Kotlin Java

```
geofenceList.add(new Geofence.Builder()
    // Set the request ID of the geofence. This is a string to identify this
    // geofence.
    .setRequestId(entry.getKey())

    .setCircularRegion(
        entry.getValue().latitude,
        entry.getValue().longitude,
        Constants.GEOFENCE_RADIUS_IN_METERS
    )
    .setExpirationDuration(Constants.GEOFENCE_EXPIRATION_IN_MILLISECONDS)
    .setTransitionTypes(Geofence.GEOFENCE_TRANSITION_ENTER |
        Geofence.GEOFENCE_TRANSITION_EXIT)
    .build());
```

This example pulls data from a constants file. In actual practice, apps might dynamically create geofences based on the user's location.

Specify geofences and initial triggers

The following snippet uses the `GeofencingRequest` class and its nested `GeofencingRequestBuilder` class to specify the geofences to monitor and to set how related geofence events are triggered:

```
Kotlin  Java
```

```
private GeofencingRequest getGeofencingRequest() {  
    GeofencingRequest.Builder builder = new GeofencingRequest.Builder();  
    builder.setInitialTrigger(GeofencingRequest.INITIAL_TRIGGER_ENTER);  
    builder.addGeofences(geofenceList);  
    return builder.build();  
}
```

This example shows the use of two geofence triggers. The `GEOFENCE_TRANSITION_ENTER` transition triggers when a device enters a geofence, and the `GEOFENCE_TRANSITION_EXIT` transition triggers when a device exits a geofence. Specifying `INITIAL_TRIGGER_ENTER` tells Location services that `GEOFENCE_TRANSITION_ENTER` should be triggered if the device is already inside the geofence.

In many cases, it may be preferable to use instead `INITIAL_TRIGGER_DWELL`, which triggers events only when the user stops for a defined duration within a geofence. This approach can help reduce "alert spam" resulting from large numbers notifications when a device briefly enters and exits geofences. Another strategy for getting best results from your geofences is to set a minimum radius of 100 meters. This helps account for the location accuracy of typical Wi-Fi networks, and also helps reduce device power consumption.

Define a broadcast receiver for geofence transitions

An `Intent` sent from Location Services can trigger various actions in your app, but you should *not* have it start an activity or fragment, because components should only become visible in response to a user action. In many cases, a `BroadcastReceiver` is a good way to handle a geofence transition. A `BroadcastReceiver` gets updates when an event occurs, such as a transition into or out of a geofence, and can start long-running background work.

The following snippet shows how to define a `PendingIntent` that starts a `BroadcastReceiver`:

Kotlin Java

```
public class MainActivity extends AppCompatActivity {

    // ...

    private PendingIntent getGeofencePendingIntent() {
        // Reuse the PendingIntent if we already have it.
        if (geofencePendingIntent != null) {
            return geofencePendingIntent;
        }
        Intent intent = new Intent(this, GeofenceBroadcastReceiver.class);
        // We use FLAG_UPDATE_CURRENT so that we get the same pending intent back when
        // calling addGeofences() and removeGeofences().
        geofencePendingIntent = PendingIntent.getBroadcast(this, 0, intent, PendingIntent.
            FLAG_UPDATE_CURRENT);
        return geofencePendingIntent;
    }
}
```

Add geofences

To add geofences, use the `GeofencingClient.addGeofences()` method. Provide the `GeofencingRequest` object, and the `PendingIntent`. The following snippet demonstrates processing the results:

Kotlin Java

```

geofencingClient.addGeofences(getGeofencingRequest(), getGeofencePendingIntent())
    .addOnSuccessListener(this, new OnSuccessListener<Void>() {
        @Override
        public void onSuccess(Void aVoid) {
            // Geofences added
            // ...
        }
    })
    .addOnFailureListener(this, new OnFailureListener() {
        @Override
        public void onFailure(@NonNull Exception e) {
            // Failed to add geofences
            // ...
        }
    });

```

<https://developer.android.com/training/location/geofencing>

37. Samsung provides a mobile device, wherein the at least one module comprises instructions for: receiving, using the at least one computer readable program instruction, from a first particular application program during its execution on the mobile device, a first request for a reservation for a first particular designated geographic area of interest for having a first particular associated identifier exclusively provided for use by the first particular application program after it is determined that the mobile device has at least entered the first particular designated geographic area of interest, wherein the first request comprises data representing a) the first particular associated identifier, represented by a data string, as provided content by the first particular application program to be associated with the first particular designated geographic area of interest and exclusively related to the first particular application program, and b) a first perimeter definition

provided by the first particular application program, wherein the first perimeter definition comprises at least data representing a first latitude and longitude coordinate and a first radius value for defining the first particular designated geographic area of interest, including as demonstrated in the exemplary text and images below:

Create and monitor geofences

Geofencing combines awareness of the user's current location with awareness of the user's proximity to locations that may be of interest. To mark a location of interest, you specify its latitude and longitude. To adjust the proximity for the location, you add a radius. The latitude, longitude, and radius define a geofence, creating a circular area, or fence, around the location of interest.

You can have multiple active geofences, with a limit of 100 per app, per device user. For each geofence, you can ask Location Services to send you entrance and exit events, or you can specify a duration within the geofence area to wait, or *dwell*, before triggering an event. You can limit the duration of any geofence by specifying an expiration duration in milliseconds. After the geofence expires, Location Services automatically removes it.



This lesson shows you how to add and remove geofences, and then listen for geofence transitions using a `BroadcastReceiver`.

Create and add geofences

Your app needs to create and add geofences using the location API's builder class for creating Geofence objects, and the convenience class for adding them. Also, to handle the intents sent from Location Services when geofence transitions occur, you can define a `PendingIntent` as shown in this section.

★ **Note:** On single-user devices, there is a limit of 100 geofences per app. For multi-user devices, the limit is 100 geofences per app per device user.

Create geofence objects

First, use `Geofence.Builder` to create a geofence, setting the desired radius, duration, and transition types for the geofence. For example, to populate a list object:

Kotlin Java

```

geofenceList.add(new Geofence.Builder()
    // Set the request ID of the geofence. This is a string to identify this
    // geofence.
    .setRequestId(entry.getKey())

    .setCircularRegion(
        entry.getValue().latitude,
        entry.getValue().longitude,
        Constants.GEOFENCE_RADIUS_IN_METERS
    )
    .setExpirationDuration(Constants.GEOFENCE_EXPIRATION_IN_MILLISECONDS)
    .setTransitionTypes(Geofence.GEOFENCE_TRANSITION_ENTER |
        Geofence.GEOFENCE_TRANSITION_EXIT)
    .build());
  
```

This example pulls data from a constants file. In actual practice, apps might dynamically create geofences based on the user's location.

Specify geofences and initial triggers

The following snippet uses the `GeofencingRequest` class and its nested `GeofencingRequest.Builder` class to specify the geofences to monitor and to set how related geofence events are triggered:

Kotlin Java

```
private GeofencingRequest getGeofencingRequest() {  
    GeofencingRequest.Builder builder = new GeofencingRequest.Builder();  
    builder.setInitialTrigger(GeofencingRequest.INITIAL_TRIGGER_ENTER);  
    builder.addGeofences(geofenceList);  
    return builder.build();  
}
```

This example shows the use of two geofence triggers. The `GEOFENCE_TRANSITION_ENTER` transition triggers when a device enters a geofence, and the `GEOFENCE_TRANSITION_EXIT` transition triggers when a device exits a geofence. Specifying `INITIAL_TRIGGER_ENTER` tells Location services that `GEOFENCE_TRANSITION_ENTER` should be triggered if the device is already inside the geofence.

In many cases, it may be preferable to use instead `INITIAL_TRIGGER_DWELL`, which triggers events only when the user stops for a defined duration within a geofence. This approach can help reduce "alert spam" resulting from large numbers notifications when a device briefly enters and exits geofences. Another strategy for getting best results from your geofences is to set a minimum radius of 100 meters. This helps account for the location accuracy of typical Wi-Fi networks, and also helps reduce device power consumption.

Add geofences

To add geofences, use the `GeofencingClient.addGeofences()` method. Provide the `GeofencingRequest` object, and the `PendingIntent`. The following snippet demonstrates processing the results:

Kotlin Java

```

geofencingClient.addGeofences(getGeofencingRequest(), getGeofencePendingIntent())
    .addOnSuccessListener(this, new OnSuccessListener<Void>() {
        @Override
        public void onSuccess(Void aVoid) {
            // Geofences added
            // ...
        }
    })
    .addOnFailureListener(this, new OnFailureListener() {
        @Override
        public void onFailure(@NonNull Exception e) {
            // Failed to add geofences
            // ...
        }
    });

```

<https://developer.android.com/training/location/geofencing>

38. Samsung provides a mobile device, wherein the at least one module comprises instructions for: determining availability for the first particular designated geographic area of interest to be reserved for the first particular application program, including as demonstrated in the exemplary text and images below:

Add geofences

To add geofences, use the `GeofencingClient.addGeofences()` method. Provide the `GeofencingRequest` object, and the `PendingIntent`. The following snippet demonstrates processing the results:

Kotlin Java

```

geofencingClient.addGeofences(getGeofencingRequest(), getGeofencePendingIntent())
    .addOnSuccessListener(this, new OnSuccessListener<Void>() {
        @Override
        public void onSuccess(Void aVoid) {
            // Geofences added
            // ...
        }
    })
    .addOnFailureListener(this, new OnFailureListener() {
        @Override
        public void onFailure(@NonNull Exception e) {
            // Failed to add geofences
            // ...
        }
    });

```

<https://developer.android.com/training/location/geofencing>

GeofenceStatusCodes

public final class **GeofenceStatusCodes** extends `CommonStatusCodes`

Geofence specific status codes, for use in `Status.getStatusCode()`

Constant Summary

int	<code>GEOFENCE_INSUFFICIENT_LOCATION_PERMISSION</code>	The client doesn't have sufficient location permission to perform geofencing operations.
int	<code>GEOFENCE_NOT_AVAILABLE</code>	Geofence service is not available now.
int	<code>GEOFENCE_REQUEST_TOO_FREQUENT</code>	Your app has been adding Geofences too frequently.
int	<code>GEOFENCE_TOO_MANY_GEOFENCES</code>	Your app has registered more than 100 geofences.
int	<code>GEOFENCE_TOO_MANY_PENDING_INTENTS</code>	You have provided more than 5 different PendingIntents to the <code>GeofencingApi.addGeofences(GoogleApiClient, GeofencingRequest, PendingIntent)</code> call.

<https://developers.google.com/android/reference/com/google/android/gms/location/GeofenceStatusCodes>

39. Samsung provides a mobile device, wherein the at least one module comprises instructions for: using the first perimeter definition in conjunction with the first particular associated identifier to establish the first particular designated geographic area of interest in the first request as an area reserved for first content related to the first particular application program and not an area reserved for first content related to other application programs, wherein the first content related to the first particular application program comprises the first particular associated identifier, including as demonstrated in the exemplary text and images below:

Create and monitor geofences

Geofencing combines awareness of the user's current location with awareness of the user's proximity to locations that may be of interest. To mark a location of interest, you specify its latitude and longitude. To adjust the proximity for the location, you add a radius. The latitude, longitude, and radius define a geofence, creating a circular area, or fence, around the location of interest.

You can have multiple active geofences, with a limit of 100 per app, per device user. For each geofence, you can ask Location Services to send you entrance and exit events, or you can specify a duration within the geofence area to wait, or *dwell*, before triggering an event. You can limit the duration of any geofence by specifying an expiration duration in milliseconds. After the geofence expires, Location Services automatically removes it.



This lesson shows you how to add and remove geofences, and then listen for geofence transitions using a `BroadcastReceiver`.

Create and add geofences

Your app needs to create and add geofences using the location API's builder class for creating Geofence objects, and the convenience class for adding them. Also, to handle the intents sent from Location Services when geofence transitions occur, you can define a [PendingIntent](#) as shown in this section.

★ **Note:** On single-user devices, there is a limit of 100 geofences per app. For multi-user devices, the limit is 100 geofences per app per device user.

Create geofence objects

First, use [Geofence.Builder](#) to create a geofence, setting the desired radius, duration, and transition types for the geofence. For example, to populate a list object:

```

Kotlin      Java
            Java

geofenceList.add(new Geofence.Builder()
    // Set the request ID of the geofence. This is a string to identify this
    // geofence.
    .setRequestId(entry.getKey())

    .setCircularRegion(
        entry.getValue().latitude,
        entry.getValue().longitude,
        Constants.GEOFENCE_RADIUS_IN_METERS
    )
    .setExpirationDuration(Constants.GEOFENCE_EXPIRATION_IN_MILLISECONDS)
    .setTransitionTypes(Geofence.GEOFENCE_TRANSITION_ENTER |
        Geofence.GEOFENCE_TRANSITION_EXIT)
    .build());
  
```

This example pulls data from a constants file. In actual practice, apps might dynamically create geofences based on the user's location.

Specify geofences and initial triggers

The following snippet uses the `GeofencingRequest` class and its nested `GeofencingRequestBuilder` class to specify the geofences to monitor and to set how related geofence events are triggered:

```
Kotlin  Java
private GeofencingRequest getGeofencingRequest() {
    GeofencingRequest.Builder builder = new GeofencingRequest.Builder();
    builder.setInitialTrigger(GeofencingRequest.INITIAL_TRIGGER_ENTER);
    builder.addGeofences(geofenceList);
    return builder.build();
}
```

This example shows the use of two geofence triggers. The `GEOFENCE_TRANSITION_ENTER` transition triggers when a device enters a geofence, and the `GEOFENCE_TRANSITION_EXIT` transition triggers when a device exits a geofence. Specifying `INITIAL_TRIGGER_ENTER` tells Location services that `GEOFENCE_TRANSITION_ENTER` should be triggered if the device is already inside the geofence.

In many cases, it may be preferable to use instead `INITIAL_TRIGGER_DWELL`, which triggers events only when the user stops for a defined duration within a geofence. This approach can help reduce "alert spam" resulting from large numbers notifications when a device briefly enters and exits geofences. Another strategy for getting best results from your geofences is to set a minimum radius of 100 meters. This helps account for the location accuracy of typical Wi-Fi networks, and also helps reduce device power consumption.

Add geofences

To add geofences, use the `GeofencingClient.addGeofences()` method. Provide the `GeofencingRequest` object, and the `PendingIntent`. The following snippet demonstrates processing the results:

Kotlin Java

```

geofencingClient.addGeofences(getGeofencingRequest(), getGeofencePendingIntent())
    .addOnSuccessListener(this, new OnSuccessListener<Void>() {
        @Override
        public void onSuccess(Void aVoid) {
            // Geofences added
            // ...
        }
    })
    .addOnFailureListener(this, new OnFailureListener() {
        @Override
        public void onFailure(@NonNull Exception e) {
            // Failed to add geofences
            // ...
        }
    });

```

<https://developer.android.com/training/location/geofencing>

40. Samsung provides a mobile device, wherein the at least one module comprises instructions for: storing, in the memory, in response to receiving the first request, after availability for the first particular designated geographic area of interest to be reserved for the first particular application program has been positively determined, an at least first record, for the first particular application program, associated with the first particular associated identifier and the first particular designated geographic area of interest, thereby designating the first particular application program as a first one of the one or more registered application programs on the mobile device, wherein the one or more registered application programs on the mobile device each consists of an application program designated for having a particular identifier, being associated with a particular reserved geographic area of interest, to be exclusively provided for use by said application program after it

is determined, by at least use of the at least one processor and of the location information, that the mobile device has at least entered said particular reserved geographic area of interest, including as demonstrated in the exemplary text and images below:

SAMSUNG		Galaxy S10e S10 S10+ S10 5G	
		HIGHLIGHTS	SPECS
Memory	Galaxy S10e		
	• 6GB RAM with 128GB internal storage • 8GB RAM with 256GB internal storage		
	Galaxy S10+		
	• 8GB RAM with 128GB internal storage • 8GB RAM with 512GB internal storage (Only ceramic models) • 12GB RAM with 1TB internal storage (Only Performance Edition ceramic models)		
	Galaxy S10		
	• 8GB RAM with 128GB internal storage • 8GB RAM with 512GB internal storage		
	Galaxy S10 5G		
	• 8GB RAM with 256GB internal storage • 8GB RAM with 512GB internal storage		

<https://www.samsung.com/global/galaxy/galaxy-s10/specs/>

Add geofences

To add geofences, use the `GeofencingClient.addGeofences()` method. Provide the `GeofencingRequest` object, and the `PendingIntent`. The following snippet demonstrates processing the results:

Kotlin

Java

```

geofencingClient.addGeofences(getGeofencingRequest(), getGeofencePendingIntent())
    .addOnSuccessListener(this, new OnSuccessListener<Void>() {
        @Override
        public void onSuccess(Void aVoid) {
            // Geofences added
            // ...
        }
    })
    .addOnFailureListener(this, new OnFailureListener() {
        @Override
        public void onFailure(@NonNull Exception e) {
            // Failed to add geofences
            // ...
        }
    });

```

<https://developer.android.com/training/location/geofencing>

GeofencingClient

public class **GeofencingClient** extends [GoogleApi<Api.ApiOptions.NoOptions>](#)

The main entry point for interacting with the geofencing APIs.

Get an instance of this client via [LocationServices.getGeofencingClient\(Activity\)](#).

All methods are thread safe.

Public Method Summary

Task<Void>	addGeofences(GeofencingRequest geofencingRequest, PendingIntent pendingIntent) Sets alerts to be notified when the device enters or exits one of the specified geofences.
Task<Void>	removeGeofences(List<String> geofenceRequestIds) Removes geofences by their request IDs.
Task<Void>	removeGeofences(PendingIntent pendingIntent) Removes all geofences associated with the given pendingIntent.

public Task<Void> addGeofences ([GeofencingRequest geofencingRequest](#), [PendingIntent pendingIntent](#))

Sets alerts to be notified when the device enters or exits one of the specified geofences. If an existing geofence with the same request ID is already registered, the old geofence is replaced by the new one, and the new [PendingIntent](#) is used to generate intents for alerts.

[Task](#) is completed when geofences are successfully added or failed to be added. Upon failure, an [ApiException](#) will be set on the [Task](#). Refer to [GeofenceStatusCodes](#) for possible errors when adding geofences.

When a geofence transition (for example, entering or exiting) matches one of the transition filter (see [Geofence.Builder.setTransitionTypes\(int\)](#)) in the given geofence list, an intent is generated using the given pending intent. You can call [GeofencingEvent.fromIntent\(android.content.Intent\)](#) to get the transition type, geofences that triggered this intent and the location that triggered the geofence transition.

In case network location provider is disabled by the user, the geofence service will stop updating, all registered geofences will be removed and an intent is generated by the provided pending intent. In this case, the [GeofencingEvent](#) created from this intent represents an error event, where [GeofencingEvent.hasError\(\)](#) returns `true` and [GeofencingEvent.getErrorCode\(\)](#) returns [GeofenceStatusCodes.GEOFENCE_NOT_AVAILABLE](#).

This method requires [Manifest.permission.ACCESS_FINE_LOCATION](#).

Parameters

geofencingRequest	geofencing request that include a list of geofences to be added and related triggering behavior. The request must be created using GeofencingRequest.Builder .
pendingIntent	a pending intent that will be used to generate an intent when matched geofence transition is observed

Throws

SecurityException	if the app does not have Manifest.permission.ACCESS_FINE_LOCATION permission
NullPointerException	if geofencingRequest or pendingIntent is null

<https://developers.google.com/android/reference/com/google/android/gms/location/GeofencingClient.html>

Handle geofence transitions

When Location Services detects that the user has entered or exited a geofence, it sends out the `Intent` contained in the `PendingIntent` you included in the request to add geofences. A broadcast receiver like `GeofenceBroadcastReceiver` notices that the `Intent` was invoked and can then obtain the geofencing event from the intent, determine the type of Geofence transition(s), and determine which of the defined geofences was triggered. The broadcast receiver can direct an app to start performing background work or, if desired, send a notification as output.

The following snippet shows how to define a `BroadcastReceiver` that posts a notification when a geofence transition occurs. When the user clicks the notification, the app's main activity appears:

Kotlin Java

```
class GeofenceBroadcastReceiver : BroadcastReceiver() {
    // ...
    override fun onReceive(context: Context?, intent: Intent?) {
        val geofencingEvent = GeofencingEvent.fromIntent(intent)
        if (geofencingEvent.hasError()) {
            val errorMessage = GeofenceStatusCodes
                .getStatusCodeString(geofencingEvent.errorCode)
            Log.e(TAG, errorMessage)
            return
        }

        // Get the transition type.
        val geofenceTransition = geofencingEvent.geofenceTransition

        // Test that the reported transition was of interest.
        if (geofenceTransition == Geofence.GEOFENCE_TRANSITION_ENTER |
            geofenceTransition == Geofence.GEOFENCE_TRANSITION_EXIT) {

            // Get the geofences that were triggered. A single event can trigger
            // multiple geofences.
            val triggeringGeofences = geofencingEvent.triggeringGeofences

            // Get the transition details as a String.
            val geofenceTransitionDetails = getGeofenceTransitionDetails(
                this,
                geofenceTransition,
                triggeringGeofences
            )

            // Send notification and log the transition details.
            sendNotification(geofenceTransitionDetails)
            Log.i(TAG, geofenceTransitionDetails)
        } else {
            // Log the error.
            Log.e(TAG, getString(R.string.geofence_transition_invalid_type,
                geofenceTransition))
        }
    }
}
```

After detecting the transition event via the `PendingIntent`, the `BroadcastReceiver` gets the geofence transition type and tests whether it is one of the events the app uses to trigger notifications -- either `GEOFENCE_TRANSITION_ENTER` or `GEOFENCE_TRANSITION_EXIT` in this case. The service then sends a notification and logs the transition details.

<https://developer.android.com/training/location/geofencing>

41. Samsung provides a mobile device, wherein the at least one module comprises instructions for: receiving, using the at least one computer readable program instruction, from a second particular application program during its execution on the mobile device, a second request for a reservation for a second particular designated geographic area of interest for having a second particular associated identifier exclusively provided for use by the second particular application program after it is determined that the mobile device has at least entered the second particular designated geographic area of interest, wherein the second request comprises data representing a) the second particular associated identifier, represented by a data string, as provided content by the second particular application program to be associated with the second particular designated geographic area of interest and exclusively related to the second particular application program, and b) a second perimeter definition provided by the second particular application program, wherein the second perimeter definition comprises at least data representing a second latitude and longitude coordinate and a second radius value for defining the second particular designated geographic area of interest, including as demonstrated in the exemplary text and images below:

Create and monitor geofences

Geofencing combines awareness of the user's current location with awareness of the user's proximity to locations that may be of interest. To mark a location of interest, you specify its latitude and longitude. To adjust the proximity for the location, you add a radius. The latitude, longitude, and radius define a geofence, creating a circular area, or fence, around the location of interest.

You can have multiple active geofences, with a limit of 100 per app, per device user. For each geofence, you can ask Location Services to send you entrance and exit events, or you can specify a duration within the geofence area to wait, or *dwell*, before triggering an event. You can limit the duration of any geofence by specifying an expiration duration in milliseconds. After the geofence expires, Location Services automatically removes it.



This lesson shows you how to add and remove geofences, and then listen for geofence transitions using a `BroadcastReceiver`.

Create and add geofences

Your app needs to create and add geofences using the location API's builder class for creating Geofence objects, and the convenience class for adding them. Also, to handle the intents sent from Location Services when geofence transitions occur, you can define a `PendingIntent` as shown in this section.

★ **Note:** On single-user devices, there is a limit of 100 geofences per app. For multi-user devices, the limit is 100 geofences per app per device user.

Create geofence objects

First, use `Geofence.Builder` to create a geofence, setting the desired radius, duration, and transition types for the geofence. For example, to populate a list object:

Kotlin Java

```
geofenceList.add(new Geofence.Builder()
    // Set the request ID of the geofence. This is a string to identify this
    // geofence.
    .setRequestId(entry.getKey())

    .setCircularRegion(
        entry.getValue().latitude,
        entry.getValue().longitude,
        Constants.GEOFENCE_RADIUS_IN_METERS
    )
    .setExpirationDuration(Constants.GEOFENCE_EXPIRATION_IN_MILLISECONDS)
    .setTransitionTypes(Geofence.GEOFENCE_TRANSITION_ENTER |
        Geofence.GEOFENCE_TRANSITION_EXIT)
    .build());
```

This example pulls data from a constants file. In actual practice, apps might dynamically create geofences based on the user's location.

Specify geofences and initial triggers

The following snippet uses the `GeofencingRequest` class and its nested `GeofencingRequest.Builder` class to specify the geofences to monitor and to set how related geofence events are triggered:

```
Kotlin      Java
private GeofencingRequest getGeofencingRequest() {
    GeofencingRequest.Builder builder = new GeofencingRequest.Builder();
    builder.setInitialTrigger(GeofencingRequest.INITIAL_TRIGGER_ENTER);
    builder.addGeofences(geofenceList);
    return builder.build();
}
```

This example shows the use of two geofence triggers. The `GEOFENCE_TRANSITION_ENTER` transition triggers when a device enters a geofence, and the `GEOFENCE_TRANSITION_EXIT` transition triggers when a device exits a geofence. Specifying `INITIAL_TRIGGER_ENTER` tells Location services that `GEOFENCE_TRANSITION_ENTER` should be triggered if the device is already inside the geofence.

In many cases, it may be preferable to use instead `INITIAL_TRIGGER_DWELL`, which triggers events only when the user stops for a defined duration within a geofence. This approach can help reduce "alert spam" resulting from large numbers notifications when a device briefly enters and exits geofences. Another strategy for getting best results from your geofences is to set a minimum radius of 100 meters. This helps account for the location accuracy of typical Wi-Fi networks, and also helps reduce device power consumption.

Add geofences

To add geofences, use the `GeofencingClient.addGeofences()` method. Provide the `GeofencingRequest` object, and the `PendingIntent`. The following snippet demonstrates processing the results:

```
Kotlin      Java
geofencingClient.addGeofences(getGeofencingRequest(), getGeofencePendingIntent())
    .addOnSuccessListener(this, new OnSuccessListener<Void>() {
        @Override
        public void onSuccess(Void aVoid) {
            // Geofences added
            // ...
        }
    })
    .addOnFailureListener(this, new OnFailureListener() {
        @Override
        public void onFailure(@NonNull Exception e) {
            // Failed to add geofences
            // ...
        }
    });
```

<https://developer.android.com/training/location/geofencing>

42. Samsung provides a mobile device, wherein the at least one module comprises instructions for: determining availability for the second particular designated geographic area of interest to be reserved for the second particular application program, including as demonstrated in the exemplary text and images below:

Add geofences

To add geofences, use the `GeofencingClient.addGeofences()` method. Provide the `GeofencingRequest` object, and the `PendingIntent`. The following snippet demonstrates processing the results:

Kotlin

Java

```
geofencingClient.addGeofences(getGeofencingRequest(), getGeofencePendingIntent())
    .addOnSuccessListener(this, new OnSuccessListener<Void>() {
        @Override
        public void onSuccess(Void aVoid) {
            // Geofences added
            // ...
        }
    })
    .addOnFailureListener(this, new OnFailureListener() {
        @Override
        public void onFailure(@NonNull Exception e) {
            // Failed to add geofences
            // ...
        }
    });
```

<https://developer.android.com/training/location/geofencing>

GeofenceStatusCodes

public final class **GeofenceStatusCodes** extends [CommonStatusCodes](#)

Geofence specific status codes, for use in [Status.getStatusCode\(\)](#)

Constant Summary

int	GEOFENCE_INSUFFICIENT_LOCATION_PERMISSION	The client doesn't have sufficient location permission to perform geofencing operations.
int	GEOFENCE_NOT_AVAILABLE	Geofence service is not available now.
int	GEOFENCE_REQUEST_TOO_FREQUENT	Your app has been adding Geofences too frequently.
int	GEOFENCE_TOO_MANY_GEOFENCES	Your app has registered more than 100 geofences.
int	GEOFENCE_TOO_MANY_PENDING_INTENTS	You have provided more than 5 different PendingIntents to the GeofencingApi.addGeofences(GoogleApiClient, GeofencingRequest, PendingIntent) call.

<https://developers.google.com/android/reference/com/google/android/gms/location/GeofenceStatusCodes>

43. Samsung provides a mobile device, wherein the at least one module comprises instructions for: using the second perimeter definition in conjunction with the second particular associated identifier to establish the second particular designated geographic area of interest in the second request as an area reserved for second content related to the second particular application program and not an area reserved for second content related to other application programs, wherein the second content related to the second particular application program comprises the second particular associated identifier, including as demonstrated in the exemplary text and images below:

Create and monitor geofences

Geofencing combines awareness of the user's current location with awareness of the user's proximity to locations that may be of interest. To mark a location of interest, you specify its latitude and longitude. To adjust the proximity for the location, you add a radius. The latitude, longitude, and radius define a geofence, creating a circular area, or fence, around the location of interest.

You can have multiple active geofences, with a limit of 100 per app, per device user. For each geofence, you can ask Location Services to send you entrance and exit events, or you can specify a duration within the geofence area to wait, or *dwell*, before triggering an event. You can limit the duration of any geofence by specifying an expiration duration in milliseconds. After the geofence expires, Location Services automatically removes it.



This lesson shows you how to add and remove geofences, and then listen for geofence transitions using a `BroadcastReceiver`.

Create and add geofences

Your app needs to create and add geofences using the location API's builder class for creating Geofence objects, and the convenience class for adding them. Also, to handle the intents sent from Location Services when geofence transitions occur, you can define a `PendingIntent` as shown in this section.

★ **Note:** On single-user devices, there is a limit of 100 geofences per app. For multi-user devices, the limit is 100 geofences per app per device user.

Create geofence objects

First, use `Geofence.Builder` to create a geofence, setting the desired radius, duration, and transition types for the geofence. For example, to populate a list object:

Kotlin Java

```
geofenceList.add(new Geofence.Builder()
    // Set the request ID of the geofence. This is a string to identify this
    // geofence.
    .setRequestId(entry.getKey())

    .setCircularRegion(
        entry.getValue().latitude,
        entry.getValue().longitude,
        Constants.GEOFENCE_RADIUS_IN_METERS
    )
    .setExpirationDuration(Constants.GEOFENCE_EXPIRATION_IN_MILLISECONDS)
    .setTransitionTypes(Geofence.GEOFENCE_TRANSITION_ENTER |
        Geofence.GEOFENCE_TRANSITION_EXIT)
    .build());
```

This example pulls data from a constants file. In actual practice, apps might dynamically create geofences based on the user's location.

Specify geofences and initial triggers

The following snippet uses the `GeofencingRequest` class and its nested `GeofencingRequest.Builder` class to specify the geofences to monitor and to set how related geofence events are triggered:

Kotlin Java

```
private GeofencingRequest getGeofencingRequest() {
    GeofencingRequest.Builder builder = new GeofencingRequest.Builder();
    builder.setInitialTrigger(GeofencingRequest.INITIAL_TRIGGER_ENTER);
    builder.addGeofences(geofenceList);
    return builder.build();
}
```

This example shows the use of two geofence triggers. The `GEOFENCE_TRANSITION_ENTER` transition triggers when a device enters a geofence, and the `GEOFENCE_TRANSITION_EXIT` transition triggers when a device exits a geofence. Specifying `INITIAL_TRIGGER_ENTER` tells Location services that `GEOFENCE_TRANSITION_ENTER` should be triggered if the device is already inside the geofence.

In many cases, it may be preferable to use instead `INITIAL_TRIGGER_DWELL`, which triggers events only when the user stops for a defined duration within a geofence. This approach can help reduce "alert spam" resulting from large numbers notifications when a device briefly enters and exits geofences. Another strategy for getting best results from your geofences is to set a minimum radius of 100 meters. This helps account for the location accuracy of typical Wi-Fi networks, and also helps reduce device power consumption.

Add geofences

To add geofences, use the `GeofencingClient.addGeofences()` method. Provide the `GeofencingRequest` object, and the `PendingIntent`. The following snippet demonstrates processing the results:

Kotlin Java

```
geofencingClient.addGeofences(getGeofencingRequest(), getGeofencePendingIntent())
    .addOnSuccessListener(this, new OnSuccessListener<Void>() {
        @Override
        public void onSuccess(Void aVoid) {
            // Geofences added
            // ...
        }
    })
    .addOnFailureListener(this, new OnFailureListener() {
        @Override
        public void onFailure(@NonNull Exception e) {
            // Failed to add geofences
            // ...
        }
    });
```

<https://developer.android.com/training/location/geofencing>

44. Samsung provides a mobile device, wherein the at least one module comprises instructions for: storing, in the memory, in response to receiving the second request, after availability for the second particular designated geographic area of interest to be reserved for the second particular application program has been positively determined, an at least second record, for the second particular application program, associated with the second particular associated identifier and the second particular designated geographic area of interest, thereby designating the second particular application program as a second one of the one or more registered application programs on the mobile device, including as demonstrated in the exemplary text and images below:

SAMSUNG		Galaxy S10e S10 S10+ S10 5G	
		HIGHLIGHTS	SPECS
Memory	Galaxy S10e		
	• 6GB RAM with 128GB internal storage • 8GB RAM with 256GB internal storage		
	Galaxy S10+		
	• 8GB RAM with 128GB internal storage • 8GB RAM with 512GB internal storage (Only ceramic models) • 12GB RAM with 1TB internal storage (Only Performance Edition ceramic models)		
	Galaxy S10		
	• 8GB RAM with 128GB internal storage • 8GB RAM with 512GB internal storage		
	Galaxy S10 5G		
	• 8GB RAM with 256GB internal storage • 8GB RAM with 512GB internal storage		

<https://www.samsung.com/global/galaxy/galaxy-s10/specs/>

Add geofences

To add geofences, use the `GeofencingClient.addGeofences()` method. Provide the `GeofencingRequest` object, and the `PendingIntent`. The following snippet demonstrates processing the results:

Kotlin Java

```

geofencingClient.addGeofences(getGeofencingRequest(), getGeofencePendingIntent())
    .addOnSuccessListener(this, new OnSuccessListener<Void>() {
        @Override
        public void onSuccess(Void aVoid) {
            // Geofences added
            // ...
        }
    })
    .addOnFailureListener(this, new OnFailureListener() {
        @Override
        public void onFailure(@NonNull Exception e) {
            // Failed to add geofences
            // ...
        }
    });

```

<https://developer.android.com/training/location/geofencing>

GeofencingClient

public class **GeofencingClient** extends `GoogleApi<Api.ApiOptions.NoOptions>`

The main entry point for interacting with the geofencing APIs.

Get an instance of this client via `LocationServices.getGeofencingClient(Activity)`.

All methods are thread safe.

Public Method Summary

Task<Void>	<code>addGeofences(GeofencingRequest geofencingRequest, PendingIntent pendingIntent)</code> Sets alerts to be notified when the device enters or exits one of the specified geofences.
Task<Void>	<code>removeGeofences(List<String> geofenceRequestIds)</code> Removes geofences by their request IDs.
Task<Void>	<code>removeGeofences(PendingIntent pendingIntent)</code> Removes all geofences associated with the given <code>pendingIntent</code> .

```
public Task<Void> addGeofences (GeofencingRequest geofencingRequest, PendingIntent pendingIntent)
```

Sets alerts to be notified when the device enters or exits one of the specified geofences. If an existing geofence with the same request ID is already registered, the old geofence is replaced by the new one, and the new `PendingIntent` is used to generate intents for alerts.

`Task` is completed when geofences are successfully added or failed to be added. Upon failure, an `ApiException` will be set on the `Task`. Refer to `GeofenceStatusCodes` for possible errors when adding geofences.

When a geofence transition (for example, entering or exiting) matches one of the transition filter (see `Geofence.Builder.setTransitionTypes(int)`) in the given geofence list, an intent is generated using the given pending intent. You can call `GeofencingEvent.fromIntent(android.content.Intent)` to get the transition type, geofences that triggered this intent and the location that triggered the geofence transition.

In case network location provider is disabled by the user, the geofence service will stop updating, all registered geofences will be removed and an intent is generated by the provided pending intent. In this case, the `GeofencingEvent` created from this intent represents an error event, where `GeofencingEvent.hasError()` returns `true` and `GeofencingEvent.getErrorCode()` returns `GeofenceStatusCodes.GEOFENCE_NOT_AVAILABLE`.

This method requires `Manifest.permission.ACCESS_FINE_LOCATION`.

Parameters

<code>geofencingRequest</code>	geofencing request that include a list of geofences to be added and related triggering behavior. The request must be created using <code>GeofencingRequest.Builder</code> .
<code>pendingIntent</code>	a pending intent that will be used to generate an intent when matched geofence transition is observed

Throws

<code>SecurityException</code>	if the app does not have <code>Manifest.permission.ACCESS_FINE_LOCATION</code> permission
<code>NullPointerException</code>	if <code>geofencingRequest</code> or <code>pendingIntent</code> is null

<https://developers.google.com/android/reference/com/google/android/gms/location/GeofencingClient.html>

Handle geofence transitions

When Location Services detects that the user has entered or exited a geofence, it sends out the `Intent` contained in the `PendingIntent` you included in the request to add geofences. A broadcast receiver like `GeofenceBroadcastReceiver` notices that the `Intent` was invoked and can then obtain the geofencing event from the intent, determine the type of Geofence transition(s), and determine which of the defined geofences was triggered. The broadcast receiver can direct an app to start performing background work or, if desired, send a notification as output.

The following snippet shows how to define a `BroadcastReceiver` that posts a notification when a geofence transition occurs. When the user clicks the notification, the app's main activity appears:

```

Kotlin  Java
class GeofenceBroadcastReceiver : BroadcastReceiver() {
    // ...
    override fun onReceive(context: Context?, intent: Intent?) {
        val geofencingEvent = GeofencingEvent.fromIntent(intent)
        if (geofencingEvent.hasError()) {
            val errorMessage = GeofenceStatusCodes
                .getStatusCodeString(geofencingEvent.errorCode)
            Log.e(TAG, errorMessage)
            return
        }

        // Get the transition type.
        val geofenceTransition = geofencingEvent.geofenceTransition

        // Test that the reported transition was of interest.
        if (geofenceTransition == Geofence.GEOFENCE_TRANSITION_ENTER |
            geofenceTransition == Geofence.GEOFENCE_TRANSITION_EXIT) {

            // Get the geofences that were triggered. A single event can trigger
            // multiple geofences.
            val triggeringGeofences = geofencingEvent.triggeringGeofences

            // Get the transition details as a String.
            val geofenceTransitionDetails = getGeofenceTransitionDetails(
                this,
                geofenceTransition,
                triggeringGeofences
            )

            // Send notification and log the transition details.
            sendNotification(geofenceTransitionDetails)
            Log.i(TAG, geofenceTransitionDetails)
        } else {
            // Log the error.
            Log.e(TAG, getString(R.string.geofence_transition_invalid_type,
                geofenceTransition))
        }
    }
}

```

After detecting the transition event via the `PendingIntent`, the `BroadcastReceiver` gets the geofence transition type and tests whether it is one of the events the app uses to trigger notifications -- either `GEOFENCE_TRANSITION_ENTER` or `GEOFENCE_TRANSITION_EXIT` in this case. The service then sends a notification and logs the transition details.

<https://developer.android.com/training/location/geofencing>

45. Samsung provides a mobile device, wherein the at least one module comprises instructions for: selecting the first particular associated identifier associated with the at least first record stored in the memory to be provided for use by the first one of the one or more registered application programs on the mobile device after it is determined, by at least use of the at least one processor, of the location information, and of the first particular designated geographic area of interest associated with the at least first record stored in the memory for the first one of the one or more registered application programs on the mobile device, that the mobile device has at least entered the first particular designated geographic area of interest associated with the at least first record stored in the memory and has remained therein for at least a first designated length of time, including as demonstrated in the exemplary text and images below:

Create and monitor geofences

Geofencing combines awareness of the user's current location with awareness of the user's proximity to locations that may be of interest. To mark a location of interest, you specify its latitude and longitude. To adjust the proximity for the location, you add a radius. The latitude, longitude, and radius define a geofence, creating a circular area, or fence, around the location of interest.

You can have multiple active geofences, with a limit of 100 per app, per device user. For each geofence, you can ask Location Services to send you entrance and exit events, or you can specify a duration within the geofence area to wait, or *dwell*, before triggering an event. You can limit the duration of any geofence by specifying an expiration duration in milliseconds. After the geofence expires, Location Services automatically removes it.



This lesson shows you how to add and remove geofences, and then listen for geofence transitions using a `BroadcastReceiver`.

Define a broadcast receiver for geofence transitions

An `Intent` sent from Location Services can trigger various actions in your app, but you should *not* have it start an activity or fragment, because components should only become visible in response to a user action. In many cases, a `BroadcastReceiver` is a good way to handle a geofence transition. A `BroadcastReceiver` gets updates when an event occurs, such as a transition into or out of a geofence, and can start long-running background work.

The following snippet shows how to define a `PendingIntent` that starts a `BroadcastReceiver`:

Kotlin Java

```
public class MainActivity extends AppCompatActivity {

    // ...

    private PendingIntent getGeofencePendingIntent() {
        // Reuse the PendingIntent if we already have it.
        if (geofencePendingIntent != null) {
            return geofencePendingIntent;
        }
        Intent intent = new Intent(this, GeofenceBroadcastReceiver.class);
        // We use FLAG_UPDATE_CURRENT so that we get the same pending intent back when
        // calling addGeofences() and removeGeofences().
        geofencePendingIntent = PendingIntent.getBroadcast(this, 0, intent, PendingIntent.
            FLAG_UPDATE_CURRENT);
        return geofencePendingIntent;
    }
}
```

Handle geofence transitions

When Location Services detects that the user has entered or exited a geofence, it sends out the `Intent` contained in the `PendingIntent` you included in the request to add geofences. A broadcast receiver like `GeofenceBroadcastReceiver` notices that the `Intent` was invoked and can then obtain the geofencing event from the intent, determine the type of Geofence transition(s), and determine which of the defined geofences was triggered. The broadcast receiver can direct an app to start performing background work or, if desired, send a notification as output.

The following snippet shows how to define a `BroadcastReceiver` that posts a notification when a geofence transition occurs. When the user clicks the notification, the app's main activity appears:

```

Kotlin      Java
class GeofenceBroadcastReceiver : BroadcastReceiver() {
    // ...
    override fun onReceive(context: Context?, intent: Intent?) {
        val geofencingEvent = GeofencingEvent.fromIntent(intent)
        if (geofencingEvent.hasError()) {
            val errorMessage = GeofenceStatusCodes
                .getStatusCodeString(geofencingEvent.errorCode)
            Log.e(TAG, errorMessage)
            return
        }

        // Get the transition type.
        val geofenceTransition = geofencingEvent.geofenceTransition

        // Test that the reported transition was of interest.
        if (geofenceTransition == Geofence.GEOFENCE_TRANSITION_ENTER |
            geofenceTransition == Geofence.GEOFENCE_TRANSITION_EXIT) {

            // Get the geofences that were triggered. A single event can trigger
            // multiple geofences.
            val triggeringGeofences = geofencingEvent.triggeringGeofences

            // Get the transition details as a String.
            val geofenceTransitionDetails = getGeofenceTransitionDetails(
                this,
                geofenceTransition,
                triggeringGeofences
            )

            // Send notification and log the transition details.
            sendNotification(geofenceTransitionDetails)
            Log.i(TAG, geofenceTransitionDetails)
        } else {
            // Log the error.
            Log.e(TAG, getString(R.string.geofence_transition_invalid_type,
                geofenceTransition))
        }
    }
}

```

After detecting the transition event via the `PendingIntent`, the `BroadcastReceiver` gets the geofence transition type and tests whether it is one of the events the app uses to trigger notifications -- either `GEOFENCE_TRANSITION_ENTER` or `GEOFENCE_TRANSITION_EXIT` in this case. The service then sends a notification and logs the transition details.

Use the dwell transition type to reduce alert spam

If you receive a large number of alerts when driving briefly past a geofence, the best way to reduce the alerts is to use a transition type of `GEOFENCE_TRANSITION_DWELL` instead of `GEOFENCE_TRANSITION_ENTER`. This way, the dwelling alert is sent only when the user stops inside a geofence for a given period of time. You can choose the duration by setting a [loitering delay](#).

<https://developer.android.com/training/location/geofencing>

46. Samsung provides a mobile device, wherein the at least one module comprises instructions for: selecting the second particular associated identifier associated with the at least second record stored in the memory to be provided for use by the second one of the one or more registered application programs on the mobile device after it is determined, by at least use of the at least one processor, of the location information, and of the second particular designated geographic area of interest associated with the at least second record stored in the memory for the second one of the one or more registered application programs on the mobile device, that the mobile device has at least entered the second particular designated geographic area of interest associated with the at least second record stored in the memory and has remained therein for at least a second designated length of time, including as demonstrated in the exemplary text and images below:

Create and monitor geofences

Geofencing combines awareness of the user's current location with awareness of the user's proximity to locations that may be of interest. To mark a location of interest, you specify its latitude and longitude. To adjust the proximity for the location, you add a radius. The latitude, longitude, and radius define a geofence, creating a circular area, or fence, around the location of interest.

You can have multiple active geofences, with a limit of 100 per app, per device user. For each geofence, you can ask Location Services to send you entrance and exit events, or you can specify a duration within the geofence area to wait, or *dwell*, before triggering an event. You can limit the duration of any geofence by specifying an expiration duration in milliseconds. After the geofence expires, Location Services automatically removes it.



This lesson shows you how to add and remove geofences, and then listen for geofence transitions using a `BroadcastReceiver`.

Define a broadcast receiver for geofence transitions

An `Intent` sent from Location Services can trigger various actions in your app, but you should *not* have it start an activity or fragment, because components should only become visible in response to a user action. In many cases, a `BroadcastReceiver` is a good way to handle a geofence transition. A `BroadcastReceiver` gets updates when an event occurs, such as a transition into or out of a geofence, and can start long-running background work.

The following snippet shows how to define a `PendingIntent` that starts a `BroadcastReceiver`:

Kotlin Java

```
public class MainActivity extends AppCompatActivity {

    // ...

    private PendingIntent getGeofencePendingIntent() {
        // Reuse the PendingIntent if we already have it.
        if (geofencePendingIntent != null) {
            return geofencePendingIntent;
        }
        Intent intent = new Intent(this, GeofenceBroadcastReceiver.class);
        // We use FLAG_UPDATE_CURRENT so that we get the same pending intent back when
        // calling addGeofences() and removeGeofences().
        geofencePendingIntent = PendingIntent.getBroadcast(this, 0, intent, PendingIntent.
            FLAG_UPDATE_CURRENT);
        return geofencePendingIntent;
    }
}
```

Handle geofence transitions

When Location Services detects that the user has entered or exited a geofence, it sends out the `Intent` contained in the `PendingIntent` you included in the request to add geofences. A broadcast receiver like `GeofenceBroadcastReceiver` notices that the `Intent` was invoked and can then obtain the geofencing event from the intent, determine the type of Geofence transition(s), and determine which of the defined geofences was triggered. The broadcast receiver can direct an app to start performing background work or, if desired, send a notification as output.

The following snippet shows how to define a `BroadcastReceiver` that posts a notification when a geofence transition occurs. When the user clicks the notification, the app's main activity appears:

```

Kotlin  Java

class GeofenceBroadcastReceiver : BroadcastReceiver() {
    // ...
    override fun onReceive(context: Context?, intent: Intent?) {
        val geofencingEvent = GeofencingEvent.fromIntent(intent)
        if (geofencingEvent.hasError()) {
            val errorMessage = GeofenceStatusCodes
                .getStatusCodeString(geofencingEvent.errorCode)
            Log.e(TAG, errorMessage)
            return
        }

        // Get the transition type.
        val geofenceTransition = geofencingEvent.geofenceTransition

        // Test that the reported transition was of interest.
        if (geofenceTransition == Geofence.GEOFENCE_TRANSITION_ENTER |
            geofenceTransition == Geofence.GEOFENCE_TRANSITION_EXIT) {

            // Get the geofences that were triggered. A single event can trigger
            // multiple geofences.
            val triggeringGeofences = geofencingEvent.triggeringGeofences

            // Get the transition details as a String.
            val geofenceTransitionDetails = getGeofenceTransitionDetails(
                this,
                geofenceTransition,
                triggeringGeofences
            )

            // Send notification and log the transition details.
            sendNotification(geofenceTransitionDetails)
            Log.i(TAG, geofenceTransitionDetails)
        } else {
            // Log the error.
            Log.e(TAG, getString(R.string.geofence_transition_invalid_type,
                geofenceTransition))
        }
    }
}

```

After detecting the transition event via the `PendingIntent`, the `BroadcastReceiver` gets the geofence transition type and tests whether it is one of the events the app uses to trigger notifications -- either `GEOFENCE_TRANSITION_ENTER` or `GEOFENCE_TRANSITION_EXIT` in this case. The service then sends a notification and logs the transition details.

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If you receive a large number of alerts when driving briefly past a geofence, the best way to reduce the alerts is to use a transition type of `GEOFENCE_TRANSITION_DWELL` instead of `GEOFENCE_TRANSITION_ENTER`. This way, the dwelling alert is sent only when the user stops inside a geofence for a given period of time. You can choose the duration by setting a `loitering delay`.

<https://developer.android.com/training/location/geofencing>

47. Samsung provides a mobile device, wherein the at least one module comprises instructions for: providing, to the first one of the one or more registered application programs on the mobile device, at least the first particular associated identifier from its selecting in response to receiving, from the first one of the one or more registered application programs on the mobile device, a request to receive content, including as demonstrated in the exemplary text and images below:

Define a broadcast receiver for geofence transitions

An `Intent` sent from Location Services can trigger various actions in your app, but you should *not* have it start an activity or fragment, because components should only become visible in response to a user action. In many cases, a `BroadcastReceiver` is a good way to handle a geofence transition. A `BroadcastReceiver` gets updates when an event occurs, such as a transition into or out of a geofence, and can start long-running background work.

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        }
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        // We use FLAG_UPDATE_CURRENT so that we get the same pending intent back when
        // calling addGeofences() and removeGeofences().
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Handle geofence transitions

When Location Services detects that the user has entered or exited a geofence, it sends out the `Intent` contained in the `PendingIntent` you included in the request to add geofences. A broadcast receiver like `GeofenceBroadcastReceiver` notices that the `Intent` was invoked and can then obtain the geofencing event from the intent, determine the type of Geofence transition(s), and determine which of the defined geofences was triggered. The broadcast receiver can direct an app to start performing background work or, if desired, send a notification as output.

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                .getStatusCodeString(geofencingEvent.errorCode)
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        }

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        // Test that the reported transition was of interest.
        if (geofenceTransition == Geofence.GEOFENCE_TRANSITION_ENTER |
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            // multiple geofences.
            val triggeringGeofences = geofencingEvent.triggeringGeofences

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            val geofenceTransitionDetails = getGeofenceTransitionDetails(
                this,
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            sendNotification(geofenceTransitionDetails)
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        } else {
            // Log the error.
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                geofenceTransition))
        }
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}

```

After detecting the transition event via the `PendingIntent`, the `BroadcastReceiver` gets the geofence transition type and tests whether it is one of the events the app uses to trigger notifications -- either `GEOFENCE_TRANSITION_ENTER` or `GEOFENCE_TRANSITION_EXIT` in this case. The service then sends a notification and logs the transition details.

<https://developer.android.com/training/location/geofencing>

48. Samsung provides a mobile device, wherein the at least one module comprises instructions for: providing, to the second one of the one or more registered application programs on the mobile device, at least the second particular associated identifier from its selecting in response to receiving, from the second one of the one or more registered application programs on the mobile device, a request to receive content, including as demonstrated in the exemplary text and images below:

Define a broadcast receiver for geofence transitions

An `Intent` sent from Location Services can trigger various actions in your app, but you should *not* have it start an activity or fragment, because components should only become visible in response to a user action. In many cases, a `BroadcastReceiver` is a good way to handle a geofence transition. A `BroadcastReceiver` gets updates when an event occurs, such as a transition into or out of a geofence, and can start long-running background work.

The following snippet shows how to define a `PendingIntent` that starts a `BroadcastReceiver`:

Kotlin Java

```
public class MainActivity extends AppCompatActivity {

    // ...

    private PendingIntent getGeofencePendingIntent() {
        // Reuse the PendingIntent if we already have it.
        if (geofencePendingIntent != null) {
            return geofencePendingIntent;
        }
        Intent intent = new Intent(this, GeofenceBroadcastReceiver.class);
        // We use FLAG_UPDATE_CURRENT so that we get the same pending intent back when
        // calling addGeofences() and removeGeofences().
        geofencePendingIntent = PendingIntent.getBroadcast(this, 0, intent, PendingIntent.
            FLAG_UPDATE_CURRENT);
        return geofencePendingIntent;
    }
}
```

Handle geofence transitions

When Location Services detects that the user has entered or exited a geofence, it sends out the `Intent` contained in the `PendingIntent` you included in the request to add geofences. A broadcast receiver like `GeofenceBroadcastReceiver` notices that the `Intent` was invoked and can then obtain the geofencing event from the intent, determine the type of Geofence transition(s), and determine which of the defined geofences was triggered. The broadcast receiver can direct an app to start performing background work or, if desired, send a notification as output.

The following snippet shows how to define a `BroadcastReceiver` that posts a notification when a geofence transition occurs. When the user clicks the notification, the app's main activity appears:

Kotlin

Java

```
class GeofenceBroadcastReceiver : BroadcastReceiver() {
    // ...
    override fun onReceive(context: Context?, intent: Intent?) {
        val geofencingEvent = GeofencingEvent.fromIntent(intent)
        if (geofencingEvent.hasError()) {
            val errorMessage = GeofenceStatusCodes
                .getStatusCodeString(geofencingEvent.errorCode)
            Log.e(TAG, errorMessage)
            return
        }

        // Get the transition type.
        val geofenceTransition = geofencingEvent.geofenceTransition

        // Test that the reported transition was of interest.
        if (geofenceTransition == Geofence.GEOFENCE_TRANSITION_ENTER |
            geofenceTransition == Geofence.GEOFENCE_TRANSITION_EXIT) {

            // Get the geofences that were triggered. A single event can trigger
            // multiple geofences.
            val triggeringGeofences = geofencingEvent.triggeringGeofences

            // Get the transition details as a String.
            val geofenceTransitionDetails = getGeofenceTransitionDetails(
                this,
                geofenceTransition,
                triggeringGeofences
            )

            // Send notification and log the transition details.
            sendNotification(geofenceTransitionDetails)
            Log.i(TAG, geofenceTransitionDetails)
        } else {
            // Log the error.
            Log.e(TAG, getString(R.string.geofence_transition_invalid_type,
                geofenceTransition))
        }
    }
}
```

After detecting the transition event via the `PendingIntent`, the `BroadcastReceiver` gets the geofence transition type and tests whether it is one of the events the app uses to trigger notifications -- either `GEOFENCE_TRANSITION_ENTER` or `GEOFENCE_TRANSITION_EXIT` in this case. The service then sends a notification and logs the transition details.

<https://developer.android.com/training/location/geofencing>

49. By engaging in the conduct described herein, Samsung has injured Plaintiffs and is thus liable for infringement of the '418 Patent, pursuant to 35 U.S.C. § 271. Samsung has committed these acts of infringement without license or authorization.

50. As a result of Samsung's infringement of the '418 Patent, Plaintiffs have suffered monetary damages and are entitled to a monetary judgment in an amount adequate to compensate for Samsung's past infringement, together with interests and costs. In addition, Samsung's infringement is causing irreparable harm and monetary damage to Plaintiffs and will continue to do so unless and until Samsung is enjoined by the Court.

COUNT II: CLAIM FOR PATENT INFRINGEMENT OF THE '387 PATENT

51. Plaintiffs repeat and reallege the allegations in paragraphs 1-50 as if fully set forth herein.

52. Samsung has infringed, contributed to the infringement of, and/or induced infringement of the '387 Patent by making, using, selling, offering for sale, or importing into the United States, or by intending that others make, use, import into, offer for sale, or sell in the United States, products and/or methods covered by one or more claims of the '387 Patent including, but not limited to, mobile devices and components thereof.

53. Upon information and belief, Samsung's mobile devices, including smartphones, tablets, and watches, that infringe one or more claims of the '387 Patent include at least the following products, as well as products with reasonably similar functionality:

- Galaxy S series, Galaxy Note series, Galaxy Z Flip series, Galaxy Fold series, and Galaxy A series smartphones;

- Galaxy Tab S series, Galaxy Tab A series, and Galaxy Book S series tablets; and
- Galaxy Watch 3 series, Galaxy Watch 3 Titanium series, Galaxy Watch Active2 series, Galaxy Watch Active series, Galaxy Watch series, and Galaxy Fit2 series watches.

Upon information and belief, these products are offered in several varieties, including different options for size, display, processor, storage, and battery. The products listed are exemplary, and Plaintiffs will be able to provide a more comprehensive list after discovery. Upon information and belief, Samsung also infringes one or more claims of the '387 Patent through its use of geofencing or location information in its advertising or content delivery efforts or its own applications it develops.

54. For example, upon information and belief, Samsung's mobile devices infringe at least claim 1 of the '387 Patent. Samsung makes, uses, sells, offers for sale, imports, exports, supplies, or distributes within the United States its mobile devices and thus directly infringes the '387 Patent.

55. Samsung indirectly infringes the '387 Patent as provided by 35 U.S.C. § 271(b) by inducing infringement by others, such as manufacturers, resellers and end-user customers in this District and throughout the United States. For example, direct infringement is the result of activities performed by manufacturers, resellers, or operators/carriers of Samsung's mobile devices, who, upon information and belief, perform each step of the claimed invention as directed by Samsung. Samsung received actual notice of the '387 Patent at least as early as the filing of this Complaint.

56. Upon information and belief, Samsung's affirmative acts of selling Samsung's mobile devices, causing Samsung's mobile devices to be manufactured, and providing directions, instructions, schematics, diagrams, or designs to its manufacturers, resellers, or operators/carriers to make or use Samsung's mobile devices in a manner that directly infringes the '387 Patent induce infringement by others, such as manufacturers, resellers, or operators/carriers in this District and throughout the United States. Upon information and belief, through its manufacture and sales of Samsung's mobile devices, Samsung performed the acts that constitute induced infringement with knowledge or willful blindness that the induced acts would constitute infringement.

57. Samsung also indirectly infringes the '387 Patent by contributing to infringement by others, such as manufacturers, resellers, and operators/carriers, in accordance with 35 U.S.C. § 271(c) in this District and throughout the United States. Upon information and belief, direct infringement is the result of activities performed by manufacturers, resellers, or operators/carriers of Samsung's mobile devices.

58. Upon information and belief, Samsung's affirmative acts of selling Samsung's mobile devices and causing Samsung's mobile devices to be manufactured and sold contribute to Samsung's manufacturers, resellers, and operators/carriers making or using Samsung's mobile devices in a normal and customary way that infringes the '387 Patent. Upon information and belief, Samsung's mobile devices constitute the material part of Plaintiffs' patented invention, have no substantial non-infringing uses, and are known by Samsung to be especially made or especially adapted for use to infringe the '387 Patent.

59. Samsung provides a mobile device comprising: memory, at least one processor operably coupled to the memory, a location-determination component, and at least one module

configured for execution by the at least one processor, including as demonstrated in the exemplary text and images below:

SAMSUNG Mobile TV & Audio Home Appliances Smart Home Computing Offers Collections Explore Support Business

Home / Phones / All Phones



Galaxy S
Starting from \$99.99[®]



Galaxy Note
Starting from \$499.99[®]



Galaxy Z Fold
Starting from \$1449.99[®]



Galaxy Z Flip
Starting from \$649.99[®]

<https://www.samsung.com/us/>

SAMSUNG Galaxy S10e | S10 | S10+ | S10 5G

HIGHLIGHTS **SPECS** COMPARE

Memory

Galaxy S10e

- 6GB RAM with 128GB internal storage
- 8GB RAM with 256GB internal storage

Galaxy S10

- 8GB RAM with 128GB internal storage
- 8GB RAM with 512GB internal storage

Galaxy S10+

- 8GB RAM with 128GB internal storage
- 8GB RAM with 512GB internal storage (Only ceramic models)
- 12GB RAM with 1TB internal storage (Only Performance Edition ceramic models)

Galaxy S10 5G

- 8GB RAM with 256GB internal storage
- 8GB RAM with 512GB internal storage

SAMSUNG Galaxy S10e | S10 | S10+ | S10 5G

HIGHLIGHTS **SPECS** COMPARE

AP

8nm 64-bit Octa-Core Processor ※ 2.73GHz (Maximum Clock Speed) + 2.31GHz + 1.95GHz
7nm 64-bit Octa-Core Processor ※ 2.84GHz (Maximum Clock Speed) + 2.41GHz + 1.78GHz

*May differ by country and carrier.

SAMSUNG Galaxy S10e | S10 | S10+ | S10 5G

HIGHLIGHTS **SPECS** COMPARE

OS

Android 9 (Pie)

SAMSUNG

Galaxy S10e | S10 | S10+ | S10 5G

HIGHLIGHTS | **SPECS** | COMPARE

Network & Connectivity

Enhanced 4x4 MIMO, Up to 7CA, LAA, LTE Cat.20
Up to 2.0Gbps Download / Up to 150Mbps Upload

5G Non-Standalone (NSA), Sub6 / mmWave (Galaxy S10 5G only)

Wi-Fi 802.11 a/b/g/n/ac/ax (2.4/5GHz), VHT80 MU-MIMO, 1024QAM
Up to 1.2Gbps Download / Up to 1.2Gbps Upload

Bluetooth® v 5.0 (LE up to 2Mbps), ANT+, USB type-C, NFC, Location (GPS, Galileo, Glonass, BeiDou)

*Actual speed may vary depending on country, carrier, and user environment.
*Depending on country or carrier, 5G connectivity may use Sub6 only, mmWave only, or Sub6 and mmWave together.
*Galileo and BeiDou coverage may be limited. BeiDou may not be available for certain countries.

SAMSUNG

Galaxy S10e | S10 | S10+ | S10 5G

HIGHLIGHTS | **SPECS** | COMPARE

[Bixby](#)

Bixby Routines

Bixby

Bixby Vision

Apps Mode

- Home décor
- Makeup & Hair Dyeing
- Styling

Lens Mode

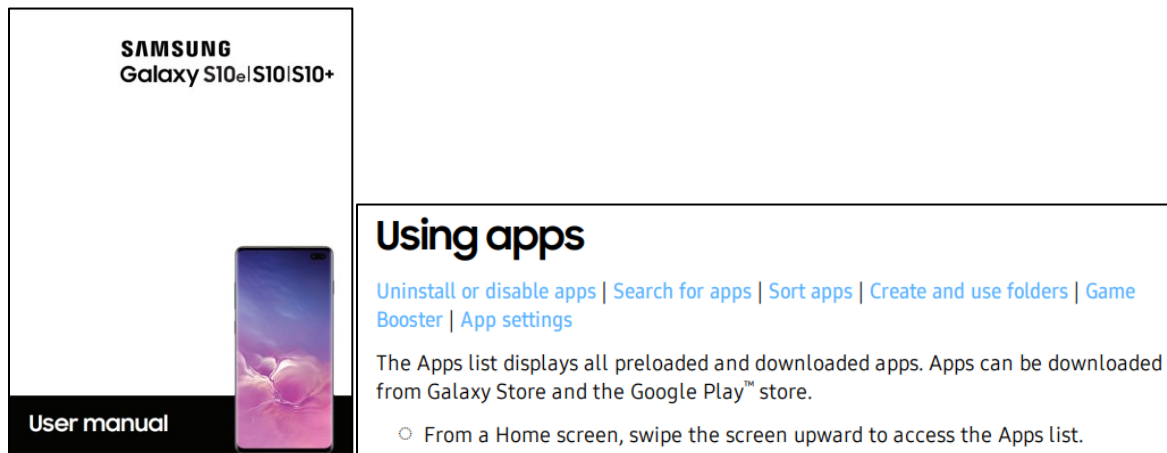
- Image
- Shopping
- Translation
- Place

- Picture play
- 3rd party Downloads
- Food
- Wine
- Book
- QR Code

<https://www.samsung.com/global/galaxy/galaxy-s10/specs/>

60. Samsung provides a mobile device, wherein the at least one module comprises at least one instruction for: receiving, from an application program during its execution in the mobile device, one or more requests to reserve at least one selected geographic area of interest, wherein the at least one selected geographic area of interest in each of the one or more requests is being requested via said application program to be reserved for having a particular identifier associated with the at least one selected geographic area of interest provided to said application program after

it has been determined, by at least use of the at least one processor and of location information representing at least one physical geographic location of the mobile device as determined by the location-determination component, that the mobile device has at least entered the at least one selected geographic area of interest, and wherein each of the one or more requests comprises data representing a) said particular identifier, represented by a data string, as content provided via said application program to be associated with the at least one selected geographic area of interest, b) at least one latitude value, at least one longitude value, and at least one radius value, each being provided via said application program, to be used for establishing a perimeter boundary for the at least one selected geographic area of interest, and c) information specifying at least one area bound by the perimeter boundary as the at least one selected geographic area of interest, including as demonstrated in the exemplary text and images below:



https://downloadcenter.samsung.com/content/UM/202103/20210304004310357/ATT_SM-G970U_G973U_G975U_EN_UM_R_11.0_022221_FINAL.pdf

Create and monitor geofences

Geofencing combines awareness of the user's current location with awareness of the user's proximity to locations that may be of interest. To mark a location of interest, you specify its latitude and longitude. To adjust the proximity for the location, you add a radius. The latitude, longitude, and radius define a geofence, creating a circular area, or fence, around the location of interest.

You can have multiple active geofences, with a limit of 100 per app, per device user. For each geofence, you can ask Location Services to send you entrance and exit events, or you can specify a duration within the geofence area to wait, or *dwell* , before triggering an event. You can limit the duration of any geofence by specifying an expiration duration in milliseconds. After the geofence expires, Location Services automatically removes it.



This lesson shows you how to add and remove geofences, and then listen for geofence transitions using a `BroadcastReceiver`.

Set up for geofence monitoring

The first step in requesting geofence monitoring is to request the necessary permissions. To use geofencing, your app must request the following:

- `ACCESS_FINE_LOCATION`
- `ACCESS_BACKGROUND_LOCATION` if your app targets Android 10 (API level 29) or higher

To learn more, see the guide on how to [request location permissions](#).

If you want to use a `BroadcastReceiver` to listen for geofence transitions, add an element specifying the service name. This element must be a child of the `<application>` element:

```
<application
  android:allowBackup="true">
  ...
  <receiver android:name=".GeofenceBroadcastReceiver"/>
</application>
```

If you want to use a `BroadcastReceiver` to listen for geofence transitions, add an element specifying the service name. This element must be a child of the `<application>` element:

```
<application
  android:allowBackup="true">
  ...
  <receiver android:name=".GeofenceBroadcastReceiver"/>
</application>
```

To access the location APIs, you need to create an instance of the Geofencing client. To learn how to connect your client:

Kotlin Java

```
lateinit var geofencingClient: GeofencingClient

override fun onCreate(savedInstanceState: Bundle?) {
    // ...
    geofencingClient = LocationServices.getGeofencingClient(this)
}
```

Create and add geofences

Your app needs to create and add geofences using the location API's builder class for creating Geofence objects, and the convenience class for adding them. Also, to handle the intents sent from Location Services when geofence transitions occur, you can define a `PendingIntent` as shown in this section.

★ **Note:** On single-user devices, there is a limit of 100 geofences per app. For multi-user devices, the limit is 100 geofences per app per device user.

Create geofence objects

First, use `Geofence.Builder` to create a geofence, setting the desired radius, duration, and transition types for the geofence. For example, to populate a list object:

Kotlin Java

```
geofenceList.add(new Geofence.Builder()
    // Set the request ID of the geofence. This is a string to identify this
    // geofence.
    .setRequestId(entry.getKey())

    .setCircularRegion(
        entry.getValue().latitude,
        entry.getValue().longitude,
        Constants.GEOFENCE_RADIUS_IN_METERS
    )
    .setExpirationDuration(Constants.GEOFENCE_EXPIRATION_IN_MILLISECONDS)
    .setTransitionTypes(Geofence.GEOFENCE_TRANSITION_ENTER |
        Geofence.GEOFENCE_TRANSITION_EXIT)
    .build());
```

This example pulls data from a constants file. In actual practice, apps might dynamically create geofences based on the user's location.

Specify geofences and initial triggers

The following snippet uses the `GeofencingRequest` class and its nested `GeofencingRequest.Builder` class to specify the geofences to monitor and to set how related geofence events are triggered:

Kotlin Java

```
private GeofencingRequest getGeofencingRequest() {  
    GeofencingRequest.Builder builder = new GeofencingRequest.Builder();  
    builder.setInitialTrigger(GeofencingRequest.INITIAL_TRIGGER_ENTER);  
    builder.addGeofences(geofenceList);  
    return builder.build();  
}
```

This example shows the use of two geofence triggers. The `GEOFENCE_TRANSITION_ENTER` transition triggers when a device enters a geofence, and the `GEOFENCE_TRANSITION_EXIT` transition triggers when a device exits a geofence. Specifying `INITIAL_TRIGGER_ENTER` tells Location services that `GEOFENCE_TRANSITION_ENTER` should be triggered if the device is already inside the geofence.

In many cases, it may be preferable to use instead `INITIAL_TRIGGER_DWELL`, which triggers events only when the user stops for a defined duration within a geofence. This approach can help reduce "alert spam" resulting from large numbers notifications when a device briefly enters and exits geofences. Another strategy for getting best results from your geofences is to set a minimum radius of 100 meters. This helps account for the location accuracy of typical Wi-Fi networks, and also helps reduce device power consumption.

Define a broadcast receiver for geofence transitions

An `Intent` sent from Location Services can trigger various actions in your app, but you should *not* have it start an activity or fragment, because components should only become visible in response to a user action. In many cases, a `BroadcastReceiver` is a good way to handle a geofence transition. A `BroadcastReceiver` gets updates when an event occurs, such as a transition into or out of a geofence, and can start long-running background work.

The following snippet shows how to define a `PendingIntent` that starts a `BroadcastReceiver`:

```
Kotlin  Java

public class MainActivity extends AppCompatActivity {

    // ...

    private PendingIntent getGeofencePendingIntent() {
        // Reuse the PendingIntent if we already have it.
        if (geofencePendingIntent != null) {
            return geofencePendingIntent;
        }
        Intent intent = new Intent(this, GeofenceBroadcastReceiver.class);
        // We use FLAG_UPDATE_CURRENT so that we get the same pending intent back when
        // calling addGeofences() and removeGeofences().
        geofencePendingIntent = PendingIntent.getBroadcast(this, 0, intent, PendingIntent.
            FLAG_UPDATE_CURRENT);
        return geofencePendingIntent;
    }
}
```

Add geofences

To add geofences, use the `GeofencingClient.addGeofences()` method. Provide the `GeofencingRequest` object, and the `PendingIntent`. The following snippet demonstrates processing the results:

Kotlin Java

```

geofencingClient.addGeofences(getGeofencingRequest(), getGeofencePendingIntent())
    .addOnSuccessListener(this, new OnSuccessListener<Void>() {
        @Override
        public void onSuccess(Void aVoid) {
            // Geofences added
            // ...
        }
    })
    .addOnFailureListener(this, new OnFailureListener() {
        @Override
        public void onFailure(@NonNull Exception e) {
            // Failed to add geofences
            // ...
        }
    });

```

<https://developer.android.com/training/location/geofencing>

61. Samsung provides a mobile device, wherein the at least one module comprises at least one instruction for: registering said application program, in the memory, for having said particular identifier provided to said application program after it has been determined, by at least use of the at least one processor and of the location information, that the mobile device has at least entered the at least one selected geographic area of interest, including as demonstrated in the exemplary text and images below:

Create and monitor geofences

Geofencing combines awareness of the user's current location with awareness of the user's proximity to locations that may be of interest. To mark a location of interest, you specify its latitude and longitude. To adjust the proximity for the location, you add a radius. The latitude, longitude, and radius define a geofence, creating a circular area, or fence, around the location of interest.

You can have multiple active geofences, with a limit of 100 per app, per device user. For each geofence, you can ask Location Services to send you entrance and exit events, or you can specify a duration within the geofence area to wait, or *dwell* , before triggering an event. You can limit the duration of any geofence by specifying an expiration duration in milliseconds. After the geofence expires, Location Services automatically removes it.



This lesson shows you how to add and remove geofences, and then listen for geofence transitions using a `BroadcastReceiver`.

Create and add geofences

Your app needs to create and add geofences using the location API's builder class for creating Geofence objects, and the convenience class for adding them. Also, to handle the intents sent from Location Services when geofence transitions occur, you can define a `PendingIntent` as shown in this section.

★ **Note:** On single-user devices, there is a limit of 100 geofences per app. For multi-user devices, the limit is 100 geofences per app per device user.

Create geofence objects

First, use `Geofence.Builder` to create a geofence, setting the desired radius, duration, and transition types for the geofence. For example, to populate a list object:

Kotlin Java

```
geofenceList.add(new Geofence.Builder()
    // Set the request ID of the geofence. This is a string to identify this
    // geofence.
    .setRequestId(entry.getKey())

    .setCircularRegion(
        entry.getValue().latitude,
        entry.getValue().longitude,
        Constants.GEOFENCE_RADIUS_IN_METERS
    )
    .setExpirationDuration(Constants.GEOFENCE_EXPIRATION_IN_MILLISECONDS)
    .setTransitionTypes(Geofence.GEOFENCE_TRANSITION_ENTER |
        Geofence.GEOFENCE_TRANSITION_EXIT)
    .build());
```

This example pulls data from a constants file. In actual practice, apps might dynamically create geofences based on the user's location.

Specify geofences and initial triggers

The following snippet uses the `GeofencingRequest` class and its nested `GeofencingRequest.Builder` class to specify the geofences to monitor and to set how related geofence events are triggered:

```
Kotlin  Java
private GeofencingRequest getGeofencingRequest() {
    GeofencingRequest.Builder builder = new GeofencingRequest.Builder();
    builder.setInitialTrigger(GeofencingRequest.INITIAL_TRIGGER_ENTER);
    builder.addGeofences(geofenceList);
    return builder.build();
}
```

This example shows the use of two geofence triggers. The `GEOFENCE_TRANSITION_ENTER` transition triggers when a device enters a geofence, and the `GEOFENCE_TRANSITION_EXIT` transition triggers when a device exits a geofence. Specifying `INITIAL_TRIGGER_ENTER` tells Location services that `GEOFENCE_TRANSITION_ENTER` should be triggered if the device is already inside the geofence.

In many cases, it may be preferable to use instead `INITIAL_TRIGGER_DWELL`, which triggers events only when the user stops for a defined duration within a geofence. This approach can help reduce "alert spam" resulting from large numbers notifications when a device briefly enters and exits geofences. Another strategy for getting best results from your geofences is to set a minimum radius of 100 meters. This helps account for the location accuracy of typical Wi-Fi networks, and also helps reduce device power consumption.

Add geofences

To add geofences, use the `GeofencingClient.addGeofences()` method. Provide the `GeofencingRequest` object, and the `PendingIntent`. The following snippet demonstrates processing the results:

Kotlin **Java**

```
geofencingClient.addGeofences(getGeofencingRequest(), getGeofencePendingIntent())
    .addOnSuccessListener(this, new OnSuccessListener<Void>() {
        @Override
        public void onSuccess(Void aVoid) {
            // Geofences added
            // ...
        }
    })
    .addOnFailureListener(this, new OnFailureListener() {
        @Override
        public void onFailure(@NonNull Exception e) {
            // Failed to add geofences
            // ...
        }
    });
```

<https://developer.android.com/training/location/geofencing>

62. Samsung provides a mobile device, wherein the at least one module comprises at least one instruction for: storing, in the memory, at least one record, for said application program, associated with said particular identifier and the at least one selected geographic area of interest, including as demonstrated in the exemplary text and images below:

SAMSUNG		Galaxy S10e S10 S10+ S10 5G	
		HIGHLIGHTS	SPECS
Memory	Galaxy S10e	COMPARISON	
	6GB RAM with 128GB internal storage 8GB RAM with 256GB internal storage		
	Galaxy S10+		
	8GB RAM with 128GB internal storage 8GB RAM with 512GB internal storage (Only ceramic models) 12GB RAM with 1TB internal storage (Only Performance Edition ceramic models)		
		Galaxy S10	
		8GB RAM with 128GB internal storage 8GB RAM with 512GB internal storage	
		Galaxy S10 5G	
		8GB RAM with 256GB internal storage 8GB RAM with 512GB internal storage	

<https://www.samsung.com/global/galaxy/galaxy-s10/specs/>

Add geofences

To add geofences, use the `GeofencingClient.addGeofences()` method. Provide the `GeofencingRequest` object, and the `PendingIntent`. The following snippet demonstrates processing the results:

Kotlin Java

```
geofencingClient.addGeofences(getGeofencingRequest(), getGeofencePendingIntent())
    .addOnSuccessListener(this, new OnSuccessListener<Void>() {
        @Override
        public void onSuccess(Void aVoid) {
            // Geofences added
            // ...
        }
    })
    .addOnFailureListener(this, new OnFailureListener() {
        @Override
        public void onFailure(@NonNull Exception e) {
            // Failed to add geofences
            // ...
        }
    });
```

<https://developer.android.com/training/location/geofencing>

GeofencingClient

public class **GeofencingClient** extends `GoogleApi<Api.ApiOptions.NoOptions>`

The main entry point for interacting with the geofencing APIs.

Get an instance of this client via `LocationServices.getGeofencingClient(Activity)`.

All methods are thread safe.

Public Method Summary

Task<Void>	<code>addGeofences(GeofencingRequest geofencingRequest, PendingIntent pendingIntent)</code> Sets alerts to be notified when the device enters or exits one of the specified geofences.
Task<Void>	<code>removeGeofences(List<String> geofenceRequestIds)</code> Removes geofences by their request IDs.
Task<Void>	<code>removeGeofences(PendingIntent pendingIntent)</code> Removes all geofences associated with the given <code>pendingIntent</code> .

```
public Task<Void> addGeofences (GeofencingRequest geofencingRequest, PendingIntent pendingIntent)
```

Sets alerts to be notified when the device enters or exits one of the specified geofences. If an existing geofence with the same request ID is already registered, the old geofence is replaced by the new one, and the new `PendingIntent` is used to generate intents for alerts.

`Task` is completed when geofences are successfully added or failed to be added. Upon failure, an `ApiException` will be set on the `Task`. Refer to `GeofenceStatusCodes` for possible errors when adding geofences.

When a geofence transition (for example, entering or exiting) matches one of the transition filter (see `Geofence.Builder.setTransitionTypes(int)`) in the given geofence list, an intent is generated using the given pending intent. You can call `GeofencingEvent.fromIntent(android.content.Intent)` to get the transition type, geofences that triggered this intent and the location that triggered the geofence transition.

In case network location provider is disabled by the user, the geofence service will stop updating, all registered geofences will be removed and an intent is generated by the provided pending intent. In this case, the `GeofencingEvent` created from this intent represents an error event, where `GeofencingEvent.hasError()` returns `true` and `GeofencingEvent.getErrorCode()` returns `GeofenceStatusCodes.GEOFENCE_NOT_AVAILABLE`.

This method requires `Manifest.permission.ACCESS_FINE_LOCATION`.

Parameters

<code>geofencingRequest</code>	geofencing request that include a list of geofences to be added and related triggering behavior. The request must be created using <code>GeofencingRequest.Builder</code> .
<code>pendingIntent</code>	a pending intent that will be used to generate an intent when matched geofence transition is observed

Throws

<code>SecurityException</code>	if the app does not have <code>Manifest.permission.ACCESS_FINE_LOCATION</code> permission
<code>NullPointerException</code>	if <code>geofencingRequest</code> or <code>pendingIntent</code> is null

<https://developers.google.com/android/reference/com/google/android/gms/location/GeofencingClient.html>

Handle geofence transitions

When Location Services detects that the user has entered or exited a geofence, it sends out the `Intent` contained in the `PendingIntent` you included in the request to add geofences. A broadcast receiver like `GeofenceBroadcastReceiver` notices that the `Intent` was invoked and can then obtain the geofencing event from the intent, determine the type of Geofence transition(s), and determine which of the defined geofences was triggered. The broadcast receiver can direct an app to start performing background work or, if desired, send a notification as output.

The following snippet shows how to define a `BroadcastReceiver` that posts a notification when a geofence transition occurs. When the user clicks the notification, the app's main activity appears:

```

Kotlin  Java

class GeofenceBroadcastReceiver : BroadcastReceiver() {
    // ...
    override fun onReceive(context: Context?, intent: Intent?) {
        val geofencingEvent = GeofencingEvent.fromIntent(intent)
        if (geofencingEvent.hasError()) {
            val errorMessage = GeofenceStatusCodes
                .getStatusCodeString(geofencingEvent.errorCode)
            Log.e(TAG, errorMessage)
            return
        }

        // Get the transition type.
        val geofenceTransition = geofencingEvent.geofenceTransition

        // Test that the reported transition was of interest.
        if (geofenceTransition == Geofence.GEOFENCE_TRANSITION_ENTER |
            geofenceTransition == Geofence.GEOFENCE_TRANSITION_EXIT) {

            // Get the geofences that were triggered. A single event can trigger
            // multiple geofences.
            val triggeringGeofences = geofencingEvent.triggeringGeofences

            // Get the transition details as a String.
            val geofenceTransitionDetails = getGeofenceTransitionDetails(
                this,
                geofenceTransition,
                triggeringGeofences
            )

            // Send notification and log the transition details.
            sendNotification(geofenceTransitionDetails)
            Log.i(TAG, geofenceTransitionDetails)
        } else {
            // Log the error.
            Log.e(TAG, getString(R.string.geofence_transition_invalid_type,
                geofenceTransition))
        }
    }
}

```

After detecting the transition event via the `PendingIntent`, the `BroadcastReceiver` gets the geofence transition type and tests whether it is one of the events the app uses to trigger notifications -- either `GEOFENCE_TRANSITION_ENTER` or `GEOFENCE_TRANSITION_EXIT` in this case. The service then sends a notification and logs the transition details.

<https://developer.android.com/training/location/geofencing>

63. Samsung provides a mobile device, wherein the at least one module comprises at least one instruction for: obtaining the location information representing at least one physical geographic location of the mobile device as determined by the location-determination component, including as demonstrated in the exemplary text and images below:

SAMSUNG		Galaxy S10e S10 S10+ S10 5G		
		HIGHLIGHTS	SPECS	COMPARE
Network & Connectivity		Enhanced 4x4 MIMO, Up to 7CA, LAA, LTE Cat.20 Up to 2.0Gbps Download / Up to 150Mbps Upload 5G Non-Standalone (NSA), Sub6 / mmWave (Galaxy S10 5G only) Wi-Fi 802.11 a/b/g/n/ac/ax (2.4/5GHz), VHT80 MU-MIMO, 1024QAM Up to 1.2Gbps Download / Up to 1.2Gbps Upload Bluetooth® v 5.0 (LE up to 2Mbps), ANT+, USB type-C, NFC, Location (GPS, Galileo, Glonass, BeiDou) *Actual speed may vary depending on country, carrier, and user environment. *Depending on country or carrier, 5G connectivity may use Sub6 only, mmWave only, or Sub6 and mmWave together. *Galileo and BeiDou coverage may be limited. BeiDou may not be available for certain countries.		

<https://www.samsung.com/global/galaxy/galaxy-s10/specs/>

Set up for geofence monitoring

The first step in requesting geofence monitoring is to request the necessary permissions. To use geofencing, your app must request the following:

- `ACCESS_FINE_LOCATION`
- `ACCESS_BACKGROUND_LOCATION` if your app targets Android 10 (API level 29) or higher

To learn more, see the guide on how to [request location permissions](#).

If you want to use a `BroadcastReceiver` to listen for geofence transitions, add an element specifying the service name. This element must be a child of the `<application>` element:

```
<application
  android:allowBackup="true">
  ...
  <receiver android:name=".GeofenceBroadcastReceiver"/>
</application>
```

If you want to use a `BroadcastReceiver` to listen for geofence transitions, add an element specifying the service name. This element must be a child of the `<application>` element:

```
<application
  android:allowBackup="true">
  ...
  <receiver android:name=".GeofenceBroadcastReceiver"/>
</application>
```

To access the location APIs, you need to create an instance of the Geofencing client. To learn how to connect your client:

Kotlin

Java

```
lateinit var geofencingClient: GeofencingClient

override fun onCreate(savedInstanceState: Bundle?) {
    // ...
    geofencingClient = LocationServices.getGeofencingClient(this)
}
```

<https://developer.android.com/training/location/geofencing>

64. Samsung provides a mobile device, wherein the at least one module comprises at least one instruction for: after it has been determined, by at least use of the at least one processor, of the location information, and of the at least one selected geographic area of interest associated with the at least one record stored in the memory for said application program, that the mobile device has at least entered the at least one selected geographic area of interest associated with the at least one record stored in the memory and has remained therein for at least a designated length of time, providing at least said particular identifier associated with the at least one record stored in the memory to said application program, including as demonstrated in the exemplary text and images below:

Create and monitor geofences

Geofencing combines awareness of the user's current location with awareness of the user's proximity to locations that may be of interest. To mark a location of interest, you specify its latitude and longitude. To adjust the proximity for the location, you add a radius. The latitude, longitude, and radius define a geofence, creating a circular area, or fence, around the location of interest.

You can have multiple active geofences, with a limit of 100 per app, per device user. For each geofence, you can ask Location Services to send you entrance and exit events, or you can specify a duration within the geofence area to wait, or *dwell*, before triggering an event. You can limit the duration of any geofence by specifying an expiration duration in milliseconds. After the geofence expires, Location Services automatically removes it.



This lesson shows you how to add and remove geofences, and then listen for geofence transitions using a `BroadcastReceiver`.

Define a broadcast receiver for geofence transitions

An `Intent` sent from Location Services can trigger various actions in your app, but you should *not* have it start an activity or fragment, because components should only become visible in response to a user action. In many cases, a `BroadcastReceiver` is a good way to handle a geofence transition. A `BroadcastReceiver` gets updates when an event occurs, such as a transition into or out of a geofence, and can start long-running background work.

The following snippet shows how to define a `PendingIntent` that starts a `BroadcastReceiver`:

Kotlin Java

```
public class MainActivity extends AppCompatActivity {

    // ...

    private PendingIntent getGeofencePendingIntent() {
        // Reuse the PendingIntent if we already have it.
        if (geofencePendingIntent != null) {
            return geofencePendingIntent;
        }
        Intent intent = new Intent(this, GeofenceBroadcastReceiver.class);
        // We use FLAG_UPDATE_CURRENT so that we get the same pending intent back when
        // calling addGeofences() and removeGeofences().
        geofencePendingIntent = PendingIntent.getBroadcast(this, 0, intent, PendingIntent.
            FLAG_UPDATE_CURRENT);
        return geofencePendingIntent;
    }
}
```

Handle geofence transitions

When Location Services detects that the user has entered or exited a geofence, it sends out the `Intent` contained in the `PendingIntent` you included in the request to add geofences. A broadcast receiver like `GeofenceBroadcastReceiver` notices that the `Intent` was invoked and can then obtain the geofencing event from the intent, determine the type of Geofence transition(s), and determine which of the defined geofences was triggered. The broadcast receiver can direct an app to start performing background work or, if desired, send a notification as output.

The following snippet shows how to define a `BroadcastReceiver` that posts a notification when a geofence transition occurs. When the user clicks the notification, the app's main activity appears:

```

Kotlin      Java
class GeofenceBroadcastReceiver : BroadcastReceiver() {
    // ...
    override fun onReceive(context: Context?, intent: Intent?) {
        val geofencingEvent = GeofencingEvent.fromIntent(intent)
        if (geofencingEvent.hasError()) {
            val errorMessage = GeofenceStatusCodes
                .getStatusCodeString(geofencingEvent.errorCode)
            Log.e(TAG, errorMessage)
            return
        }

        // Get the transition type.
        val geofenceTransition = geofencingEvent.geofenceTransition

        // Test that the reported transition was of interest.
        if (geofenceTransition == Geofence.GEOFENCE_TRANSITION_ENTER |
            geofenceTransition == Geofence.GEOFENCE_TRANSITION_EXIT) {

            // Get the geofences that were triggered. A single event can trigger
            // multiple geofences.
            val triggeringGeofences = geofencingEvent.triggeringGeofences

            // Get the transition details as a String.
            val geofenceTransitionDetails = getGeofenceTransitionDetails(
                this,
                geofenceTransition,
                triggeringGeofences
            )

            // Send notification and log the transition details.
            sendNotification(geofenceTransitionDetails)
            Log.i(TAG, geofenceTransitionDetails)
        } else {
            // Log the error.
            Log.e(TAG, getString(R.string.geofence_transition_invalid_type,
                geofenceTransition))
        }
    }
}

```

After detecting the transition event via the `PendingIntent`, the `BroadcastReceiver` gets the geofence transition type and tests whether it is one of the events the app uses to trigger notifications -- either `GEOFENCE_TRANSITION_ENTER` or `GEOFENCE_TRANSITION_EXIT` in this case. The service then sends a notification and logs the transition details.

Use the dwell transition type to reduce alert spam

If you receive a large number of alerts when driving briefly past a geofence, the best way to reduce the alerts is to use a transition type of `GEOFENCE_TRANSITION_DWELL` instead of `GEOFENCE_TRANSITION_ENTER`. This way, the dwelling alert is sent only when the user stops inside a geofence for a given period of time. You can choose the duration by setting a `loitering delay`.

<https://developer.android.com/training/location/geofencing>

65. By engaging in the conduct described herein, Samsung has injured Plaintiffs and is thus liable for infringement of the '387 Patent, pursuant to 35 U.S.C. § 271. Samsung has committed these acts of infringement without license or authorization.

66. As a result of Samsung's infringement of the '387 Patent, Plaintiffs have suffered monetary damages and are entitled to a monetary judgment in an amount adequate to compensate for Samsung's past infringement, together with interests and costs. In addition, Samsung's infringement is causing irreparable harm and monetary damage to Plaintiffs and will continue to do so unless and until Samsung is enjoined by the Court.

COUNT III: CLAIM FOR PATENT INFRINGEMENT OF THE '447 PATENT

67. Plaintiffs repeat and reallege the allegations in paragraphs 1-66 as if fully set forth herein.

68. Samsung has infringed, contributed to the infringement of, and/or induced infringement of the '447 Patent by making, using, selling, offering for sale, or importing into the United States, or by intending that others make, use, import into, offer for sale, or sell in the United States, products and/or methods covered by one or more claims of the '447 Patent including, but not limited to, mobile devices and components thereof.

69. Upon information and belief, Samsung's mobile devices, including smartphones, tablets, and watches, that infringe one or more claims of the '447 Patent include at least the following products, as well as products with reasonably similar functionality:

- Galaxy S series, Galaxy Note series, Galaxy Z Flip series, Galaxy Fold series, and Galaxy A series smartphones;
- Galaxy Tab S series, Galaxy Tab A series, and Galaxy Book S series tablets; and
- Galaxy Watch 3 series, Galaxy Watch 3 Titanium series, Galaxy Watch Active2 series, Galaxy Watch Active series, Galaxy Watch series, and Galaxy Fit2 series watches.

Upon information and belief, these products are offered in several varieties, including different options for size, display, processor, storage, and battery. The products listed are exemplary, and Plaintiffs will be able to provide a more comprehensive list after discovery. Upon information and belief, Samsung also infringes one or more claims of the '447 Patent through its use of geofencing or location information in its advertising or content delivery efforts or its own applications it develops.

70. For example, upon information and belief, Samsung's mobile devices infringe at least claim 1 of the '447 Patent. Samsung makes, uses, sells, offers for sale, imports, exports, supplies, or distributes within the United States its mobile devices and thus directly infringes the '447 Patent.

71. Samsung indirectly infringes the '447 Patent as provided by 35 U.S.C. § 271(b) by inducing infringement by others, such as manufacturers, resellers, and end-user customers in this

District and throughout the United States. For example, direct infringement is the result of activities performed by manufacturers, resellers, or operators/carriers of Samsung's mobile devices, who, upon information and belief, perform each step of the claimed invention as directed by Samsung. Samsung received actual notice of the '447 Patent at least as early as the filing of this Complaint.

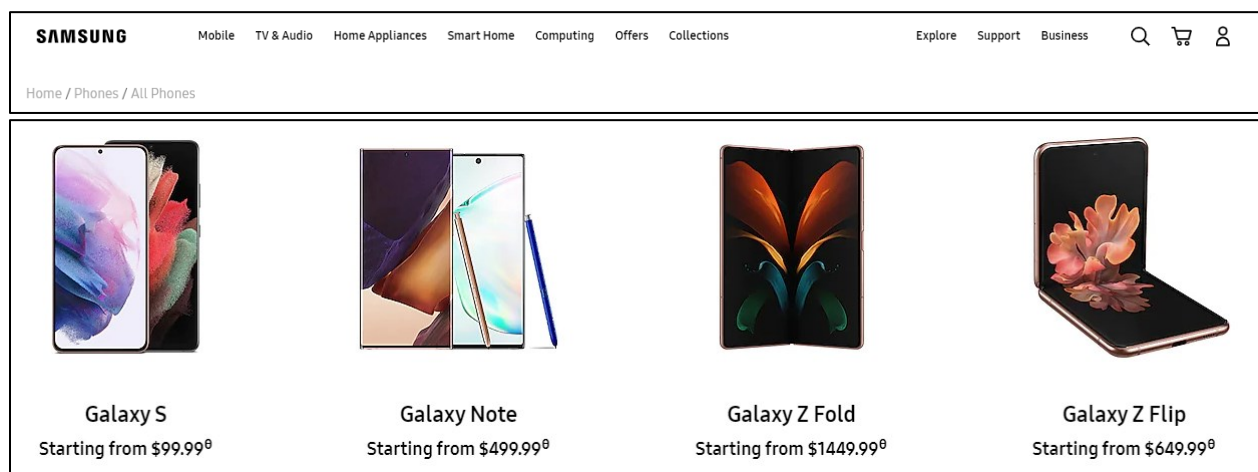
72. Upon information and belief, Samsung's affirmative acts of selling Samsung's mobile devices, causing Samsung's mobile devices to be manufactured, and providing directions, instructions, schematics, diagrams, or designs to its manufacturers, resellers, or operators/carriers to make or use Samsung's mobile devices in a manner that directly infringes the '447 Patent induce infringement by others, such as manufacturers, resellers, or operators/carriers in this District and throughout the United States. Upon information and belief, through its manufacture and sales of Samsung's mobile devices, Samsung performed the acts that constitute induced infringement with knowledge or willful blindness that the induced acts would constitute infringement.

73. Samsung also indirectly infringes the '447 Patent by contributing to infringement by others, such as manufacturers, resellers, and operators/carriers, in accordance with 35 U.S.C. § 271(c) in this District and throughout the United States. Upon information and belief, direct infringement is the result of activities performed by manufacturers, resellers, or operators/carriers of Samsung's mobile devices.

74. Upon information and belief, Samsung's affirmative acts of selling Samsung's mobile devices and causing Samsung's mobile devices to be manufactured and sold contribute to Samsung's manufacturers, resellers, and operators/carriers making or using Samsung's mobile devices in a normal and customary way that infringes the '447 Patent. Upon information and belief,

Samsung's mobile devices constitute the material part of Plaintiffs' patented invention, have no substantial non-infringing uses, and are known by Samsung to be especially made or especially adapted for use to infringe the '447 Patent.

75. Samsung provides a mobile device comprising: memory, at least one processor operably coupled to the memory, a location-determination component, and at least one module configured for execution by the at least one processor, including as demonstrated in the exemplary text and images below:



<https://www.samsung.com/us/>

SAMSUNG		Galaxy S10e S10 S10+ S10 5G	
		HIGHLIGHTS	SPECS
Memory	Galaxy S10e	• 6GB RAM with 128GB internal storage • 8GB RAM with 256GB internal storage	
	Galaxy S10	• 8GB RAM with 128GB internal storage • 8GB RAM with 512GB internal storage	
	Galaxy S10+	• 8GB RAM with 128GB internal storage • 8GB RAM with 512GB internal storage (Only ceramic models) • 12GB RAM with 1TB internal storage (Only Performance Edition ceramic models)	
	Galaxy S10 5G	• 8GB RAM with 256GB internal storage • 8GB RAM with 512GB internal storage	

SAMSUNG		Galaxy S10e S10 S10+ S10 5G
		HIGHLIGHTS SPECS COMPARE
AP	8nm 64-bit Octa-Core Processor ※ 2.730GHz (Maximum Clock Speed) + 2.310GHz + 1.950GHz 7nm 64-bit Octa-Core Processor ※ 2.840GHz (Maximum Clock Speed) + 2.410GHz + 1.780GHz *May differ by country and carrier.	

SAMSUNG		Galaxy S10e S10 S10+ S10 5G
		HIGHLIGHTS SPECS COMPARE
OS	Android 9 (Pie)	

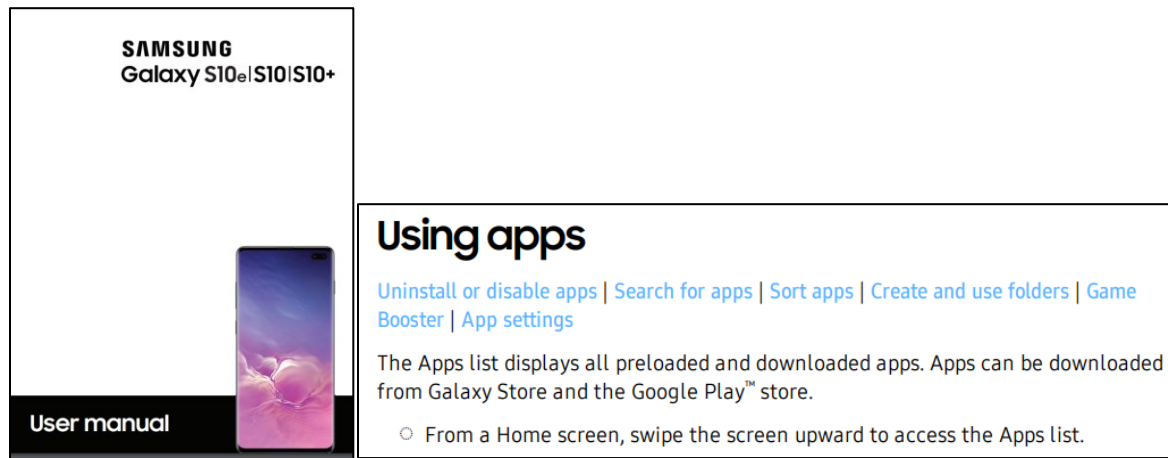
SAMSUNG		Galaxy S10e S10 S10+ S10 5G
		HIGHLIGHTS SPECS COMPARE
Network & Connectivity	Enhanced 4x4 MIMO, Up to 7CA, LAA, LTE Cat.20 Up to 2.0Gbps Download / Up to 150Mbps Upload 5G Non-Standalone (NSA), Sub6 / mmWave (Galaxy S10 5G only) Wi-Fi 802.11 a/b/g/n/ac/ax (2.4/5GHz), VHT80 MU-MIMO, 1024QAM Up to 1.2Gbps Download / Up to 1.2Gbps Upload Bluetooth® v 5.0 (LE up to 2Mbps), ANT+, USB type-C, NFC, Location (GPS, Galileo, Glonass, BeiDou) *Actual speed may vary depending on country, carrier, and user environment. *Depending on country or carrier, 5G connectivity may use Sub6 only, mmWave only, or Sub6 and mmWave together. *Galileo and BeiDou coverage may be limited. BeiDou may not be available for certain countries.	

SAMSUNG		Galaxy S10e S10 S10+ S10 5G
		HIGHLIGHTS SPECS COMPARE
Bixby 	Bixby Routines Bixby Bixby Vision Apps Mode • Home décor • Makeup & Hair Dyeing • Styling Lens Mode • Image • Shopping • Translation • Place	
		• Picture play • 3rd party Downloads • Food • Wine • Book • QR Code

<https://www.samsung.com/global/galaxy/galaxy-s10/specs/>

76. Samsung provides a mobile device, wherein the at least one module comprises at least one instruction for: in response to receiving, from an application program during its execution in the mobile device, a request for having at least a first identifier being associated with a first designated geographic area of interest provided to the application program after it has been determined, by at least use of the at least one processor and of location information representing at least one physical geographic location of the mobile device as determined by the location-determination component, that the mobile device has at least entered the first designated geographic area of interest and has remained therein for at least a predetermined length of time, after receiving, from the application program, both a first data string comprising the first identifier to be associated with the first designated geographic area of interest and first geographic data to be used for defining the first designated geographic area of interest and to be used with the first identifier to establish, in the memory, the first designated geographic area of interest as a first area specifically reserved for delivery of the first identifier related to the application program, after establishing, in the memory, the first designated geographic area of interest as the first area specifically reserved for delivery of the first identifier related to the application program, after storing, in the memory, a first record comprising the first identifier, and after determining, by at least use of the at least one processor and of the location information, that the mobile device has at least entered the first area specifically reserved for delivery of the first identifier related to the application program and has remained therein for at least the predetermined length of time, delivering, from the first record stored in the memory and to the application program, at least first

datum comprising at least the first identifier, including as demonstrated in the exemplary text and images below:



https://downloadcenter.samsung.com/content/UM/202103/20210304004310357/ATT_SM-G970U_G973U_G975U_EN_UM_R_11.0_022221_FINAL.pdf

Create and monitor geofences

Geofencing combines awareness of the user's current location with awareness of the user's proximity to locations that may be of interest. To mark a location of interest, you specify its latitude and longitude. To adjust the proximity for the location, you add a radius. The latitude, longitude, and radius define a geofence, creating a circular area, or fence, around the location of interest.

You can have multiple active geofences, with a limit of 100 per app, per device user. For each geofence, you can ask Location Services to send you entrance and exit events, or you can specify a duration within the geofence area to wait, or *dwell*, before triggering an event. You can limit the duration of any geofence by specifying an expiration duration in milliseconds. After the geofence expires, Location Services automatically removes it.



This lesson shows you how to add and remove geofences, and then listen for geofence transitions using a `BroadcastReceiver`.

Set up for geofence monitoring

The first step in requesting geofence monitoring is to request the necessary permissions. To use geofencing, your app must request the following:

- `ACCESS_FINE_LOCATION`
- `ACCESS_BACKGROUND_LOCATION` if your app targets Android 10 (API level 29) or higher

To learn more, see the guide on how to [request location permissions](#).

If you want to use a `BroadcastReceiver` to listen for geofence transitions, add an element specifying the service name. This element must be a child of the `<application>` element:

```
<application
  android:allowBackup="true">
  ...
  <receiver android:name=".GeofenceBroadcastReceiver"/>
</application/>
```

If you want to use a `BroadcastReceiver` to listen for geofence transitions, add an element specifying the service name. This element must be a child of the `<application>` element:

```
<application
  android:allowBackup="true">
  ...
  <receiver android:name=".GeofenceBroadcastReceiver"/>
</application/>
```

To access the location APIs, you need to create an instance of the Geofencing client. To learn how to connect your client:

Kotlin Java

```
lateinit var geofencingClient: GeofencingClient

override fun onCreate(savedInstanceState: Bundle?) {
    // ...
    geofencingClient = LocationServices.getGeofencingClient(this)
}
```

Create and add geofences

Your app needs to create and add geofences using the location API's builder class for creating Geofence objects, and the convenience class for adding them. Also, to handle the intents sent from Location Services when geofence transitions occur, you can define a `PendingIntent` as shown in this section.

★ **Note:** On single-user devices, there is a limit of 100 geofences per app. For multi-user devices, the limit is 100 geofences per app per device user.

Create geofence objects

First, use `Geofence.Builder` to create a geofence, setting the desired radius, duration, and transition types for the geofence. For example, to populate a list object:

Kotlin Java

```
geofenceList.add(new Geofence.Builder()
    // Set the request ID of the geofence. This is a string to identify this
    // geofence.
    .setRequestId(entry.getKey())

    .setCircularRegion(
        entry.getValue().latitude,
        entry.getValue().longitude,
        Constants.GEOFENCE_RADIUS_IN_METERS
    )
    .setExpirationDuration(Constants.GEOFENCE_EXPIRATION_IN_MILLISECONDS)
    .setTransitionTypes(Geofence.GEOFENCE_TRANSITION_ENTER |
        Geofence.GEOFENCE_TRANSITION_EXIT)
    .build());
```

This example pulls data from a constants file. In actual practice, apps might dynamically create geofences based on the user's location.

Specify geofences and initial triggers

The following snippet uses the `GeofencingRequest` class and its nested `GeofencingRequest.Builder` class to specify the geofences to monitor and to set how related geofence events are triggered:

```
Kotlin  Java
private GeofencingRequest getGeofencingRequest() {
    GeofencingRequest.Builder builder = new GeofencingRequest.Builder();
    builder.setInitialTrigger(GeofencingRequest.INITIAL_TRIGGER_ENTER);
    builder.addGeofences(geofenceList);
    return builder.build();
}
```

This example shows the use of two geofence triggers. The `GEOFENCE_TRANSITION_ENTER` transition triggers when a device enters a geofence, and the `GEOFENCE_TRANSITION_EXIT` transition triggers when a device exits a geofence. Specifying `INITIAL_TRIGGER_ENTER` tells Location services that `GEOFENCE_TRANSITION_ENTER` should be triggered if the device is already inside the geofence.

In many cases, it may be preferable to use instead `INITIAL_TRIGGER_DWELL`, which triggers events only when the user stops for a defined duration within a geofence. This approach can help reduce "alert spam" resulting from large numbers notifications when a device briefly enters and exits geofences. Another strategy for getting best results from your geofences is to set a minimum radius of 100 meters. This helps account for the location accuracy of typical Wi-Fi networks, and also helps reduce device power consumption.

Define a broadcast receiver for geofence transitions

An `Intent` sent from Location Services can trigger various actions in your app, but you should *not* have it start an activity or fragment, because components should only become visible in response to a user action. In many cases, a `BroadcastReceiver` is a good way to handle a geofence transition. A `BroadcastReceiver` gets updates when an event occurs, such as a transition into or out of a geofence, and can start long-running background work.

The following snippet shows how to define a `PendingIntent` that starts a `BroadcastReceiver`:

Kotlin Java

```
public class MainActivity extends AppCompatActivity {

    // ...

    private PendingIntent getGeofencePendingIntent() {
        // Reuse the PendingIntent if we already have it.
        if (geofencePendingIntent != null) {
            return geofencePendingIntent;
        }
        Intent intent = new Intent(this, GeofenceBroadcastReceiver.class);
        // We use FLAG_UPDATE_CURRENT so that we get the same pending intent back when
        // calling addGeofences() and removeGeofences().
        geofencePendingIntent = PendingIntent.getBroadcast(this, 0, intent, PendingIntent.
            FLAG_UPDATE_CURRENT);
        return geofencePendingIntent;
    }
}
```

Add geofences

To add geofences, use the `GeofencingClient.addGeofences()` method. Provide the `GeofencingRequest` object, and the `PendingIntent`. The following snippet demonstrates processing the results:

Kotlin Java

```

geofencingClient.addGeofences(getGeofencingRequest(), getGeofencePendingIntent())
    .addOnSuccessListener(this, new OnSuccessListener<Void>() {
        @Override
        public void onSuccess(Void aVoid) {
            // Geofences added
            // ...
        }
    })
    .addOnFailureListener(this, new OnFailureListener() {
        @Override
        public void onFailure(@NonNull Exception e) {
            // Failed to add geofences
            // ...
        }
    });

```

Handle geofence transitions

When Location Services detects that the user has entered or exited a geofence, it sends out the `Intent` contained in the `PendingIntent` you included in the request to add geofences. A broadcast receiver like `GeofenceBroadcastReceiver` notices that the `Intent` was invoked and can then obtain the geofencing event from the intent, determine the type of Geofence transition(s), and determine which of the defined geofences was triggered. The broadcast receiver can direct an app to start performing background work or, if desired, send a notification as output.

The following snippet shows how to define a `BroadcastReceiver` that posts a notification when a geofence transition occurs. When the user clicks the notification, the app's main activity appears:

```

Kotlin  Java

class GeofenceBroadcastReceiver : BroadcastReceiver() {
    // ...
    override fun onReceive(context: Context?, intent: Intent?) {
        val geofencingEvent = GeofencingEvent.fromIntent(intent)
        if (geofencingEvent.hasError()) {
            val errorMessage = GeofenceStatusCodes
                .getStatusCodeString(geofencingEvent.errorCode)
            Log.e(TAG, errorMessage)
            return
        }

        // Get the transition type.
        val geofenceTransition = geofencingEvent.geofenceTransition

        // Test that the reported transition was of interest.
        if (geofenceTransition == Geofence.GEOFENCE_TRANSITION_ENTER |
            geofenceTransition == Geofence.GEOFENCE_TRANSITION_EXIT) {

            // Get the geofences that were triggered. A single event can trigger
            // multiple geofences.
            val triggeringGeofences = geofencingEvent.triggeringGeofences

            // Get the transition details as a String.
            val geofenceTransitionDetails = getGeofenceTransitionDetails(
                this,
                geofenceTransition,
                triggeringGeofences
            )

            // Send notification and log the transition details.
            sendNotification(geofenceTransitionDetails)
            Log.i(TAG, geofenceTransitionDetails)
        } else {
            // Log the error.
            Log.e(TAG, getString(R.string.geofence_transition_invalid_type,
                geofenceTransition))
        }
    }
}

```

After detecting the transition event via the `PendingIntent`, the `BroadcastReceiver` gets the geofence transition type and tests whether it is one of the events the app uses to trigger notifications -- either `GEOFENCE_TRANSITION_ENTER` or `GEOFENCE_TRANSITION_EXIT` in this case. The service then sends a notification and logs the transition details.

Use the dwell transition type to reduce alert spam

If you receive a large number of alerts when driving briefly past a geofence, the best way to reduce the alerts is to use a transition type of `GEOFENCE_TRANSITION_DWELL` instead of `GEOFENCE_TRANSITION_ENTER`. This way, the dwelling alert is sent only when the user stops inside a geofence for a given period of time. You can choose the duration by setting a `loitering delay`.

<https://developer.android.com/training/location/geofencing>

77. By engaging in the conduct described herein, Samsung has injured Plaintiffs and is thus liable for infringement of the '447 Patent, pursuant to 35 U.S.C. § 271. Samsung has committed these acts of infringement without license or authorization.

78. As a result of Samsung's infringement of the '447 Patent, Plaintiffs have suffered monetary damages and are entitled to a monetary judgment in an amount adequate to compensate for Samsung's past infringement, together with interests and costs. In addition, Samsung's infringement is causing irreparable harm and monetary damage to Plaintiffs and will continue to do so unless and until Samsung is enjoined by the Court.

DEMAND FOR JURY TRIAL

79. Plaintiffs hereby demand a trial by jury on all claims so triable.

PRAYER FOR RELIEF

WHEREFORE, Plaintiffs respectfully request that this Court enter judgment in their favor and grant the following relief:

- A. Adjudge that Samsung infringes the Asserted Patents;
- B. Adjudge that the Asserted Patents are valid and enforceable;
- C. Award Plaintiffs damages in an amount adequate to compensate Plaintiffs for Samsung's infringement of the Asserted Patents, but in no event less than a reasonable royalty under 35 U.S.C. § 284;
- D. Award enhanced damages pursuant to 35 U.S.C. § 284;
- E. Award Plaintiffs pre-judgment and post-judgment interest to the full extent allowed under the law, as well as their costs;

- F. Enter an order finding that this is an exceptional case and awarding Plaintiffs their reasonable attorneys' fees pursuant to 35 U.S.C. § 285;
- G. Enter a permanent injunction against all Samsung products found to infringe the Asserted Patents;
- H. Award, in lieu of an injunction, a compulsory forward royalty;
- I. Order an accounting of damages; and
- J. Award such other relief, including equitable relief, as the Court may deem appropriate and just under the circumstances.

DATED: July 30, 2021

Respectfully submitted,

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EXHIBIT A



US009779418B2

(12) **United States Patent**
Hardin et al.

(10) **Patent No.:** **US 9,779,418 B2**
(45) **Date of Patent:** **Oct. 3, 2017**

(54) **EXCLUSIVE DELIVERY OF CONTENT
WITHIN GEOGRAPHIC AREAS**

H04W 4/028; H04W 4/001; H04W 4/18;
H04W 8/18; H04W 88/02; H04L 67/18;
H04L 67/306; H04L 67/20; H04L 67/26;
(Continued)

(71) Applicants: **Ryan Hardin**, Henderson, TX (US);
Andrew Hill, Houston, TX (US)

(56) **References Cited**

(72) Inventors: **Ryan Hardin**, Henderson, TX (US);
Andrew Hill, Houston, TX (US)

U.S. PATENT DOCUMENTS

(*) Notice: Subject to any disclaimer, the term of this
patent is extended or adjusted under 35
U.S.C. 154(b) by 0 days.

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6,847,888 B2 1/2005 Fox et al.
(Continued)

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(21) Appl. No.: **15/009,961**

(22) Filed: **Jan. 29, 2016**

AdMob, Inc., "Help for Advertisers—Ad Pricing", http://www.admob.com/home/help/helpfiles/Advertisers/Ad_Pricing, May 19, 2009.

(65) **Prior Publication Data**

US 2016/0148268 A1 May 26, 2016

(Continued)

Primary Examiner — Olumide T Ajibade Akonai

Related U.S. Application Data

(63) Continuation of application No. 14/608,285, filed on
Jan. 29, 2015, now Pat. No. 9,286,625, which is a
(Continued)

(51) **Int. Cl.**
H04W 4/00 (2009.01)
G06Q 30/00 (2012.01)
(Continued)

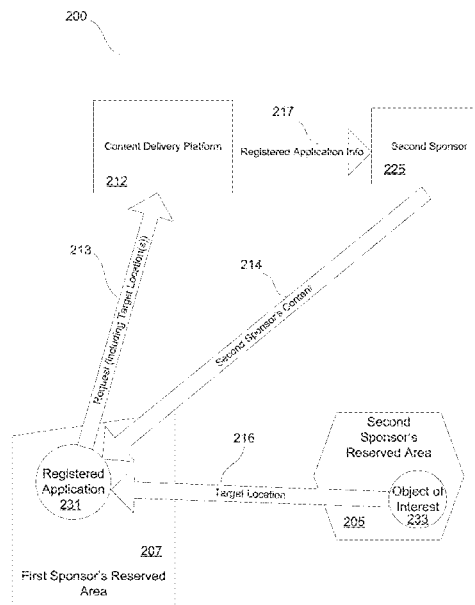
(52) **U.S. Cl.**
CPC **G06Q 30/0261** (2013.01); **G06Q 30/02**
(2013.01); **G06Q 30/0266** (2013.01);
(Continued)

(58) **Field of Classification Search**
CPC H04W 4/02; H04W 64/00; H04W 4/021;
H04W 4/023; H04W 4/206; H04W 4/027;

(57) **ABSTRACT**

Application developers can request to have their applications registered for use with a content delivery platform. The operator of the content delivery platform establishes perimeters defining geographic areas, and maintains records reserving particular areas for delivery of content associated with particular sponsors. Registered applications running on mobile devices can request content from the content delivery platform. Based at least in part on the request, the content delivery platform can identify a target location, which may be the location of the mobile device, or some other location indicated in the request. A mobile device can be provided content based on the relationship of the target location to the geographic areas, so that a registered application running on a mobile device with a target location contained within a geographic area assigned to a particular sponsor will receive content related to that sponsor.

25 Claims, 7 Drawing Sheets



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Related U.S. Application Data

continuation of application No. 13/856,392, filed on Apr. 3, 2013, now Pat. No. 8,977,247, which is a continuation of application No. 12/434,094, filed on May 1, 2009, now Pat. No. 8,433,296.

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(58) Field of Classification Search

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 USPC 455/414.1, 414.2, 456.1–456.6, 418, 419
 See application file for complete search history.

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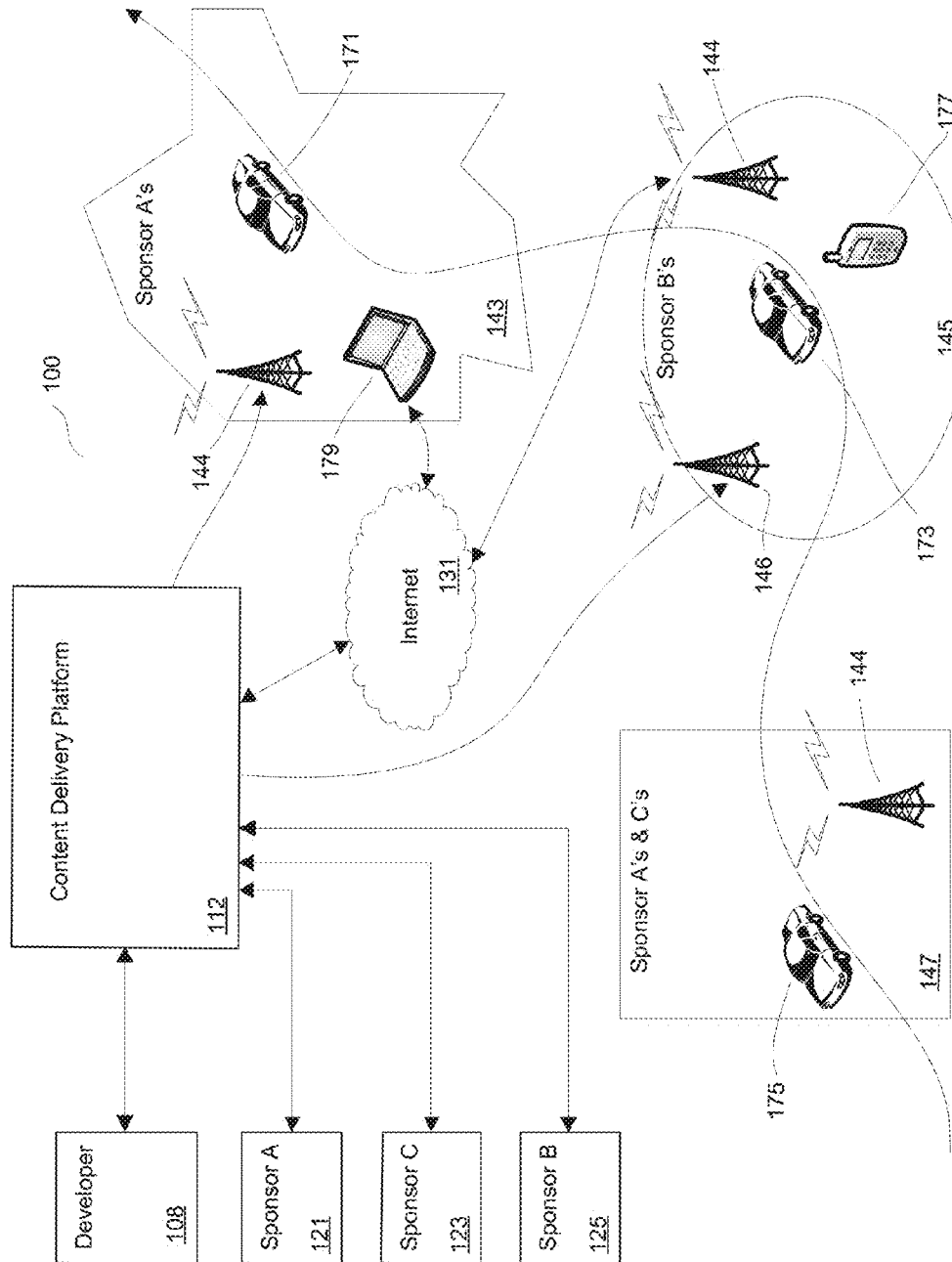


FIG. 1

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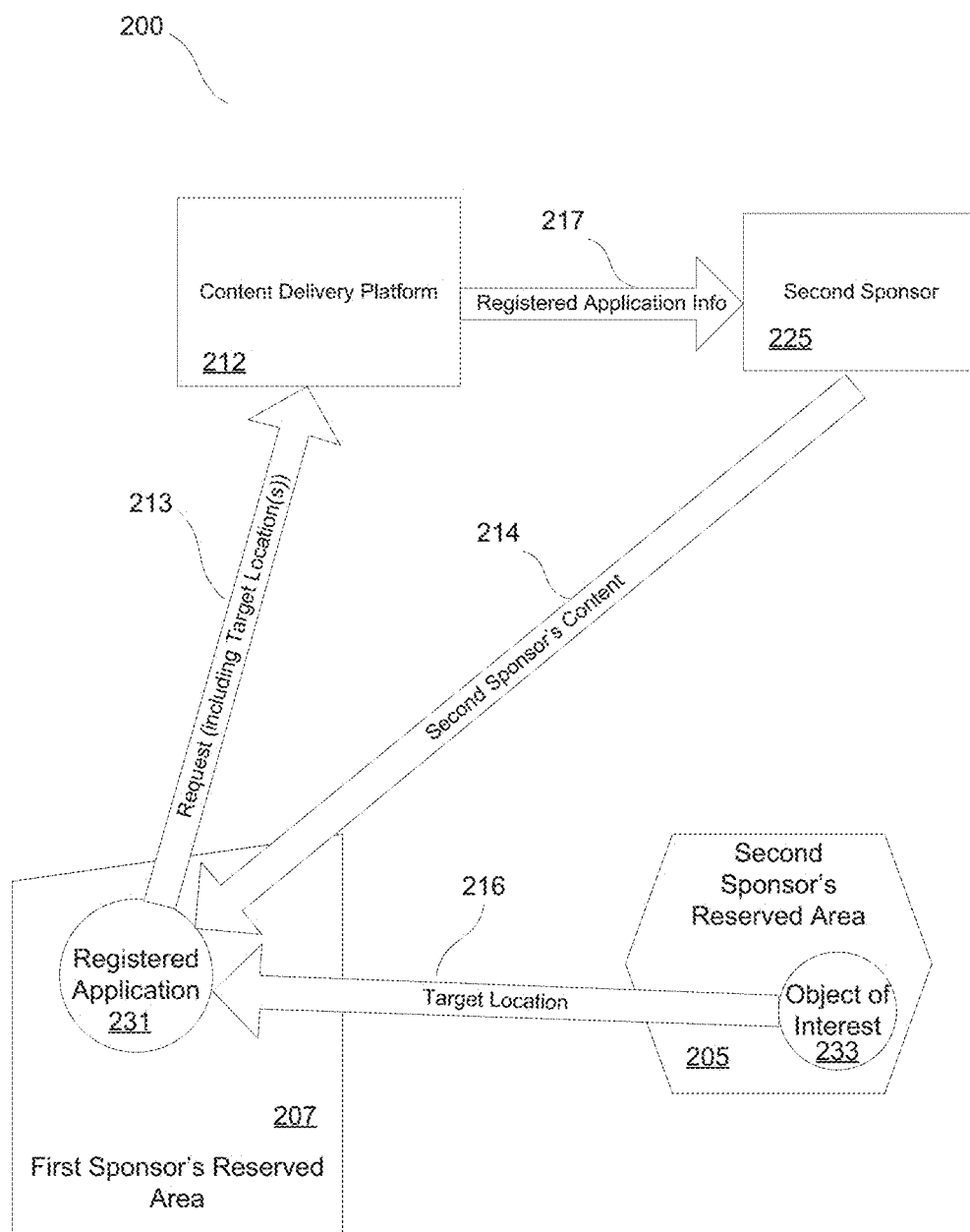
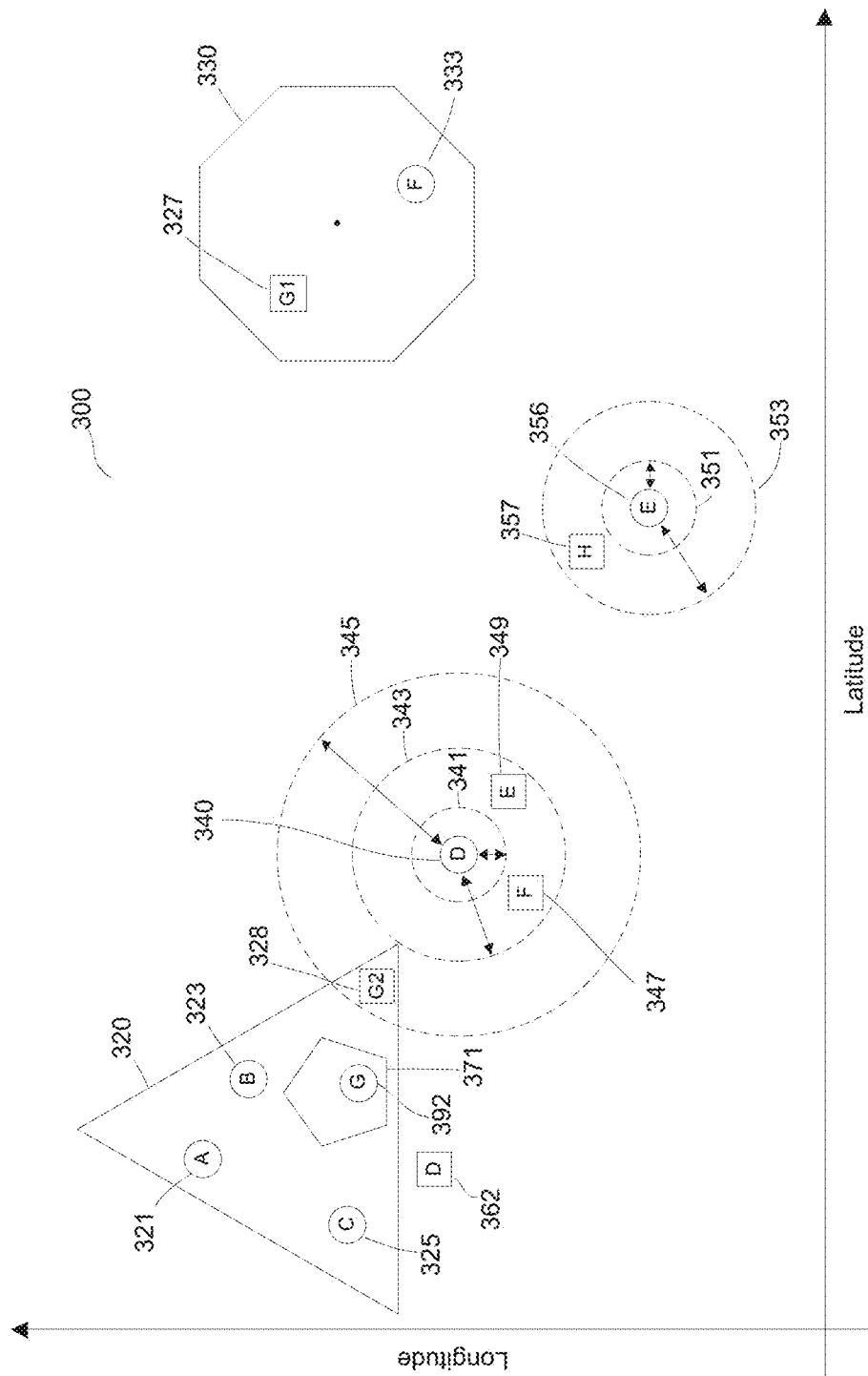


FIG. 2



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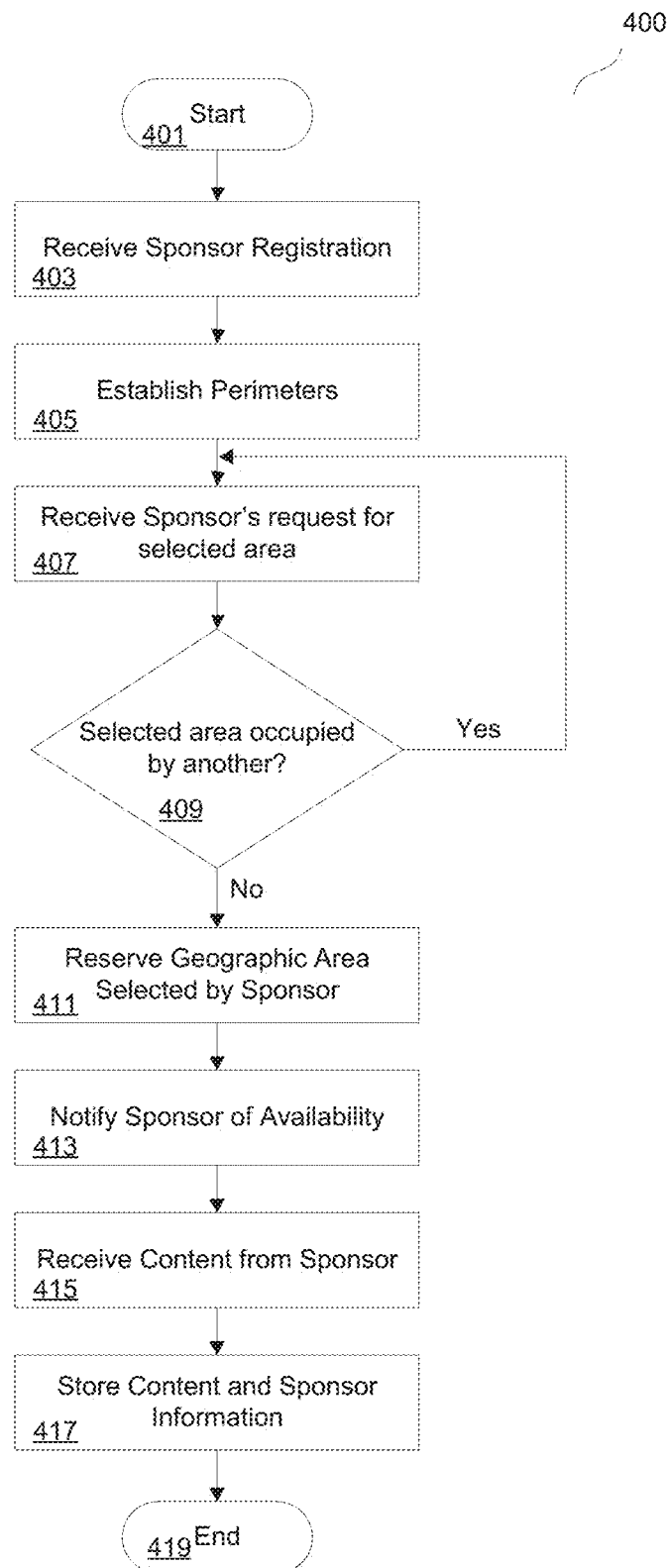


FIG. 4

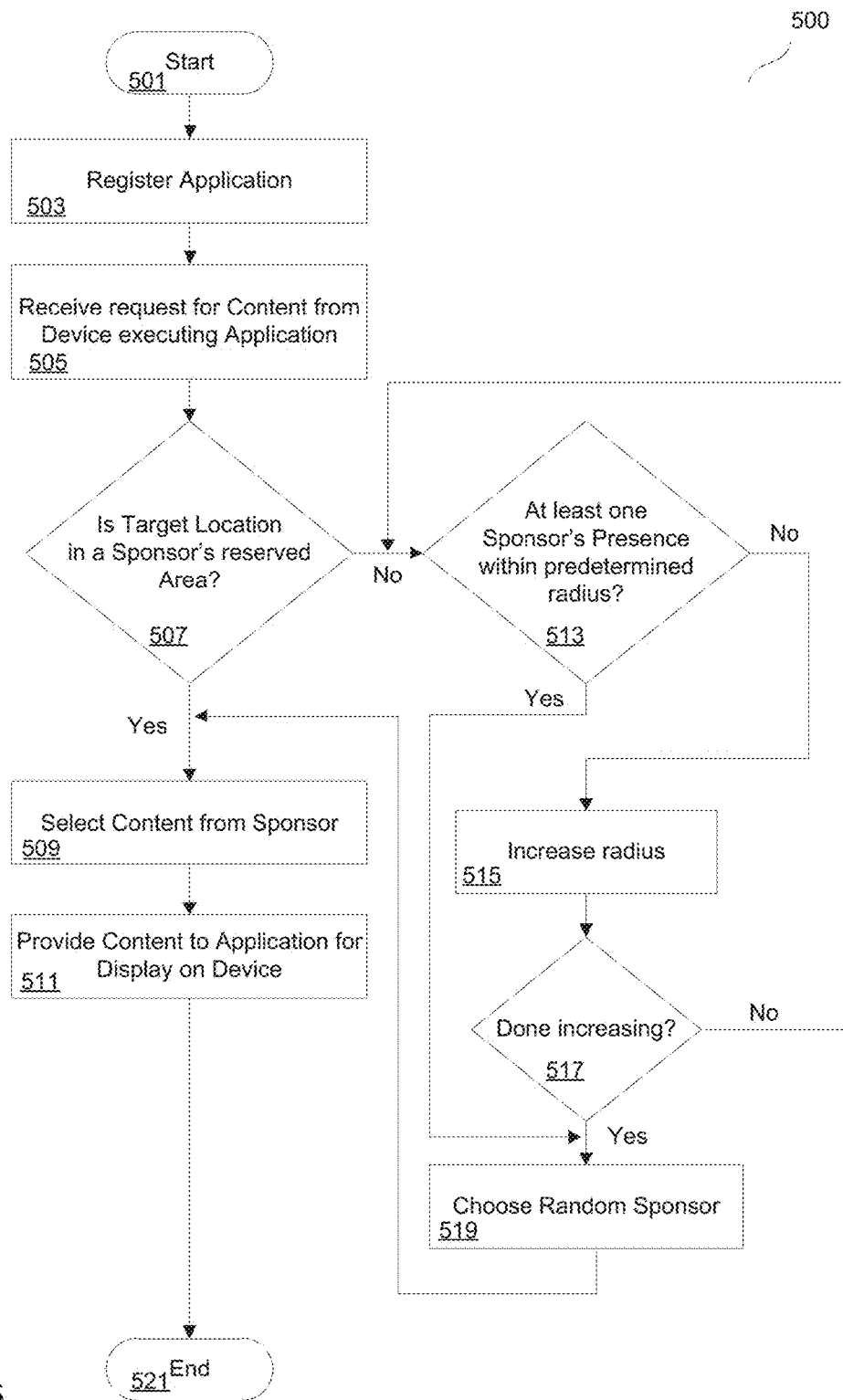


FIG. 5

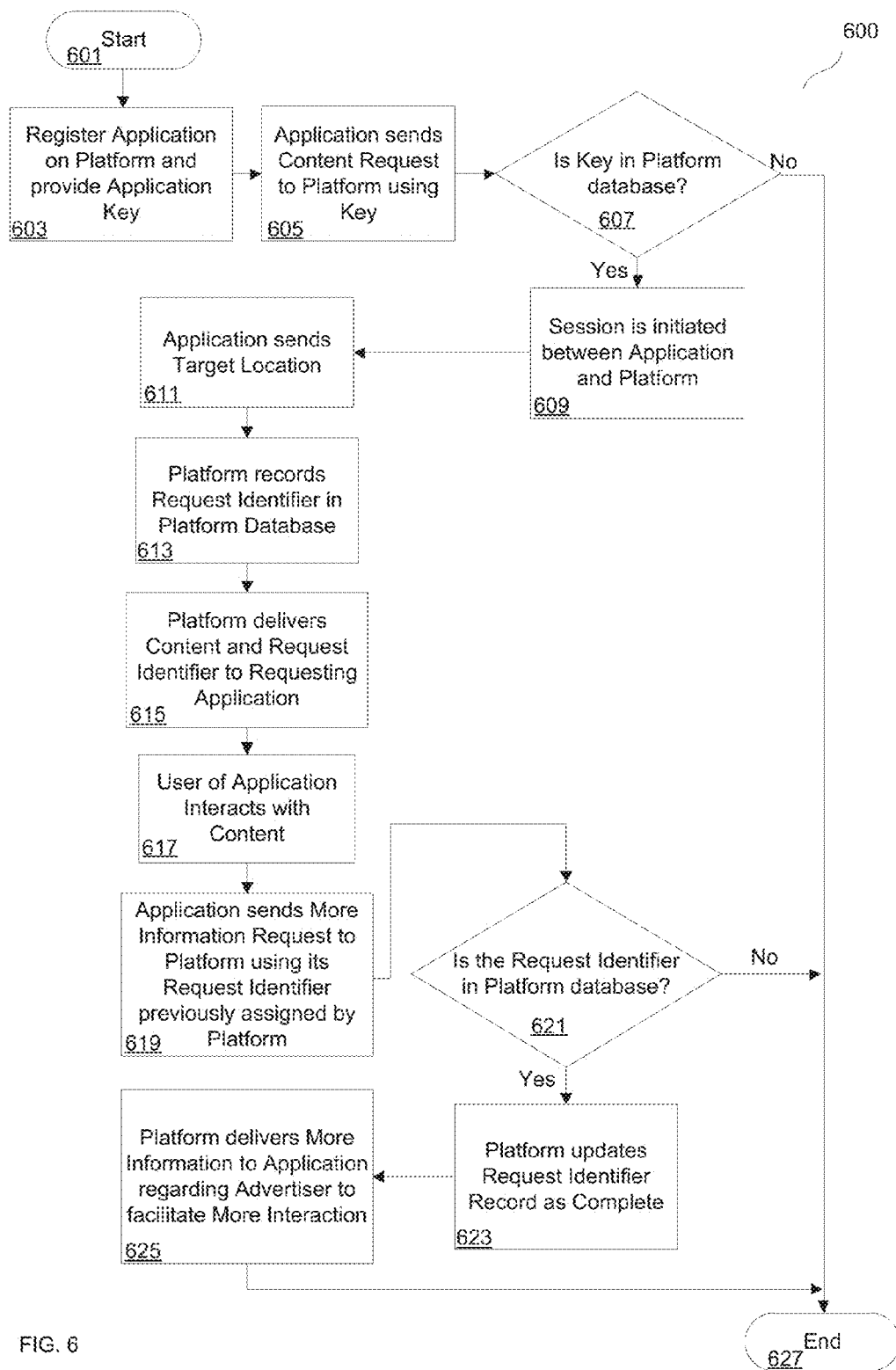


FIG. 6

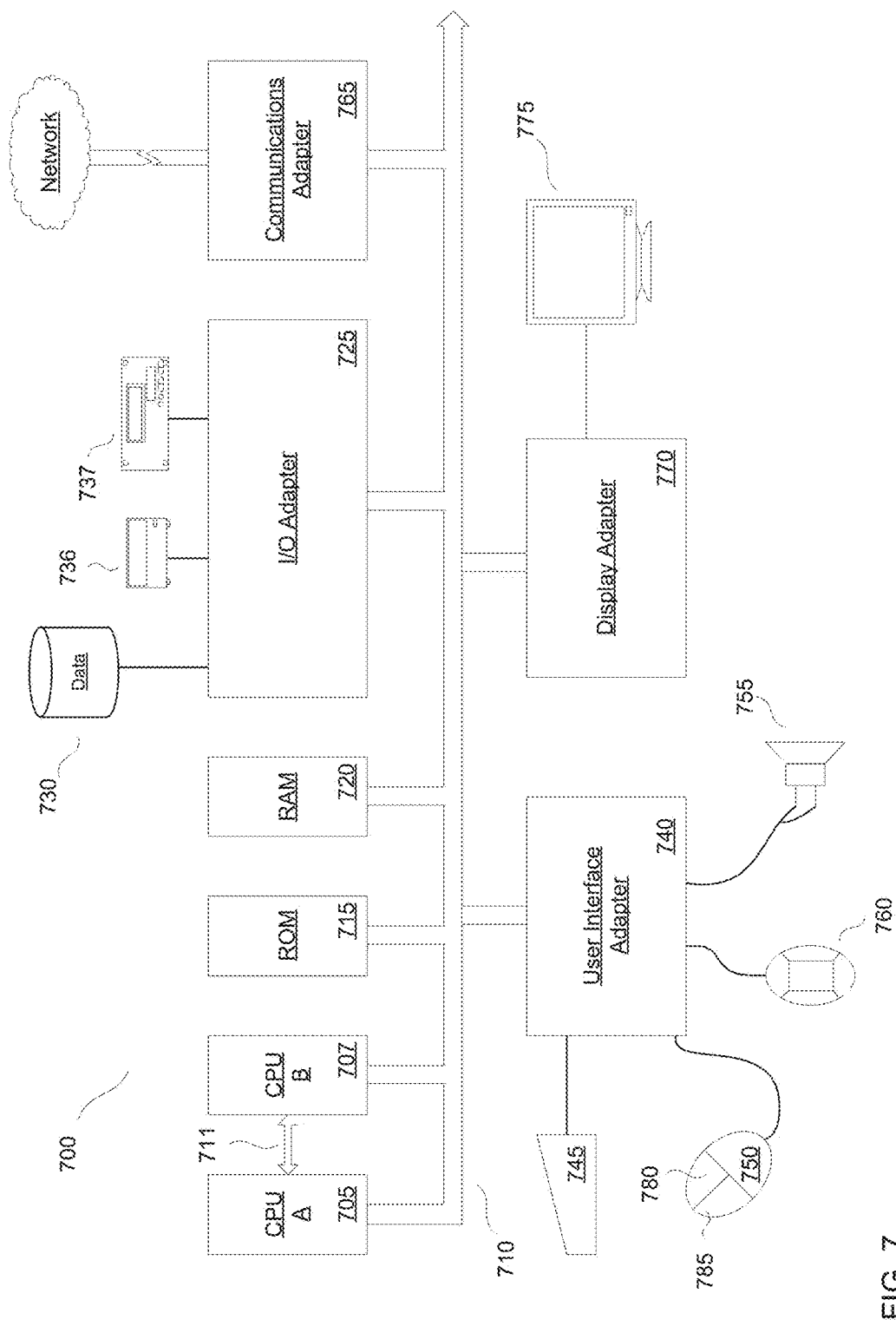


FIG. 7

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**EXCLUSIVE DELIVERY OF CONTENT
WITHIN GEOGRAPHIC AREAS****CROSS REFERENCE TO RELATED
APPLICATIONS**

This continuation patent application claims priority from co-pending U.S. Non-provisional patent application having Ser. No. 14/608,285, filed 29 Jan. 2015, entitled "EXCLUSIVE DELIVERY OF CONTENT WITHIN GEOGRAPHIC AREAS", which claims priority from U.S. Non-provisional patent application having Ser. No. 13/856,392, filed 3 Apr. 2013, entitled "EXCLUSIVE DELIVERY OF CONTENT WITHIN GEOGRAPHIC AREAS", now U.S. Pat. No. 8,977,247 issued on 10 Mar. 2015, which claims priority from U.S. Non-provisional patent application having Ser. No. 12/434,094, filed 1 May 2009, entitled "EXCLUSIVE DELIVERY OF CONTENT WITHIN GEOGRAPHIC AREAS", now U.S. Pat. No. 8,433,296 issued on 30 Apr. 2013, all having a common applicant herewith and being incorporated herein in their entirety by reference.

FIELD

This disclosure relates generally to delivery of content, and more particularly to delivery of content within reserved geographic areas.

BACKGROUND

Advertisements can be delivered to various devices, including mobile devices, within communications range of areas transmitters or other information providers. For example, advertisements can be delivered to cellular phones within range of a particular cellular phone provider's network area. Furthermore, advertisements can be delivered using digital billboards, or via the Internet, based on user interactions and preferences.

When delivering advertisements and other content to some mobile devices, currently available technologies can broadcast the content to all devices equipped to receive them. In some cases, advertisements are broadcast to any mobile device within a city, or a similar area. When delivering non-broadcast content, for example via the Internet, it is common to deliver the content in response to a request, received from the receiving device. In some cases, push technology can be used to deliver content to multiple users concurrently.

In each of these cases, a mobile device can usually receive content from multiple different content providers. Current technologies are, therefore, less than perfect.

SUMMARY

Various embodiments disclosed herein include registering an application program for use with a content delivery platform, establishing multiple perimeters defining respective geographic areas, and maintaining records associating sponsors with particular geographic areas. The content delivery platform can receive a request from a registered application program for content to be displayed on a mobile device, and the request can be used to determine a target location. In some embodiments, a sponsor is selected based on a relationship between the target location and one or more reserved geographic areas. Content is then provided to the application program.

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In some embodiments, the content delivery platform can record a request identifier associated with a received request, and provide the request identifier to the mobile device to assist in tracking future actions relating to the request for content. The content delivery platform can also receive information related to user interaction with the provided content, including the request identifier, and provide additional content in response to the received information.

Content can be delivered to a mobile device running a registered application if a target location is at least partially within a predetermined radial distance of a geographical area associated with a sponsor; if the mobile device is not located within the predetermined radial distance, the radial distance can be increased. In some embodiments, content is delivered if the target location, e.g. the location of the mobile device or another location of interest, is located entirely within a geographic area exclusively reserved by a particular sponsor. In some embodiments, the content delivery platform can select from among several sponsors in deciding which content to deliver to a mobile device.

In at least one embodiment, the content delivery system reserves exclusive interests in geographic areas for particular sponsors based on the sponsors' requests, and store a record of that interest. In some embodiments, the content delivery system receives, from a sponsor, content to be delivered to mobile devices based on a target location being positioned within particular geographic areas. The content delivery system can also reserve an interest in geographic areas that remain unreserved by other sponsors. Furthermore, some embodiments include time based restrictions.

Various embodiments can be implemented as a system that includes memory, a communications interface, and a processor that cooperate to store and execute a program of instructions implementing various methods and techniques described herein. Furthermore, some embodiments can be implemented as a computer readable medium tangibly embodying a program of instructions.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an abstract representation of exclusive content delivery to particular reserved areas according to various embodiments of the present disclosure;

FIG. 2 is a diagram illustrating a target location other than the location of the mobile device executing a registered application, according to embodiments of the present disclosure;

FIG. 3 is a graph representing expanded search areas to determine which content is delivered according to various embodiments of the present disclosure;

FIG. 4 is a flowchart illustrating a method of reserving a geographic area according to embodiments of the present disclosure;

FIG. 5 is a flowchart illustrating registration of an application for content delivery according to embodiments of the present disclosure;

FIG. 6 is a flowchart illustrating delivery of content to particular applications in a reserved area according to embodiments of the present disclosure;

FIG. 7 is a diagram illustrating a processing system according to embodiments of the present disclosure.

DETAILED DESCRIPTION

Various embodiments of the present disclosure provide for delivering content, such as advertisements, to registered applications being run on any of various mobile electronic

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devices configured to be readily moved, carried, or otherwise transported between different various geographic areas defined by perimeters. Sponsors can reserve an exclusive interest, or in some embodiments a semi-exclusive interest, in a geographic area, so that other sponsors' advertisements are excluded from being broadcast or otherwise provided to a registered program being executed on a mobile device located within a reserved geographic area.

Referring first to FIG. 1, system 100, is illustrated. System 100 can provide for exclusive delivery of advertising or other content to registered applications running on mobile devices located within a particular proximity to a reserved geographic area. System 100, as illustrated, includes content delivery platform 112, which is in communication with developer platform 108, and systems or individuals operating under control of sponsor A 121, sponsor C 123, and sponsor B 125. Content delivery platform 112 receives a request from developer platform 108 to register a program or other application for use on mobile devices. Content delivery platform 112 can use the registered application program to provide selected content to mobile devices.

In some embodiments, a registered application program is provided to mobile devices by developer platform 108, content delivery platform 112, one of sponsor A 121, sponsor C 123, or sponsor B 125, or by another desired delivery mechanism. In some embodiments, registering the application program with content delivery platform 112 allows developer 108 to receive revenue from sponsor A 121, sponsor C 123, or sponsor B 125 for content displayed on a mobile device located within, or in proximity to, a geographical area reserved by one or more of the sponsors.

Sponsor A 121, sponsor C 123, or sponsor B 125 can reserve an exclusive interest in a particular geographic area by sending a request to content delivery platform 112. In some embodiments, the request can be for exclusive delivery of content to mobile devices running any registered application within given geographic areas, or for content to be delivered to particular registered applications based on a target location. The request can also include time limitations, limitations based on the length of time a mobile device remains within a given geographic area, or other desired limitations. Furthermore, the reserved interest can be either completely exclusive, or semi-exclusive.

System 100 can include a network, for example Internet 131, through which content delivery platform 112, can communicate to other networked devices; and communication towers 144, which can include AM or FM broadcast towers, mobile telephone stations, or other suitable communication infrastructure, including satellites (not illustrated) that might be useful in providing content based on a target location. Content delivery platform 112 can use this communication infrastructure to communicate with various computing devices, including portable computer 179, which may include laptop computers, desktop computers, palmtop computers, tablet computers, digital video recorders (DVRs), television set-top boxes, or any of various general or dedicated purpose computers that can be carried or transported; wireless device 177, which can include personal digital assistants (PDAs), cellular telephones, personal communication system (PCS) devices, music players, video players, gaming consoles, or portable televisions; or any of various devices that may be included in, or carried by, motor vehicles 171, 173, or 175, including navigation systems, satellite radios, or the like. It should be noted that the term "mobile device" can include all computing devices as listed above that can communicate with content delivery platform 112, that the above listing of devices is not exhaustive, and

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that a device that qualifies as one type of device may also be considered to be of another type. For example, a mobile phone may also be a general purpose computing device, a radio, a television, and a navigation system.

Still referring to FIG. 1, consider first motor vehicle 171, which is located within sponsor A's reserved geographic area 143. A driver of first motor vehicle 171 can receive advertisements or other content from Sponsor A via a registered application running on a radio, a PDA, a cellular telephone, a laptop, or a global positioning navigation device (none of which are specifically illustrated). In this example, because first motor vehicle 171 is located within sponsor A's reserved geographic area 143, content delivery platform 112 provides content exclusively related to sponsor A 121; advertisements or other content from sponsor C 123 and sponsor B 125 can be excluded.

Portable computer 179 can be connected to Internet 131 via a hardwired network connection, a Wi-Fi connection or other suitable communication connection. In some embodiments, if portable computer 179 is running a registered program application, the user of portable computer 179 will receive content related exclusively to sponsor A as long as he is within sponsor A's reserved geographic area 143. In some embodiments, the driver of first motor vehicle 171 and the user of laptop 179 will still be able to receive advertisements from other sponsors through devices not running a program that has been registered on content delivery platform 112, or through non-registered programs running on the same device.

In some embodiments, the location of mobile devices, or another target location, can be determined using various suitable methods. For example, a mobile device running a registered application can provide location information to content delivery platform 112 in the form of latitude or longitude coordinates, raw or processed GPS data, or other location information received and recorded by either the device itself or another device. In some embodiments, a target location, e.g. the location of a mobile device, can be determined based on signals received from cellular transmission towers, satellites, or methods such as triangulation or dead reckoning, or by IP address. Content delivery platform 112 can receive the location of mobile devices from a third source, for example a location provider, a cellular telephone network provider, or a third party tracking source, rather than from the mobile device itself. Thus, the location of a mobile device can be received from the mobile device, determined by content delivery platform 112, received from a third-party source, or determined based on a combination of these or other methods.

Sponsor A's reserved geographic area 143 illustrates an embodiment in which a perimeter can be defined by streets, county boundaries, city boundaries, landmarks, or other features commonly found on maps. In contrast, sponsor B's reserved geographic area 145 can be an ellipse, circle, oval, or other geometric shape that can be determined, at least in part, based on a radius.

In this example, both second motor vehicle 173 and wireless device 177 are located within sponsor B's reserved geographic area 145. The driver of second motor vehicle 173 and the user of wireless device 177 can receive advertisements or other content via towers 144. For example, if the driver of second motor vehicle 173 is operating a navigation device executing an application program registered by developer 108, advertisements and other content received on the navigation device can be determined based on the location within sponsor B's reserved geographic area 145. Likewise, the user of wireless device 177 will receive

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advertisements related to sponsor B from within a registered application. In some embodiments, content delivery platform 112 can prevent content from sponsor A 121 and sponsor C 123 from being delivered to a mobile device carried by second motor vehicle 173 and wireless device 177, because both motor vehicle 173 and wireless device 177 are located in sponsor B's reserved geographic area 145.

Turning next to sponsor A and sponsor C's reserved geographic area 147, note that the perimeter is a square, rectangle or similarly shaped. In some embodiments, the perimeter may be defined entirely by longitude and latitude lines and/or coordinates that constitute an area. In other embodiments, sponsor A and sponsor C's reserved geographic area 147 can be partially bounded by a longitude or latitude line, a road, river, railway, county, state, parish, city, locality, or other desired boundary. In some embodiments, the perimeter of a sponsor A and sponsor C's reserved geographic area 147 can be defined by a combination of longitude or latitude lines, with one or more remaining boundaries defined based on radius or diameter.

Because third motor vehicle 175 is within sponsor A and sponsor C's reserved geographic area 147, a mobile device carried by third motor vehicle 175 can receive advertising content from either or both sponsor A and sponsor C. In some embodiments, the interest in sponsor A and sponsor C's reserved geographic area 147 can be equally divided between sponsor A 121 and sponsor C 123, while in other embodiments one of sponsor A 121 and sponsor C 123 can have an interest superior to that of the other. In some embodiments, content delivery platform 112 can deliver advertisements or other content related to Sponsor A at selected times, while content related to Sponsor C is delivered at other times. Additionally, content related to sponsor A may be delivered via a first registered application, while content related to sponsor C can be delivered via a second registered application. Thus, sponsors can advertise or provide other content to members of particular demographics based on a type of application a particular demographic is more likely to use.

Referring next to FIG. 2, a target location other than a mobile device in a system 200 is illustrated according to embodiments of the present disclosure. As shown in FIG. 2, a user of registered application 231 is located within the perimeter defining first sponsor's reserved area 207. Object of interest 233 is located in second sponsor's reserved area 205. In some embodiments, object of interest 233 can be any type of object of interest to the user of registered application 231. For example, object of interest 233 could be a friend of the user of registered application 231, and this friend may be employing a mobile phone, a laptop, a kiosk computer, a PDA, or any other device capable of sending location information 216 directly or indirectly to registered application 231. In some embodiments, target location information 216 can be any type of information that can be used to determine the location of the object of interest 233. In at least one embodiment, target location information 216 may be a geocoded twitter message. In another example, object of interest 233 could be an end destination on a map, and the location information 216 of this end destination can be sent to registered application 231.

In response to receiving the target location information 216 from object of interest 233, registered application 231 can send a request 213 to content delivery platform 212. The request can include, but is not limited to, information indicating the location of object of interest 233, a request for content, information indicating the location of registered

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application 231, information indicating the identity of the registered application 231, and a previously received request identifier.

Content delivery platform 212 can receive and process request 213 to identify the location of registered application 231 and the location of object of interest 233. In some embodiments, both locations need not be identified. Furthermore, in some embodiments the specific location need not be identified, as long as a determination that object of interest 233 is located within a given proximity of second sponsor's reserved area 205, or that registered application 231 is located within first sponsor's reserved area 207.

Content delivery platform 212 can provide registered application information 217 to second sponsor 225 to allow second sponsor 225 to deliver second sponsor's content 214 to registered application 231. The registered application information 217 can be an application identifier, a request identifier, a target location, a communications address, or other information that can be utilized by second sponsor 225. In some embodiments, application information 217 need not be provided to second sponsor 225, but instead can be processed internally by content delivery platform 212, and a determination can be made for second sponsor's content 214 to be delivered directly to application 231 from content delivery platform 212, or a third party (not illustrated).

Note that in the illustrated embodiment, despite the fact that registered application 231 is located within first sponsor's reserved area 207, the information delivered to registered application 231 can be content related exclusively to second sponsor's reserved area 205, in which object of interest 233 is located. This is because, in the illustrated embodiment, the target location is the location of object of interest 233, rather than the location of a mobile device executing registered application 231.

In some embodiments, information from the first sponsor can also be delivered to registered application 231, because the locations of the device running registered application 231 and object of interest 233 are both considered target locations. Furthermore, in some embodiments content need not be delivered directly from second sponsor 225, but instead can be provided by content delivery platform 212, or a third party (not illustrated).

Referring next to FIG. 3, a graph showing various geographic areas with reference to longitude and latitude is illustrated according to some embodiments of the present disclosure. The geographic areas in FIG. 3 are for illustration only and carry no particular significance with respect to their geometric shapes. Graph 300 includes a triangular area 320, reserved for sponsor A; pentagonal area 371, reserved for sponsor G; and octagonal area 330, also reserved for sponsor G. In the illustrated example, sponsor G has two physical addresses: G1 327, which lies within sponsor G's reserved octagonal area 330, and G2 328 which, lies within sponsor A's reserved triangular area 320. Furthermore, in the illustrated embodiment, sponsor A does not have a physical location within sponsor A's reserved triangular area 320. These examples help illustrate that there is not necessarily a correlation between a sponsor's physical address and a reserved geographic area, although in some embodiments there may be such a correlation.

As illustrated by FIG. 3, a single target location F 333 is located within sponsor G's reserved octagonal area 330, and target location F 333 can be a mobile device running a registered application, or target location F 333 can represent a target location other than the location of a mobile device.

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as illustrated in FIG. 2. In some embodiments, the mobile device with target location F 333 receives advertising exclusively from advertiser G.

As further illustrated by FIG. 3, there are four target locations: target location A 321, target location B 323, target location C 325, and target location G 392 within advertiser A's reserved triangular area 320. Note also, however, that target location G 392 also lies within one of sponsor G's reserved geographic areas, pentagonal area 371. Consider the following example in which target location A 321 and target location B 323 each are mobile devices executing a first application registered with a content delivery platform, such as content delivery platform 112, of FIG. 1. Further assume, for purposes of this example, that target location C 325 is a mobile device executing a second, different application, which is also registered with the content delivery platform. Because both the first and second applications are registered with the content delivery platform, each of the three devices, with target location A 321 target location B 323 and target location C 325 can receive advertisements or other content from within their respective applications. In this example, the content delivered to all three devices can be related exclusively to sponsor A, regardless of which registered application is being executed, because sponsor A has the only reserved interest in the portions of triangular area 320 occupied by mobile devices having target locations A 321 B 323 and C 325.

In some embodiments, target location G 392 can be a mobile device running two or more registered applications, and can receive content related to sponsor A, because the mobile device lies within triangular area 320. But, target location G 392 also lies within pentagonal area 371, and the mobile device can therefore receive content associated with sponsor G. In some embodiments, content related to sponsor A can be delivered via one of the registered applications, while another registered application receives and displays content related to sponsor G. In other embodiments, one of sponsor A or sponsor G can have a superior interest to the other, and a preference can be given to that sponsor's content for delivery. For example, sponsor G may have a superior interest in pentagonal area 371, which also forms part of triangular area 320. In such a case, if content related to sponsor G is available for delivery to the application on the mobile device with target location G 392, that content will be delivered in preference to content related to sponsor A. However, if there is no high priority content related to sponsor G to be delivered, content related to sponsor A may be provided in its stead. Various other priority and time sharing mechanisms and methods can be implemented according to the teachings set forth herein. Note that in some embodiments, multiple registered applications are not required to implement priority and time sharing mechanisms.

In some instances, a mobile device can have target locations, such as target location D 324 or target location E 356, located outside of areas reserved by sponsors. In such a case, a check can be made to determine if either target location D 340 or target location E 356 are located within a given proximity of a sponsor-reserved area such as triangular area 320 or octagonal area 330. So, for example, a check can be made to determine whether any reserved areas lie within a given radius of target location D 340, defining a search area 341, or within a given radius of target location E 356, defining a search area 351. In some embodiments, if no sponsor reserved area intersects an area within an initially small radius, further checks can be performed by incrementally increasing the radius. So, for example, after a first

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check finds no advertiser reserved areas within search areas 341 or 351, the search areas can be increased to encompass areas 343 and 353, respectively.

In the illustrated example, there is no reserved area intersecting search area 353, but sponsor H 357 has a physical address within area 353. In some embodiments, once it is determined that a registered sponsor has a physical address location within a search radius, but there are no sponsor reserved geographic areas in proximity to or encompassing a target location, an advertisement or other content can be delivered to a mobile device, such as the device with target location 356.

Another situation arises when there are no sponsor reserved geographic areas intersecting a search area, but there are multiple sponsor physical locations within a given radius. Consider area 343, which contains sponsor E's location 349, and sponsor F's location 347. Because neither sponsor E nor sponsor F has established a reserved area that intersects with search area 343, a random choice can be made between these two sponsors to determine which sponsor's content to provide to the registered application on the device with target location D 340. In other embodiments, preference may be given to one of sponsor E's location 349 and sponsor F's location 347 based on each physical locations' proximity to target location D 340, based on a travel time between the device with target location D 340 and the sponsors' locations, or based on some other desired parameter. In further embodiments, if no sponsor's reserved geographic area intersects any portion of area 343, no content is sent to mobile device D with target location 340, despite the fact that location sponsor E's location 359, and sponsor F's location 347 are both within the perimeter defining search area 343.

In some embodiments, the search radius can continue to be expanded until a search area 345 intersects with a sponsor reserved geographic area. In the illustrated embodiment, search area 345 intersects sponsor A's reserved triangular area 320. Note that sponsor G2's physical location 328 is also located within search area 345. In some embodiments, content from either sponsor A or sponsor G can be selected using any of various processes, because target location D 340 is not located entirely within triangular area 320. In some embodiments, however, because the expanded search area 345 encompasses even a portion of sponsor A's reserved triangular area 320, content related to sponsor G will be excluded, and content related to sponsor A will be exclusively provided to mobile device with target location D 340. In some embodiments, because target location D 340 is not located within sponsor A's reserved triangular area 320, content related to sponsor A will be excluded, and content related to sponsor G will be exclusively provided to mobile device with target location D 340.

Additional techniques accounting for the proximity of exclusively reserved advertising areas and sponsor's physical locations with respect to mobile device locations can be implemented according to the teaching set forth herein. For example, in some embodiments, sponsors may obtain an interest in all otherwise unreserved geographic areas. For example, a content delivery system can deliver content from a "default" sponsor, if it is determined that no other content is to be delivered to a mobile device.

Referring next to FIG. 4, a method 400 for allowing sponsors to reserve particular geographic areas will be discussed according to embodiments of the present disclosure. Method 400 begins, as illustrated by block 401. As illustrated by block 403, a content delivery platform (for example content delivery platform 112 as illustrated in FIG.

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1. can receive a request for sponsor registration, which can also include receiving physical address location from the sponsor. As illustrated by block **405**, the sponsor can establish perimeters defining geographic areas of exclusive or semi-exclusive control. These geographic areas are areas the sponsor wishes to reserve for delivery of his own advertisements or other content controlled by the sponsor.

The perimeters established can be based on map features, such as streets, rivers, landmarks, or any of the other various map features. The perimeters can also be defined by latitude and longitude, or various geometric constructs having a given relative position to either a point location, a map location, a physical address, or otherwise. Some embodiments allow for establishing perimeters defining areas based on a combination of the various types of constructs. So, for example, latitude, longitude and map features may be used to establish the reserved area, or a combination of coordinates and geometric constructs can be used in conjunction with other suitable boundary identifiers to establish an area that may be reserved specifically for content related to a particular advertiser or sponsor.

In some embodiments, the perimeters may be generated interactively, using sponsor established perimeter definitions, or other unique sponsor requests. Some embodiments employ pre-defined areas, or allow selection of areas based on predetermined factors, and present sponsors a choice from among previously established options.

As illustrated by block **407**, a sponsor's request for a selected area is received. As illustrated by block **409**, a check is made to determine if the selected area, or a portion of the selected area, has already been reserved by another sponsor. If the area selected by the sponsor is already owned or is otherwise unavailable, method **400** may return to block **407**, and the sponsor can choose another area. In some embodiments, overlap of various sponsor areas may be allowed based on type of business, type of application used to deliver the content, or otherwise.

As illustrated by block **411**, if an area selected for exclusive or semi-exclusive content delivery is available, the selected geographic area can be reserved for the sponsor. And as illustrated by block **413**, the sponsor can be notified that an interest in the geographic area has been reserved for him.

A sponsor can provide content for delivery to mobile devices having target locations contained within its reserved area, as illustrated by block **415**. This content can include advertisements, still image content, animated content, video content, audio content, alphanumeric identifiers, or other content suitable for delivery to mobile devices via registered applications. As illustrated by block **417**, the content received from the sponsor can be stored for later delivery to registered applications running on mobile devices having target locations that exist within the sponsor's reserved area, which such target locations may include, but are not limited to, when the mobile device or target location physically enters or remains within the sponsor's reserved area for a desired length of time. In some embodiments, content can be delivered to a mobile device by the sponsor or another party in response to a notification that the mobile device or target location has entered or is contained within the sponsor's reserved area. Method **400** ends, as illustrated at block **419**.

Referring next to FIG. 5, a method **500** of registering an application program for use in conjunction with a content delivery platform is illustrated according to various embodiments of the present disclosure. Method **500** begins as illustrated by block **501**. As illustrated by block **503**, an application can be registered on a content delivery platform

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in response to a request by a developer, for example developer **108** as illustrated in FIG. 1. As illustrated by block **505**, a request for content can be received from a device running a registered application. In some embodiments, the same registered application may be executed on any of various mobile devices, including mobile telephones, personal digital assistants, laptops, and the like. Furthermore, multiple devices may execute copies of the same registered application, multiple different registered applications may be executed on a single mobile device, and multiple different registered applications may be executed on multiple devices.

As illustrated by block **507** a determination is made as to whether the application sending the request for content has a target location that is located within a sponsor's reserved geographic area. In some embodiments, the target location may be the location of the device. In some embodiments, the target location may be a location other than the location of the device, as illustrated in FIG. 2. As illustrated by block **509**, if the target location is located within a sponsor's reserved area, content from the corresponding sponsor can be chosen for delivery to the mobile device. The content can be chosen based on a number of different parameters or combinations of parameters. In some embodiments, different sponsors may designate particular content to be provided on different days of the week or at different times of day. Some such embodiments allow a single geographic area to be shared by different advertisers or sponsors. For example, content associated with a first sponsor may be selected for delivery in a particular geographic area during the lunch hour, while content related to a second sponsor is selected for delivery in that same geographic area between the hours of midnight and 2 am.

In some embodiments, content from one sponsor can be selected for delivery in a particular geographic area in specific situations, even though a different sponsor has generally reserved that same geographic area. For example, content from a first sponsor can be delivered during a football game to mobile devices located in a geographic area normally reserved by a second sponsor, effectively trumping content related to the second sponsor that would otherwise be delivered. In some embodiments, additional criteria can be applied to determine which sponsors' content will be provided to mobile devices in a particular geographic area.

As illustrated by block **511**, selected content can be provided to an application for display on a mobile device. In at least one embodiment, different content from the same sponsor can be provided to the same device for display within different applications, or the same content from the same sponsor can be displayed for all mobile devices running all registered applications that have target locations within the delivery area for the content. For example, a first program run on a mobile device may display a first advertisement within that program while a second program running on the same device may display a second advertisement, which is different from the first advertisement. In some embodiments in which an interest in a particular geographic area is shared between multiple sponsors, a primary sponsor's content can be exclusively displayed via a first registered application running on a particular mobile device, while content from other sponsors can be displayed via a second and subsequent applications running on the same mobile device.

As illustrated by block **513**, if the target location is not within a sponsor's reserved area, a determination can be made regarding whether at least one sponsor's presence is within a first predetermined radius of the target location. In some embodiments, a determination is made regarding

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whether a sponsor's physical location is within a predetermined radius of the target location. In some embodiments, a determination is made regarding whether a sponsor's geographic area, or a portion of a sponsor's geographic area, is contained within a predetermined radius of the target location. If at least one sponsor's presence is within a predetermined radius of the target location, a sponsor is chosen from a random or pseudo-random process, as illustrated by block 519. Content is then selected for delivery, as illustrated by block 509. As illustrated by block 515, if a sponsor's presence is not within a predetermined radius of the target location, the search radius can be increased. As illustrated by block 517, a check can be made to determine whether any more increases should be made. In some embodiments, the search radius can continue to be increased incrementally, in a logarithmic manner, or otherwise, until at least a portion of a sponsor's reserved area intersects the search area defined by the search radius. In some embodiments, the search radius can be increased a predetermined number of times, or can be limited based on system resources, time constraints, or other desired parameters. The processes illustrated by blocks 513, 515, and 517 can be repeated until a positive indication is produced by the process at block 517.

As illustrated by block 519, content from a randomly or pseudo-randomly selected sponsor can be delivered to a mobile device if the target location is not within a desired proximity to a sponsor's reserved area. In some embodiments, rather than delivering content randomly, content selections can be made based on desired criteria. Content related to a sponsor that reserved all otherwise unallocated space can be delivered to a mobile device executing a registered application. In some such embodiments, if any particular geographic areas have not yet been reserved, or if any device requesting content does not have a target location contained within a reserved geographic area, the default sponsor's content can be delivered to the mobile device. Method 500 ends as illustrated by block 521.

Referring next to FIG. 6, a method of interaction between a mobile device and a content providing platform is illustrated according to various embodiments of the present disclosure. Method 600 begins as illustrated by block 601. As illustrated by block 603 an application platform key can be provided to a developer in response to the developer registering an application for use on the application platform. The developer can, in turn, provide the key to mobile devices on which the registered application is installed. As illustrated by block 605, when a mobile device requests content from the content providing platform, the mobile device can send the key along with its request. As illustrated by block 607, the content providing platform can verify that the key matches a valid key stored in its database, or elsewhere, before providing content to the application.

In some embodiments, key verification can be performed by an entity other than the content providing platform. As illustrated by block 627, if a verification check on the key fails, no content is provided to the requesting application, and the method 600 ends.

As illustrated by block 609, if the key is validated a session can be initiated between the application on the mobile device, and the content delivery platform. As illustrated by block 611 in at least one embodiment, the application running on the mobile device sends the mobile device's location, or another target location, to the content delivery platform. However, in some embodiments the actual location is not sent by the device, but may be provided to the content delivery platform from another source. Furthermore, the content delivery platform, or a subsystem of a

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communications system employed by the content delivery platform, can determine the location of the mobile device based on raw, partially, or completely processed information received from the mobile device or from another source. For example, the mobile device can forward information associated with a target location to the content delivery platform, or the content delivery server can obtain location information from a third party application or device, from a home location register (HLR), from a visiting location register (VLR), from raw, differential, processed or semi-processed GPS data, from power signals used in code-division multiple access (CDMA) or other wireless communications systems, or otherwise.

As illustrated by block 613, the content delivery platform records the request from the registered application in a request identifier in the platform database, or some other suitable storage location. The request identifier can be used in some embodiments to track further interaction with the registered application, or to deliver additional content to a requesting mobile device. Thus, in some embodiments, a mobile device or other target location that is only temporarily located within a particular sponsor's reserved geographic area may continue to receive information from that sponsor after the mobile device, or the target location, exits the sponsor's reserved area. In other embodiments, content related to a sponsor is discontinued in response to a mobile device exiting, or the target location losing focus within, the sponsor's reserved area.

As illustrated by block 615, the content delivery platform can deliver the request identifier to the requesting application along with the requested content. As illustrated by block 617, a user of the mobile device can interact with the provided content using any of various methods such as pressing a button, selecting a user selectable object on a graphical user interface, or otherwise. The application on the mobile device can send an indication of the interaction to the content delivery platform via the same communication channel used to send the request, or via a different communications channel.

As illustrated by block 619, a registered application running on a mobile device can send an additional information request to the platform using the previously assigned request identifier. In some embodiments, using the previously assigned platform request identifier permits tracking of a series of interactions between a particular application and the content delivery platform. Furthermore, using the request identifier can allow individualized content to be delivered to different registered applications which may or may not be running on the same mobile device.

As illustrated by block 621, a determination is made regarding whether a request identifier sent in conjunction with a request for further information is maintained in the platform database or other suitable storage. As illustrated by block 623, if the request identifier is contained in the database or other storage area, the content delivery platform can update a request identifier record as being complete. And as illustrated by block 625, the content delivery platform can deliver more content to the requesting application. As illustrated by block 627, method 600 can proceed to end after delivering the additional content.

The methods and processes discussed previously, as well as other embodiments, may be implemented in a processing system executing a set of instructions stored in memory, or on a removable computer readable medium. An example of a system according to some embodiments is illustrated in FIG. 7. Referring now to FIG. 7, a block diagram of a processing system is illustrated and discussed. Process-

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ing system 700 includes one or more central processing units, such as CPU A 705 and CPU B 707, which may be conventional microprocessors interconnected with various other units via at least one system bus 710. CPU A 705 and CPU B 707 may be separate cores of an individual, multi-core processor, or individual processors connected via a specialized bus 711. In some embodiments, CPU A 705 or CPU B 707 may be a specialized processor, such as a graphics processor, other co-processor, or the like.

Processing system 700 includes random access memory (RAM) 720; read-only memory (ROM) 715, wherein the ROM 715 could also be erasable programmable read-only memory (EPROM) or electrically erasable programmable read-only memory (EEPROM); and input/output (I/O) adapter 725, for connecting peripheral devices such as disk units 730, optical drive 736, or tape drive 737 to system bus 710; a user interface adapter 740 for connecting keyboard 745, mouse 750, speaker 755, microphone 760, or other user interface devices to system bus 710; communications adapter 765 for connecting processing system 700 to an information network such as the Internet or any of various local area networks, wide area networks, telephone networks, or the like; and display adapter 770 for connecting system bus 710 to a display device such as monitor 775. Mouse 750 has a series of buttons 780, 785 and may be used to control a cursor shown on monitor 775.

It will be understood that processing system 700 may include other suitable data processing systems without departing from the scope of the present disclosure. For example, processing system 700 may include bulk storage and cache memories, which provide temporary storage of at least some program code in order to reduce the number of times code must be retrieved from bulk storage during execution.

Various disclosed embodiments can be implemented in hardware, software, or a combination containing both hardware and software elements. In one or more embodiments, the invention is implemented in software, which includes but is not limited to firmware, resident software, microcode, etc. Some embodiments may be realized as a computer program product, and may be implemented as a computer-usable or computer-readable medium embodying program code for use by, or in connection with, a computer, a processor, or other suitable instruction execution system.

For the purposes of this description, a computer-usable or computer readable medium can be any apparatus that can contain, store, communicate, propagate, or transport the program for use by or in connection with the instruction execution system, apparatus, or device. By way of example, and not limitation, computer readable media may comprise any of various types of computer storage media, including volatile and non-volatile, removable and non-removable media implemented in any suitable method or technology for storage of information such as computer readable instructions, data structures, program modules, or other data. Computer storage media include, but are not limited to, RAM, ROM, EEPROM, flash memory or other memory technology, CD-ROM, digital versatile disks (DVD) or other optical storage, magnetic cassettes, magnetic tape, magnetic disk storage or other magnetic storage devices, or any other medium which can be used to store the desired information and which can be accessed by a computer. Data structures and transmission of data (including wireless transmission) particular to aspects of the disclosure are also encompassed within the scope of the disclosure.

Various embodiments have been described for delivering content related to a commercial media program. Other

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variations and modifications of the embodiments disclosed may be made based on the description provided, without departing from the scope of the invention as set forth in the following claims.

What is claimed is:

1. A method comprising:

implementing, on a mobile device, at least one computer readable program instruction, made available for use by one or more distinct application programs operating on the mobile device, for receiving, from a particular one application program of the one or more distinct application programs during the particular one application program's execution on the mobile device, a request to reserve, for the particular one application program, at least one designated geographic area of interest for having a particular associated identifier exclusively provided for use by the particular one application program after it is determined, by at least use of at least one processor tangibly embodied by the mobile device and of location information representing a physical geographic location of the mobile device as determined by a location-determination component tangibly embodied in the mobile device for determining the mobile device's physical geographic location, that the mobile device has at least entered the at least one designated geographic area of interest, wherein the at least one computer readable program instruction comprises at least one input parameter for receiving, from the particular one application program, data representing a) the particular associated identifier as provided content associated with the at least one designated geographic area of interest and exclusively related to the particular one application program, and b) a perimeter definition defining, with at least reference to longitude and latitude, the at least one designated geographic area of interest, and wherein the one or more distinct application programs each comprises a system of executable coded instructions as programmed by at least one developer for execution on the mobile device; using the at least one computer readable program instruction to receive, from a first particular application program during its execution on the mobile device, a first request for a reservation for a first particular designated geographic area of interest for having a first particular associated identifier exclusively provided for use by the first particular application program after it is determined that the mobile device has at least entered the first particular designated geographic area of interest, wherein the first request comprises data representing a) the first particular associated identifier, represented by a data string, as provided content by the first particular application program to be associated with the first particular designated geographic area of interest and exclusively related to the first particular application program, and b) a first perimeter definition provided by the first particular application program, wherein the first perimeter definition comprises at least data representing a first latitude and longitude coordinate and a first radius value for defining the first particular designated geographic area of interest; determining availability for the first particular designated geographic area of interest to be reserved for the first particular application program; using the first perimeter definition in conjunction with the first particular associated identifier to establish the first particular designated geographic area of interest; and using the first request as an area reserved for first content related

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to the first particular application program and not an area reserved for first content related to other application programs, wherein the first content related to the first particular application program comprises the first particular associated identifier;

in response to receiving the first request, after availability for the first particular designated geographic area of interest to be reserved for the first particular application program has been positively determined, storing, in a memory tangibly embodied by the mobile device, an at least first record, for the first particular application program, associated with the first particular associated identifier and the first particular designated geographic area of interest, thereby designating the first particular application program as a first one of one or more registered application programs on the mobile device, wherein the one or more registered application programs on the mobile device each consists of an application program designated for having a particular identifier, being associated with a particular reserved geographic area of interest, to be exclusively provided for use by said application program after it is determined, by at least use of the at least one processor and of the location information, that the mobile device has at least entered said particular reserved geographic area of interest;

using the at least one computer readable program instruction to receive, from a second particular application program during its execution on the mobile device, a second request for a reservation for a second particular designated geographic area of interest for having a second particular associated identifier exclusively provided for use by the second particular application program after it is determined that the mobile device has at least entered the second particular designated geographic area of interest, wherein the second request comprises data representing a) the second particular associated identifier, represented by a data string, as provided content by the second particular application program to be associated with the second particular designated geographic area of interest and exclusively related to the second particular application program, and b) a second perimeter definition provided by the second particular application program, wherein the second perimeter definition comprises at least data representing a second latitude and longitude coordinate and a second radius value for defining the second particular designated geographic area of interest;

determining availability for the second particular designated geographic area of interest to be reserved for the second particular application program;

using the second perimeter definition in conjunction with the second particular associated identifier to establish the second particular designated geographic area of interest in the second request as an area reserved for second content related to the second particular application program and not an area reserved for second content related to other application programs, wherein the second content related to the second particular application program comprises the second particular associated identifier;

in response to receiving the second request, after availability for the second particular designated geographic area of interest to be reserved for the second particular application program has been positively determined, storing, in the memory, an at least second record, for the second particular application program, associated

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with the second particular associated identifier and the second particular designated geographic area of interest, thereby designating the second particular application program as a second one of the one or more registered application programs on the mobile device;

after it is determined, by at least use of the at least one processor, of the location information, and of the first particular designated geographic area of interest associated with the at least first record stored in the memory for the first one of the one or more registered application programs on the mobile device, that the mobile device has at least entered the first particular designated geographic area of interest associated with the at least first record stored in the memory and has remained therein for at least a first designated length of time, selecting the first particular associated identifier associated with the at least first record stored in the memory to be provided for use by the first one of the one or more registered application programs on the mobile device;

after it is determined, by at least use of the at least one processor, of the location information, and of the second particular designated geographic area of interest associated with the at least second record stored in the memory for the second one of the one or more registered application programs on the mobile device, that the mobile device has at least entered the second particular designated geographic area of interest associated with the at least second record stored in the memory and has remained therein for at least a second designated length of time, selecting the second particular associated identifier associated with the at least second record stored in the memory to be provided for use by the second one of the one or more registered application programs on the mobile device;

in response to receiving, from the first one of the one or more registered application programs on the mobile device, a request to receive content, providing, to the first one of the one or more registered application programs on the mobile device, at least the first particular associated identifier from its selecting; and

in response to receiving, from the second one of the one or more registered application programs on the mobile device, a request to receive content, providing, to the second one of the one or more registered application programs on the mobile device, at least the second particular associated identifier from its selecting.

2. The method of claim 1, further comprising:

after providing, to the first one of the one or more registered application programs on the mobile device, at least the first particular associated identifier from its selecting, displaying, on the mobile device via a graphical user interface tangibly embodied by the mobile device and via the first one of the one or more registered application programs on the mobile device, content related to the first particular designated geographic area of interest.

3. The method of claim 1, further comprising:

using the at least one computer readable program instruction to receive, from a third particular application program during its execution on the mobile device, a third request for a reservation for a third particular designated geographic area of interest for having a third particular associated identifier exclusively provided for use by the third particular application program after it is determined that the mobile device, following a first designated start time and for a first designated duration of time, has at least entered the third particular

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designated geographic area of interest and has remained therein for at least a third designated length of time, wherein the third request comprises data representing a) the third particular associated identifier, represented by a data string, as provided content by the third particular application program to be associated with the third particular designated geographic area of interest and exclusively related to the third particular application program, b) a third perimeter definition provided by the third particular application program, c) the third designated length of time, and d) the first designated duration of time;

determining availability for the third particular designated geographic area of interest to be reserved for the third particular application program;

using the third perimeter definition in conjunction with the third particular associated identifier to establish the third particular designated geographic area of interest in the third request as an area reserved for third content related to the third particular application program and not an area reserved for third content related to other application programs, wherein the third content related to the third particular application program comprises the third particular associated identifier;

in response to receiving the third request, after availability for the third particular designated geographic area of interest to be reserved for the third particular application program has been positively determined, storing, in the memory, an at least third record, for the third particular application program, associated with the third particular associated identifier and the third particular designated geographic area of interest, thereby designating the third particular application program as a third one of the one or more registered application programs on the mobile device;

after it is determined, by at least use of the at least one processor, of the location information, and of the third particular designated geographic area of interest associated with the at least third record stored in the memory for the third one of the one or more registered application programs on the mobile device, that the mobile device, following the first designated start time and during the first designated duration of time, has at least entered the third particular designated geographic area of interest associated with the at least third record stored in the memory and has remained therein for at least the third designated length of time, selecting the third particular associated identifier associated with the at least third record stored in the memory to be provided for use by the third one of the one or more registered application programs on the mobile device; and

in response to receiving, from the third one of the one or more registered application programs on the mobile device, a request to receive content, providing, to the third one of the one or more registered application programs on the mobile device, at least the third particular associated identifier from its selecting.

4. The method of claim 3 wherein the third request includes a data value representing the first designated start time.

5. The method of claim 4 wherein the third perimeter definition comprises at least data values for a first latitude data value, a first longitude data value, a second latitude data value, and a second longitude data value for defining the third particular designated geographic area of interest.

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6. The method of claim 1, further comprising:

creating a first notification indicating that the mobile device has at least entered the first particular designated geographic area of interest associated with the at least first record stored in the memory; and

creating a second notification indicating that the mobile device has at least entered the second particular designated geographic area of interest associated with the at least second record stored in the memory.

7. The method of claim 1, further comprising:

obtaining mobile device location information comprising at least one physical geographic location of the mobile device as determined by the location-determination component;

determining, by at least use of the at least one processor, of the mobile device location information, and of the first particular designated geographic area of interest associated with the at least first record stored in the memory for the first one of the one or more registered application programs on the mobile device, that the mobile device has at least entered the first particular designated geographic area of interest associated with the at least first record stored in the memory and has remained therein for at least the first designated length of time; and

determining, by at least use of the at least one processor, of the mobile device location information, and of the second particular designated geographic area of interest associated with the at least second record stored in the memory for the second one of the one or more registered application programs on the mobile device, that the mobile device has at least entered the second particular designated geographic area of interest associated with the at least second record stored in the memory and has remained therein for at least the second designated length of time.

8. The method of claim 1, further comprising:

prior to and as a condition for providing at least the first particular associated identifier from its selecting, verifying that a key associated with the first one of the one or more registered application programs on the mobile device matches a valid key stored in the memory; and

prior to and as a condition for providing at least the second particular associated identifier from its selecting, verifying that a key associated with the second one of the one or more registered application programs on the mobile device matches a valid key stored in the memory.

9. The method of claim 1, further comprising:

using a communications interface tangibly embodied by the mobile device to provide, to the mobile device, at least the second particular application program as received from the Internet from a content delivery platform for developer-provided application programs.

10. The method of claim 1 wherein the first request includes a data value representing the first designated length of time and the second request includes a data value representing the second designated length of time.

11. A mobile device comprising:

memory;

at least one processor operably coupled to the memory;

a location-determination component tangibly embodied in the mobile device for determining the mobile device's physical geographic location; and

at least one module stored in the memory and configured for execution by the at least one processor, wherein the at least one module comprises instructions for:

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implementing, on the mobile device, at least one computer readable program instruction, made available for use by one or more distinct application programs operating on the mobile device, for receiving, from a particular one application program of the one or more distinct application programs during the particular one application program's execution on the mobile device, a request to reserve, for the particular one application program, at least one designated geographic area of interest for having a particular associated identifier exclusively provided for use by the particular one application program after it is determined, by at least use of the at least one processor and of location information representing a physical geographic location of the mobile device as determined by the location-determination component, that the mobile device has at least entered the at least one designated geographic area of interest, wherein the at least one computer readable program instruction comprises at least one input parameter for receiving, from the particular one application program, data representing a) the particular associated identifier as provided content associated with the at least one designated geographic area of interest and exclusively related to the particular one application program, and b) a perimeter definition defining, with at least reference to longitude and latitude, the at least one designated geographic area of interest, and wherein the one or more distinct application programs each comprises a system of executable coded instructions as programmed by at least one developer for execution on the mobile device;

receiving, using the at least one computer readable program instruction, from a first particular application program during its execution on the mobile device, a first request for a reservation for a first particular designated geographic area of interest for having a first particular associated identifier exclusively provided for use by the first particular application program after it is determined that the mobile device has at least entered the first particular designated geographic area of interest, wherein the first request comprises data representing a) the first particular associated identifier, represented by a data string, as provided content by the first particular application program to be associated with the first particular designated geographic area of interest and exclusively related to the first particular application program, and b) a first perimeter definition provided by the first particular application program, wherein the first perimeter definition comprises at least data representing a first latitude and longitude coordinate and a first radius value for defining the first particular designated geographic area of interest;

determining availability for the first particular designated geographic area of interest to be reserved for the first particular application program;

using the first perimeter definition in conjunction with the first particular associated identifier to establish the first particular designated geographic area of interest in the first request as an area reserved for first content related to the first particular application program and not an area reserved for first content related to other application programs, wherein the first content related to the first particular application program comprises the first particular associated identifier;

storing, in the memory, in response to receiving the first request, after availability for the first particular designated

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nated geographic area of interest to be reserved for the first particular application program has been positively determined, an at least first record, for the first particular application program, associated with the first particular associated identifier and the first particular designated geographic area of interest, thereby designating the first particular application program as a first one of the one or more registered application programs on the mobile device, wherein the one or more registered application programs on the mobile device each consists of an application program designated for having a particular identifier, being associated with a particular reserved geographic area of interest, to be exclusively provided for use by said application program after it is determined, by at least use of the at least one processor and of the location information, that the mobile device has at least entered said particular reserved geographic area of interest;

receiving, using the at least one computer readable program instruction, from a second particular application program during its execution on the mobile device, a second request for a reservation for a second particular designated geographic area of interest for having a second particular associated identifier exclusively provided for use by the second particular application program after it is determined that the mobile device has at least entered the second particular designated geographic area of interest, wherein the second request comprises data representing a) the second particular associated identifier, represented by a data string, as provided content by the second particular application program to be associated with the second particular designated geographic area of interest and exclusively related to the second particular application program, and b) a second perimeter definition provided by the second particular application program, wherein the second perimeter definition comprises at least data representing a second latitude and longitude coordinate and a second radius value for defining the second particular designated geographic area of interest;

determining availability for the second particular designated geographic area of interest to be reserved for the second particular application program;

using the second perimeter definition in conjunction with the second particular associated identifier to establish the second particular designated geographic area of interest in the second request as an area reserved for second content related to the second particular application program and not an area reserved for second content related to other application programs, wherein the second content related to the second particular application program comprises the second particular associated identifier;

storing, in the memory, in response to receiving the second request, after availability for the second particular designated geographic area of interest to be reserved for the second particular application program has been positively determined, an at least second record, for the second particular application program, associated with the second particular associated identifier and the second particular designated geographic area of interest, thereby designating the second particular application program as a second one of the one or more registered application programs on the mobile device;

selecting the first particular associated identifier associated with the at least first record stored in the memory

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to be provided for use by the first one of the one or more registered application programs on the mobile device after it is determined, by at least use of the at least one processor, of the location information, and of the first particular designated geographic area of interest associated with the at least first record stored in the memory for the first one of the one or more registered application programs on the mobile device, that the mobile device has at least entered the first particular designated geographic area of interest associated with the at least first record stored in the memory and has remained therein for at least a first designated length of time;

selecting the second particular associated identifier associated with the at least second record stored in the memory to be provided for use by the second one of the one or more registered application programs on the mobile device after it is determined, by at least use of the at least one processor, of the location information, and of the second particular designated geographic area of interest associated with the at least second record stored in the memory for the second one of the one or more registered application programs on the mobile device, that the mobile device has at least entered the second particular designated geographic area of interest associated with the at least second record stored in the memory and has remained therein for at least a second designated length of time;

providing, to the first one of the one or more registered application programs on the mobile device, at least the first particular associated identifier from its selecting in response to receiving, from the first one of the one or more registered application programs on the mobile device, a request to receive content; and

providing, to the second one of the one or more registered application programs on the mobile device, at least the second particular associated identifier from its selecting in response to receiving, from the second one of the one or more registered application programs on the mobile device, a request to receive content.

12. The mobile device of claim 11 wherein the at least one module further comprises instructions for:

displaying, on the mobile device via a graphical user interface tangibly embodied by the mobile device and via the first one of the one or more registered application programs on the mobile device, content related to the first particular designated geographic area of interest, after providing, to the first one of the one or more registered application programs on the mobile device, at least the first particular associated identifier from its selecting.

13. The mobile device of claim 11 wherein the at least one module further comprises instructions for:

receiving, using the at least one computer readable program instruction, from a third particular application program during its execution on the mobile device, a third request for a reservation for a third particular designated geographic area of interest for having a third particular associated identifier exclusively provided for use by the third particular application program after it is determined that the mobile device, following a first designated start time and during a first designated duration of time, has at least entered the third particular designated geographic area of interest and has remained therein for at least a third designated length of time, wherein the third request comprises data representing a) the third particular associated identifier, represented by a data string, as provided content by the

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third particular application program to be associated with the third particular designated geographic area of interest and exclusively related to the third particular application program, b) a third perimeter definition provided by the third particular application program, c) the third designated length of time, and d) the first designated duration of time;

determining availability for the third particular designated geographic area of interest to be reserved for the third particular application program;

using the third perimeter definition in conjunction with the third particular associated identifier to establish the third particular designated geographic area of interest in the third request as an area reserved for third content related to the third particular application program and not an area reserved for third content related to other application programs, wherein the third content related to the third particular application program comprises the third particular associated identifier;

storing, in the memory, in response to receiving the third request, after availability for the third particular designated geographic area of interest to be reserved for the third particular application program has been positively determined, an at least third record, for the third particular application program, associated with the third particular associated identifier and the third particular designated geographic area of interest, thereby designating the third particular application program as a third one of the one or more registered application programs on the mobile device;

selecting the third particular associated identifier associated with the at least third record stored in the memory to be provided for use by the third one of the one or more registered application programs on the mobile device after it is determined, by at least use of the at least one processor, of the location information, and of the third particular designated geographic area of interest associated with the at least third record stored in the memory for the third one of the one or more registered application programs on the mobile device, that the mobile device, following the first designated start time and during the first designated duration of time, has at least entered the third particular designated geographic area of interest associated with the at least third record stored in the memory and has remained therein for at least the third designated length of time; and

providing, to the third one of the one or more registered application programs on the mobile device, at least the third particular associated identifier from its selecting in response to receiving, from the third one of the one or more registered application programs on the mobile device, a request to receive content.

14. The mobile device of claim 13 wherein the third request includes a data value representing the first designated start time.

15. The mobile device of claim 11 wherein the at least one module further comprises instructions for:

creating a first notification indicating that the mobile device has at least entered the first particular designated geographic area of interest associated with the at least first record stored in the memory; and

creating a second notification indicating that the mobile device has at least entered the second particular designated geographic area of interest associated with the at least second record stored in the memory.

16. The mobile device of claim 11 wherein the at least one module further comprises instructions for:

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obtaining mobile device location information comprising at least one physical geographic location of the mobile device as determined by the location-determination component;

determining, by at least use of the at least one processor, of the mobile device location information, and of the first particular designated geographic area of interest associated with the at least first record stored in the memory for the first one of the one or more registered application programs on the mobile device, that the mobile device has at least entered the first particular designated geographic area of interest associated with the at least first record stored in the memory and has remained therein for at least the first designated length of time; and

determining, by at least use of the at least one processor, of the mobile device location information, and of the second particular designated geographic area of interest associated with the at least second record stored in the memory for the second one of the one or more registered application programs on the mobile device, that the mobile device has at least entered the second particular designated geographic area of interest associated with the at least second record stored in the memory and has remained therein for at least the second designated length of time.

17. The mobile device of claim 11 wherein the at least one module further comprises instructions for:

using a communications interface tangibly embodied by the mobile device to provide, to the mobile device, at least the second particular application program as received from the Internet from a content delivery platform for developer-provided application programs.

18. The mobile device of claim 11 wherein the first request includes a data value representing the first designated length of time and the second request includes a data value representing the second designated length of time.

19. A non-transitory computer readable medium tangibly embodying at least one program of computer executable instructions, wherein the at least one program of computer executable instructions comprises instructions for:

implementing, on a mobile device, at least one computer readable program instruction, made available for use by one or more distinct application programs operating on the mobile device, for receiving, from a particular one application program of the one or more distinct application programs during the particular one application program's execution on the mobile device, a request to reserve, for the particular one application program, at least one designated geographic area of interest for having a particular associated identifier exclusively provided for use by the particular one application program after it is determined, by at least use of at least one processor tangibly embodied by the mobile device and of location information representing a physical geographic location of the mobile device as determined by a location-determination component tangibly embodied in the mobile device for determining the mobile device's physical geographic location, that the mobile device has at least entered the at least one designated geographic area of interest, wherein the at least one computer readable program instruction comprises at least one input parameter for receiving, from the particular one application program, data representing a) the particular associated identifier as provided content associated with the at least one designated geographic area of interest and exclusively related to

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the particular one application program, and b) a perimeter definition defining, with at least reference to longitude and latitude, the at least one designated geographic area of interest, and wherein the one or more distinct application programs each comprises a system of executable coded instructions as programmed by at least one developer for execution on the mobile device;

receiving, using the at least one computer readable program instruction, from a first particular application program during its execution on the mobile device, a first request for a reservation for a first particular designated geographic area of interest for having a first particular associated identifier exclusively provided for use by the first particular application program after it is determined that the mobile device has at least entered the first particular designated geographic area of interest, wherein the first request comprises data representing a) the first particular associated identifier, represented by a data string, as provided content by the first particular application program to be associated with the first particular designated geographic area of interest and exclusively related to the first particular application program, and b) a first perimeter definition provided by the first particular application program, wherein the first perimeter definition comprises at least data representing a first latitude and longitude coordinate and a first radius value for defining the first particular designated geographic area of interest;

determining availability for the first particular designated geographic area of interest to be reserved for the first particular application program;

using the first perimeter definition in conjunction with the first particular associated identifier to establish the first particular designated geographic area of interest in the first request as an area reserved for first content related to the first particular application program and not an area reserved for first content related to other application programs, wherein the first content related to the first particular application program comprises the first particular associated identifier;

storing, in a memory tangibly embodied by the mobile device, in response to receiving the first request, after availability for the first particular designated geographic area of interest to be reserved for the first particular application program has been positively determined, an at least first record, for the first particular application program, associated with the first particular associated identifier and the first particular designated geographic area of interest, thereby designating the first particular application program as a first one of the one or more registered application programs on the mobile device, wherein the one or more registered application programs on the mobile device each consists of an application program designated for having a particular identifier, being associated with a particular reserved geographic area of interest, to be exclusively provided for use by said application program after it is determined, by at least use of the at least one processor and of the location information, that the mobile device has at least entered said particular reserved geographic area of interest;

receiving, using the at least one computer readable program instruction, from a second particular application program during its execution on the mobile device, a second request for a reservation for a second particular designated geographic area of interest for having a second particular associated identifier exclusively pro-

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vided for use by the second particular application program after it is determined that the mobile device has at least entered the second particular designated geographic area of interest, wherein the second request comprises data representing a) the second particular associated identifier, represented by a data string, as provided content by the second particular application program to be associated with the second particular designated geographic area of interest and exclusively related to the second particular application program, and b) a second perimeter definition provided by the second particular application program, wherein the second perimeter definition comprises at least data representing a second latitude and longitude coordinate and a second radius value for defining the second particular designated geographic area of interest; determining availability for the second particular designated geographic area of interest to be reserved for the second particular application program; using the second perimeter definition in conjunction with the second particular associated identifier to establish the second particular designated geographic area of interest in the second request as an area reserved for second content related to the second particular application program and not an area reserved for second content related to other application programs, wherein the second content related to the second particular application program comprises the second particular associated identifier; storing, in the memory, in response to receiving the second request, after availability for the second particular designated geographic area of interest to be reserved for the second particular application program has been positively determined, an at least second record, for the second particular application program, associated with the second particular associated identifier and the second particular designated geographic area of interest, thereby designating the second particular application program as a second one of the one or more registered application programs on the mobile device; selecting the first particular associated identifier associated with the at least first record stored in the memory to be provided for use by the first one of the one or more registered application programs on the mobile device after it is determined, by at least use of the at least one processor, of the location information, and of the first particular designated geographic area of interest associated with the at least first record stored in the memory for the first one of the one or more registered application programs on the mobile device, that the mobile device has at least entered the first particular designated geographic area of interest associated with the at least first record stored in the memory and has remained therein for at least a first designated length of time; selecting the second particular associated identifier associated with the at least second record stored in the memory to be provided for use by the second one of the one or more registered application programs on the mobile device after it is determined, by at least use of the at least one processor, of the location information, and of the second particular designated geographic area of interest associated with the at least second record stored in the memory for the second one of the one or more registered application programs on the mobile device, that the mobile device has at least entered the second particular designated geographic area of interest

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associated with the at least second record stored in the memory and has remained therein for at least a second designated length of time; providing, to the first one of the one or more registered application programs on the mobile device, at least the first particular associated identifier from its selecting in response to receiving, from the first one of the one or more registered application programs on the mobile device, a request to receive content; and providing, to the second one of the one or more registered application programs on the mobile device, at least the second particular associated identifier from its selecting in response to receiving, from the second one of the one or more registered application programs on the mobile device, a request to receive content.

20. The computer readable medium of claim 19 wherein the at least one program of computer executable instructions further comprises instructions for: displaying, on the mobile device via a graphical user interface tangibly embodied by the mobile device and via the first one of the one or more registered application programs on the mobile device, content related to the first particular designated geographic area of interest, after providing, to the first one of the one or more registered application programs on the mobile device, at least the first particular associated identifier from its selecting.

21. The computer readable medium of claim 19 wherein the at least one program of computer executable instructions further comprises instructions for: receiving, using the at least one computer readable program instruction, from a third particular application program during its execution on the mobile device, a third request for a reservation for a third particular designated geographic area of interest for having a third particular associated identifier exclusively provided for use by the third particular application program after it is determined that the mobile device, following a first designated start time and during a first designated duration of time, has at least entered the third particular designated geographic area of interest and has remained therein for at least a third designated length of time, wherein the third request comprises data representing a) the third particular associated identifier, represented by a data string, as provided content by the third particular application program to be associated with the third particular designated geographic area of interest and exclusively related to the third particular application program, b) a third perimeter definition provided by the third particular application program, c) the third designated length of time, and d) the first designated duration of time; determining availability for the third particular designated geographic area of interest to be reserved for the third particular application program; using the third perimeter definition in conjunction with the third particular associated identifier to establish the third particular designated geographic area of interest in the third request as an area reserved for third content related to the third particular application program and not an area reserved for third content related to other application programs, wherein the third content related to the third particular application program comprises the third particular associated identifier; storing, in the memory, in response to receiving the third request, after availability for the third particular designated geographic area of interest to be reserved for the

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third particular application program has been positively determined, an at least third record, for the third particular application program, associated with the third particular associated identifier and the third particular designated geographic area of interest, thereby designating the third particular application program as a third one of the one or more registered application programs on the mobile device;

selecting the third particular associated identifier associated with the at least third record stored in the memory to be provided for use by the third one of the one or more registered application programs on the mobile device after it is determined, by at least use of the at least one processor, of the location information, and of the third particular designated geographic area of interest associated with the at least third record stored in the memory for the third one of the one or more registered application programs on the mobile device, that the mobile device, following the first designated start time and during the first designated duration of time, has at least entered the third particular designated geographic area of interest associated with the at least third record stored in the memory and has remained therein for at least the third designated length of time; and

providing, to the third one of the one or more registered application programs on the mobile device, at least the third particular associated identifier from its selecting in response to receiving, from the third one of the one or more registered application programs on the mobile device, a request to receive content.

22. The computer readable medium of claim **19** wherein the at least one program of computer executable instructions further comprises instructions for:

creating a first notification indicating that the mobile device has at least entered the first particular designated geographic area of interest associated with the at least first record stored in the memory; and

creating a second notification indicating that the mobile device has at least entered the second particular designated geographic area of interest associated with the at least second record stored in the memory.

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23. The computer readable medium of claim **19** wherein the at least one program of computer executable instructions further comprises instructions for:

obtaining mobile device location information comprising at least one physical geographic location of the mobile device as determined by the location-determination component;

determining, by at least use of the at least one processor, of the mobile device location information, and of the first particular designated geographic area of interest associated with the at least first record stored in the memory for the first one of the one or more registered application programs on the mobile device, that the mobile device has at least entered the first particular designated geographic area of interest associated with the at least first record stored in the memory and has remained therein for at least the first designated length of time; and

determining, by at least use of the at least one processor, of the mobile device location information, and of the second particular designated geographic area of interest associated with the at least second record stored in the memory for the second one of the one or more registered application programs on the mobile device, that the mobile device has at least entered the second particular designated geographic area of interest associated with the at least second record stored in the memory and has remained therein for at least the second designated length of time.

24. The computer readable medium of claim **19** wherein the at least one program of computer executable instructions further comprises instructions for:

using a communications interface tangibly embodied by the mobile device to provide, to the mobile device, at least the second particular application program as received from the Internet from a content delivery platform for developer-provided application programs.

25. The computer readable medium of claim **19** wherein the first request includes a data value representing the first designated length of time and the second request includes a data value representing the second designated length of time.

* * * * *

EXHIBIT B



US010049387B2

(12) **United States Patent**
Hardin et al.

(10) **Patent No.:** **US 10,049,387 B2**

(45) **Date of Patent:** **Aug. 14, 2018**

(54) **EXCLUSIVE DELIVERY OF CONTENT
WITHIN GEOGRAPHIC AREAS**

G06Q 30/02; G06Q 30/0267; G06Q
30/0261; G06Q 30/0241; G06Q 20/3224;
G06Q 30/0251; G06Q 20/322

(71) Applicants: **Ryan Hardin**, Henderson, TX (US);
Andrew Hill, Houston, TX (US)

See application file for complete search history.

(72) Inventors: **Ryan Hardin**, Henderson, TX (US);
Andrew Hill, Houston, TX (US)

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(*) Notice: Subject to any disclaimer, the term of this
patent is extended or adjusted under 35
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(21) Appl. No.: **15/694,786**

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(65) **Prior Publication Data**

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(Continued)

Related U.S. Application Data

Primary Examiner — Olumide Ajibade Akonai

(63) Continuation of application No. 15/009,961, filed on
Jan. 29, 2016, now Pat. No. 9,779,418, which is a
(Continued)

(57) **ABSTRACT**

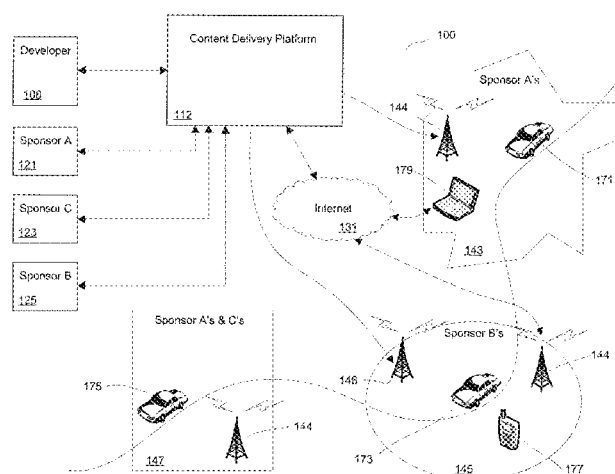
(51) **Int. Cl.**
G06Q 30/02 (2012.01)
H04W 4/18 (2009.01)
(Continued)

Application developers can request to have their applications registered for use with a content delivery platform. The operator of the content delivery platform establishes perimeters defining geographic areas, and maintains records reserving particular areas for delivery of content associated with particular sponsors. Registered applications running on mobile devices can request content from the content delivery platform. Based at least in part on the request, the content delivery platform can identify a target location, which may be the location of the mobile device, or some other location indicated in the request. A mobile device can be provided content based on the relationship of the target location to the geographic areas, so that a registered application running on a mobile device with a target location contained within a geographic area assigned to a particular sponsor will receive content related to that sponsor.

(52) **U.S. Cl.**
CPC **G06Q 30/0261** (2013.01); **G06Q 30/02**
(2013.01); **G06Q 30/0266** (2013.01);
(Continued)

(58) **Field of Classification Search**
CPC H04W 4/02; H04W 64/00; H04W 4/021;
H04W 4/023; H04W 4/206; H04W 4/027;
H04W 4/028; H04W 4/001; H04W 4/18;
H04W 8/18; H04W 88/02; H04L 67/18;
H04L 67/306; H04L 67/20; H04L 67/26;

34 Claims, 7 Drawing Sheets



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Related U.S. Application Data

continuation of application No. 14/608,285, filed on Jan. 29, 2015, now Pat. No. 9,286,625, which is a continuation of application No. 13/856,392, filed on Apr. 3, 2013, now Pat. No. 8,977,247, which is a continuation of application No. 12/434,094, filed on May 1, 2009, now Pat. No. 8,433,296.

(51) Int. Cl.

H04W 4/02 (2018.01)*H04M 3/42* (2006.01)*H04L 29/08* (2006.01)*H04W 4/021* (2018.01)

(52) U.S. Cl.

CPC *G06Q 30/0267* (2013.01); *H04M 3/42357* (2013.01); *H04W 4/02* (2013.01); *H04W 4/021* (2013.01); *H04W 4/18* (2013.01); *H04L 67/20* (2013.01); *H04M 2242/14* (2013.01)

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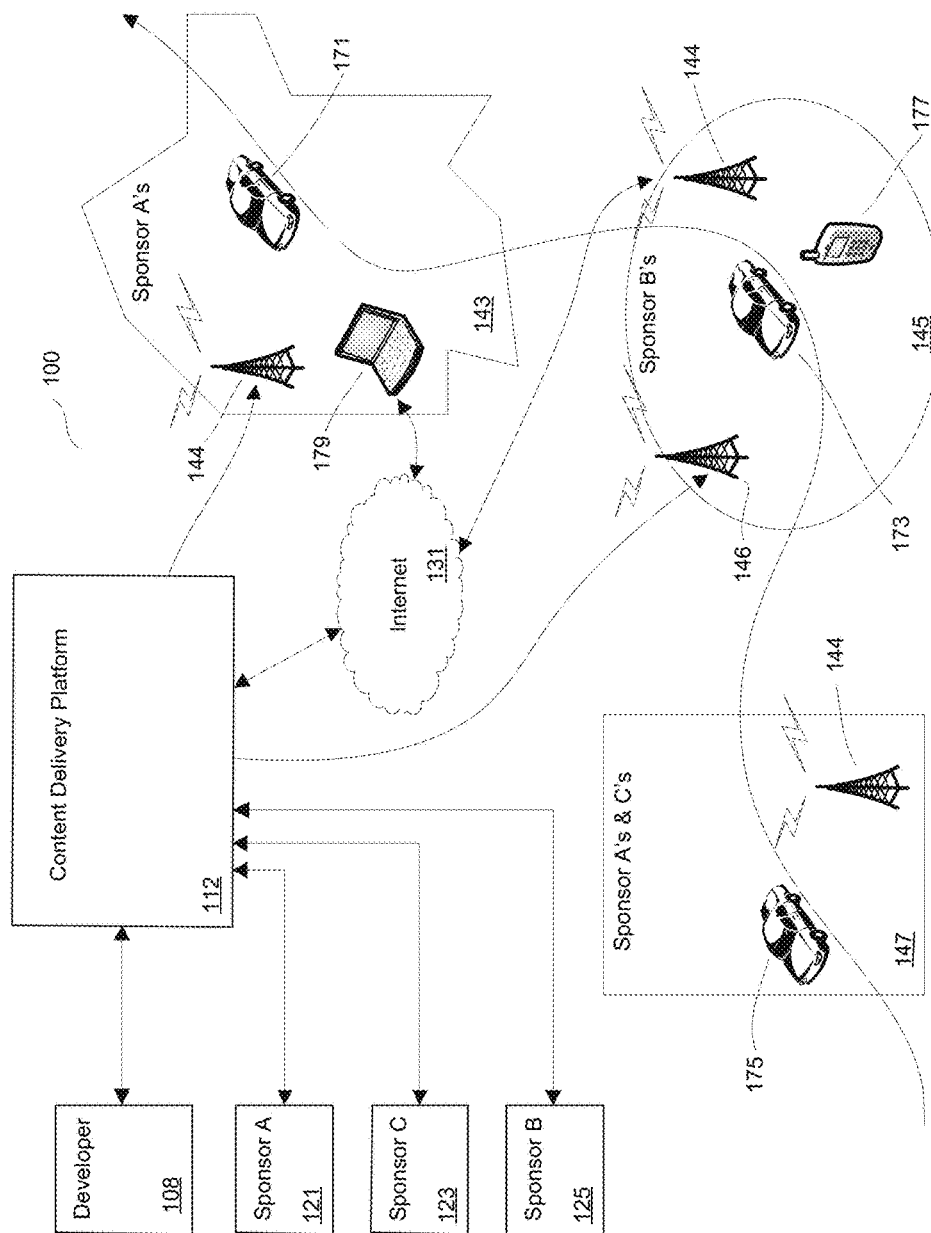


FIG. 1

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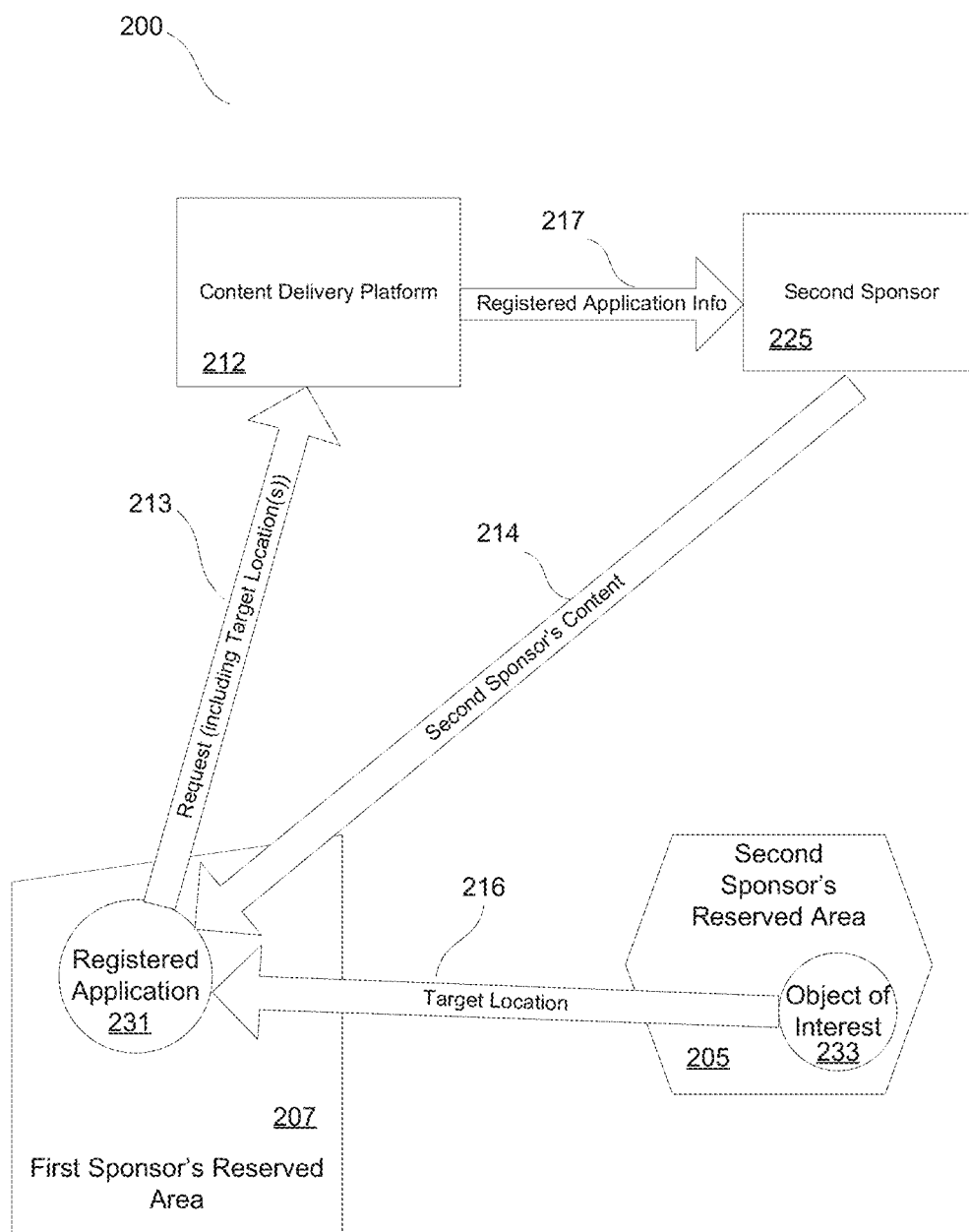
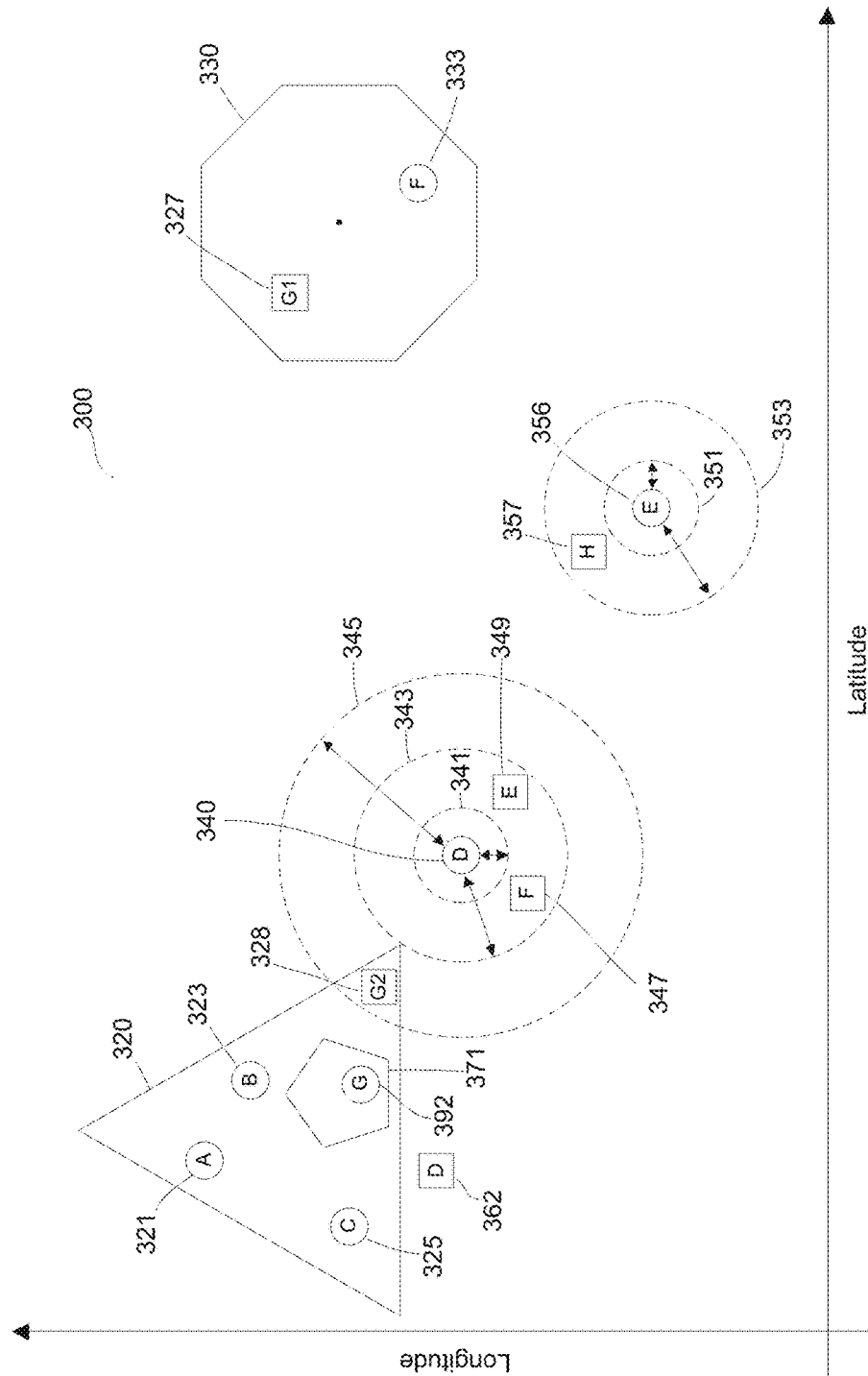


FIG. 2



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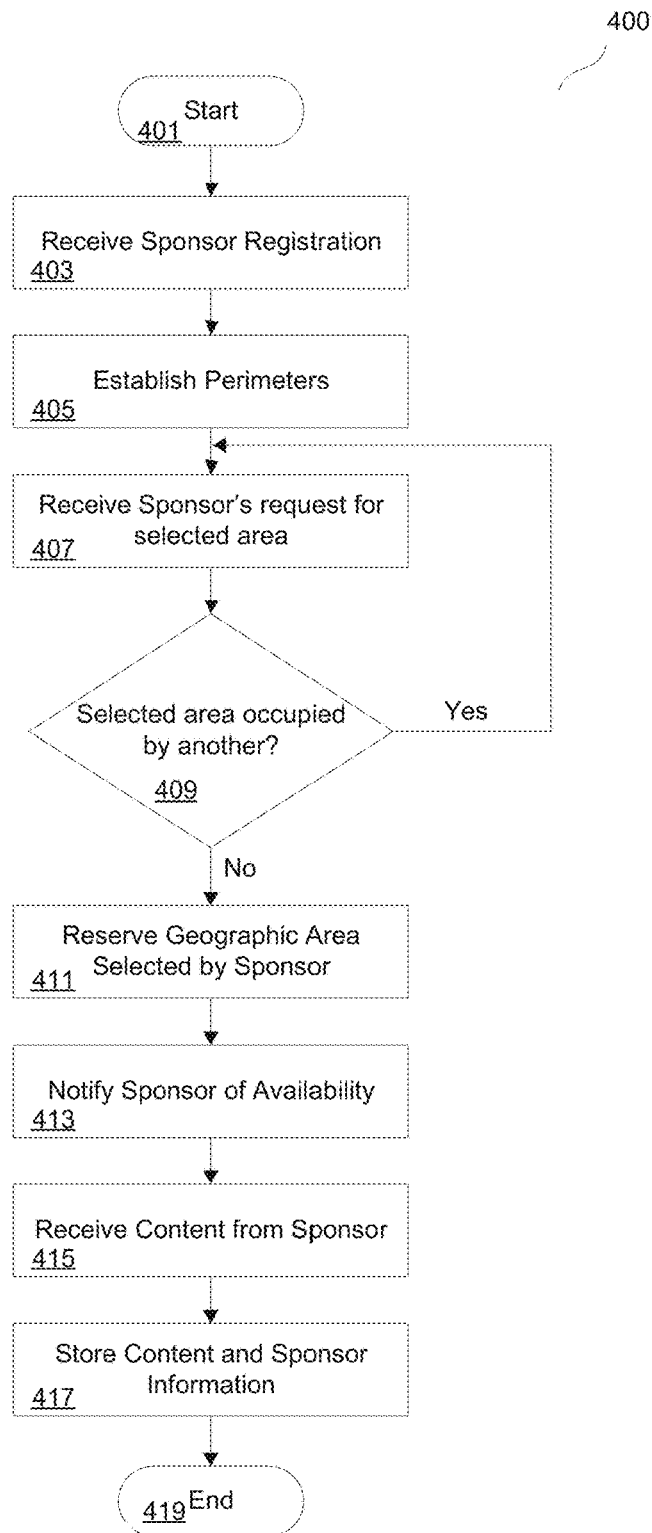


FIG. 4

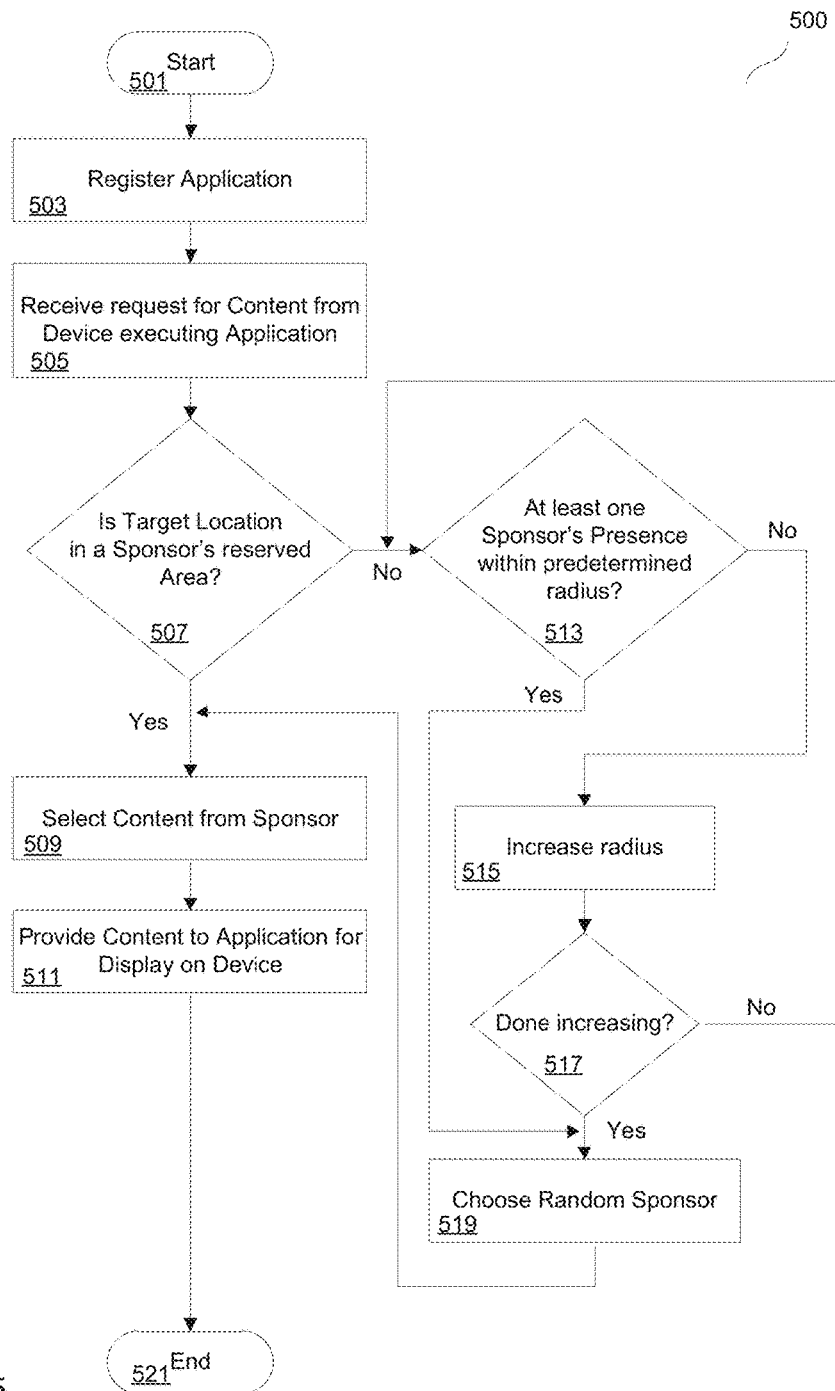


FIG. 5

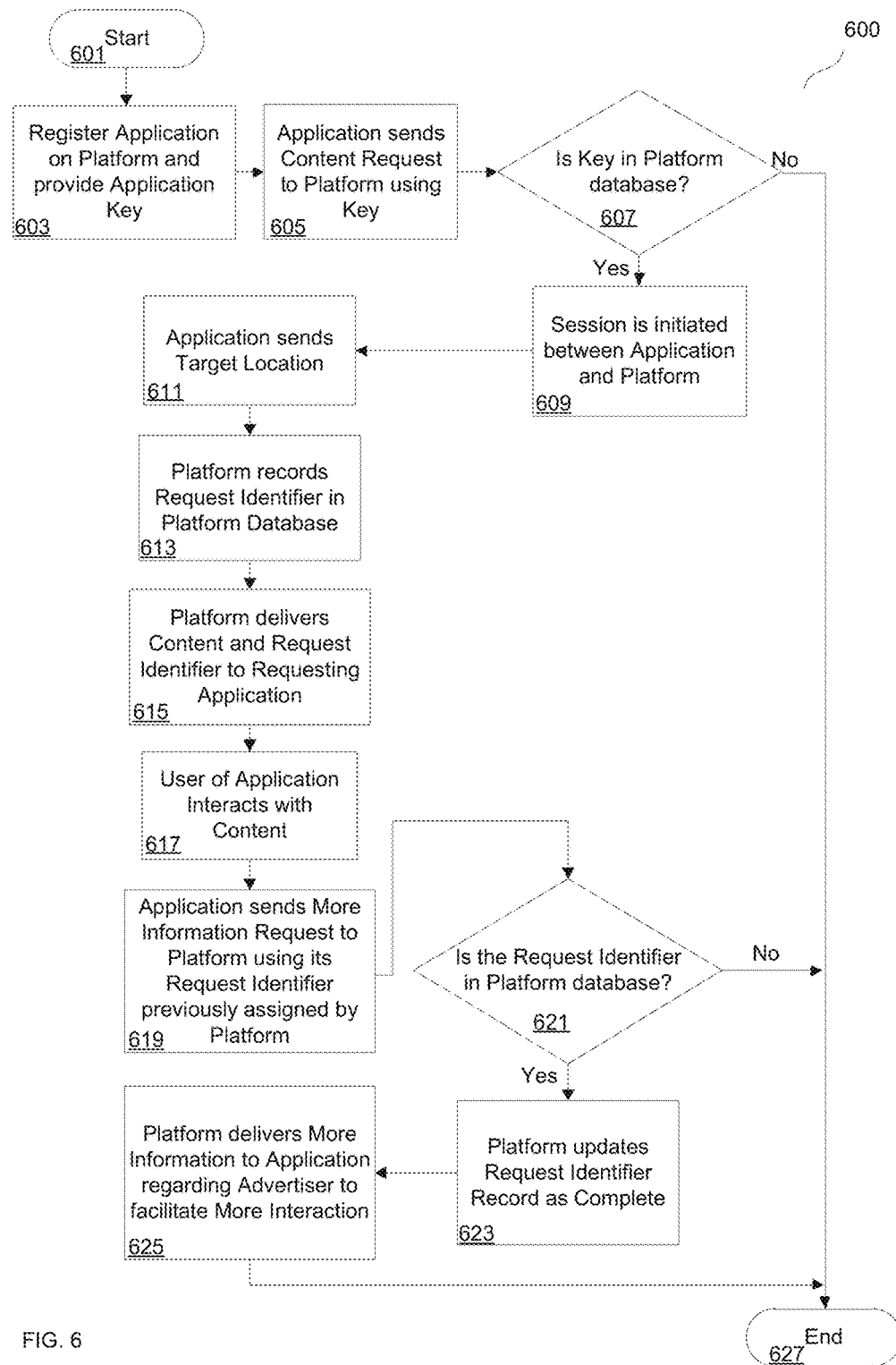


FIG. 6

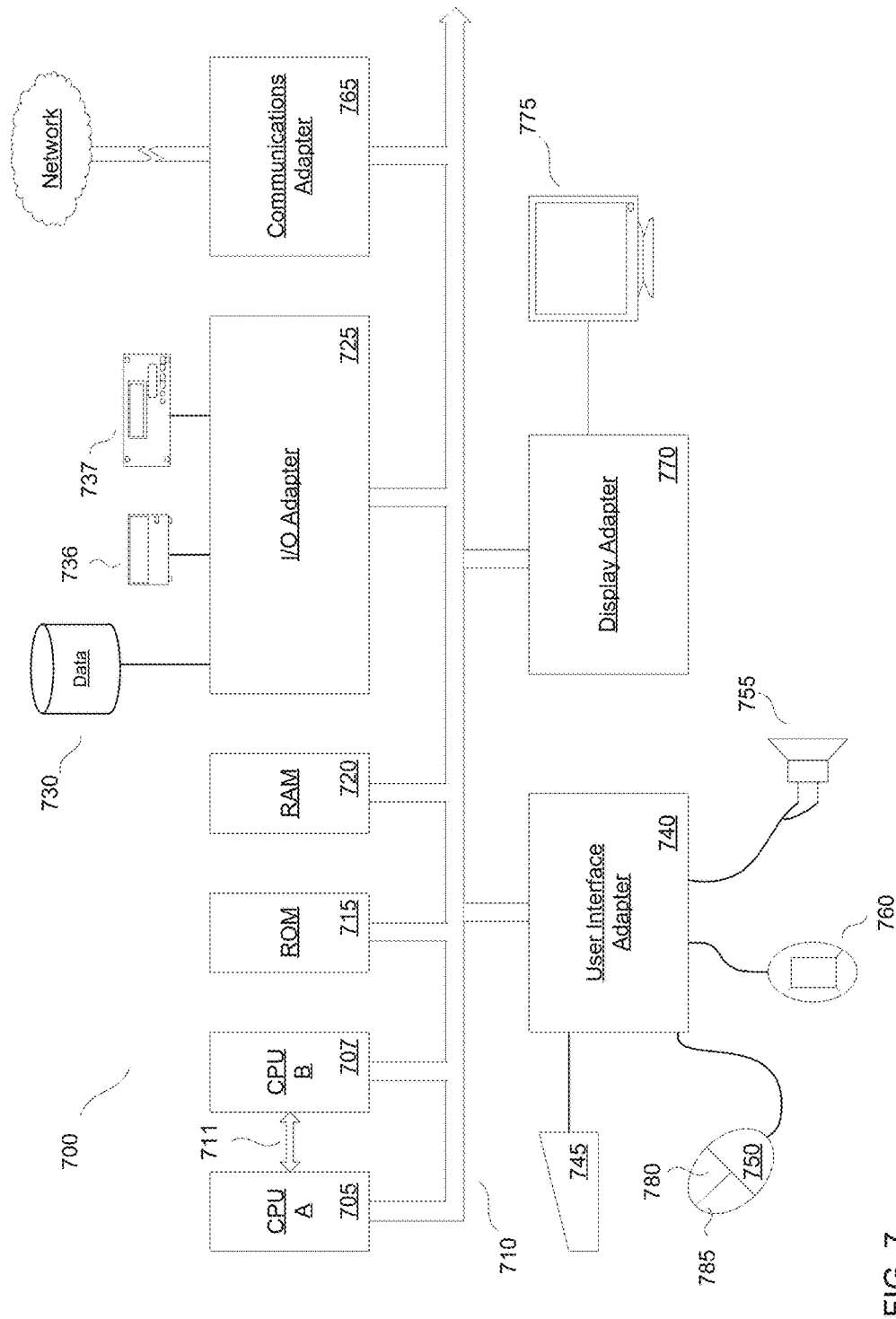


FIG. 7

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**EXCLUSIVE DELIVERY OF CONTENT
WITHIN GEOGRAPHIC AREAS****CROSS REFERENCE TO RELATED
APPLICATIONS**

This continuation patent application claims priority from co-pending U.S. Non-provisional patent application having Ser. No. 15/009,961, filed 29 Jan. 2016, entitled "EXCLUSIVE DELIVERY OF CONTENT WITHIN GEOGRAPHIC AREAS", which claims priority from co-pending U.S. Non-provisional patent application having Ser. No. 14/608,285, filed 29 Jan. 2015, entitled "EXCLUSIVE DELIVERY OF CONTENT WITHIN GEOGRAPHIC AREAS", now U.S. Pat. No. 9,286,625 issued on 15 Mar. 2016, which claims priority from co-pending U.S. Non-provisional patent application having Ser. No. 13/856,392, filed 3 Apr. 2013, entitled "EXCLUSIVE DELIVERY OF CONTENT WITHIN GEOGRAPHIC AREAS", now U.S. Pat. No. 8,977,247 issued on 10 Mar. 2015, which claims priority from co-pending U.S. Non-provisional patent application having Ser. No. 12/434,094, filed 1 May 2009, entitled "EXCLUSIVE DELIVERY OF CONTENT WITHIN GEOGRAPHIC AREAS", now U.S. Pat. No. 8,433,296 issued on 30 Apr. 2013, all having a common applicant herewith and being incorporated herein in their entirety by reference.

FIELD

This disclosure relates generally to delivery of content, and more particularly to delivery of content within reserved geographic areas.

BACKGROUND

Advertisements can be delivered to various devices, including mobile devices, within communications range of areas transmitters or other information providers. For example, advertisements can be delivered to cellular phones within range of a particular cellular phone provider's network area. Furthermore, advertisements can be delivered using digital billboards, or via the Internet, based on user interactions and preferences.

When delivering advertisements and other content to some mobile devices, currently available technologies can broadcast the content to all devices equipped to receive them. In some cases, advertisements are broadcast to any mobile device within a city, or a similar area. When delivering non-broadcast content, for example via the Internet, it is common to deliver the content in response to a request, received from the receiving device. In some cases, push technology can be used to deliver content to multiple users concurrently.

In each of these cases, a mobile device can usually receive content from multiple different content providers. Current technologies are, therefore, less than perfect.

SUMMARY

Various embodiments disclosed herein include registering an application program for use with a content delivery platform, establishing multiple perimeters defining respective geographic areas, and maintaining records associating sponsors with particular geographic areas. The content delivery platform can receive a request from a registered application program for content to be displayed on a mobile

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device, and the request can be used to determine a target location. In some embodiments, a sponsor is selected based on a relationship between the target location and one or more reserved geographic areas. Content is then provided to the application program.

In some embodiments, the content delivery platform can record a request identifier associated with a received request, and provide the request identifier to the mobile device to assist in tracking future actions relating to the request for content. The content delivery platform can also receive information related to user interaction with the provided content, including the request identifier, and provide additional content in response to the received information.

Content can be delivered to a mobile device running a registered application if a target location is at least partially within a predetermined radial distance of a geographical area associated with a sponsor; if the mobile device is not located within the predetermined radial distance, the radial distance can be increased. In some embodiments, content is delivered if the target location, e.g. the location of the mobile device or another location of interest, is located entirely within a geographic area exclusively reserved by a particular sponsor. In some embodiments, the content delivery platform can select from among several sponsors in deciding which content to deliver to a mobile device.

In at least one embodiment, the content delivery system reserves exclusive interests in geographic areas for particular sponsors based on the sponsors' requests, and store a record of that interest. In some embodiments, the content delivery system receives, from a sponsor, content to be delivered to mobile devices based on a target location being positioned within particular geographic areas. The content delivery system can also reserve an interest in geographic areas that remain unreserved by other sponsors. Furthermore, some embodiments include time based restrictions.

Various embodiments can be implemented as a system that includes memory, a communications interface, and a processor that cooperate to store and execute a program of instructions implementing various methods and techniques described herein. Furthermore, some embodiments can be implemented as a computer readable medium tangibly embodying a program of instructions.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an abstract representation of exclusive content delivery to particular reserved areas according to various embodiments of the present disclosure;

FIG. 2 is a diagram illustrating a target location other than the location of the mobile device executing a registered application, according to embodiments of the present disclosure;

FIG. 3 is a graph representing expanded search areas to determine which content is delivered according to various embodiments of the present disclosure;

FIG. 4 is a flowchart illustrating a method of reserving a geographic area according to embodiments of the present disclosure;

FIG. 5 is a flowchart illustrating registration of an application for content delivery according to embodiments of the present disclosure;

FIG. 6 is a flowchart illustrating delivery of content to particular applications in a reserved area according to embodiments of the present disclosure;

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FIG. 7 is a diagram illustrating a processing system according to embodiments of the present disclosure.

DETAILED DESCRIPTION

Various embodiments of the present disclosure provide for delivering content, such as advertising, to registered applications being run on any of various mobile electronic devices configured to be readily moved, carried, or otherwise transported between different various geographic areas defined by perimeters. Sponsors can reserve an exclusive interest, or in some embodiments a semi-exclusive interest, in a geographic area, so that other sponsors' advertisements are excluded from being broadcast or otherwise provided to a registered program being executed on a mobile device located within a reserved geographic area.

Referring first to FIG. 1, system 100, is illustrated. System 100 can provide for exclusive delivery of advertising or other content to registered applications running on mobile devices located within a particular proximity to a reserved geographic area. System 100, as illustrated, includes content delivery platform 112, which is in communication with developer platform 108, and systems or individuals operating under control of sponsor A 121, sponsor C 123, and sponsor B 125. Content delivery platform 112 receives a request from developer platform 108 to register a program or other application for use on mobile devices. Content delivery platform 112 can use the registered application program to provide selected content to mobile devices.

In some embodiments, a registered application program is provided to mobile devices by developer platform 108, content delivery platform 112, one of sponsor A 121, sponsor C 123, or sponsor B 125, or by another desired delivery mechanism. In some embodiments, registering the application program with content delivery platform 112 allows developer 108 to receive revenue from sponsor A 121, sponsor C 123, or sponsor B 125 for content displayed on a mobile device located within, or in proximity to, a geographical area reserved by one or more of the sponsors.

Sponsor A 121, sponsor C 123, or sponsor B 125 can reserve an exclusive interest in a particular geographic area by sending a request to content delivery platform 112. In some embodiments, the request can be for exclusive delivery of content to mobile devices running any registered application within given geographic areas, or for content to be delivered to particular registered applications based on a target location. The request can also include time limitations, limitations based on the length of time a mobile device remains within a given geographic area, or other desired limitations. Furthermore, the reserved interest can be either completely exclusive, or semi-exclusive.

System 100 can include a network, for example Internet 131, through which content delivery platform 112, can communicate to other networked devices; and communication towers 144, which can include AM or FM broadcast towers, mobile telephone stations, or other suitable communication infrastructure, including satellites (not illustrated) that might be useful in providing content based on a target location. Content delivery platform 112 can use this communication infrastructure to communicate with various computing devices, including portable computer 179, which may include laptop computers, desktop computers, palmtop computers, tablet computers, digital video recorders (DVRs), television set-top boxes, or any of various general or dedicated purpose computers that can be carried or transported; wireless device 177, which can include personal digital assistants (PDAs), cellular telephones, personal com-

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munication system (PCS) devices, music players, video players, gaming consoles, or portable televisions; or any of various devices that may be included in, or carried by, motor vehicles 171, 173, or 175, including navigation systems, satellite radios, or the like. It should be noted that the term "mobile device" can include all computing devices as listed above that can communicate with content delivery platform 112, that the above listing of devices is not exhaustive, and that a device that qualifies as one type of device may also be considered to be of another type. For example, a mobile phone may also be a general purpose computing device, a radio, a television, and a navigation system.

Still referring to FIG. 1, consider first motor vehicle 171, which is located within sponsor A's reserved geographic area 143. A driver of first motor vehicle 171 can receive advertisements or other content from Sponsor A via a registered application running on a radio, a PDA, a cellular telephone, a laptop, or a global positioning navigation device (none of which are specifically illustrated). In this example, because first motor vehicle 171 is located within sponsor A's reserved geographic area 143, content delivery platform 112 provides content exclusively related to sponsor A 121; advertisements or other content from sponsor C 123 and sponsor B 125 can be excluded.

Portable computer 179 can be connected to Internet 131 via a hardwired network connection, a Wi-Fi connection or other suitable communication connection. In some embodiments, if portable computer 179 is running a registered program application, the user of portable computer 179 will receive content related exclusively to sponsor A as long as he is within sponsor A's reserved geographic area 143. In some embodiments, the driver of first motor vehicle 171 and the user of laptop 179 will still be able to receive advertisements from other sponsors through devices not running a program that has been registered on content delivery platform 112, or through non-registered programs running on the same device.

In some embodiments, the location of mobile devices, or another target location, can be determined using various suitable methods. For example, a mobile device running a registered application can provide location information to content delivery platform 112 in the form of latitude or longitude coordinates, raw or processed GPS data, or other location information received and recorded by either the device itself or another device. In some embodiments, a target location, e.g. the location of a mobile device, can be determined based on signals received from cellular transmission towers, satellites, or methods such as triangulation or dead reckoning, or by IP address. Content delivery platform 112 can receive the location of mobile devices from a third source, for example a location provider, a cellular telephone network provider, or a third party tracking source, rather than from the mobile device itself. Thus, the location of a mobile device can be received from the mobile device, determined by content delivery platform 112, received from a third-party source, or determined based on a combination of these or other methods.

Sponsor A's reserved geographic area 143 illustrates an embodiment in which a perimeter can be defined by streets, county boundaries, city boundaries, landmarks, or other features commonly found on maps. In contrast, sponsor B's reserved geographic area 145 can be an ellipse, circle, oval, or other geometric shape that can be determined, at least in part, based on a radius.

In this example, both second motor vehicle 173 and wireless device 177 are located within sponsor B's reserved geographic area 145. The driver of second motor vehicle 173

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and the user of wireless device 177 can receive advertisements or other content via towers 144. For example, if the driver of second motor vehicle 173 is operating a navigation device executing an application program registered by developer 108, advertisements and other content received on the navigation device can be determined based on the location within sponsor B's reserved geographic area 145. Likewise, the user of wireless device 177 will receive advertisements related to sponsor B from within a registered application. In some embodiments, content delivery platform 112 can prevent content from sponsor A 121 and sponsor C 123 from being delivered to a mobile device carried by second motor vehicle 173 and wireless device 177, because both motor vehicle 173 and wireless device 177 are located in sponsor B's reserved geographic area 145.

Turning next to sponsor A and sponsor C's reserved geographic area 147, note that the perimeter is a square, rectangle or similarly shaped. In some embodiments, the perimeter may be defined entirely by longitude and latitude lines and/or coordinates that constitute an area. In other embodiments, sponsor A and sponsor C's reserved geographic area 147 can be partially bounded by a longitude or latitude line, a road, river, railway, county, state, parish, city, locality, or other desired boundary. In some embodiments, the perimeter of a sponsor A and sponsor C's reserved geographic area 147 can be defined by a combination of longitude or latitude lines, with one or more remaining boundaries defined based on radius or diameter.

Because third motor vehicle 175 is within sponsor A and sponsor C's reserved geographic area 147, a mobile device carried by third motor vehicle 175 can receive advertising content from either or both sponsor A and sponsor C. In some embodiments, the interest in sponsor A and sponsor C's reserved geographic area 147 can be equally divided between sponsor A 121 and sponsor C 123, while in other embodiments one of sponsor A 121 and sponsor C 123 can have an interest superior to that of the other. In some embodiments, content delivery platform 112 can deliver advertisements or other content related to Sponsor A at selected times, while content related to Sponsor C is delivered at other times. Additionally, content related to sponsor A may be delivered via a first registered application, while content related to sponsor C can be delivered via a second registered application. Thus, sponsors can advertise or provide other content to members of particular demographics based on a type of application a particular demographic is more likely to use.

Referring next to FIG. 2, a target location other than a mobile device in a system 200 is illustrated according to embodiments of the present disclosure. As shown in FIG. 2, a user of registered application 231 is located within the perimeter defining first sponsor's reserved area 207. Object of interest 233 is located in second sponsor's reserved area 205. In some embodiments, object of interest 233 can be any type of object of interest to the user of registered application 231. For example, object of interest 233 could be a friend of the user of registered application 231, and this friend may be employing a mobile phone, a laptop, a kiosk computer, a PDA, or any other device capable of sending location information 216 directly or indirectly to registered application 231. In some embodiments, target location information 216 can be any type of information that can be used to determine the location of the object of interest 233. In at least one embodiment, target location information 216 may be a geocoded twitter message. In another example, object

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of interest 233 could be an end destination on a map, and the location information 216 of this end destination can be sent to registered application 231.

In response to receiving the target location information 216 from object of interest 233, registered application 231 can send a request 213 to content delivery platform 212. The request can include, but is not limited to, information indicating the location of object of interest 233, a request for content, information indicating the location of registered application 231, information indicating the identity of the registered application 231, and a previously received request identifier.

Content delivery platform 212 can receive and process request 213 to identify the location of registered application 231 and the location of object of interest 233. In some embodiments, both locations need not be identified. Furthermore, in some embodiments the specific location need not be identified, as long as a determination that object of interest 233 is located within a given proximity of second sponsor's reserved area 205, or that registered application 231 is located within first sponsor's reserved area 207.

Content delivery platform 212 can provide registered application information 217 to second sponsor 225 to allow second sponsor 225 to deliver second sponsor's content 214 to registered application 231. The registered application information 217 can be an application identifier, a request identifier, a target location, a communications address, or other information that can be utilized by second sponsor 225. In some embodiments, application information 217 need not be provided to second sponsor 225, but instead can be processed internally by content delivery platform 212, and a determination can be made for second sponsor's content 214 to be delivered directly to application 231 from content delivery platform 212, or a third party (not illustrated).

Note that in the illustrated embodiment, despite the fact that registered application 231 is located within first sponsor's reserved area 207, the information delivered to registered application 231 can be content related exclusively to second sponsor's reserved area 205, in which object of interest 233 is located. This is because, in the illustrated embodiment, the target location is the location of object of interest 233, rather than the location of a mobile device executing registered application 231.

In some embodiments, information from the first sponsor can also be delivered to registered application 231, because the locations of the device running registered application 231 and object of interest 233 are both considered target locations. Furthermore, in some embodiments content need not be delivered directly from second sponsor 225, but instead can be provided by content delivery platform 212, or a third party (not illustrated).

Referring next to FIG. 3, a graph showing various geographic areas with reference to longitude and latitude is illustrated according to some embodiments of the present disclosure. The geographic areas in FIG. 3 are for illustration only and carry no particular significance with respect to their geometric shapes. Graph 300 includes a triangular area 320, reserved for sponsor A; pentagonal area 371, reserved for sponsor G; and octagonal area 330, also reserved for sponsor G. In the illustrated example, sponsor G has two physical addresses: G1 327, which lies within sponsor G's reserved octagonal area 330, and G2 328 which, lies within sponsor A's reserved triangular area 320. Furthermore, in the illustrated embodiment, sponsor A does not have a physical location within sponsor A's reserved area 320. These examples help illustrate that there is not necessarily a

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correlation between a sponsor's physical address and a reserved geographic area, although in some embodiments there may be such a correlation.

As illustrated by FIG. 3, a single target location F 333 is located within sponsor G's reserved octagonal area 330, and target location F 333 can be a mobile device running a registered application, or target location F 333 can represent a target location other than the location of a mobile device, as illustrated in FIG. 2. In some embodiments, the mobile device with target location F 333 receives advertising exclusively from advertiser G.

As further illustrated by FIG. 3, there are four target locations: target location A 321, target location B 323, target location C 325, and target location G 392 within advertiser A's reserved triangular area 320. Note also, however, that target location G 392 also lies within one of sponsor G's reserved geographic areas, pentagonal area 371. Consider the following example in which target location A 321 and target location B 323 each are mobile devices executing a first application registered with a content delivery platform, such as content delivery platform 112, of FIG. 1. Further assume, for purposes of this example, that target location C 325 is a mobile device executing a second, different application, which is also registered with the content delivery platform. Because both the first and second applications are registered with the content delivery platform, each of the three devices, with target location A 321 target location B 323 and target location C 325 can receive advertisements or other content from within their respective applications. In this example, the content delivered to all three devices can be related exclusively to sponsor A, regardless of which registered application is being executed, because sponsor A has the only reserved interest in the portions of triangular area 320 occupied by mobile devices having target locations A 321 B 323 and C 325.

In some embodiments, target location G 392 can be a mobile device running two or more registered applications, and can receive content related to sponsor A, because the mobile device lies within triangular area 320. But, target location G 392 also lies within pentagonal area 371, and the mobile device can therefore receive content associated with sponsor G. In some embodiments, content related to sponsor A can be delivered via one of the registered applications, while another registered application receives and displays content related to sponsor G. In other embodiments, one of sponsor A or sponsor G can have a superior interest to the other, and a preference can be given to that sponsor's content for delivery. For example, sponsor G may have a superior interest in pentagonal area 371, which also forms part of triangular area 320. In such a case, if content related to sponsor G is available for delivery to the application on the mobile device with target location G 392, that content will be delivered in preference to content related to sponsor A. However, if there is no high priority content related to sponsor G to be delivered, content related to sponsor A may be provided in its stead. Various other priority and time sharing mechanisms and methods can be implemented according to the teachings set forth herein. Note that in some embodiments, multiple registered applications are not required to implement priority and time sharing mechanisms.

In some instances, a mobile device can have target locations, such as target location D 324 or target location E 356, located outside of areas reserved by sponsors. In such a case, a check can be made to determine if either target location D 340 or target location E 356 are located within a given proximity of a sponsor-reserved area such as triangu-

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lar area 320 or octagonal area 330. So, for example, a check can be made to determine whether any reserved areas lie within a given radius of target location D 340, defining a search area 341, or within a given radius of target location E 356, defining a search area 351. In some embodiments, if no sponsor reserved area intersects an area within an initially small radius, further checks can be performed by incrementally increasing the radius. So, for example, after a first check finds no advertiser reserved areas within search areas 341 or 351, the search areas can be increased to encompass areas 343 and 353, respectively.

In the illustrated example, there is no reserved area intersecting search area 353, but sponsor H 357 has a physical address within area 353. In some embodiments, once it is determined that a registered sponsor has a physical address location within a search radius, but there are no sponsor reserved geographic areas in proximity to or encompassing a target location, an advertisement or other content can be delivered to a mobile device, such as the device with target location 356.

Another situation arises when there are no sponsor reserved geographic areas intersecting a search area, but there are multiple sponsor physical locations within a given radius. Consider area 343, which contains sponsor E's location 349, and sponsor F's location 347. Because neither sponsor E nor sponsor F has established a reserved area that intersects with search area 343, a random choice can be made between these two sponsors to determine which sponsor's content to provide to the registered application on the device with target location D 340. In other embodiments, preference may be given to one of sponsor E's location 349 and sponsor F's location 347 based on each physical locations' proximity to target location D 340, based on a travel time between the device with target location D 340 and the sponsors' locations, or based on some other desired parameter. In further embodiments, if no sponsor's reserved geographic area intersects any portion of area 343, no content is sent to mobile device D with target location 340, despite the fact that location sponsor E's location 359, and sponsor F's location 347 are both within the perimeter defining search area 343.

In some embodiments, the search radius can continue to be expanded until a search area 345 intersects with a sponsor reserved geographic area. In the illustrated embodiment, search area 345 intersects sponsor A's reserved triangular area 320. Note that sponsor G2's physical location 328 is also located within search area 345. In some embodiments, content from either sponsor A or sponsor G can be selected using any of various processes, because target location D 340 is not located entirely within triangular area 320. In some embodiments, however, because the expanded search area 345 encompasses even a portion of sponsor A's reserved triangular area 320, content related to sponsor G will be excluded, and content related to sponsor A will be exclusively provided to mobile device with target location D 340. In some embodiments, because target location D 340 is not located within sponsor A's reserved triangular area 320, content related to sponsor A will be excluded, and content related to sponsor G will be exclusively provided to mobile device with target location D 340.

Additional techniques accounting for the proximity of exclusively reserved advertising areas and sponsor's physical locations with respect to mobile device locations can be implemented according to the teaching set forth herein. For example, in some embodiments, sponsors may obtain an interest in all otherwise unreserved geographic areas. For example, a content delivery system can deliver content from

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a “default” sponsor, if it is determined that no other content is to be delivered to a mobile device.

Referring next to FIG. 4, a method 400 for allowing sponsors to reserve particular geographic areas will be discussed according to embodiments of the present disclosure. Method 400 begins, as illustrated by block 401. As illustrated by block 403, a content delivery platform, for example content delivery platform 112 as illustrated in FIG. 1, can receive a request for sponsor registration, which can also include receiving physical address location from the sponsor. As illustrated by block 405, the sponsor can establish perimeters defining geographic areas of exclusive or semi-exclusive control. These geographic areas are areas the sponsor wishes to reserve for delivery of his own advertisements or other content controlled by the sponsor.

The perimeters established can be based on map features, such as streets, rivers, landmarks, or any of the other various map features. The perimeters can also be defined by latitude and longitude, or various geometric constructs having a given relative position to either a point location, a map location, a physical address, or otherwise. Some embodiments allow for establishing perimeters defining areas based on a combination of the various types of constructs. So, for example, latitude, longitude and map features may be used to establish the reserved area, or a combination of coordinates and geometric constructs can be used in conjunction with other suitable boundary identifiers to establish an area that may be reserved specifically for content related to a particular advertiser or sponsor.

In some embodiments, the perimeters may be generated interactively, using sponsor established perimeter definitions, or other unique sponsor requests. Some embodiments employ pre-defined areas, or allow selection of areas based on predetermined factors, and present sponsors a choice from among previously established options.

As illustrated by block 407, a sponsor’s request for a selected area is received. As illustrated by block 409, a check is made to determine if the selected area, or a portion of the selected area, has already been reserved by another sponsor. If the area selected by the sponsor is already owned or is otherwise unavailable, method 400 may return to block 407, and the sponsor can choose another area. In some embodiments, overlap of various sponsor areas may be allowed based on type of business, type of application used to deliver the content, or otherwise.

As illustrated by block 411, if an area selected for exclusive or semi-exclusive content delivery is available, the selected geographic area can be reserved for the sponsor. And as illustrated by block 413, the sponsor can be notified that an interest in the geographic area has been reserved for him.

A sponsor can provide content for delivery to mobile devices having target locations contained within its reserved area, as illustrated by block 415. This content can include advertisements, still image content, animated content, video content, audio content, alphanumeric identifiers, or other content suitable for delivery to mobile devices via registered applications. As illustrated by block 417, the content received from the sponsor can be stored for later delivery to registered applications running on mobile devices having target locations that exist within the sponsor’s reserved area, which such target locations may include, but are not limited to, when the mobile device or target location physically enters or remains within the sponsor’s reserved area for a desired length of time. In some embodiments, content can be delivered to a mobile device by the sponsor or another party in response to a notification that the mobile device or target

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location has entered or is contained within the sponsor’s reserved area. Method 400 ends, as illustrated at block 419.

Referring next to FIG. 5, a method 500 of registering an application program for use in conjunction with a content delivery platform is illustrated according to various embodiments of the present disclosure. Method 500 begins as illustrated by block 501. As illustrated by block 503, an application can be registered on a content delivery platform in response to a request by a developer, for example developer 108 as illustrated in FIG. 1. As illustrated by block 505, a request for content can be received from a device running a registered application. In some embodiments, the same registered application may be executed on any of various mobile devices, including mobile telephones, personal digital assistants, laptops, and the like. Furthermore, multiple devices may execute copies of the same registered application, multiple different registered applications may be executed on a single mobile device, and multiple different registered applications may be executed on multiple devices.

As illustrated by block 507 a determination is made as to whether the application sending the request for content has a target location that is located within a sponsor’s reserved geographic area. In some embodiments, the target location may be the location of the device. In some embodiments, the target location may be a location other than the location of the device, as illustrated in FIG. 2. As illustrated by block 509, if the target location is located within a sponsor’s reserved area, content from the corresponding sponsor can be chosen for delivery to the mobile device. The content can be chosen based on a number of different parameters or combinations of parameters. In some embodiments, different sponsors may designate particular content to be provided on different days of the week or at different times of day. Some such embodiments allow a single geographic area to be shared by different advertisers or sponsors. For example, content associated with a first sponsor may be selected for delivery in a particular geographic area during the lunch hour, while content related to a second sponsor is selected for delivery in that same geographic area between the hours of midnight and 2 am.

In some embodiments, content from one sponsor can be selected for delivery in a particular geographic area in specific situations, even though a different sponsor has generally reserved that same geographic area. For example, content from a first sponsor can be delivered during a football game to mobile devices located in a geographic area normally reserved by a second sponsor, effectively trumping content related to the second sponsor that would otherwise be delivered. In some embodiments, additional criteria can be applied to determine which sponsors’ content will be provided to mobile devices in a particular geographic area.

As illustrated by block 511, selected content can be provided to an application for display on a mobile device. In at least one embodiment, different content from the same sponsor can be provided to the same device for display within different applications, or the same content from the same sponsor can be displayed for all mobile devices running all registered applications that have target locations within the delivery area for the content. For example, a first program run on a mobile device may display a first advertisement within that program while a second program running on the same device may display a second advertisement, which is different from the first advertisement. In some embodiments in which an interest in a particular geographic area is shared between multiple sponsors, a primary sponsor’s content can be displayed via a first registered application running on a particular mobile

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device, while content from other sponsors can be displayed via a second and subsequent applications running on the same mobile device.

As illustrated by block 513, if the target location is not within a sponsor's reserved area, a determination can be made regarding whether at least one sponsor's presence is within a first predetermined radius of the target location. In some embodiments, a determination is made regarding whether a sponsor's physical location is within a predetermined radius of the target location. In some embodiments, a determination is made regarding whether a sponsor's geographic area, or a portion of a sponsor's geographic area, is contained within a predetermined radius of the target location. If at least one sponsor's presence is within a predetermined radius of the target location, a sponsor is chosen from a random or pseudo-random process, as illustrated by block 519. Content is then selected for delivery, as illustrated by block 509. As illustrated by block 515, if a sponsor's presence is not within a predetermined radius of the target location, the search radius can be increased. As illustrated by block 517, a check can be made to determine whether any more increases should be made. In some embodiments, the search radius can continue to be increased incrementally, in a logarithmic manner, or otherwise, until at least a portion of a sponsor's reserved area intersects the search area defined by the search radius. In some embodiments, the search radius can be increased a predetermined number of times, or can be limited based on system resources, time constraints, or other desired parameters. The processes illustrated by blocks 513, 515, and 517 can be repeated until a positive indication is produced by the process at block 517.

As illustrated by block 519, content from a randomly or pseudo-randomly selected sponsor can be delivered to a mobile device if the target location is not within a desired proximity to a sponsor's reserved area. In some embodiments, rather than delivering content randomly, content selections can be made based on desired criteria. Content related to a sponsor that reserved all otherwise unallocated space can be delivered to a mobile device executing a registered application. In some such embodiments, if any particular geographic areas have not yet been reserved, or if any device requesting content does not have a target location contained within a reserved geographic area, the default sponsor's content can be delivered to the mobile device. Method 500 ends as illustrated by block 521.

Preferring next to FIG. 6, a method of interaction between a mobile device and a content providing platform is illustrated according to various embodiments of the present disclosure. Method 600 begins as illustrated by block 601. As illustrated by block 603 an application platform key can be provided to a developer in response to the developer registering an application for use on the application platform. The developer can, in turn, provide the key to mobile devices on which the registered application is installed. As illustrated by block 605, when a mobile device requests content from the content providing platform, the mobile device can send the key along with its request. As illustrated by block 607, the content providing platform can verify that the key matches a valid key stored in its database, or elsewhere, before providing content to the application.

In some embodiments, key verification can be performed by an entity other than the content providing platform. As illustrated by block 627, if a verification check on the key fails, no content is provided to the requesting application, and the method 600 ends.

As illustrated by block 609, if the key is validated a session can be initiated between the application on the

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mobile device, and the content delivery platform. As illustrated by block 611 in at least one embodiment, the application running on the mobile device sends the mobile device's location, or another target location, to the content delivery platform. However, in some embodiments the actual location is not sent by the device, but may be provided to the content delivery platform from another source. Furthermore, the content delivery platform, or a subsystem of a communications system employed by the content delivery platform, can determine the location of the mobile device based on raw, partially, or completely processed information received from the mobile device or from another source. For example, the mobile device can forward information associated with a target location to the content delivery platform, or the content delivery server can obtain location information from a third party application or device, from a home location register (HLR), from a visiting location register (VLR), from raw, differential, processed or semi-processed GPS data, from power signals used in code-division multiple access (CDMA) or other wireless communications systems, or otherwise.

As illustrated by block 613, the content delivery platform records the request from the registered application in a request identifier in the platform database, or some other suitable storage location. The request identifier can be used in some embodiments to track further interaction with the registered application, or to deliver additional content to a requesting mobile device. Thus, in some embodiments, a mobile device or other target location that is only temporarily located within a particular sponsor's reserved geographic area may continue to receive information from that sponsor after the mobile device, or the target location, exits the sponsor's reserved area. In other embodiments, content related to a sponsor is discontinued in response to a mobile device exiting, or the target location losing focus within, the sponsor's reserved area.

As illustrated by block 615, the content delivery platform can deliver the request identifier to the requesting application along with the requested content. As illustrated by block 617, a user of the mobile device can interact with the provided content using any of various methods such as pressing a button, selecting a user selectable object on a graphical user interface, or otherwise. The application on the mobile device can send an indication of the interaction to the content delivery platform via the same communication channel used to send the request, or via a different communications channel.

As illustrated by block 619, a registered application running on a mobile device can send an additional information request to the platform using the previously assigned request identifier. In some embodiments, using the previously assigned platform request identifier permits tracking of a series of interactions between a particular application and the content delivery platform. Furthermore, using the request identifier can allow individualized content to be delivered to different registered applications which may or may not be running on the same mobile device.

As illustrated by block 621, a determination is made regarding whether a request identifier sent in conjunction with a request for further information is maintained in the platform database or other suitable storage. As illustrated by block 623, if the request identifier is contained in the database or other storage area, the content delivery platform can update a request identifier record as being complete. And as illustrated by block 625, the content delivery platform can deliver more content to the requesting application. As illus-

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trated by block 627, method 600 can proceed to end after delivering the additional content.

The methods and processes discussed previously, as well as other embodiments, may be implemented in a processing system executing a set of instructions stored in memory, or on a removable computer readable medium. An example of a system according to some embodiments is illustrated in FIG. 7. Referring now to FIG. 7, a high-level block diagram of a processing system is illustrated and discussed. Processing system 700 includes one or more central processing units, such as CPU A 705 and CPU B 707, which may be conventional microprocessors interconnected with various other units via at least one system bus 710. CPU A 705 and CPU B 707 may be separate cores of an individual, multi-core processor, or individual processors connected via a specialized bus 711. In some embodiments, CPU A 705 or CPU B 707 may be a specialized processor, such as a graphics processor, other co-processor, or the like.

Processing system 700 includes random access memory (RAM) 720; read-only memory (ROM) 715, wherein the ROM 715 could also be erasable programmable read-only memory (EPROM) or electrically erasable programmable read-only memory (EEPROM); and input/output (I/O) adapter 725, for connecting peripheral devices such as disk units 730, optical drive 736, or tape drive 737 to system bus 710; a user interface adapter 740 for connecting keyboard 745, mouse 750, speaker 755, microphone 760, or other user interface devices to system bus 710; communications adapter 765 for connecting processing system 700 to an information network such as the Internet or any of various local area networks, wide area networks, telephone networks, or the like; and display adapter 770 for connecting system bus 710 to a display device such as monitor 775. Mouse 750 has a series of buttons 780, 785 and may be used to control a cursor shown on monitor 775.

It will be understood that processing system 700 may include other suitable data processing systems without departing from the scope of the present disclosure. For example, processing system 700 may include bulk storage and cache memories, which provide temporary storage of at least some program code in order to reduce the number of times code must be retrieved from bulk storage during execution.

Various disclosed embodiments can be implemented in hardware, software, or a combination containing both hardware and software elements. In one or more embodiments, the invention is implemented in software, which includes but is not limited to firmware, resident software, microcode, etc. Some embodiments may be realized as a computer program product, and may be implemented as a computer-usable or computer-readable medium embodying program code for use by, or in connection with, a computer, a processor, or other suitable instruction execution system.

For the purposes of this description, a computer-usable or computer readable medium can be any apparatus that can contain, store, communicate, propagate, or transport the program for use by or in connection with the instruction execution system, apparatus, or device. By way of example, and not limitation, computer readable media may comprise any of various types of computer storage media, including volatile and non-volatile, removable and non-removable media implemented in any suitable method or technology for storage of information such as computer readable instructions, data structures, program modules, or other data. Computer storage media include, but are not limited to, RAM, ROM, EEPROM, flash memory or other memory technology, CD-ROM, digital versatile disks (DVD) or other

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optical storage, magnetic cassettes, magnetic tape, magnetic disk storage or other magnetic storage devices, or any other medium which can be used to store the desired information and which can be accessed by a computer. Data structures and transmission of data (including wireless transmission) particular to aspects of the disclosure are also encompassed within the scope of the disclosure.

Various embodiments have been described for delivering content related to a commercial media program. Other variations and modifications of the embodiments disclosed may be made based on the description provided, without departing from the scope of the invention as set forth in the following claims.

What is claimed is:

1. A mobile device comprising:

memory;

at least one processor operably coupled to the memory; a location-determination component; and

at least one module configured for execution by the at least one processor, wherein the at least one module comprises at least one instruction for:

receiving, from an application program during its execution in the mobile device, one or more requests to reserve at least one selected geographic area of interest, wherein the at least one selected geographic area of interest in each of the one or more requests is being requested via said application program to be reserved for having a particular identifier associated with the at least one selected geographic area of interest provided to said application program after it has been determined, by at least use of the at least one processor and of location information representing at least one physical geographic location of the mobile device as determined by the location-determination component, that the mobile device has at least entered the at least one selected geographic area of interest, and wherein each of the one or more requests comprises data representing a) said particular identifier, represented by a data string, as content provided via said application program to be associated with the at least one selected geographic area of interest, b) at least one latitude value, at least one longitude value, and at least one radius value, each being provided via said application program, to be used for establishing a perimeter boundary for the at least one selected geographic area of interest, and c) information specifying at least one area bound by the perimeter boundary as the at least one selected geographic area of interest;

registering said application program, in the memory, for having said particular identifier provided to said application program after it has been determined, by at least use of the at least one processor and of the location information, that the mobile device has at least entered the at least one selected geographic area of interest;

storing, in the memory, at least one record, for said application program, associated with said particular identifier and the at least one selected geographic area of interest;

obtaining the location information representing at least one physical geographic location of the mobile device as determined by the location-determination component; and

after it has been determined, by at least use of the at least one processor, of the location information, that the mobile device has at least entered the at least one selected geographic area of interest.

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associated with the at least one record stored in the memory for said application program, that the mobile device has at least entered the at least one selected geographic area of interest associated with the at least one record stored in the memory and has remained therein for at least a designated length of time, providing at least said particular identifier associated with the at least one record stored in the memory to said application program.

2. The mobile device of claim 1 wherein the at least one module further comprises at least one instruction for:

determining, by at least use of the at least one processor, of the location information, and of the at least one selected geographic area of interest associated with the at least one record stored in the memory for said application program, that the mobile device has at least entered the at least one selected geographic area of interest associated with the at least one record stored in the memory and has remained therein for at least the designated length of time.

3. The mobile device of claim 2 wherein:

storing the at least one record includes storing the at least one record after availability for the at least one selected geographic area of interest to be reserved per each of the one or more requests has been positively determined; and

the at least one module further comprises at least one instruction for:

determining availability for the at least one selected geographic area of interest to be reserved for said application program.

4. The mobile device of claim 2 wherein the at least one module further comprises at least one instruction for:

after providing at least said particular identifier associated with the at least one record stored in the memory to said application program, displaying, on the mobile device via a graphical user interface tangibly embodied by the mobile device and via said application program, content related to the at least one selected geographic area of interest.

5. The mobile device of claim 2 wherein the at least one module further comprises at least one instruction for:

creating a notification indicating that the mobile device has at least entered the at least one selected geographic area of interest associated with the at least one record stored in the memory.

6. The mobile device of claim 2 wherein the at least one module further comprises at least one instruction for:

receiving a data value representing the designated length of time.

7. The mobile device of claim 2 wherein the at least one instruction for receiving, from an application program during its execution in the mobile device, one or more requests to reserve at least one selected geographic area of interest includes being at least one instruction for receiving, from at least one other application program during its execution in the mobile device, one or more other requests to reserve at least one other selected geographic area of interest.

8. The mobile device of claim 7 wherein the at least one module further comprises at least one instruction for:

using the at least one selected geographic area of interest with said particular identifier to establish, in the memory, the at least one selected geographic area of interest in each of the one or more requests as an area reserved for content related to said application program and not an area reserved for content related to the at least one other application program.

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9. The mobile device of claim 6 wherein the at least one module further comprises at least one instruction for:

providing at least said particular identifier associated with the at least one record stored in the memory to said application program after it has been determined, by at least use of the at least one processor, of the location information, and of the at least one selected geographic area of interest associated with the at least one record stored in the memory for said application program, that the mobile device, following a designated start time and during a designated duration of time, has at least entered the at least one selected geographic area of interest and has remained therein for at least the designated length of time; and

receiving a data value representing the designated duration of time.

10. A non-transitory computer readable medium tangibly embodying at least one program of computer executable instructions, wherein the at least one program of computer executable instructions comprises at least one instruction for:

receiving, on a mobile device, from an application program during its execution in the mobile device, one or more requests to reserve at least one selected geographic area of interest, wherein the at least one selected geographic area of interest in each of the one or more requests is being requested via said application program to be reserved for having a particular identifier associated with the at least one selected geographic area of interest provided to said application program after it has been determined, by at least use of at least one processor tangibly embodied by the mobile device and of location information representing at least one physical geographic location of the mobile device as determined by a location-determination component tangibly embodied by the mobile device, that the mobile device has at least entered the at least one selected geographic area of interest, and wherein each of the one or more requests comprises data representing a) said particular identifier, represented by a data string, as content provided via said application program to be associated with the at least one selected geographic area of interest, b) at least one latitude value, at least one longitude value, and at least one radius value, each being provided via said application program, to be used for establishing a perimeter boundary for the at least one selected geographic area of interest, and c) information specifying at least one area bound by the perimeter boundary as the at least one selected geographic area of interest;

registering said application program, in a memory tangibly embodied by the mobile device, for having said particular identifier provided to said application program after it has been determined, by at least use of the at least one processor and of the location information, that the mobile device has at least entered the at least one selected geographic area of interest;

storing, in the memory, at least one record, for said application program, associated with said particular identifier and the at least one selected geographic area of interest;

obtaining the location information representing at least one physical geographic location of the mobile device as determined by the location-determination component; and

after it has been determined, by at least use of the at least one processor, of the location information, and of the at

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least one selected geographic area of interest associated with the at least one record stored in the memory for said application program, that the mobile device has at least entered the at least one selected geographic area of interest associated with the at least one record stored in the memory and has remained therein for at least a designated length of time, providing at least said particular identifier associated with the at least one record stored in the memory to said application program.

11. The computer readable medium of claim 10 wherein the at least one program of computer executable instructions further comprises at least one instruction for:

determining, by at least use of the at least one processor, of the location information, and of the at least one selected geographic area of interest associated with the at least one record stored in the memory for said application program, that the mobile device has at least entered the at least one selected geographic area of interest associated with the at least one record stored in the memory and has remained therein for at least the designated length of time.

12. The computer readable medium of claim 11 wherein: storing the at least one record includes storing the at least one record after availability for the at least one selected geographic area of interest to be reserved per each of the one or more requests has been positively determined; and

the at least one program of computer executable instructions further comprises at least one instruction for: determining availability for the at least one selected geographic area of interest to be reserved for said application program.

13. The computer readable medium of claim 11 wherein the at least one program of computer executable instructions further comprises at least one instruction for:

after providing at least said particular identifier associated with the at least one record stored in the memory to said application program, displaying, on the mobile device via a graphical user interface tangibly embodied by the mobile device and via said application program, content related to the at least one selected geographic area of interest.

14. The computer readable medium of claim 11 wherein the at least one program of computer executable instructions further comprises at least one instruction for:

creating a notification indicating that the mobile device has at least entered the at least one selected geographic area of interest associated with the at least one record stored in the memory.

15. The computer readable medium of claim 11 wherein the at least one program of computer executable instructions further comprises at least one instruction for:

receiving a data value representing the designated length of time.

16. The computer readable medium of claim 11 wherein the at least one instruction for receiving, from an application program during its execution in the mobile device, one or more requests to reserve at least one selected geographic area of interest includes being at least one instruction for receiving, from at least one other application program during its execution in the mobile device, one or more other requests to reserve at least one other selected geographic area of interest.

17. The computer readable medium of claim 16 wherein the at least one program of computer executable instructions further comprises at least one instruction for:

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using the at least one selected geographic area of interest with said particular identifier to establish, in the memory, the at least one selected geographic area of interest in each of the one or more requests as an area reserved for content related to said application program and not an area reserved for content related to the at least one other application program.

18. The computer readable medium of claim 15 wherein the at least one program of computer executable instructions further comprises at least one instruction for:

providing at least said particular identifier associated with the at least one record stored in the memory to said application program after it has been determined, by at least use of the at least one processor, of the location information, and of the at least one selected geographic area of interest associated with the at least one record stored in the memory for said application program, that the mobile device, following a designated start time and during a designated duration of time, has at least entered the at least one selected geographic area of interest and has remained therein for at least the designated length of time; and

receiving a data value representing the designated duration of time.

19. A method comprising:

sending a request, via a particular application program executing in a mobile device, to at least one program of computer executable instructions operating in the mobile device, to reserve a particular selected geographic area of interest for having a specific identifier associated with the particular selected geographic area of interest provided to the particular application program after it has been determined that the mobile device has at least entered the particular selected geographic area of interest, wherein the request comprises data representing a) the specific identifier to be associated with the particular selected geographic area of interest, b) a particular latitude value, a particular longitude value, and a particular radius value to be used for establishing a particular perimeter boundary for the particular selected geographic area of interest, and c) information specifying at least one particular area bound by the particular perimeter boundary as the particular selected geographic area of interest, and wherein the at least one program of computer executable instructions comprises at least one instruction for:

receiving, on the mobile device, from an application program during its execution in the mobile device, one or more requests to reserve at least one selected geographic area of interest, wherein the at least one selected geographic area of interest in each of the one or more requests is being requested via said application program to be reserved for having a particular identifier associated with the at least one selected geographic area of interest provided to said application program after it has been determined, by at least use of at least one processor tangibly embodied by the mobile device and of location information representing at least one physical geographic location of the mobile device as determined by a location-determination component tangibly embodied by the mobile device, that the mobile device has at least entered the at least one selected geographic area of interest, and wherein each of the one or more requests comprises data representing a) said particular identifier, represented by a data string, as content provided via said application program to be associated with the at least one selected geographic

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area of interest, b) at least one latitude value, at least one longitude value, and at least one radius value, each being provided via said application program, to be used for establishing a perimeter boundary for the at least one selected geographic area of interest, and c) information specifying at least one area bound by the perimeter boundary as the at least one selected geographic area of interest;

registering said application program, in a memory tangibly embodied by the mobile device, for having said particular identifier provided to said application program after it has been determined, by at least use of the at least one processor and of the location information, that the mobile device has at least entered the at least one selected geographic area of interest;

storing, in the memory, at least one record, for said application program, associated with said particular identifier and the at least one selected geographic area of interest;

obtaining the location information representing at least one physical geographic location of the mobile device as determined by the location-determination component; and

after it has been determined, by at least use of the at least one processor, of the location information, and of the at least one selected geographic area of interest associated with the at least one record stored in the memory for said application program, that the mobile device has at least entered the at least one selected geographic area of interest associated with the at least one record stored in the memory and has remained therein for at least a designated length of time, providing at least said particular identifier associated with the at least one record stored in the memory to said application program.

20. The method of claim 19, further comprising: implementing, in the mobile device, the at least one program of computer executable instructions.

21. The method of claim 19 wherein the at least one program of computer executable instructions further comprises at least one instruction for:

determining, by at least use of the at least one processor, of the location information, and of the at least one selected geographic area of interest associated with the at least one record stored in the memory for said application program, that the mobile device has at least entered the at least one selected geographic area of interest associated with the at least one record stored in the memory and has remained therein for at least the designated length of time.

22. The method of claim 21 wherein:

storing the at least one record includes storing the at least one record after availability for the at least one selected geographic area of interest to be reserved per each of the one or more requests has been positively determined; and

the at least one program of computer executable instructions further comprises at least one instruction for:

determining availability for the at least one selected geographic area of interest to be reserved for said application program.

23. The method of claim 21, further comprising:

after the providing at least said particular identifier associated with the at least one record stored in the memory to said application program wherein said application program is the particular application program, displaying, on the mobile device via a graphical user interface tangibly embodied by the mobile device and via the

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particular application program, content related to the at least one selected geographic area of interest.

24. The method of claim 21, further comprising:

creating a notification indicating that the mobile device has at least entered the at least one selected geographic area of interest associated with the at least one record stored in the memory wherein the at least one selected geographic area of interest is the particular selected geographic area of interest.

25. The method of claim 21 wherein the at least one program of computer executable instructions further comprises at least one instruction for:

receiving a data value representing the designated length of time.

26. The method of claim 21 wherein the at least one instruction for receiving, on the mobile device, from an application program during its execution in the mobile device, one or more requests to reserve at least one selected geographic area of interest includes being at least one instruction for receiving, on the mobile device, from at least one other application program during its execution in the mobile device, one or more other requests to reserve at least one other selected geographic area of interest.

27. The method of claim 26 wherein the at least one program of computer executable instructions further comprises at least one instruction for:

using the at least one selected geographic area of interest with said particular identifier to establish, in the memory, the at least one selected geographic area of interest in each of the one or more requests as an area reserved for content related to said application program and not an area reserved for content related to the at least one other application program.

28. The method of claim 25 wherein the at least one program of computer executable instructions further comprises at least one instruction for:

providing at least said particular identifier associated with the at least one record stored in the memory to said application program after it has been determined, by at least use of the at least one processor, of the location information, and of the at least one selected geographic area of interest associated with the at least one record stored in the memory for said application program, that the mobile device, following a designated start time and during a designated duration of time, has at least entered the at least one selected geographic area of interest and has remained therein for at least the designated length of time; and

receiving a data value representing the designated duration of time.

29. The mobile device of claim 3 wherein the at least one module further comprises at least one instruction for:

after providing at least said particular identifier associated with the at least one record stored in the memory to said application program, displaying, on the mobile device via a graphical user interface tangibly embodied by the mobile device and via said application program, content related to the at least one selected geographic area of interest.

30. The mobile device of claim 29 wherein:

the at least one instruction for receiving, from an application program during its execution in the mobile device, one or more requests to reserve at least one selected geographic area of interest includes being at least one instruction for receiving, from at least one other application program during its execution in the

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mobile device, one or more other requests to reserve at least one other selected geographic area of interest; and the at least one module further comprises at least one instruction for:

using the at least one selected geographic area of interest with said particular identifier to establish, in the memory, the at least one selected geographic area of interest in each of the one or more requests as an area reserved for content related to said application program and not an area reserved for content related to the at least one other application program.

31. The computer readable medium of claim **12** wherein the at least one program of computer executable instructions further comprises at least one instruction for:

after providing at least said particular identifier associated with the at least one record stored in the memory to said application program, displaying, on the mobile device via a graphical user interface tangibly embodied by the mobile device and via said application program, content related to the at least one selected geographic area of interest.

32. The computer readable medium of claim **31** wherein: the at least one instruction for receiving, from an application program during its execution in the mobile device, one or more requests to reserve at least one selected geographic area of interest includes being at least one instruction for receiving, from at least one other application program during its execution in the mobile device, one or more other requests to reserve at least one other selected geographic area of interest; and the at least one program of computer executable instructions further comprises at least one instruction for: using the at least one selected geographic area of interest with said particular identifier to establish, in

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the memory, the at least one selected geographic area of interest in each of the one or more requests as an area reserved for content related to said application program and not an area reserved for content related to the at least one other application program.

33. The method of claim **22**, further comprising:

after the providing at least said particular identifier associated with the at least one record stored in the memory to said application program wherein said application program is the particular application program, displaying, on the mobile device via a graphical user interface tangibly embodied by the mobile device and via the particular application program, content related to the at least one selected geographic area of interest.

34. The method of claim **22** wherein:

the at least one instruction for receiving, on the mobile device, from an application program during its execution in the mobile device, one or more requests to reserve at least one selected geographic area of interest includes being at least one instruction for receiving, on the mobile device, from at least one other application program during its execution in the mobile device, one or more other requests to reserve at least one other selected geographic area of interest; and

the at least one program of computer executable instructions further comprises at least one instruction for:

using the at least one selected geographic area of interest with said particular identifier to establish, in the memory, the at least one selected geographic area of interest in each of the one or more requests as an area reserved for content related to said application program and not an area reserved for content related to the at least one other application program.

* * * * *

EXHIBIT C



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(12) **United States Patent**
Hardin et al.

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(54) **EXCLUSIVE DELIVERY OF CONTENT
WITHIN GEOGRAPHIC AREAS**

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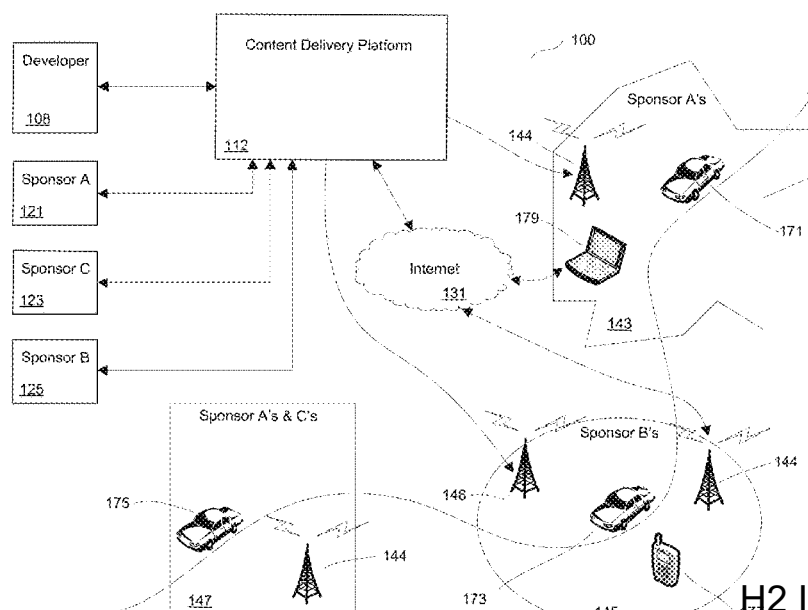
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(57) **ABSTRACT**

Application developers can request to have their applications registered for use with a content delivery platform. The operator of the content delivery platform establishes perimeters defining geographic areas, and maintains records reserving particular areas for delivery of content associated with particular sponsors. Registered applications running on mobile devices can request content from the content delivery platform. Based at least in part on the request, the content delivery platform can identify a target location, which may be the location of the mobile device, or some other location indicated in the request. A mobile device can be provided content based on the relationship of the target location to the geographic areas, so that a registered application running on a mobile device with a target location contained within a geographic area assigned to a particular sponsor will receive content related to that sponsor.

52 Claims, 7 Drawing Sheets



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Related U.S. Application Data

continuation of application No. 15/009,961, filed on Jan. 29, 2016, now Pat. No. 9,779,418, which is a continuation of application No. 14/608,285, filed on Jan. 29, 2015, now Pat. No. 9,286,625, which is a continuation of application No. 13/856,392, filed on Apr. 3, 2013, now Pat. No. 8,977,247, which is a continuation of application No. 12/434,094, filed on May 1, 2009, now Pat. No. 8,433,296.

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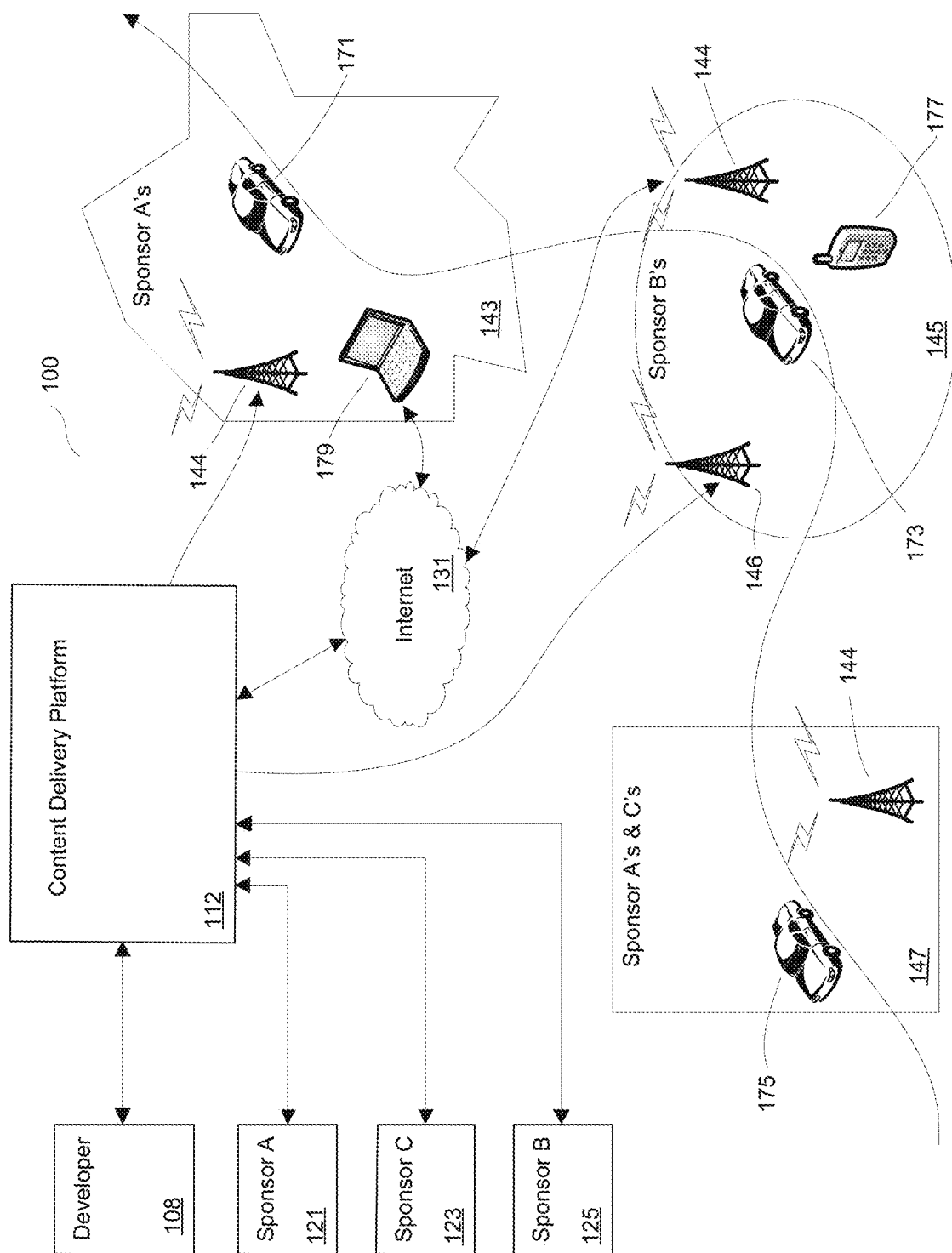


FIG. 1

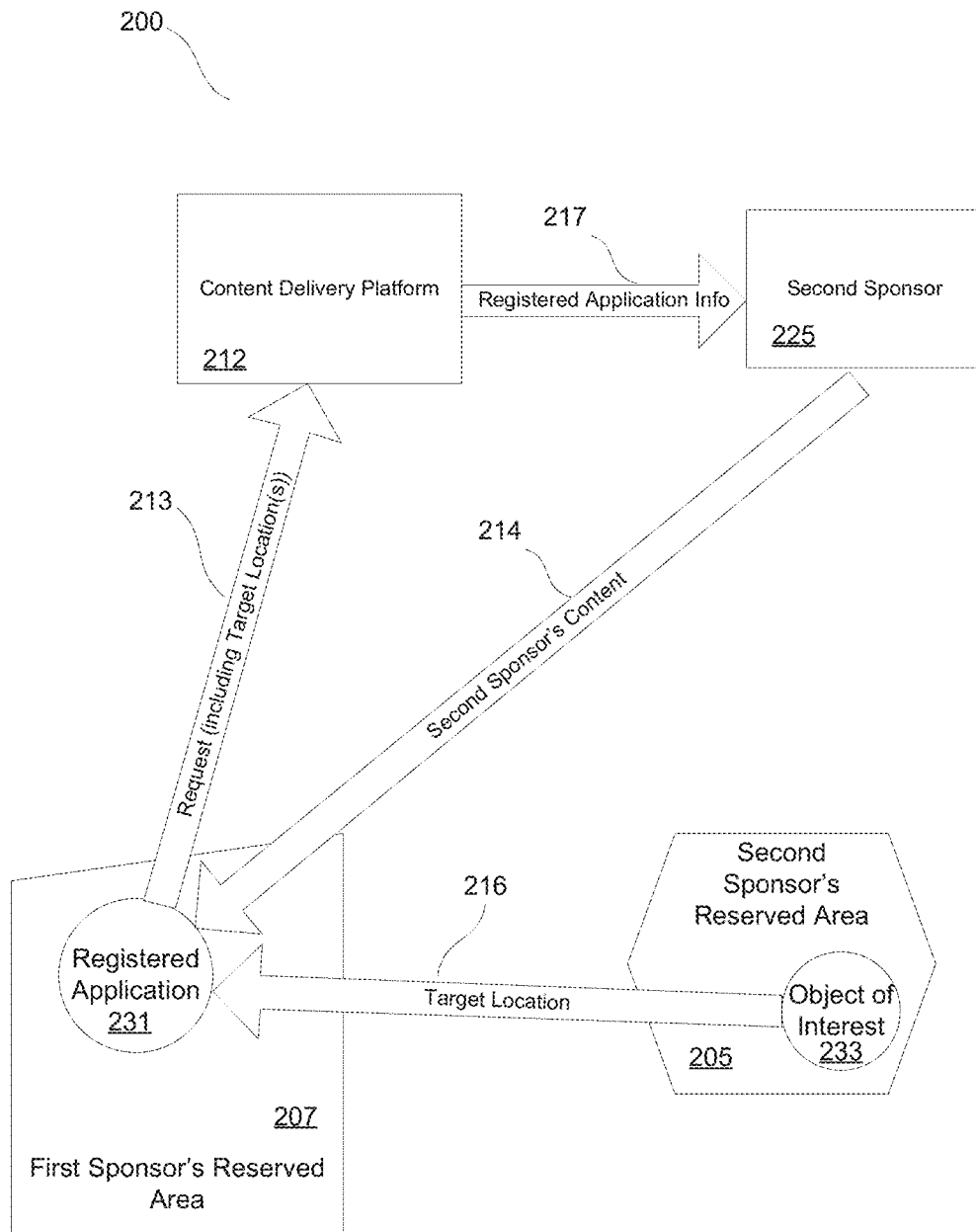
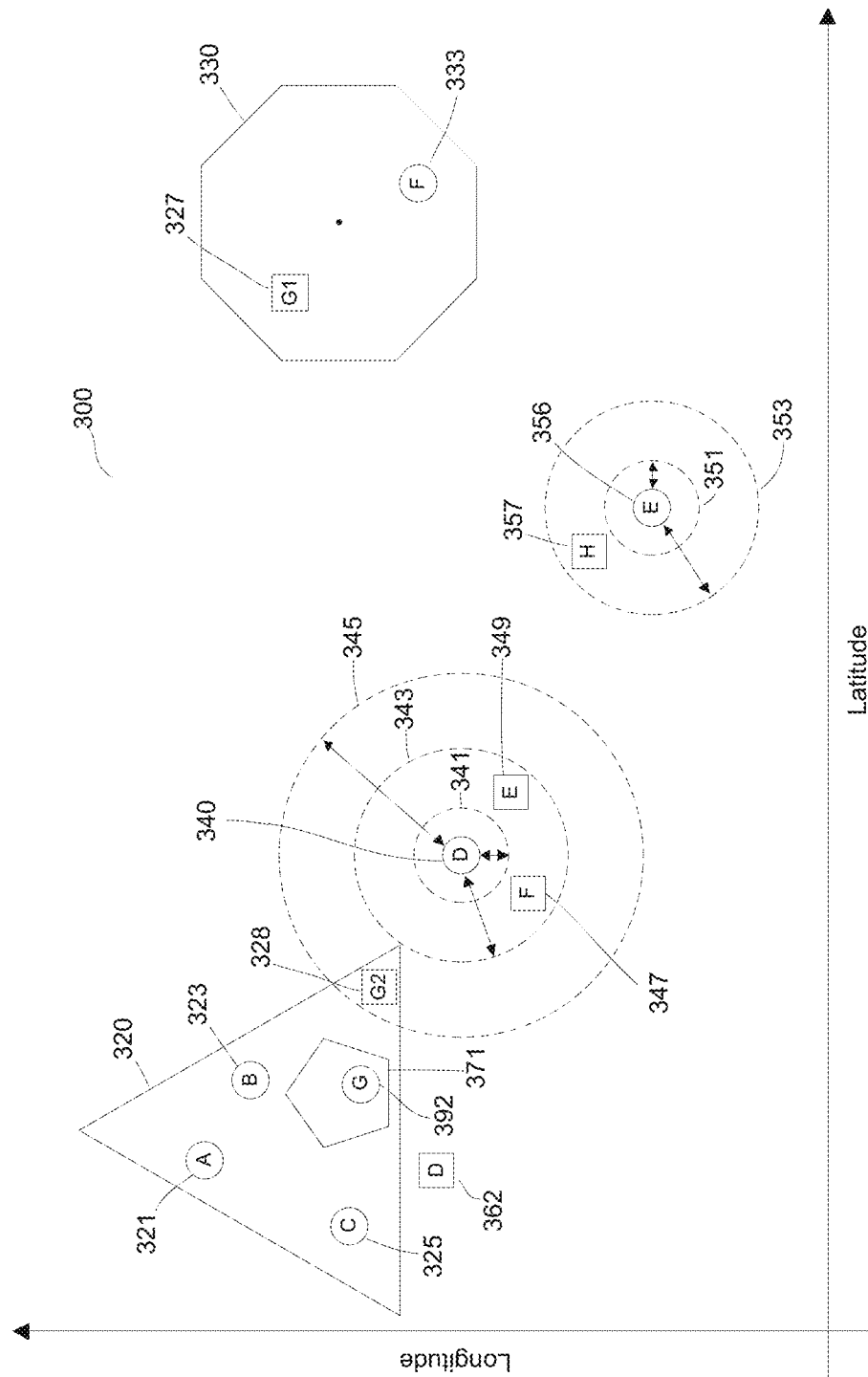


FIG. 2



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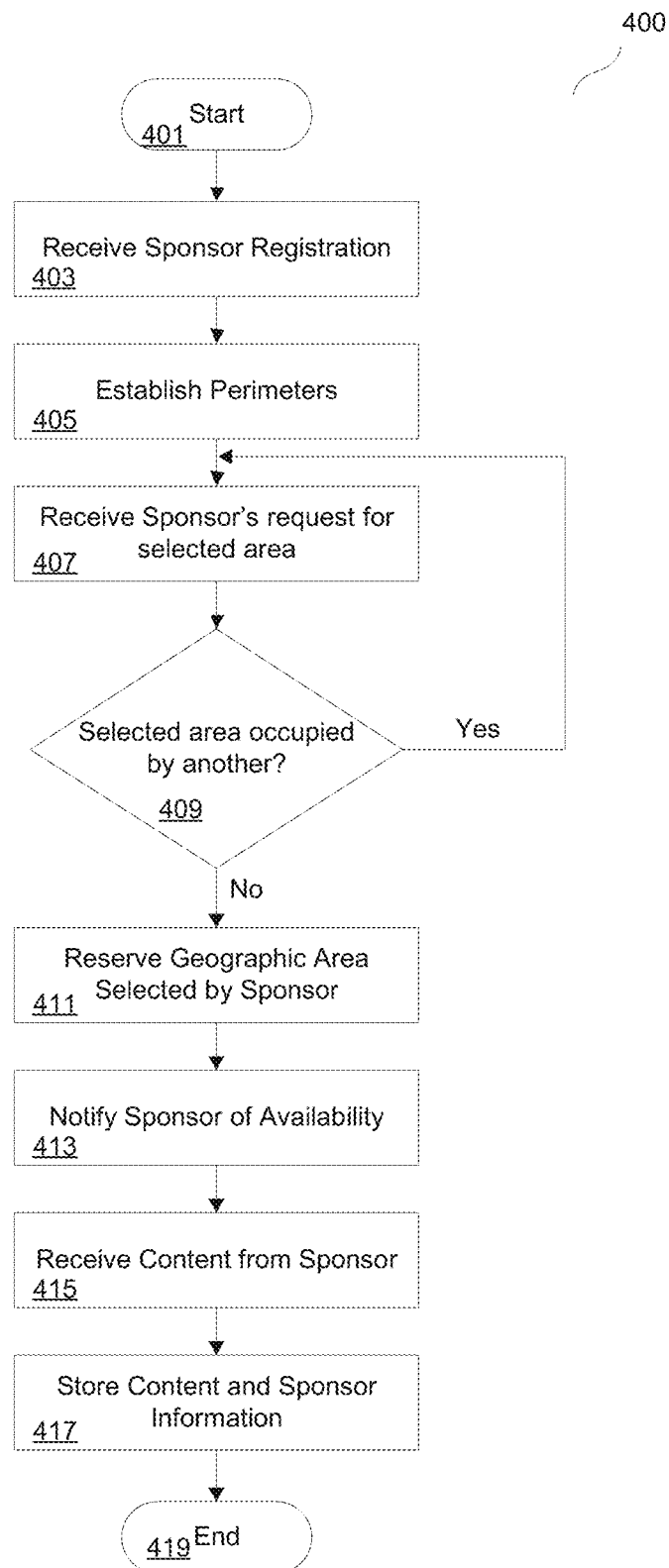


FIG. 4

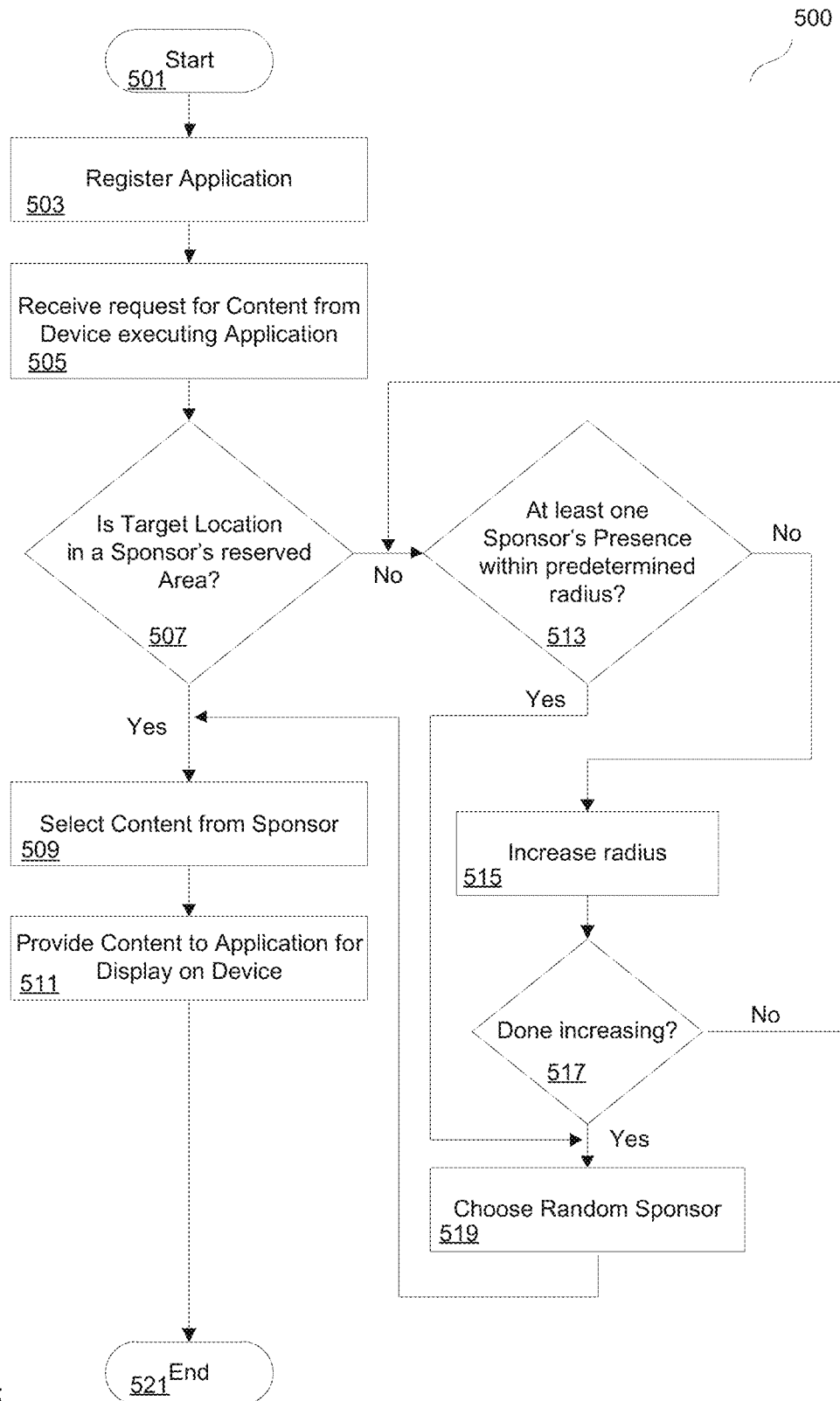


FIG. 5

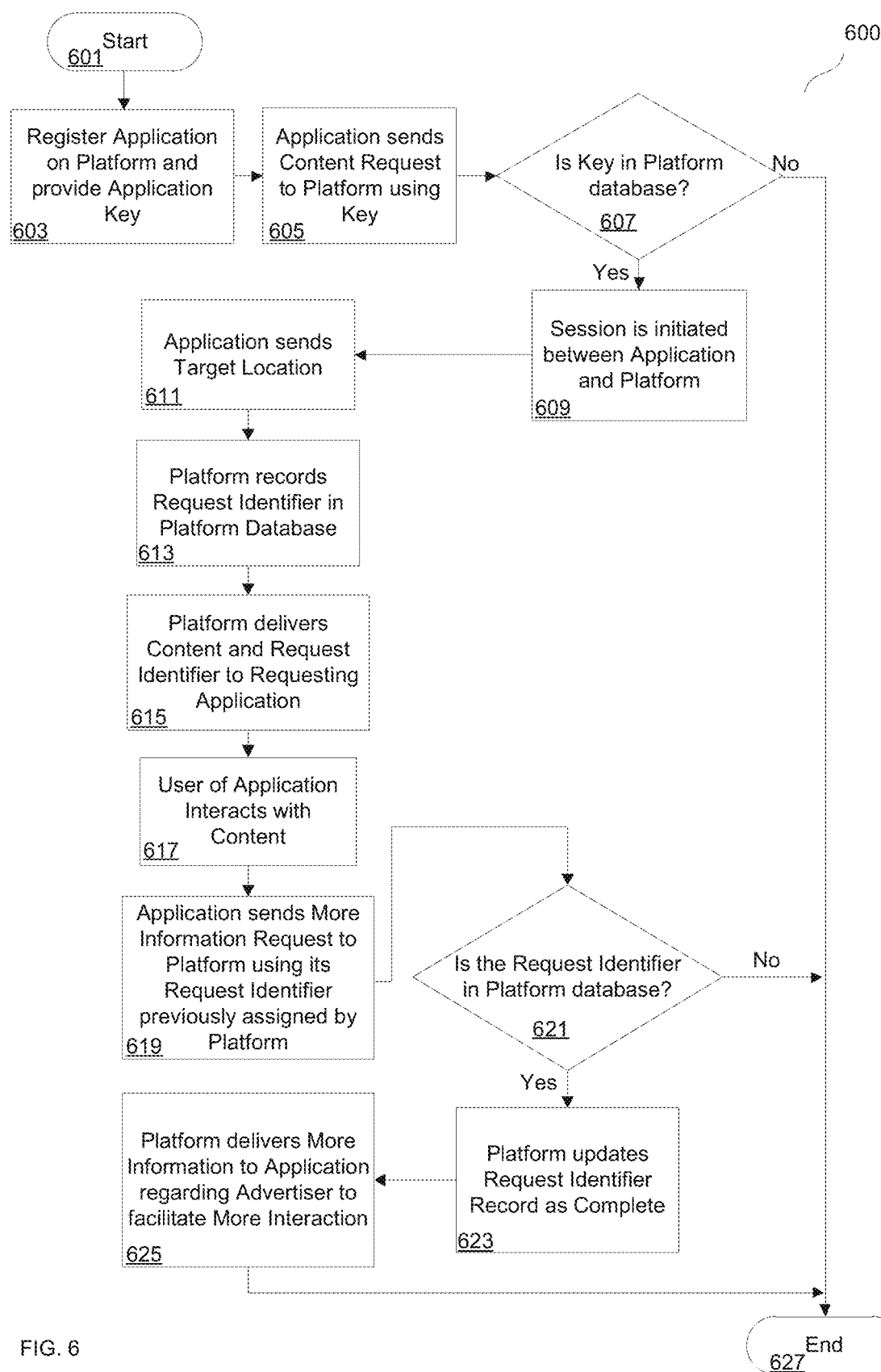


FIG. 6

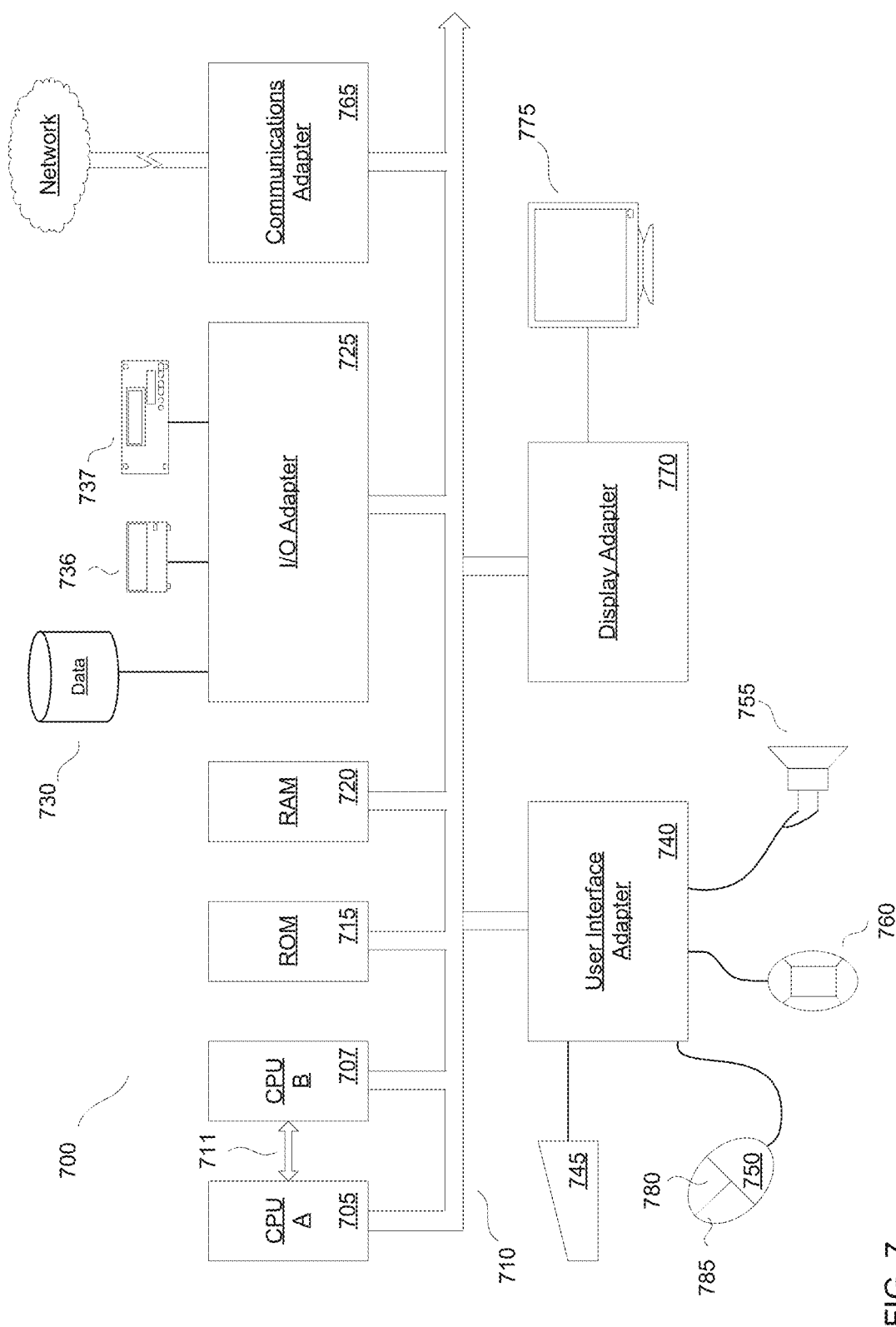


FIG. 7

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**EXCLUSIVE DELIVERY OF CONTENT
WITHIN GEOGRAPHIC AREAS****CROSS REFERENCE TO RELATED
APPLICATIONS**

This continuation patent application claims priority from co-pending United States Non-provisional patent application having Ser. No. 15/694,786, filed 2 Sep. 2017, entitled "EXCLUSIVE DELIVERY OF CONTENT WITHIN GEOGRAPHIC AREAS", which claims priority from co-pending United States Non-provisional patent application having Ser. No. 15/009,961, filed 29 Jan. 2016, entitled "EXCLUSIVE DELIVERY OF CONTENT WITHIN GEOGRAPHIC AREAS", now U.S. Pat. No. 9,779,418 issued on 3 Oct. 2017, which claims priority from co-pending United States Non-provisional patent application having Ser. No. 14/608,285, filed 29 Jan. 2015, entitled "EXCLUSIVE DELIVERY OF CONTENT WITHIN GEOGRAPHIC AREAS", now U.S. Pat. No. 9,286,625 issued on 15 Mar. 2016, which claims priority from co-pending United States Non-provisional patent application having Ser. No. 13/856,392, filed 3 Apr. 2013, entitled "EXCLUSIVE DELIVERY OF CONTENT WITHIN GEOGRAPHIC AREAS", now U.S. Pat. No. 8,977,247 issued on 10 Mar. 2015, which claims priority from co-pending United States Non-provisional patent application having Ser. No. 12/434,094, filed 1 May 2009, entitled "EXCLUSIVE DELIVERY OF CONTENT WITHIN GEOGRAPHIC AREAS", now U.S. Pat. No. 8,433,296 issued on 30 Apr. 2013, all having a common applicant herewith and being incorporated herein in their entirety by reference.

FIELD

This disclosure relates generally to delivery of content, and more particularly to delivery of content within reserved geographic areas.

BACKGROUND

Advertisements can be delivered to various devices, including mobile devices, within communications range of areas transmitters or other information providers. For example, advertisements can be delivered to cellular phones within range of a particular cellular phone provider's network area. Furthermore, advertisements can be delivered using digital billboards, or via the Internet, based on user interactions and preferences.

When delivering advertisements and other content to some mobile devices, currently available technologies can broadcast the content to all devices equipped to receive them. In some cases, advertisements are broadcast to any mobile device within a city, or a similar area. When delivering non-broadcast content, for example via the Internet, it is common to deliver the content in response to a request, received from the receiving device. In some cases, push technology can be used to deliver content to multiple users concurrently.

In each of these cases, a mobile device can usually receive content from multiple different content providers. Current technologies are, therefore, less than perfect.

SUMMARY

Various embodiments disclosed herein include registering an application program for use with a content delivery

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platform, establishing multiple perimeters defining respective geographic areas, and maintaining records associating sponsors with particular geographic areas. The content delivery platform can receive a request from a registered application program for content to be displayed on a mobile device, and the request can be used to determine a target location. In some embodiments, a sponsor is selected based on a relationship between the target location and one or more reserved geographic areas. Content is then provided to the application program.

In some embodiments, the content delivery platform can record a request identifier associated with a received request, and provide the request identifier to the mobile device to assist in tracking future actions relating to the request for content. The content delivery platform can also receive information related to user interaction with the provided content, including the request identifier, and provide additional content in response to the received information.

Content can be delivered to a mobile device running a registered application if a target location is at least partially within a predetermined radial distance of a geographical area associated with a sponsor; if the mobile device is not located within the predetermined radial distance, the radial distance can be increased. In some embodiments, content is delivered if the target location, e.g. the location of the mobile device or another location of interest, is located entirely within a geographic area exclusively reserved by a particular sponsor. In some embodiments, the content delivery platform can select from among several sponsors in deciding which content to deliver to a mobile device.

In at least one embodiment, the content delivery system reserves exclusive interests in geographic areas for particular sponsors based on the sponsors' requests, and store a record of that interest. In some embodiments, the content delivery system receives, from a sponsor, content to be delivered to mobile devices based on a target location being positioned within particular geographic areas. The content delivery system can also reserve an interest in geographic areas that remain unreserved by other sponsors. Furthermore, some embodiments include time based restrictions.

Various embodiments can be implemented as a system that includes memory, a communications interface, and a processor that cooperate to store and execute a program of instructions implementing various methods and techniques described herein. Furthermore, some embodiments can be implemented as a computer readable medium tangibly embodying a program of instructions.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an abstract representation of exclusive content delivery to particular reserved areas according to various embodiments of the present disclosure;

FIG. 2 is a diagram illustrating a target location other than the location of the mobile device executing a registered application, according to embodiments of the present disclosure;

FIG. 3 is a graph representing expanded search areas to determine which content is delivered according to various embodiments of the present disclosure;

FIG. 4 is a flowchart illustrating a method of reserving a geographic area according to embodiments of the present disclosure;

FIG. 5 is a flowchart illustrating registration of an application for content delivery according to embodiments of the present disclosure;

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FIG. 6 is a flowchart illustrating delivery of content to particular applications in a reserved area according to embodiments of the present disclosure;

FIG. 7 is a diagram illustrating a processing system according to embodiments of the present disclosure.

DETAILED DESCRIPTION

Various embodiments of the present disclosure provide for delivering content, such as advertising, to registered applications being run on any of various mobile electronic devices configured to be readily moved, carried, or otherwise transported between different various geographic areas defined by perimeters. Sponsors can reserve an exclusive interest, or in some embodiments a semi-exclusive interest, in a geographic area, so that other sponsors' advertisements are excluded from being broadcast or otherwise provided to a registered program being executed on a mobile device located within a reserved geographic area.

Referring first to FIG. 1, system 100, is illustrated. System 100 can provide for exclusive delivery of advertising or other content to registered applications running on mobile devices located within a particular proximity to a reserved geographic area. System 100, as illustrated, includes content delivery platform 112, which is in communication with developer platform 108, and systems or individuals operating under control of sponsor A 121, sponsor C 123, and sponsor B 125. Content delivery platform 112 receives a request from developer platform 108 to register a program or other application for use on mobile devices. Content delivery platform 112 can use the registered application program to provide selected content to mobile devices.

In some embodiments, a registered application program is provided to mobile devices by developer platform 108, content delivery platform 112, one of sponsor A 121, sponsor C 123, or sponsor B 125, or by another desired delivery mechanism. In some embodiments, registering the application program with content delivery platform 112 allows developer 108 to receive revenue from sponsor A 121, sponsor C 123, or sponsor B 125 for content displayed on a mobile device located within, or in proximity to, a geographical area reserved by one or more of the sponsors.

Sponsor A 121, sponsor C 123, or sponsor B 125 can reserve an exclusive interest in a particular geographic area by sending a request to content delivery platform 112. In some embodiments, the request can be for exclusive delivery of content to mobile devices running any registered application within given geographic areas, or for content to be delivered to particular registered applications based on a target location. The request can also include time limitations, limitations based on the length of time a mobile device remains within a given geographic area, or other desired limitations. Furthermore, the reserved interest can be either completely exclusive, or semi-exclusive.

System 100 can include a network, for example Internet 131, through which content delivery platform 112, can communicate to other networked devices; and communication towers 144, which can include AM or FM broadcast towers, mobile telephone stations, or other suitable communication infrastructure, including satellites (not illustrated) that might be useful in providing content based on a target location. Content delivery platform 112 can use this communication infrastructure to communicate with various computing devices, including portable computer 179, which may include laptop computers, desktop computers, palmtop computers, tablet computers, digital video recorders (DVRs), television set-top boxes, or any of various general

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or dedicated purpose computers that can be carried or transported; wireless device 177, which can include personal digital assistants (PDAs), cellular telephones, personal communication system (PCS) devices, music players, video players, gaming consoles, or portable televisions; or any of various devices that may be included in, or carried by, motor vehicles 171, 173, or 175, including navigation systems, satellite radios, or the like. It should be noted that the term "mobile device" can include all computing devices as listed above that can communicate with content delivery platform 112, that the above listing of devices is not exhaustive, and that a device that qualifies as one type of device may also be considered to be of another type. For example, a mobile phone may also be a general purpose computing device, a radio, a television, and a navigation system.

Still referring to FIG. 1, consider first motor vehicle 171, which is located within sponsor A's reserved geographic area 143. A driver of first motor vehicle 171 can receive advertisements or other content from Sponsor A via a registered application running on a radio, a PDA, a cellular telephone, a laptop, or a global positioning navigation device (none of which are specifically illustrated). In this example, because first motor vehicle 171 is located within sponsor A's reserved geographic area 143, content delivery platform 121 provides content exclusively related to sponsor A 121; advertisements or other content from sponsor C 123 and sponsor B 125 can be excluded.

Portable computer 179 can be connected to Internet 131 via a hardwired network connection, a Wi-Fi connection or other suitable communication connection. In some embodiments, if portable computer 179 is running a registered program application, the user of portable computer 179 will receive content related exclusively to sponsor A as long as he is within sponsor A's reserved geographic area 143. In some embodiments, the driver of first motor vehicle 171 and the user of laptop 179 will still be able to receive advertisements from other sponsors through devices not running a program that has been registered on content delivery platform 112, or through non-registered programs running on the same device.

In some embodiments, the location of mobile devices, or another target location, can be determined using various suitable methods. For example, a mobile device running a registered application can provide location information to content delivery platform 112 in the form of latitude or longitude coordinates, raw or processed GPS data, or other location information received and recorded by either the device itself or another device. In some embodiments, a target location, e.g. the location of a mobile device, can be determined based on signals received from cellular transmission towers, satellites, or methods such as triangulation or dead reckoning, or by IP address. Content delivery platform 112 can receive the location of mobile devices from a third source, for example a location provider, a cellular telephone network provider, or a third party tracking source, rather than from the mobile device itself. Thus, the location of a mobile device can be received from the mobile device, determined by content delivery platform 112, received from a third-party source, or determined based on a combination of these or other methods.

Sponsor A's reserved geographic area 143 illustrates an embodiment in which a perimeter can be defined by streets, county boundaries, city boundaries, landmarks, or other features commonly found on maps. In contrast, sponsor B's reserved geographic area 145 can be an ellipse, circle, oval, or other geometric shape that can be determined at least in part, based on a radius.

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In this example, both second motor vehicle 173 and wireless device 177 are located within sponsor B's reserved geographic area 145. The driver of second motor vehicle 173 and the user of wireless device 177 can receive advertisements or other content via towers 144. For example, if the driver of second motor vehicle 173 is operating a navigation device executing an application program registered by developer 108, advertisements and other content received on the navigation device can be determined based on the location within sponsor B's reserved geographic area 145. Likewise, the user of wireless device 177 will receive advertisements related to sponsor B from within a registered application. In some embodiments, content delivery platform 112 can prevent content from sponsor A 121 and sponsor C 123 from being delivered to a mobile device carried by second motor vehicle 173 and wireless device 177, because both motor vehicle 173 and wireless device 177 are located in sponsor B's reserved geographic area 145.

Turning next to sponsor A and sponsor C's reserved geographic area 147, note that the perimeter is a square, rectangle or similarly shaped. In some embodiments, the perimeter may be defined entirely by longitude and latitude lines and/or coordinates that constitute an area. In other embodiments, sponsor A and sponsor C's reserved geographic area 147 can be partially bounded by a longitude or latitude line, a road, river, railway, county, state, parish, city, locality, or other desired boundary. In some embodiments, the perimeter of a sponsor A and sponsor C's reserved geographic area 147 can be defined by a combination of longitude or latitude lines, with one or more remaining boundaries defined based on radius or diameter.

Because third motor vehicle 175 is within sponsor A and sponsor C's reserved geographic area 147, a mobile device carried by third motor vehicle 175 can receive advertising content from either or both sponsor A and sponsor C. In some embodiments, the interest in sponsor A and sponsor C's reserved geographic area 147 can be equally divided between sponsor A 121 and sponsor C 123, while in other embodiments one of sponsor A 121 and sponsor C 123 can have an interest superior to that of the other. In some embodiments, content delivery platform 112 can deliver advertisements or other content related to Sponsor A at selected times, while content related to Sponsor C is delivered at other times. Additionally, content related to sponsor A may be delivered via a first registered application, while content related to sponsor C can be delivered via a second registered application. Thus, sponsors can advertise or provide other content to members of particular demographics based on a type of application a particular demographic is more likely to use.

Referring next to FIG. 2, a target location other than a mobile device in a system 200 is illustrated according to embodiments of the present disclosure. As shown in FIG. 2, a user of registered application 231 is located within the perimeter defining first sponsor's reserved area 207. Object of interest 233 is located in second sponsor's reserved area 205. In some embodiments, object of interest 233 can be any type of object of interest to the user of registered application 231. For example, object of interest 233 could be a friend of the user of registered application 231, and this friend may be employing a mobile phone, a laptop, a kiosk computer, a PDA, or any other device capable of sending location information 216 directly or indirectly to registered application 231. In some embodiments, target location information 216 can be any type of information that can be used to determine the location of the object of interest 233. In at least one embodiment, target location information 216 may

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be a geocoded twitter message. In another example, object of interest 233 could be an end destination on a map, and the location information 216 of this end destination can be sent to registered application 231.

In response to receiving the target location information 216 from object of interest 233, registered application 231 can send a request 213 to content delivery platform 212. The request can include, but is not limited to, information indicating the location of object of interest 233, a request for content, information indicating the location of registered application 231, information indicating the identity of the registered application 231, and a previously received request identifier.

Content delivery platform 212 can receive and process request 213 to identify the location of registered application 231 and the location of object of interest 233. In some embodiments, both locations need not be identified. Furthermore, in some embodiments the specific location need not be identified, as long as a determination that object of interest 233 is located within a given proximity of second sponsor's reserved area 205, or that registered application 231 is located within first sponsor's reserved area 207.

Content delivery platform 212 can provide registered application information 217 to second sponsor 225 to allow second sponsor 225 to deliver second sponsor's content 214 to registered application 231. The registered application information 217 can be an application identifier, a request identifier, a target location, a communications address, or other information that can be utilized by second sponsor 225. In some embodiments, application information 217 need not be provided to second sponsor 225, but instead can be processed internally by content delivery platform 212, and a determination can be made for second sponsor's content 214 to be delivered directly to application 231 from content delivery platform 212, or a third party (not illustrated).

Note that in the illustrated embodiment, despite the fact that registered application 231 is located within first sponsor's reserved area 207, the information delivered to registered application 231 can be content related exclusively to second sponsor's reserved area 205, in which object of interest 233 is located. This is because, in the illustrated embodiment, the target location is the location of object of interest 233, rather than the location of a mobile device executing registered application 231.

In some embodiments, information from the first sponsor can also be delivered to registered application 231, because the locations of the device running registered application 231 and object of interest 233 are both considered target locations. Furthermore, in some embodiments content need not be delivered directly from second sponsor 225, but instead can be provided by content delivery platform 212, or a third party (not illustrated).

Referring next to FIG. 3, a graph showing various geographic areas with reference to longitude and latitude is illustrated according to some embodiments of the present disclosure. The geographic areas in FIG. 3 are for illustration only and carry no particular significance with respect to their geometric shapes. Graph 300 includes a triangular area 320, reserved for sponsor A; pentagonal area 371, reserved for sponsor G; and octagonal area 330, also reserved for sponsor G. In the illustrated example, sponsor G has two physical addresses: G1 327, which lies within sponsor G's reserved octagonal area 330, and G2 328 which, lies within sponsor A's reserved triangular area 320. Furthermore, in the illustrated embodiment, sponsor A does not have a physical location within sponsor A's reserved triangular area 320.

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These examples help illustrate that there is not necessarily a correlation between a sponsor's physical address and a reserved geographic area, although in some embodiments there may be such a correlation.

As illustrated by FIG. 3, a single target location F 333 is located within sponsor G's reserved octagonal area 330, and target location F 333 can be a mobile device running a registered application, or target location F 333 can represent a target location other than the location of a mobile device, as illustrated in FIG. 2. In some embodiments, the mobile device with target location F 333 receives advertising exclusively from advertiser G.

As further illustrated by FIG. 3, there are four target locations: target location A 321, target location B 323, target location C 325, and target location G 392 within advertiser A's reserved triangular area 320. Note also, however, that target location G 392 also lies within one of sponsor G's reserved geographic areas, pentagonal area 371. Consider the following example in which target location A 321 and target location B 323 each are mobile devices executing a first application registered with a content delivery platform, such as content delivery platform 112, of FIG. 1. Further assume, for purposes of this example, that target location C 325 is a mobile device executing a second, different application, which is also registered with the content delivery platform. Because both the first and second applications are registered with the content delivery platform, each of the three devices, with target location A 321 target location B 323 and target location C 325 can receive advertisements or other content from within their respective applications. In this example, the content delivered to all three devices can be related exclusively to sponsor A, regardless of which registered application is being executed, because sponsor A has the only reserved interest in the portions of triangular area 320 occupied by mobile devices having target locations A 321 B 323 and C 325.

In some embodiments, target location G 392 can be a mobile device running two or more registered applications, and can receive content related to sponsor A, because the mobile device lies within triangular area 320. But, target location G 392 also lies within pentagonal area 371, and the mobile device can therefore receive content associated with sponsor G. In some embodiments, content related to sponsor A can be delivered via one of the registered applications, while another registered application receives and displays content related to sponsor G. In other embodiments, one of sponsor A or sponsor G can have a superior interest to the other, and a preference can be given to that sponsor's content for delivery. For example, sponsor G may have a superior interest in pentagonal area 371, which also forms part of triangular area 320. In such a case, if content related to sponsor G is available for delivery to the application on the mobile device with target location G 392, that content will be delivered in preference to content related to sponsor A. However, if there is no high priority content related to sponsor G to be delivered, content related to sponsor A may be provided in its stead. Various other priority and time sharing mechanisms and methods can be implemented according to the teachings set forth herein. Note that in some embodiments, multiple registered applications are not required to implement priority and time sharing mechanisms.

In some instances, a mobile device can have target locations, such as target location D 324 or target location E 356, located outside of areas reserved by sponsors. In such a case, a check can be made to determine if either target location D 340 or target location E 356 are located within a

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given proximity of a sponsor-reserved area such as triangular area 320 or octagonal area 330. So, for example, a check can be made to determine whether any reserved areas lie within a given radius of target location D 340, defining a search area 341, or within a given radius of target location E 356, defining a search area 351. In some embodiments, if no sponsor reserved area intersects an area within an initially small radius, further checks can be performed by incrementally increasing the radius. So, for example, after a first check finds no advertiser reserved areas within search areas 341 or 351, the search areas can be increased to encompass areas 343 and 353, respectively.

In the illustrated example, there is no reserved area intersecting search area 353, but sponsor H 357 has a physical address within area 353. In some embodiments, once it is determined that a registered sponsor has a physical address location within a search radius, but there are no sponsor reserved geographic areas in proximity to or encompassing a target location, an advertisement or other content can be delivered to a mobile device, such as the device with target location 356.

Another situation arises when there are no sponsor reserved geographic areas intersecting a search area, but there are multiple sponsor physical locations within a given radius. Consider area 343, which contains sponsor E's location 349, and sponsor F's location 347. Because neither sponsor E nor sponsor F has established a reserved area that intersects with search area 343, a random choice can be made between these two sponsors to determine which sponsor's content to provide to the registered application on the device with target location D 340. In other embodiments, preference may be given to one of sponsor E's location 349 and sponsor F's location 347 based on each physical locations' proximity to target location D 340, based on a travel time between the device with target location D 340 and the sponsors' locations, or based on some other desired parameter. In further embodiments, if no sponsor's reserved geographic area intersects any portion of area 343, no content is sent to mobile device D with target location 340, despite the fact that location sponsor E's location 359, and sponsor F's location 347 are both within the perimeter defining search area 343.

In some embodiments, the search radius can continue to be expanded until a search area 345 intersects with a sponsor reserved geographic area. In the illustrated embodiment, search area 345 intersects sponsor A's reserved triangular area 320. Note that sponsor G's physical location 328 is also located within search area 345. In some embodiments, content from either sponsor A or sponsor G can be selected using any of various processes, because target location D 340 is not located entirely within triangular area 320. In some embodiments, however, because the expanded search area 345 encompasses even a portion of sponsor A's reserved triangular area 320, content related to sponsor G will be excluded, and content related to sponsor A will be exclusively provided to mobile device with target location D 340. In some embodiments, because target location D 340 is not located within sponsor A's reserved triangular area 320, content related to sponsor A will be excluded, and content related to sponsor G will be exclusively provided to mobile device with target location D 340.

Additional techniques accounting for the proximity of exclusively reserved advertising areas and sponsor's physical locations with respect to mobile device locations can be implemented according to the teaching set forth herein. For example, in some embodiments, sponsor's physical locations can be used to determine a superior interest in all otherwise unreserved geographic areas. For

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example, a content delivery system can deliver content from a “default” sponsor, if it is determined that no other content is to be delivered to a mobile device.

Referring next to FIG. 4, a method 400 for allowing sponsors to reserve particular geographic areas will be discussed according to embodiments of the present disclosure. Method 400 begins, as illustrated by block 401. As illustrated by block 403, a content delivery platform, for example content delivery platform 112 as illustrated in FIG. 1, can receive a request for sponsor registration, which can also include receiving physical address location from the sponsor. As illustrated by block 405, the sponsor can establish perimeters defining geographic areas of exclusive or semi-exclusive control. These geographic areas are areas the sponsor wishes to reserve for delivery of his own advertisements or other content controlled by the sponsor.

The perimeters established can be based on map features, such as streets, rivers, landmarks, or any of the other various map features. The perimeters can also be defined by latitude and longitude, or various geometric constructs having a given relative position to either a point location, a map location, a physical address, or otherwise. Some embodiments allow for establishing perimeters defining areas based on a combination of the various types of constructs. So, for example, latitude, longitude and map features may be used to establish the reserved area, or a combination of coordinates and geometric constructs can be used in conjunction with other suitable boundary identifiers to establish an area that may be reserved specifically for content related to a particular advertiser or sponsor.

In some embodiments, the perimeters may be generated interactively, using sponsor established perimeter definitions, or other unique sponsor requests. Some embodiments employ pre-defined areas, or allow selection of areas based on predetermined factors, and present sponsors a choice from among previously established options.

As illustrated by block 407, a sponsor’s request for a selected area is received. As illustrated by block 409, a check is made to determine if the selected area, or a portion of the selected area, has already been reserved by another sponsor. If the area selected by the sponsor is already owned or is otherwise unavailable, method 400 may return to block 407, and the sponsor can choose another area. In some embodiments, overlap of various sponsor areas may be allowed based on type of business, type of application used to deliver the content, or otherwise.

As illustrated by block 411, if an area selected for exclusive or semi-exclusive content delivery is available, the selected geographic area can be reserved for the sponsor. And as illustrated by block 413, the sponsor can be notified that an interest in the geographic area has been reserved for him.

A sponsor can provide content for delivery to mobile devices having target locations contained within its reserved area, as illustrated by block 415. This content can include advertisements, still image content, animated content, video content, audio content, alphanumeric identifiers, or other content suitable for delivery to mobile devices via registered applications. As illustrated by block 417, the content received from the sponsor can be stored for later delivery to registered applications running on mobile devices having target locations that exist within the sponsor’s reserved area, which such target locations may include, but are not limited to, when the mobile device or target location physically enters or remains within the sponsor’s reserved area for a desired length of time. In some embodiments, content can be delivered to a mobile device by the sponsor or another party

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in response to a notification that the mobile device or target location has entered or is contained within the sponsor’s reserved area. Method 400 ends, as illustrated at block 419.

Referring next to FIG. 5, a method 500 of registering an application program for use in conjunction with a content delivery platform is illustrated according to various embodiments of the present disclosure. Method 500 begins as illustrated by block 501. As illustrated by block 503, an application can be registered on a content delivery platform in response to a request by a developer, for example developer 108 as illustrated in FIG. 1. As illustrated by block 505, a request for content can be received from a device running a registered application. In some embodiments, the same registered application may be executed on any of various mobile devices, including mobile telephones, personal digital assistants, laptops, and the like. Furthermore, multiple devices may execute copies of the same registered application, multiple different registered applications may be executed on a single mobile device, and multiple different registered applications may be executed on multiple devices.

As illustrated by block 507 a determination is made as to whether the application sending the request for content has a target location that is located within a sponsor’s reserved geographic area. In some embodiments, the target location may be the location of the device. In some embodiments, the target location may be a location other than the location of the device, as illustrated in FIG. 2. As illustrated by block 509, if the target location is located within a sponsor’s reserved area, content from the corresponding sponsor can be chosen for delivery to the mobile device. The content can be chosen based on a number of different parameters or combinations of parameters. In some embodiments, different sponsors may designate particular content to be provided on different days of the week or at different times of day. Some such embodiments allow a single geographic area to be shared by different advertisers or sponsors. For example, content associated with a first sponsor may be selected for delivery in a particular geographic area during the lunch hour, while content related to a second sponsor is selected for delivery in that same geographic area between the hours of midnight and 2 am.

In some embodiments, content from one sponsor can be selected for delivery in a particular geographic area in specific situations, even though a different sponsor has generally reserved that same geographic area. For example, content from a first sponsor can be delivered during a football game to mobile devices located in a geographic area normally reserved by a second sponsor, effectively trumping content related to the second sponsor that would otherwise be delivered. In some embodiments, additional criteria can be applied to determine which sponsors’ content will be provided to mobile devices in a particular geographic area.

As illustrated by block 511, selected content can be provided to an application for display on a mobile device. In at least one embodiment, different content from the same sponsor can be provided to the same device for display within different applications, or the same content from the same sponsor can be displayed for all mobile devices running all registered applications that have target locations within the delivery area for the content. For example, a first program run on a mobile device may display a first advertisement within that program while a second program running on the same device may display a second advertisement, which is different from the first advertisement. In some embodiments in which an interest in a particular geographic area is shared between multiple sponsors, a primary sponsor’s content can be exclusively displayed via

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a first registered application running on a particular mobile device, while content from other sponsors can be displayed via a second and subsequent applications running on the same mobile device.

As illustrated by block 513, if the target location is not within a sponsor's reserved area, a determination can be made regarding whether at least one sponsor's presence is within a first predetermined radius of the target location. In some embodiments, a determination is made regarding whether a sponsor's physical location is within a predetermined radius of the target location. In some embodiments, a determination is made regarding whether a sponsor's geographic area, or a portion of a sponsor's geographic area, is contained within a predetermined radius of the target location. If at least one sponsor's presence is within a predetermined radius of the target location, a sponsor is chosen from a random or pseudo-random process, as illustrated by block 519. Content is then selected for delivery, as illustrated by block 509. As illustrated by block 515, if a sponsor's presence is not within a predetermined radius of the target location, the search radius can be increased. As illustrated by block 517, a check can be made to determine whether any more increases should be made. In some embodiments, the search radius can continue to be increased incrementally, in a logarithmic manner, or otherwise, until at least a portion of a sponsor's reserved area intersects the search area defined by the search radius. In some embodiments, the search radius can be increased a predetermined number of times, or can be limited based on system resources, time constraints, or other desired parameters. The processes illustrated by blocks 513, 515, and 517 can be repeated until a positive indication is produced by the process at block 517.

As illustrated by block 519, content from a randomly or pseudo-randomly selected sponsor can be delivered to a mobile device if the target location is not within a desired proximity to a sponsor's reserved area. In some embodiments, rather than delivering content randomly, content selections can be made based on desired criteria. Content related to a sponsor that reserved all otherwise unallocated space can be delivered to a mobile device executing a registered application. In some such embodiments, if any particular geographic areas have not yet been reserved, or if any device requesting content does not have a target location contained within a reserved geographic area, the default sponsor's content can be delivered to the mobile device. Method 500 ends as illustrated by block 521.

Preferring next to FIG. 6, a method of interaction between a mobile device and a content providing platform is illustrated according to various embodiments of the present disclosure. Method 600 begins as illustrated by block 601. As illustrated by block 603 an application platform key can be provided to a developer in response to the developer registering an application for use on the application platform. The developer can, in turn, provide the key to mobile devices on which the registered application is installed. As illustrated by block 605, when a mobile device requests content from the content providing platform, the mobile device can send the key along with its request. As illustrated by block 607, the content providing platform can verify that the key matches a valid key stored in its database, or elsewhere, before providing content to the application.

In some embodiments, key verification can be performed by an entity other than the content providing platform. As illustrated by block 627, if a verification check on the key fails, no content is provided to the requesting application, and the method 600 ends.

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As illustrated by block 609, if the key is validated a session can be initiated between the application on the mobile device, and the content delivery platform. As illustrated by block 611 in at least one embodiment, the application running on the mobile device sends the mobile device's location, or another target location, to the content delivery platform. However, in some embodiments the actual location is not sent by the device, but may be provided to the content delivery platform from another source. Furthermore, the content delivery platform, or a subsystem of a communications system employed by the content delivery platform, can determine the location of the mobile device based on raw, partially, or completely processed information received from the mobile device or from another source. For example, the mobile device can forward information associated with a target location to the content delivery platform, or the content delivery server can obtain location information from a third party application or device, from a home location register (HLR), from a visiting location register (VLR), from raw, differential, processed or semi-processed GPS data, from power signals used in code-division multiple access (CDMA) or other wireless communications systems, or otherwise.

As illustrated by block 613, the content delivery platform records the request from the registered application in a request identifier in the platform database, or some other suitable storage location. The request identifier can be used in some embodiments to track further interaction with the registered application, or to deliver additional content to a requesting mobile device. Thus, in some embodiments, a mobile device or other target location that is only temporarily located within a particular sponsor's reserved geographic area may continue to receive information from that sponsor after the mobile device, or the target location, exits the sponsor's reserved area. In other embodiments, content related to a sponsor is discontinued in response to a mobile device exiting, or the target location losing focus within, the sponsor's reserved area.

As illustrated by block 615, the content delivery platform can deliver the request identifier to the requesting application along with the requested content. As illustrated by block 617, a user of the mobile device can interact with the provided content using any of various methods such as pressing a button, selecting a user selectable object on a graphical user interface, or otherwise. The application on the mobile device can send an indication of the interaction to the content delivery platform via the same communication channel used to send the request, or via a different communications channel.

As illustrated by block 619, a registered application running on a mobile device can send an additional information request to the platform using the previously assigned request identifier. In some embodiments, using the previously assigned platform request identifier permits tracking of a series of interactions between a particular application and the content delivery platform. Furthermore, using the request identifier can allow individualized content to be delivered to different registered applications which may or may not be running on the same mobile device.

As illustrated by block 621, a determination is made regarding whether a request identifier sent in conjunction with a request for further information is maintained in the platform database or other suitable storage. As illustrated by block 623, if the request identifier is contained in the database or other storage area, the content delivery platform can update a request identifier record as illustrated by block 625, the content delivery platform can

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deliver more content to the requesting application. As illustrated by block 627, method 600 can proceed to end after delivering the additional content.

The methods and processes disclosed previously, as well as other embodiments, may be implemented in a processing system executing a set of instructions stored in memory, or on a removable computer readable medium. An example of a system according to some embodiments is illustrated in FIG. 7. Referring now to FIG. 7, a high-level block diagram of a processing system is illustrated and discussed. Processing system 700 includes one or more central processing units, such as CPU A 705 and CPU B 707, which may be conventional microprocessors interconnected with various other units via at least one system bus 710. CPU A 705 and CPU B 707 may be separate cores of an individual, multi-core processor, or individual processors connected via a specialized bus 711. In some embodiments, CPU A 705 or CPU B 707 may be a specialized processor, such as a graphics processor, other co-processor, or the like.

Processing system 700 includes random access memory (RAM) 720; read-only memory (ROM) 715, wherein the ROM 715 could also be erasable programmable read-only memory (EPROM) or electrically erasable programmable read-only memory (EEPROM); and input/output (I/O) adapter 725, for connecting peripheral devices such as disk units 730, optical drive 736, or tape drive 737 to system bus 710; a user interface adapter 740 for connecting keyboard 745, mouse 750, speaker 755, microphone 760, or other user interface devices to system bus 710; communications adapter 765 for connecting processing system 700 to an information network such as the Internet or any of various local area networks, wide area networks, telephone networks, or the like; and display adapter 770 for connecting system bus 710 to a display device such as monitor 775. Mouse 750 has a series of buttons 780, 785 and may be used to control a cursor shown on monitor 775.

It will be understood that processing system 700 may include other suitable data processing systems without departing from the scope of the present disclosure. For example, processing system 700 may include bulk storage and cache memories, which provide temporary storage of at least some program code in order to reduce the number of times code must be retrieved from bulk storage during execution.

Various disclosed embodiments can be implemented in hardware, software, or a combination containing both hardware and software elements. In one or more embodiments, the invention is implemented in software, which includes but is not limited to firmware, resident software, microcode, etc. Some embodiments may be realized as a computer program product, and may be implemented as a computer-usable or computer-readable medium embodying program code for use by, or in connection with, a computer, a processor, or other suitable instruction execution system.

For the purposes of this description, a computer-usable or computer readable medium can be any apparatus that can contain, store, communicate, propagate, or transport the program for use by or in connection with the instruction execution system, apparatus, or device. By way of example, and not limitation, computer readable media may comprise any of various types of computer storage media, including volatile and non-volatile, removable and non-removable media implemented in any suitable method or technology for storage of information such as computer readable instructions, data structures, program modules, or other data. Computer storage media include, but are not limited to, RAM, ROM, EEPROM, flash memory or other memory

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technology, CD-ROM, digital versatile disks (DVD) or other optical storage, magnetic cassettes, magnetic tape, magnetic disk storage or other magnetic storage devices, or any other medium which can be used to store the desired information and which can be accessed by a computer. Data structures and transmission of data (including wireless transmission) particular to aspects of the disclosure are also encompassed within the scope of the disclosure.

Various embodiments have been described for delivering content related to a commercial media program. Other variations and modifications of the embodiments disclosed may be made based on the description provided, without departing from the scope of the invention as set forth in the following claims.

What is claimed is:

1. A mobile device comprising:
memory;

at least one processor operably coupled to the memory;
a location-determination component; and

at least one module configured for execution by the at least one processor, wherein the at least one module comprises at least one instruction for:

in response to receiving, from an application program during its execution in the mobile device, a request for having at least a first identifier being associated with a first designated geographic area of interest provided to the application program after it has been determined, by at least use of the at least one processor and of location information representing at least one physical geographic location of the mobile device as determined by the location-determination component, that the mobile device has at least entered the first designated geographic area of interest and has remained therein for at least a predetermined length of time, after receiving, from the application program, both a first data string comprising the first identifier to be associated with the first designated geographic area of interest and first geographic data to be used for defining the first designated geographic area of interest and to be used with the first identifier to establish, in the memory, the first designated geographic area of interest as a first area specifically reserved for delivery of the first identifier related to the application program, after establishing, in the memory, the first designated geographic area of interest as the first area specifically reserved for delivery of the first identifier related to the application program, after storing, in the memory, a first record comprising the first identifier, and after determining, by at least use of the at least one processor and of the location information, that the mobile device has at least entered the first area specifically reserved for delivery of the first identifier related to the application program and has remained therein for at least the predetermined length of time, delivering, from the first record stored in the memory and to the application program, at least first datum comprising at least the first identifier.

2. The mobile device of claim 1 wherein the at least one module further comprises at least one instruction for:

receiving, from the application program during its execution in the mobile device, the request for having at least the first identifier being associated with the first designated geographic area of interest provided to the application program after it has been determined, by at least use of the at least one processor and of the location

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information, that the mobile device has at least entered the first designated geographic area of interest and has remained therein for at least the predetermined length of time.

3. The mobile device of claim 2 wherein:

the first geographic data from the application program comprises at least one geometric construct that establishes at least one perimeter for defining the first designated geographic area of interest; and

the at least one module further comprises at least one instruction for:

receiving, from the application program during its execution in the mobile device, both the first data string comprising the first identifier to be associated with the first designated geographic area of interest and the first geographic data to be used for defining the first designated geographic area of interest and to be used with the first identifier to establish, in the memory, the first designated geographic area of interest as the first area specifically reserved for delivery of the first identifier related to the application program.

4. The mobile device of claim 3 wherein the at least one geometric construct from the application program that establishes the at least one perimeter for defining the first designated geographic area of interest comprises at least one radius value.

5. The mobile device of claim 3 wherein the at least one geometric construct from the application program that establishes the at least one perimeter for defining the first designated geographic area of interest comprises a combination of at least two latitudinal values and at least two longitudinal values.

6. The mobile device of claim 4 wherein the first geographic data from the application program further comprises at least one latitude value and at least one longitude value for defining the first designated geographic area of interest.

7. The mobile device of claim 6 wherein:

the at least one instruction for delivering, from the first record stored in the memory and to the application program, at least first datum comprising at least the first identifier includes being at least one instruction for delivering the at least first datum after obtaining the location information representing at least one physical geographic location of the mobile device as determined by the location-determination component; and

the at least one module further comprises at least one instruction for:

obtaining the location information representing at least one physical geographic location of the mobile device as determined by the location-determination component; and

determining, by at least use of the at least one processor and of the location information, that the mobile device has at least entered the first area specifically reserved for delivery of the first identifier related to the application program and has remained therein for at least the predetermined length of time.

8. The mobile device of claim 7 wherein the at least one module further comprises at least one instruction for:

registering, in the memory, the application program for having at least the first identifier provided to the application program after it has been determined, by at least use of the at least one processor and of the location information, that the mobile device has at least entered the first area specifically reserved for delivery of the

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first identifier related to the application program and has remained therein for at least the predetermined length of time.

9. The mobile device of claim 7 wherein the at least one module further comprises at least one instruction for:

in response to receiving, from the application program during its execution in the mobile device, a request for having at least a second identifier being associated with a second designated geographic area of interest provided to the application program after it has been determined, by at least use of the at least one processor and of the location information, that the mobile device has at least entered the second designated geographic area of interest and has remained therein for at least a second predetermined length of time, after receiving, from the application program, both a second data string comprising the second identifier to be associated with the second designated geographic area of interest and second geographic data to be used for defining the second designated geographic area of interest and to be used with the second identifier to establish, in the memory, the second designated geographic area of interest as a second area specifically reserved for delivery of the second identifier related to the application program, after establishing, in the memory, the second designated geographic area of interest as the second area specifically reserved for delivery of the second identifier related to the application program, after storing, in the memory, a second record comprising the second identifier, and after determining, by at least use of the at least one processor and of the location information, that the mobile device has at least entered the second area specifically reserved for delivery of the second identifier related to the application program and has remained therein for at least the second predetermined length of time, delivering, from the second record stored in the memory and to the application program, at least second datum comprising at least the second identifier.

10. The mobile device of claim 7 wherein:

the at least one instruction for delivering, from the first record stored in the memory and to the application program, at least first datum comprising at least the first identifier includes being at least one instruction for delivering the at least first datum after availability for the first designated geographic area of interest to be reserved for the application program has been positively determined; and

the at least one module further comprises at least one instruction for:

determining availability for the first designated geographic area of interest to be reserved for the application program.

11. The mobile device of claim 7 wherein the at least one module further comprises at least one instruction for:

sending, via the application program, to the at least one instruction for receiving the request for having at least the first identifier being associated with the first designated geographic area of interest provided to the application program, the request for having at least the first identifier being associated with the first designated geographic area of interest provided to the application program after it has been determined, by at least use of the at least one processor and of the location information, that the mobile device has at least entered the first

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designated geographic area of interest and has remained therein for at least the predetermined length of time; and

sending, via the application program, to the at least one instruction for receiving both the first data string comprising the first identifier and the first geographic data, the first data string comprising the first identifier and the first geographic data.

12. The mobile device of claim 11 wherein the at least one module further comprises at least one instruction for:

after receiving the first identifier in the at least first datum delivered from the first record stored in the memory, displaying, on the mobile device via a graphical user interface tangibly embodied by the mobile device and via the application program, content associated with the first designated geographic area of interest.

13. The mobile device of claim 7 wherein the at least one module further comprises at least one instruction for:

creating a notification indicating that the mobile device has at least entered the first area specifically reserved for delivery of the first identifier related to the application program and has remained therein for at least the predetermined length of time.

14. The mobile device of claim 7 wherein the first identifier, in its being associated with the first designated geographic area of interest, provides at least identification of a boundary for the first designated geographic area of interest.

15. The mobile device of claim 7 wherein the at least one instruction for receiving, from the application program during its execution in the mobile device, the request for having at least the first identifier being associated with the first designated geographic area of interest provided to the application program includes being at least one instruction for receiving, from at least one other application program during its execution in the mobile device, one or more other requests for having at least one or more identifiers each being respectfully associated with one or more designated geographic areas of interest provided to the at least one other application program after it has been determined, by at least use of the at least one processor and of the location information, that the mobile device has at least entered the one or more designated geographic areas of interest and has remained therein for at least a predetermined length of time.

16. The mobile device of claim 7 wherein:

the at least one instruction for delivering, from the first record stored in the memory and to the application program, at least first datum comprising at least the first identifier includes being at least one instruction for delivering the at least first datum after receiving, from the application program during its execution in the mobile device, a data value representing the predetermined length of time and after determining, by at least use of the at least one processor and of the location information, that the mobile device, following a designated start time and during a designated duration of time, has at least entered the first area specifically reserved for delivery of the first identifier related to the application program and has remained therein for at least the predetermined length of time; and

the at least one module further comprises at least one instruction for:

receiving, from the application program during its execution in the mobile device, the data value representing the predetermined length of time and a data value representing the designated duration of time.

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17. The mobile device of claim 9 wherein:

the second geographic data from the application program comprises at least one second geometric construct that establishes at least one second perimeter for defining the second designated geographic area of interest;

the at least one second geometric construct from the application program that establishes the at least one second perimeter for defining the second designated geographic area of interest comprises at least one second radius value;

the second geographic data from the application program further comprises at least one second latitude value and at least one second longitude value for defining the second designated geographic area of interest;

the at least one instruction for delivering, from the second record stored in the memory and to the application program, at least second datum comprising at least the second identifier includes being at least one instruction for delivering the at least second datum after obtaining the location information representing at least one physical geographic location of the mobile device as determined by the location-determination component;

the first identifier, in its being associated with the first designated geographic area of interest, provides at least identification of a boundary for the first designated geographic area of interest;

the second identifier, in its being associated with the second designated geographic area of interest, provides at least identification of a boundary for the second designated geographic area of interest; and

the at least one module further comprises at least one instruction for:

receiving, from the application program during its execution in the mobile device, the request for having at least the second identifier being associated with the second designated geographic area of interest provided to the application program after it has been determined, by at least use of the at least one processor and of the location information, that the mobile device has at least entered the second designated geographic area of interest and has remained therein for at least the second predetermined length of time;

receiving, from the application program during its execution in the mobile device, both the second data string comprising the second identifier to be associated with the second designated geographic area of interest and the second geographic data to be used for defining the second designated geographic area of interest and to be used with the second identifier to establish, in the memory, the second designated geographic area of interest as the second area specifically reserved for delivery of the second identifier related to the application program; and

determining, by at least use of the at least one processor and of the location information, that the mobile device has at least entered the second area specifically reserved for delivery of the second identifier related to the application program and has remained therein for at least the second predetermined length of time.

18. A non-transitory computer readable medium tangibly embodying at least one program of computer executable instructions, wherein the at least one program of computer executable instructions comprises at least one instruction for:

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in response to receiving, in a mobile device, from an application program during its execution in the mobile device, a request for having at least a first identifier being associated with a first designated geographic area of interest provided to the application program after it has been determined, by at least use of at least one processor tangibly embodied by the mobile device and of location information representing at least one physical geographic location of the mobile device as determined by a location-determination component tangibly embodied by the mobile device, that the mobile device has at least entered the first designated geographic area of interest and has remained therein for at least a predetermined length of time, after receiving, from the application program, both a first data string comprising the first identifier to be associated with the first designated geographic area of interest and first geographic data to be used for defining the first designated geographic area of interest and to be used with the first identifier to establish, in a memory tangibly embodied by the mobile device, the first designated geographic area of interest as a first area specifically reserved for delivery of the first identifier related to the application program, after establishing, in the memory, the first designated geographic area of interest as the first area specifically reserved for delivery of the first identifier related to the application program, after storing, in the memory, a first record comprising the first identifier, and after determining, by at least use of the at least one processor and of the location information, that the mobile device has at least entered the first area specifically reserved for delivery of the first identifier related to the application program and has remained therein for at least the predetermined length of time, delivering, from the first record stored in the memory and to the application program, at least first datum comprising at least the first identifier.

19. A method comprising:
 sending, via a particular application program executing in a mobile device, to at least one program of computer executable instructions operating in the mobile device: a request for having at least a particular identifier being associated with a particular designated geographic area of interest provided to the particular application program after it has been determined, by at least use of at least one processor tangibly embodied by the mobile device and of location information representing at least one physical geographic location of the mobile device as determined by a location-determination component tangibly embodied by the mobile device, that the mobile device has at least entered the particular designated geographic area of interest; a particular data string comprising the particular identifier to be associated with the particular designated geographic area of interest; and particular geographic data to be used for defining the particular designated geographic area of interest and to be used with the particular identifier to establish, in a memory tangibly embodied by the mobile device, the particular designated geographic area of interest as an area specifically reserved for delivery of the particular identifier related to the particular application program, wherein:
 the particular geographic data from the particular application program comprises at least one particular geometric construct that establishes at least

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one particular perimeter for defining the particular designated geographic area of interest; and the at least one program of computer executable instructions comprises at least one instruction for: in response to receiving, in the mobile device, from an application program during its execution in the mobile device, a request for having at least a first identifier being associated with a first designated geographic area of interest provided to the application program after it has been determined, by at least use of the at least one processor and of the location information, that the mobile device has at least entered the first designated geographic area of interest and has remained therein for at least a predetermined length of time, after receiving, from the application program, both a first data string comprising the first identifier to be associated with the first designated geographic area of interest and first geographic data to be used for defining the first designated geographic area of interest and to be used with the first identifier to establish, in the memory tangibly embodied by the mobile device, the first designated geographic area of interest as a first area specifically reserved for delivery of the first identifier related to the application program, after establishing, in the memory, the first designated geographic area of interest as the first area specifically reserved for delivery of the first identifier related to the application program, after storing, in the memory, a first record comprising the first identifier, and after determining, by at least use of the at least one processor and of the location information, that the mobile device has at least entered the first area specifically reserved for delivery of the first identifier related to the application program and has remained therein for at least the predetermined length of time, delivering, from the first record stored in the memory and to the application program, at least first datum comprising at least the first identifier.

20. The method of claim 19, further comprising:
 after receiving, via the particular application program, the particular identifier delivered by the at least one program of computer executable instructions in response to the at least one program of computer executable instructions receiving the particular data string, the particular geographic data, and the request for having at least the particular identifier being associated with the particular designated geographic area of interest provided to the particular application program, and after the at least one program of computer executable instructions has determined, by at least use of the at least one processor and of the location information, that the mobile device has at least entered the particular designated geographic area of interest, displaying, on the mobile device via a graphical user interface tangibly embodied by the mobile device and via the particular application program, content associated with the particular designated geographic area of interest.

21. The computer readable medium of claim 18 wherein the at least one program of computer executable instructions further comprises at least one instruction for:
 receiving, from the application program, the first identifier and the first geographic data, and in response to receiving, from the application program, the first identifier and the first geographic data, the request for having at least

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the first identifier being associated with the first designated geographic area of interest provided to the application program after it has been determined, by at least use of the at least one processor and of the location information, that the mobile device has at least entered the first designated geographic area of interest and has remained therein for at least the predetermined length of time.

22. The computer readable medium of claim 21 wherein: the first geographic data from the application program comprises at least one geometric construct that establishes at least one perimeter for defining the first designated geographic area of interest; and

the at least one program of computer executable instructions further comprises at least one instruction for:

receiving, from the application program during its execution in the mobile device, both the first data string comprising the first identifier to be associated with the first designated geographic area of interest and the first geographic data to be used for defining the first designated geographic area of interest and to be used with the first identifier to establish, in the memory, the first designated geographic area of interest as the first area specifically reserved for delivery of the first identifier related to the application program.

23. The computer readable medium of claim 22 wherein the at least one geometric construct from the application program that establishes the at least one perimeter for defining the first designated geographic area of interest comprises at least one radius value.

24. The computer readable medium of claim 22 wherein the at least one geometric construct from the application program that establishes the at least one perimeter for defining the first designated geographic area of interest comprises a combination of at least two latitudinal values and at least two longitudinal values.

25. The computer readable medium of claim 23 wherein the first geographic data from the application program further comprises at least one latitude value and at least one longitude value for defining the first designated geographic area of interest.

26. The computer readable medium of claim 25 wherein: the at least one instruction for delivering, from the first record stored in the memory and to the application program, at least first datum comprising at least the first identifier includes being at least one instruction for delivering the at least first datum after obtaining the location information representing at least one physical geographic location of the mobile device as determined by the location- determination component; and

the at least one program of computer executable instructions further comprises at least one instruction for:

obtaining the location information representing at least one physical geographic location of the mobile device as determined by the location-determination component; and

determining, by at least use of the at least one processor and of the location information, that the mobile device has at least entered the first area specifically reserved for delivery of the first identifier related to the application program and has remained therein for at least the predetermined length of time.

27. The computer readable medium of claim 26 wherein the at least one program of computer executable instructions further comprises at least one instruction for:

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registering, in the memory, the application program for having at least the first identifier provided to the application program after it has been determined, by at least use of the at least one processor and of the location information, that the mobile device has at least entered the first area specifically reserved for delivery of the first identifier related to the application program and has remained therein for at least the predetermined length of time.

28. The computer readable medium of claim 26 wherein the at least one program of computer executable instructions further comprises at least one instruction for:

in response to receiving, from the application program during its execution in the mobile device, a request for having at least a second identifier being associated with a second designated geographic area of interest provided to the application program after it has been determined, by at least use of the at least one processor and of the location information, that the mobile device has at least entered the second designated geographic area of interest and has remained therein for at least a second predetermined length of time, after receiving, from the application program, both a second data string comprising the second identifier to be associated with the second designated geographic area of interest and second geographic data to be used for defining the second designated geographic area of interest and to be used with the second identifier to establish, in the memory, the second designated geographic area of interest as a second area specifically reserved for delivery of the second identifier related to the application program, after establishing, in the memory, the second designated geographic area of interest as the second area specifically reserved for delivery of the second identifier related to the application program, after storing, in the memory, a second record comprising the second identifier, and after determining, by at least use of the at least one processor and of the location information, that the mobile device has at least entered the second area specifically reserved for delivery of the second identifier related to the application program and has remained therein for at least the second predetermined length of time, delivering, from the second record stored in the memory and to the application program, at least second datum comprising at least the second identifier.

29. The computer readable medium of claim 26 wherein: the at least one instruction for delivering, from the first record stored in the memory and to the application program, at least first datum comprising at least the first identifier includes being at least one instruction for delivering the at least first datum after availability for the first designated geographic area of interest to be reserved for the application program has been positively determined; and

the at least one program of computer executable instructions further comprises at least one instruction for:

determining availability for the first designated geographic area of interest to be reserved for the application program.

30. The computer readable medium of claim 26 wherein the at least one program of computer executable instructions further comprises at least one instruction for:

sending, via the application program, to the at least one instruction for receiving the request for having at least the first identifier being associated with the first designated geographic area of interest provided to the

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application program, the request for having at least the first identifier being associated with the first designated geographic area of interest provided to the application program after it has been determined, by at least use of the at least one processor and of the location information, that the mobile device has at least entered the first designated geographic area of interest and has remained therein for at least the predetermined length of time; and

sending, via the application program, to the at least one instruction for receiving both the first data string comprising the first identifier and the first geographic data, the first data string comprising the first identifier and the first geographic data.

31. The computer readable medium of claim 30 wherein the at least one program of computer executable instructions further comprises at least one instruction for:

after receiving the first identifier in the at least first datum delivered from the first record stored in the memory, displaying, on the mobile device via a graphical user interface tangibly embodied by the mobile device and via the application program, content associated with the first designated geographic area of interest.

32. The computer readable medium of claim 26 wherein the at least one program of computer executable instructions further comprises at least one instruction for:

creating a notification indicating that the mobile device has at least entered the first area specifically reserved for delivery of the first identifier related to the application program and has remained therein for at least the predetermined length of time.

33. The computer readable medium of claim 26 wherein the first identifier, in its being associated with the first designated geographic area of interest, provides at least identification of a boundary for the first designated geographic area of interest.

34. The computer readable medium of claim 26 wherein the at least one instruction for receiving, from the application program during its execution in the mobile device, the request for having at least the first identifier being associated with the first designated geographic area of interest provided to the application program includes being at least one instruction for receiving, from at least one other application program during its execution in the mobile device, one or more other requests for having at least one or more identifiers each being respectfully associated with one or more designated geographic areas of interest provided to the at least one other application program after it has been determined, by at least use of the at least one processor and of the location information, that the mobile device has at least entered the one or more designated geographic areas of interest and has remained therein for at least a predetermined length of time.

35. The computer readable medium of claim 26 wherein: the at least one instruction for delivering, from the first record stored in the memory and to the application program, at least first datum comprising at least the first identifier includes being at least one instruction for delivering the at least first datum after receiving, from the application program during its execution in the mobile device, a data value representing the predetermined length of time and after determining, by at least use of the at least one processor and of the location information, that the mobile device, following a designated start time and during a designated duration of time, has at least entered the first area specifically reserved for delivery of the first identifier related to the

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application program and has remained therein for at least the predetermined length of time; and

the at least one program of computer executable instructions further comprises at least one instruction for:

receiving, from the application program during its execution in the mobile device, the data value representing the predetermined length of time and a data value representing the designated duration of time.

36. The computer readable medium of claim 28 wherein: the second geographic data from the application program comprises at least one second geometric construct that establishes at least one second perimeter for defining the second designated geographic area of interest;

the at least one second geometric construct from the application program that establishes the at least one second perimeter for defining the second designated geographic area of interest comprises at least one second radius value;

the second geographic data from the application program further comprises at least one second latitude value and at least one second longitude value for defining the second designated geographic area of interest;

the at least one instruction for delivering, from the second record stored in the memory and to the application program, at least second datum comprising at least the second identifier includes being at least one instruction for delivering the at least second datum after obtaining the location information representing at least one physical geographic location of the mobile device as determined by the location-determination component;

the first identifier, in its being associated with the first designated geographic area of interest, provides at least identification of a boundary for the first designated geographic area of interest;

the second identifier, in its being associated with the second designated geographic area of interest, provides at least identification of a boundary for the second designated geographic area of interest; and

the at least one program of computer executable instructions further comprises at least one instruction for:

receiving, from the application program during its execution in the mobile device, the request for having at least the second identifier being associated with the second designated geographic area of interest provided to the application program after it has been determined, by at least use of the at least one processor and of the location information, that the mobile device has at least entered the second designated geographic area of interest and has remained therein for at least the second predetermined length of time;

receiving, from the application program during its execution in the mobile device, both the second data string comprising the second identifier to be associated with the second designated geographic area of interest and the second geographic data to be used for defining the second designated geographic area of interest and to be used with the second identifier to establish, in the memory, the second designated geographic area of interest as the second area specifically reserved for delivery of the second identifier related to the application program; and

determining, by at least use of the at least one processor and of the location information, that the mobile device has at least entered the second area specifically reserved for delivery of the second identifier

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related to the application program and has remained therein for at least the second predetermined length of time.

37. The method of claim 20 wherein the at least one program of computer executable instructions further comprises at least one instruction for:

receiving, from the application program during its execution in the mobile device, the request for having at least the first identifier being associated with the first designated geographic area of interest provided to the application program after it has been determined, by at least use of the at least one processor and of the location information, that the mobile device has at least entered the first designated geographic area of interest and has remained therein for at least the predetermined length of time.

38. The method of claim 37 wherein:

the first geographic data from the application program comprises at least one geometric construct that establishes at least one perimeter for defining the first designated geographic area of interest; and

the at least one program of computer executable instructions further comprises at least one instruction for:

receiving, from the application program during its execution in the mobile device, both the first data string comprising the first identifier to be associated with the first designated geographic area of interest and the first geographic data to be used for defining the first designated geographic area of interest and to be used with the first identifier to establish, in the memory, the first designated geographic area of interest as the first area specifically reserved for delivery of the first identifier related to the application program.

39. The method of claim 38 wherein:

the at least one geometric construct from the application program that establishes the at least one perimeter for defining the first designated geographic area of interest comprises at least one radius value; and

the at least one particular geometric construct from the particular application program that establishes at the least one particular perimeter for defining the particular designated geographic area of interest comprises at least one particular radius value.

40. The method of claim 38 wherein:

the at least one geometric construct from the application program that establishes the at least one perimeter for defining the first designated geographic area of interest comprises a combination of at least two latitudinal values and at least two longitudinal values; and

the at least one particular geometric construct from the particular application program that establishes the at least one particular perimeter for defining the particular designated geographic area of interest comprises a particular combination of at least two particular latitudinal values and at least two particular longitudinal values.

41. The method of claim 39 wherein:

the first geographic data from the application program further comprises at least one latitude value and at least one longitude value for defining the first designated geographic area of interest; and

the particular geographic data from the particular application program further comprises at least one particular latitude value and at least one particular longitude value for defining the particular designated geographic area of interest.

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42. The method of claim 41 wherein:

the at least one instruction for delivering, from the first record stored in the memory and to the application program, at least first datum comprising at least the first identifier includes being at least one instruction for delivering the at least first datum after obtaining the location information representing at least one physical geographic location of the mobile device as determined by the location-determination component; and

the at least one program of computer executable instructions further comprises at least one instruction for:

obtaining the location information representing at least one physical geographic location of the mobile device as determined by the location-determination component; and

determining, by at least use of the at least one processor and of the location information, that the mobile device has at least entered the first area specifically reserved for delivery of the first identifier related to the application program and has remained therein for at least the predetermined length of time.

43. The method of claim 42 wherein the at least one program of computer executable instructions further comprises at least one instruction for:

registering, in the memory, the application program for having at least the first identifier provided to the application program after it has been determined, by at least use of the at least one processor and of the location information, that the mobile device has at least entered the first area specifically reserved for delivery of the first identifier related to the application program and has remained therein for at least the predetermined length of time.

44. The method of claim 42 wherein the at least one program of computer executable instructions further comprises at least one instruction for:

in response to receiving, from the application program during its execution in the mobile device, a request for having at least a second identifier being associated with a second designated geographic area of interest provided to the application program after it has been determined, by at least use of the at least one processor and of the location information, that the mobile device has at least entered the second designated geographic area of interest and has remained therein for at least a second predetermined length of time, after receiving, from the application program, both a second data string comprising the second identifier to be associated with the second designated geographic area of interest and second geographic data to be used for defining the second designated geographic area of interest and to be used with the second identifier to establish, in the memory, the second designated geographic area of interest as a second area specifically reserved for delivery of the second identifier related to the application program, after establishing, in the memory, the second designated geographic area of interest as the second area specifically reserved for delivery of the second identifier related to the application program, after storing, in the memory, a second record comprising the second identifier, and after determining, by at least use of the at least one processor and of the location information, that the mobile device has at least entered the second area specifically reserved for delivery of the second identifier related to the application program and has remained therein for at least the second predetermined length of time, delivering, from the second

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record stored in the memory and to the application program, at least second datum comprising at least the second identifier.

45. The method of claim 42 wherein:

the at least one instruction for delivering, from the first record stored in the memory and to the application program, at least first datum comprising at least the first identifier includes being at least one instruction for delivering the at least first datum after availability for the first designated geographic area of interest to be reserved for the application program has been positively determined; and

the at least one program of computer executable instructions further comprises at least one instruction for: determining availability for the first designated geographic area of interest to be reserved for the application program.

46. The method of claim 42 wherein the at least one program of computer executable instructions further comprises at least one instruction for:

creating a notification indicating that the mobile device has at least entered the first area specifically reserved for delivery of the first identifier related to the application program and has remained therein for at least the predetermined length of time.

47. The method of claim 42 wherein the first identifier, in its being associated with the first designated geographic area of interest, provides at least identification of a boundary for the first designated geographic area of interest.

48. The method of claim 42 wherein the at least one instruction for receiving, from the application program during its execution in the mobile device, the request for having at least the first identifier being associated with the first designated geographic area of interest provided to the application program includes being at least one instruction for receiving, from at least one other application program during its execution in the mobile device, one or more other requests for having at least one or more identifiers each being respectfully associated with one or more designated geographic areas of interest provided to the at least one other application program after it has been determined, by at least use of the at least one processor and of the location information, that the mobile device has at least entered the one or more designated geographic areas of interest and has remained therein for at least a predetermined length of time.

49. The method of claim 42 wherein:

the at least one instruction for delivering, from the first record stored in the memory and to the application program, at least first datum comprising at least the first identifier includes being at least one instruction for delivering the at least first datum after receiving, from the application program during its execution in the mobile device, a data value representing the predetermined length of time and after determining, by at least use of the at least one processor and of the location information, that the mobile device, following a designated start time and during a designated duration of time, has at least entered the first area specifically reserved for delivery of the first identifier related to the application program and has remained therein for at least the predetermined length of time; and

the at least one program of computer executable instructions further comprises at least one instruction for: receiving, from the application program during its execution in the mobile device, the data value representing the predetermined length of time and a data value representing the designated duration of time.

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50. The method of claim 44 wherein:

the second geographic data from the application program comprises at least one second geometric construct that establishes at least one second perimeter for defining the second designated geographic area of interest;

the at least one second geometric construct from the application program that establishes the at least one second perimeter for defining the second designated geographic area of interest comprises at least one second radius value;

the second geographic data from the application program further comprises at least one second latitude value and at least one second longitude value for defining the second designated geographic area of interest;

the at least one instruction for delivering, from the second record stored in the memory and to the application program, at least second datum comprising at least the second identifier includes being at least one instruction for delivering the at least second datum after obtaining the location information representing at least one physical geographic location of the mobile device as determined by the location-determination component;

the first identifier, in its being associated with the first designated geographic area of interest, provides at least identification of a boundary for the first designated geographic area of interest;

the second identifier, in its being associated with the second designated geographic area of interest, provides at least identification of a boundary for the second designated geographic area of interest; and

the at least one program of computer executable instructions further comprises at least one instruction for:

receiving, from the application program during its execution in the mobile device, the request for having at least the second identifier being associated with the second designated geographic area of interest provided to the application program after it has been determined, by at least use of the at least one processor and of the location information, that the mobile device has at least entered the second designated geographic area of interest and has remained therein for at least the second predetermined length of time;

receiving, from the application program during its execution in the mobile device, both the second data string comprising the second identifier to be associated with the second designated geographic area of interest and the second geographic data to be used for defining the second designated geographic area of interest and to be used with the second identifier to establish, in the memory, the second designated geographic area of interest as the second area specifically reserved for delivery of the second identifier related to the application program; and

determining, by at least use of the at least one processor and of the location information, that the mobile device has at least entered the second area specifically reserved for delivery of the second identifier related to the application program and has remained therein for at least the second predetermined length of time.

51. The method of claim 50, further comprising:

sending, via the particular application program executing in the mobile device, to the at least one program of computer executable instructions operating in the mobile device:

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a request for having at least a second particular identifier being associated with a second particular designated geographic area of interest provided to the particular application program after it has been determined, by at least use of the at least one processor and of the location information, that the mobile device has at least entered the second particular designated geographic area of interest;

a second particular data string comprising the second particular identifier to be associated with the second particular designated geographic area of interest; and
 second particular geographic data to be used for defining the second particular designated geographic area of interest and to be used with the second particular identifier to establish, in the memory, the second particular designated geographic area of interest as an area specifically reserved for delivery of the second particular identifier related to the particular application program, wherein:

the second particular geographic data from the particular application program comprises at least one second particular geometric construct that estab-

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lishes at least one second particular perimeter for defining the second particular designated geographic area of interest.

52. The method of claim 51, further comprising:
 after receiving, via the particular application program, the second particular identifier delivered by the at least one program of computer executable instructions in response to the at least one program of computer executable instructions receiving the second particular data string, the second particular geographic data, and the request for having at least the second particular identifier being associated with the second particular designated geographic area of interest provided to the particular application program, and after the at least one program of computer executable instructions has determined, by at least use of the at least one processor and of the location information, that the mobile device has at least entered the second particular designated geographic area of interest, displaying, on the mobile device via the graphical user interface and via the particular application program, second content associated with the second particular designated geographic area of interest.

* * * * *

CIVIL COVER SHEET

The JS 44 civil cover sheet and the information contained herein neither replace nor supplement the filing and service of pleadings or other papers as required by law, except as provided by local rules of court. This form, approved by the Judicial Conference of the United States in September 1974, is required for the use of the Clerk of Court for the purpose of initiating the civil docket sheet. (SEE INSTRUCTIONS ON NEXT PAGE OF THIS FORM.)

I. (a) PLAINTIFFS

RYAN HARDIN AND ANDREW HILL

(b) County of Residence of First Listed Plaintiff **HARRIS**
(EXCEPT IN U.S. PLAINTIFF CASES)

(c) Attorneys (Firm Name, Address, and Telephone Number)

Winston & Strawn, LLP, 2121 N. Pearl St., Suite 900,
Dallas, TX 75201, 214-453-6500

DEFENDANTS

SAMSUNG ELECTRONICS CO., LTD., AND SAMSUNG
ELECTRONICS AMERICA, INC.

County of Residence of First Listed Defendant
(IN U.S. PLAINTIFF CASES ONLY)

NOTE: IN LAND CONDEMNATION CASES, USE THE LOCATION OF
THE TRACT OF LAND INVOLVED.

Attorneys (If Known)

II. BASIS OF JURISDICTION (Place an "X" in One Box Only)

- ☐ 1 U.S. Government Plaintiff ☒ 3 Federal Question (U.S. Government Not a Party)
- ☐ 2 U.S. Government Defendant ☐ 4 Diversity (Indicate Citizenship of Parties in Item III)

III. CITIZENSHIP OF PRINCIPAL PARTIES (Place an "X" in One Box for Plaintiff and One Box for Defendant)

- | | PTF | DEF | | PTF | DEF |
|---|---------------------------------------|---------------------------------------|---|----------------------------|----------------------------|
| Citizen of This State | ☒ 1 | ☐ 1 | Incorporated or Principal Place of Business In This State | ☐ 4 | ☐ 4 |
| Citizen of Another State | ☐ 2 | ☐ 2 | Incorporated and Principal Place of Business In Another State | ☐ 5 | ☐ 5 |
| Citizen or Subject of a Foreign Country | ☐ 3 | ☒ 3 | Foreign Nation | ☐ 6 | ☐ 6 |

IV. NATURE OF SUIT (Place an "X" in One Box Only)

Click here for: [Nature of Suit Code Descriptions.](#)

CONTRACT	TORTS	FORFEITURE/PENALTY	BANKRUPTCY	OTHER STATUTES
☐ 110 Insurance ☐ 120 Marine ☐ 130 Miller Act ☐ 140 Negotiable Instrument ☐ 150 Recovery of Overpayment & Enforcement of Judgment ☐ 151 Medicare Act ☐ 152 Recovery of Defaulted Student Loans (Excludes Veterans) ☐ 153 Recovery of Overpayment of Veteran's Benefits ☐ 160 Stockholders' Suits ☐ 190 Other Contract ☐ 195 Contract Product Liability ☐ 196 Franchise	PERSONAL INJURY ☐ 310 Airplane ☐ 315 Airplane Product Liability ☐ 320 Assault, Libel & Slander ☐ 330 Federal Employers' Liability ☐ 340 Marine ☐ 345 Marine Product Liability ☐ 350 Motor Vehicle ☐ 355 Motor Vehicle Product Liability ☐ 360 Other Personal Injury ☐ 362 Personal Injury - Medical Malpractice PERSONAL INJURY ☐ 365 Personal Injury - Product Liability ☐ 367 Health Care/Pharmaceutical Personal Injury Product Liability ☐ 368 Asbestos Personal Injury Product Liability PERSONAL PROPERTY ☐ 370 Other Fraud ☐ 371 Truth in Lending ☐ 380 Other Personal Property Damage ☐ 385 Property Damage Product Liability	☐ 625 Drug Related Seizure of Property 21 USC 881 ☐ 690 Other LABOR ☐ 710 Fair Labor Standards Act ☐ 720 Labor/Management Relations ☐ 740 Railway Labor Act ☐ 751 Family and Medical Leave Act ☐ 790 Other Labor Litigation ☐ 791 Employee Retirement Income Security Act IMMIGRATION ☐ 462 Naturalization Application ☐ 465 Other Immigration Actions	☐ 422 Appeal 28 USC 158 ☐ 423 Withdrawal 28 USC 157 INTELLECTUAL PROPERTY RIGHTS ☐ 820 Copyrights ☒ 830 Patent ☐ 835 Patent - Abbreviated New Drug Application ☐ 840 Trademark ☐ 880 Defend Trade Secrets Act of 2016 SOCIAL SECURITY ☐ 861 HIA (1395ff) ☐ 862 Black Lung (923) ☐ 863 DIWC/DIWW (405(g)) ☐ 864 SSID Title XVI ☐ 865 RSI (405(g)) FEDERAL TAX SUITS ☐ 870 Taxes (U.S. Plaintiff or Defendant) ☐ 871 IRS—Third Party 26 USC 7609	☐ 375 False Claims Act ☐ 376 Qui Tam (31 USC 3729(a)) ☐ 400 State Reapportionment ☐ 410 Antitrust ☐ 430 Banks and Banking ☐ 450 Commerce ☐ 460 Deportation ☐ 470 Racketeer Influenced and Corrupt Organizations ☐ 480 Consumer Credit (15 USC 1681 or 1692) ☐ 485 Telephone Consumer Protection Act ☐ 490 Cable/Sat TV ☐ 850 Securities/Commodities/Exchange ☐ 890 Other Statutory Actions ☐ 891 Agricultural Acts ☐ 893 Environmental Matters ☐ 895 Freedom of Information Act ☐ 896 Arbitration ☐ 899 Administrative Procedure Act/Review or Appeal of Agency Decision ☐ 950 Constitutionality of State Statutes
REAL PROPERTY ☐ 210 Land Condemnation ☐ 220 Foreclosure ☐ 230 Rent Lease & Ejectment ☐ 240 Torts to Land ☐ 245 Tort Product Liability ☐ 290 All Other Real Property	CIVIL RIGHTS ☐ 440 Other Civil Rights ☐ 441 Voting ☐ 442 Employment ☐ 443 Housing/Accommodations ☐ 445 Amer. w/Disabilities - Employment ☐ 446 Amer. w/Disabilities - Other ☐ 448 Education PRISONER PETITIONS Habeas Corpus: ☐ 463 Alien Detainee ☐ 510 Motions to Vacate Sentence ☐ 530 General ☐ 535 Death Penalty Other: ☐ 540 Mandamus & Other ☐ 550 Civil Rights ☐ 555 Prison Condition ☐ 560 Civil Detainee - Conditions of Confinement			

V. ORIGIN (Place an "X" in One Box Only)

- ☒ 1 Original Proceeding ☐ 2 Removed from State Court ☐ 3 Remanded from Appellate Court ☐ 4 Reinstated or Reopened ☐ 5 Transferred from Another District (specify) ☐ 6 Multidistrict Litigation - Transfer ☐ 8 Multidistrict Litigation - Direct File

VI. CAUSE OF ACTION

Cite the U.S. Civil Statute under which you are filing (Do not cite jurisdictional statutes unless diversity):
35 U.S.C. § 271
Brief description of cause:
Patent infringement

VII. REQUESTED IN COMPLAINT:

☐ CHECK IF THIS IS A CLASS ACTION UNDER RULE 23, F.R.Cv.P.

DEMAND \$

CHECK YES only if demanded in complaint:

JURY DEMAND: ☒ Yes ☐ No

VIII. RELATED CASE(S) IF ANY

(See instructions):

JUDGE

DOCKET NUMBER

DATE

SIGNATURE OF ATTORNEY OF RECORD

Jul 30, 2021

Sharon M. Nelson

FOR OFFICE USE ONLY

RECEIPT #

AMOUNT

APPLYING IFP

H2 Intellect - Exhibit 2015

Home Depot v. H2 Intellect - IPR2025-00480

INSTRUCTIONS FOR ATTORNEYS COMPLETING CIVIL COVER SHEET FORM JS 44

Authority For Civil Cover Sheet

The JS 44 civil cover sheet and the information contained herein neither replaces nor supplements the filings and service of pleading or other papers as required by law, except as provided by local rules of court. This form, approved by the Judicial Conference of the United States in September 1974, is required for the use of the Clerk of Court for the purpose of initiating the civil docket sheet. Consequently, a civil cover sheet is submitted to the Clerk of Court for each civil complaint filed. The attorney filing a case should complete the form as follows:

- I.(a) Plaintiffs-Defendants.** Enter names (last, first, middle initial) of plaintiff and defendant. If the plaintiff or defendant is a government agency, use only the full name or standard abbreviations. If the plaintiff or defendant is an official within a government agency, identify first the agency and then the official, giving both name and title.
 - (b) County of Residence.** For each civil case filed, except U.S. plaintiff cases, enter the name of the county where the first listed plaintiff resides at the time of filing. In U.S. plaintiff cases, enter the name of the county in which the first listed defendant resides at the time of filing. (NOTE: In land condemnation cases, the county of residence of the "defendant" is the location of the tract of land involved.)
 - (c) Attorneys.** Enter the firm name, address, telephone number, and attorney of record. If there are several attorneys, list them on an attachment, noting in this section "(see attachment)".
- II. Jurisdiction.** The basis of jurisdiction is set forth under Rule 8(a), F.R.Cv.P., which requires that jurisdictions be shown in pleadings. Place an "X" in one of the boxes. If there is more than one basis of jurisdiction, precedence is given in the order shown below.
- United States plaintiff. (1) Jurisdiction based on 28 U.S.C. 1345 and 1348. Suits by agencies and officers of the United States are included here. United States defendant. (2) When the plaintiff is suing the United States, its officers or agencies, place an "X" in this box.
- Federal question. (3) This refers to suits under 28 U.S.C. 1331, where jurisdiction arises under the Constitution of the United States, an amendment to the Constitution, an act of Congress or a treaty of the United States. In cases where the U.S. is a party, the U.S. plaintiff or defendant code takes precedence, and box 1 or 2 should be marked.
- Diversity of citizenship. (4) This refers to suits under 28 U.S.C. 1332, where parties are citizens of different states. When Box 4 is checked, the citizenship of the different parties must be checked. (See Section III below; **NOTE: federal question actions take precedence over diversity cases.**)
- III. Residence (citizenship) of Principal Parties.** This section of the JS 44 is to be completed if diversity of citizenship was indicated above. Mark this section for each principal party.
- IV. Nature of Suit.** Place an "X" in the appropriate box. If there are multiple nature of suit codes associated with the case, pick the nature of suit code that is most applicable. Click here for: [Nature of Suit Code Descriptions](#).
- V. Origin.** Place an "X" in one of the seven boxes.
- Original Proceedings. (1) Cases which originate in the United States district courts.
- Removed from State Court. (2) Proceedings initiated in state courts may be removed to the district courts under Title 28 U.S.C., Section 1441.
- Remanded from Appellate Court. (3) Check this box for cases remanded to the district court for further action. Use the date of remand as the filing date.
- Reinstated or Reopened. (4) Check this box for cases reinstated or reopened in the district court. Use the reopening date as the filing date.
- Transferred from Another District. (5) For cases transferred under Title 28 U.S.C. Section 1404(a). Do not use this for within district transfers or multidistrict litigation transfers.
- Multidistrict Litigation – Transfer. (6) Check this box when a multidistrict case is transferred into the district under authority of Title 28 U.S.C. Section 1407.
- Multidistrict Litigation – Direct File. (8) Check this box when a multidistrict case is filed in the same district as the Master MDL docket.
- PLEASE NOTE THAT THERE IS NOT AN ORIGIN CODE 7.** Origin Code 7 was used for historical records and is no longer relevant due to changes in statute.
- VI. Cause of Action.** Report the civil statute directly related to the cause of action and give a brief description of the cause. **Do not cite jurisdictional statutes unless diversity.** Example: U.S. Civil Statute: 47 USC 553 Brief Description: Unauthorized reception of cable service.
- VII. Requested in Complaint.** Class Action. Place an "X" in this box if you are filing a class action under Rule 23, F.R.Cv.P.
- Demand. In this space enter the actual dollar amount being demanded or indicate other demand, such as a preliminary injunction.
- Jury Demand. Check the appropriate box to indicate whether or not a jury is being demanded.
- VIII. Related Cases.** This section of the JS 44 is used to reference related pending cases, if any. If there are related pending cases, insert the docket numbers and the corresponding judge names for such cases.

Date and Attorney Signature. Date and sign the civil cover sheet.