

METHOD, DEVICE AND SYSTEM FOR POSITIONING LOCATION, AND COMPUTER READABLE STORAGE MEDIUM

Technical Field

The present application relates to the field of computer technologies, and in particular,
5 to a method, a device and a system for positioning a location and a computer readable storage
medium.

Background

As a means of transportation, vehicles provide convenience for the public. In real life, it
is necessary to accurately position the location of a vehicle. At present, the prior art proposes
10 a method for positioning a location based on the Global Positioning System (GPS).
Specifically, a GPS module is installed on the vehicle in advance, and when the vehicle is
traveling, a current location of the vehicle can be obtained from the global satellite
positioning system through signal interaction between the GPS module and the global
satellite positioning system, and the GPS module reports the obtained location to a vehicle
15 management server, so that the vehicle management server can obtain the driving location
of the vehicle in time.

However, since GPS signals transmitted between the GPS module and the global satellite
positioning system are greatly affected by the environment, especially in large cities with
high-rise buildings and overpasses, the strength of GPS signals cannot meet the actual needs,
20 which makes the vehicles unable to obtain GPS signals containing location information in
time and reduces the accuracy of vehicle location positioning.

Summary

In view of this, embodiments of the present application provide a method, a device, and
a system for positioning a location, and a computer readable storage medium, which are used
25 to solve the problem of inaccurate location positioning of a vehicle in the prior art.

The embodiments of the present application adopt the following technical solutions:

An embodiment of the present application provides a method for positioning a location.

The method includes:

acquiring a vehicle identification of a target vehicle;

5 determining location information when the vehicle identification of the target vehicle is acquired; and

sending the vehicle identification and the location information to a server, such that the server determines a location of the target vehicle according to the location information.

An embodiment of the present application provides a method for positioning a location.

10 The method includes:

receiving a vehicle identification and location information sent by at least one client terminal; and

determining a location of the vehicle corresponding to the vehicle identification according to the location information.

15 An embodiment of the present application provides a device for positioning a location.

The device includes:

an acquiring unit for acquiring a vehicle identification of a target vehicle;

a determining unit for determining location information when the vehicle identification of the target vehicle is acquired; and

20 a sending unit for sending the vehicle identification and the location information to a server, such that the server determines a location of the target vehicle according to the location information.

An embodiment of the present application provides a device for positioning a location.

The device includes:

a receiving unit for receiving a vehicle identification and location information sent by at least one client terminal; and

a positioning unit for determining a location of the vehicle corresponding to the vehicle identification according to the location information.

5 An embodiment of the present application provides an electronic device, including: at least one processor and a memory for storing a program and configured to perform the following steps by the at least one processor:

acquiring a vehicle identification of a target vehicle;

10 determining location information when the vehicle identification of the target vehicle is acquired; and

 sending the location information and the vehicle identification to a server, such that the server determines a location of the target vehicle according to the location information.

 An embodiment of the present application provides a computer readable storage medium, including a program for use in conjunction with an electronic device, the program being
15 executable by a processor to perform the following steps:

acquiring a vehicle identification of a target vehicle;

 determining location information when the vehicle identification of the target vehicle is acquired; and

20 sending the location information and the vehicle identification to a server, such that the server determines a location of the target vehicle according to the location information.

 An embodiment of the present application provides a system for positioning a location, including:

a carrier, located on a vehicle, for storing a vehicle identification of the vehicle;

a client terminal for acquiring the vehicle identification of the vehicle from the carrier,

25 determining location information when the vehicle identification of the vehicle is acquired,

and sending the vehicle identification of the vehicle and the location information corresponding to the vehicle identification to a server; and

a server for receiving the vehicle identification and the location information corresponding to the vehicle identification sent by the client terminal, and determining the
5 location of the vehicle according to the location information.

The above at least one technical solution adopted by the embodiments of the present application can achieve the following beneficial effects:

Through the technical solution provided by the embodiment of the present application, the client terminal acquires the vehicle identification of the target vehicle, determines the
10 location information when the vehicle identification is acquired, and then sends the vehicle identification and the location information to the server, so that the server determines the location of the target vehicle based on the location information. Compared with the conventional solution for positioning the location of the vehicle by the GPS method, the client terminal can perform the technical solution provided by the embodiment of the present
15 application to determine the location of the vehicle, thereby effectively avoiding the problem that since the GPS signal strength is weakened due to environmental factors, the vehicle location cannot be positioned. For the target vehicle, even in big cities with high-rise buildings and overpasses, by determining the location information when the vehicle identification is acquired through different client terminals, the success rate and effectiveness
20 of the location information acquisition can be improved, thereby ensuring the continuity and accuracy of the location positioning of the target vehicle.

Brief Description of the Drawings

The accompanying drawings described herein are provided to provide a further understanding of the present application, and constitute a part of the present application. The
25 illustrative embodiments of the present application and the description thereof are used to

explain the present application and are not intended to constitute an improper limitation to the present application. In the accompanying drawings:

FIG. 1 is a schematic flowchart diagram of a method for positioning a location according to an embodiment of the present application;

5 FIG. 2 is a schematic flowchart of a method for positioning a location according to an embodiment of the present application;

FIG. 3 is a schematic structural diagram of a device for positioning a location according to an embodiment of the present application;

FIG. 4 is a schematic structural diagram of a device for positioning a location according
10 to an embodiment of the present application; and

FIG. 5 is a schematic structural diagram of a system for positioning a location according to an embodiment of the present application.

Detailed Description

In order to achieve the objective of the present application, embodiments of the present
15 application provide a method, a device and a system for positioning a location, and a computer readable medium. A client terminal acquires a vehicle identification of a target vehicle, determines location information when acquiring the vehicle identification, and then sends the vehicle identification and the location information to a server, so the server determines the location of the target vehicle according to the location information.

20 It should be noted that the vehicles described in the embodiments of the present application may be public transportation vehicles such as a bus, a taxi, a public bicycle, a shared bicycle, and other social vehicles other than public transportation vehicles, which will not be listed here one by one.

The client terminal described in the embodiment of the present application may be
25 applied to a smart terminal device, such as a smart phone; or may be applied to a vehicle

management device, such as a monitoring device deployed at a traffic intersection. The application device of the client terminal is not limited herein.

In order to make the objective, technical solutions and advantages of the present application clearer, the technical solutions of the present application will be clearly and completely described in the following with reference to specific embodiments of the present application and the corresponding accompanying drawings. Apparently, the described embodiments are only a part of the embodiments of the present application, and not all of them. All other embodiments obtained by a person of ordinary skill in the art based on the embodiments of the present application without creative effort belong to the protective scope of the present application.

The technical solutions provided by the embodiments of the present application are described in detail below with reference to the accompanying drawings.

FIG. 1 is a schematic flowchart diagram of a method for positioning a location according to an embodiment of the present application. The method can be as follows. The performing entity of the embodiment of the present application is a client terminal, that is, an application client terminal that can implement the technical solution described in the embodiment of the present application, and can be run in a smart terminal device in a form of an APP.

In step 101, a vehicle identification of a target vehicle is acquired.

The target vehicle described in the embodiment of the present application may be any one of vehicles, and one vehicle is considered as a research object of the technical solution described in the present application. The vehicle identification described in the embodiment of the present application can uniquely characterize the vehicle, and may be a model of the vehicle, an engine number of the vehicle, a license plate number of the vehicle, and the like.

Assuming that the target vehicle is a public transportation vehicle, the vehicle identification described in the embodiment of the present application may further include vehicle number information of the public transportation vehicle.

In practical applications, users who can acquire the vehicle identification of the target vehicle may be roughly classified into three types: the first type is a driver of the target vehicle; the second type is a passenger riding the target vehicle; and the third type is other persons located near the target vehicle. All of the three types of persons can acquire the vehicle identification of the target vehicle, but the methods used to acquire the vehicle identification of the target vehicle may be the same or different.

How to acquire the vehicle identification of the target vehicle is described in detail below.

A first approach: for the driver of the target vehicle.

In the embodiment of the present application, when driving the target vehicle, the driver of the target vehicle may use, but is not limited to, the following approaches to enable the client terminal to acquire the vehicle identification of the target vehicle:

The client terminal receives the vehicle identification input by the driver. At this time, it can be considered that the client terminal has acquired the vehicle identification of the target vehicle.

Assuming that the target vehicle is a public transportation vehicle, and the client terminal is applied to a public transportation vehicle management system, after the public transportation vehicle management system allocates the vehicle to the driver, the vehicle identification of the allocated vehicle (the target vehicle described in the embodiment of the present application) may be sent to the client terminal used by the driver. At this time, the client terminal can also acquire the vehicle identification of the target vehicle.

A second approach: a carrier carrying the vehicle identification is arranged in the target vehicle.

Specifically, if a carrier carrying the vehicle identification of the target vehicle is detected, the vehicle identification of the target vehicle is obtained from the carrier.

In the embodiment of the present application, the carrier carrying the vehicle identification of the target vehicle may be a Radio Frequency Identification (RFID) tag; or
5 may be an in-vehicle fee-charging terminal storing the vehicle identification of the vehicle; or a two-dimensional code image storing the vehicle identification, and the representation form of the carrier is not specifically limited herein.

The following describes each of the different types of carriers separately.

1. If the carrier carrying the vehicle identification of the target vehicle is an RFID tag,
10 when the RFID tag is detected, the vehicle identification of the target vehicle is obtained from the RFID tag.

Specifically, when a distance between the client terminal and the RFID tag carrying the vehicle identification of the target vehicle is less than or equal to a propagation distance of a RF signal transmitted by the RFID tag, the client terminal can receive the RF signal sent by
15 the RFID tag. At this time, it can be considered that the client terminal has detected the RFID tag. In this way, the client terminal can parse the vehicle identification of the target vehicle from the received RF signal.

It should be noted that the RFID tag is a non-contact automatic identification tag capable of transmitting a vehicle identification through a radio frequency signal. The RFID tags can
20 also be called an electronic tag or a smart tag, which may store the vehicle identification of the vehicle into a storage space using electronic technologies. Depending on whether power is carried by themselves, RFID tags can be classified into passive type RFID tags (i.e. passive RFID tags) and active type RFID tags (i.e. active RFID tags).

Taking a passive RFID tag as an example, the client terminal can broadcast a request
25 message for requesting the vehicle identification. Since the passive RFID tag includes a radio

wave transceiver, the passive RFID tag can receive the request message broadcast by the client terminal through the radio wave transceiver, and sends the stored vehicle identification to the client terminal in the form of a radio frequency signal, so that the client terminal can obtain the vehicle identification of the vehicle from the passive RFID tag.

5 Taking an active RFID tag as an example, the active RFID tag has the feature of actively transmitting a radio frequency signal. That is, the active RFID tag transmits radio frequency signals by broadcasting. When a distance between the client terminal and the active RFID tag is less than or equal to a propagation distance of the radio frequency signal, the client terminal receives the radio frequency signal broadcasted by the active RFID tag and can
10 parse the vehicle identification of the vehicle from the radio frequency signal.

That is to say, the RFID tag can be provided on the vehicle, and the client terminal can obtain the vehicle identification of the vehicle from the RFID tag as long as the distance between the client terminal and the RFID tag satisfies a requirement of the propagation distance of the radio frequency signal transmitted by the RFID tag.

15 In the embodiment of the present application, if the carrier carrying the vehicle identification is an RFID tag, the client terminal may realize dynamic acquisition of the vehicle identification of the vehicle. It can realize automation and real-time performance of the vehicle identification acquisition, and lay a foundation for subsequent accurate positioning of the location of the vehicle.

20 It should be noted that the second approach can be applied to the driver of the target vehicle, the passenger riding the target vehicle, and other persons located in the vicinity of the target vehicle. By this approach, the acquisition of the vehicle identification of the target vehicle is relatively flexible.

Preferably, in the embodiment of the present application, the client terminal can perform
25 signal interaction with the RFID tag in a periodic (or at a fixed time interval) manner in

addition to performing signal interaction with the RFID tag in real time. Specifically, the vehicle identification is acquired from the RFID tag at a fixed time interval.

For example, starting from the driver boarding the vehicle, once it is determined that the client terminal is in an operation state, the client terminal used by the driver of the vehicle
5 can acquire the vehicle identification of the vehicle from the RFID tag of the vehicle by the above described approach. For another example, a passenger riding the vehicle can obtain the vehicle identification of the vehicle from the RFID tag of the vehicle during the ride.

Whether it is a periodic acquisition, a fixed-time-interval acquisition, or a real-time acquisition needs to be determined according to actual needs, or may be determined by the
10 user (for example, a driver, a passenger riding the vehicle, etc.), and is not specific limited in the embodiment of the present application.

Since the radio frequency signal transmitted by the RFID tag has a certain signal strength, any user who appears within the coverage of the transmitted signal can receive the radio frequency signal, that is, can obtain the vehicle identification of the vehicle from the RFID
15 tag of the vehicle. That is to say, if the carrier is an RFID tag, the approach for obtaining the vehicle identification of the vehicle is relatively flexible, and the technical solution described in the embodiments of the present application can be widely used.

2. If the carrier carrying the vehicle identification of the target vehicle is an in-vehicle fee-charging terminal, the vehicle identification of the target vehicle is obtained from the in-
20 vehicle fee-charging terminal when a boarding request is sent to the in-vehicle fee-charging terminal.

Specifically, in practical applications, if the target vehicle is a public transportation vehicle, in order to position the location of the vehicle in time so as to fully understand the distribution and operation of the public transportation vehicles, the location of the vehicle
25 may be determined according to the technical solution described in the embodiment of the

present application. In order to improve the accuracy of the vehicle location positioning, the vehicle identification may be stored in the in-vehicle fee-charging terminal, so that when a user sends a boarding request to the in-vehicle fee-charging terminal at the time boarding the vehicle, the vehicle identification is obtained from the in-vehicle fee-charging terminal in a near field communication NFC mode.

It should be noted that the boarding request here can be understood as being sent by the user to the in-vehicle fee-charging terminal when boarding the vehicle, so that the in-vehicle fee-charging terminal determines the station where the user gets on the vehicle, and prepares for subsequent calculation of the fare.

3. If the carrier is a wireless fidelity WIFI device provided by the target vehicle, the vehicle identification of the target vehicle is obtained from the WIFI device when the WIFI device is accessed.

Specifically, with the development of mobile internet technologies, installing WIFI devices on vehicles is becoming more and more popular. Through the WIFI device, mobile Internet services can be provided for a user riding the vehicle. In the embodiment of the present application, the vehicle identification of the vehicle may be stored in the WIFI device. When the client terminal used by the user accesses the WIFI device provided by the vehicle, the vehicle identification of the target vehicle can be obtained from the WIFI device.

For example, a WIFI identification of the WIFI device can uniquely represent the WIFI device. When the WIFI device is installed on a vehicle, the server may store a mapping relationship between the WIFI identification of the WIFI device and the vehicle identification of the vehicle. At this time, the client terminal can take the WIFI identification of the WIFI device as the vehicle identification of the target vehicle, and when the client terminal sends the WIFI identification to the server, the server can also determine the vehicle identification of the vehicle according to the mapping relationship.

It should be noted that as long as the client terminal can detect the WIFI identification of the WIFI device, the vehicle identification of the vehicle can be obtained through the WIFI identification of the WIFI device.

5 In practical applications, the approaches for acquiring the vehicle identification of the target vehicle in step 101 may be implemented by one of the above described approaches, or may be implemented by a plurality of the above described approaches, which is not specifically limited herein.

In step 102, location information when the vehicle identification of the target vehicle is acquired is determined.

10 In the technical solution described in the embodiment of the present application, in order to accurately position the location of the vehicle, the client terminal has to position the location when acquiring the vehicle identification of the target vehicle. Through the locations positioned by different client terminals, it lays the foundation for the server to subsequently determine the location of the vehicle based on the locations positioned by the client terminals.

15 In the embodiment of the present application, the approaches for the client terminals to position the location include, but are not limited to, an Assisted Global Positioning System (AGPS) positioning technology, a base station positioning technology, a Location Based Service (LBS) technology, and the like.

Taking A-GPS as an example, compared with traditional GPS signals, A-GPS utilizes
20 base stations deployed by a communications operator, supplemented by a positioning assistance provided by a secondary server in communication with GPS receivers in smart phones, to complete a ranging and positioning service. Therefore, A-GPS is relatively less dependent on the environment and can overcome the problems of GPS positioning.

Even in large cities with high-rise buildings and overpasses, A-GPS uses mobile
25 communication networks for positioning, which solves the coverage problem of traditional

GPS. The signal strength and transmission quality of mobile communication network signals are also less affected by the environment than the GPS satellite signals. It is highly effective using the client terminal for positioning the terminal location. At the same time, since the A-GPS has an assisted positioning from the mobile communication operation base stations, the accuracy of the client terminal positioning is greatly improved, thereby improving the accuracy in positioning the location of the vehicle.

In the embodiment of the present application, the location information positioned by the client terminal is the basis for the server to determine the location of the target vehicle. In this case, by determining the location information with the client terminal, on the one hand, the need to modify the vehicle by additionally installing a GPS module can be eliminated, and the production cost can be lowered; on the other hand, the positioning function of the client terminals can be rationally used and the efficiency of location positioning is improved.

Specifically, if the client terminal acquires the vehicle identification of the target vehicle by detecting the RFID tag, the client terminal activates a location positioning function when detecting the RFID tag, then determines the location information obtained by the positioning as the location information when the vehicle identification of the target vehicle is acquired, and can establish a mapping relationship between the vehicle identification and the location information. Preferably, the vehicle identification and location information are stored according to the mapping relationship.

Preferably, the client terminal can obtain the vehicle identification from the RFID tag at a fixed time interval, and assuming that the client terminal obtains the vehicle identification from the RFID tag in a fixed-time-interval manner, the step 102 can be performed in real time or in a fixed-time-interval manner (here a period of the time interval is the same as a period of the time interval for acquiring the vehicle identification of the vehicle) to determine the location information.

If the client terminal obtains the vehicle identification from the RFID tag in a periodic manner according to the period of the time interval, when the vehicle identification is obtained at an adjacent later time, it is further determined whether the vehicle identification obtained at an adjacent earlier time and the vehicle identification obtained at an adjacent later time are identical, if the vehicle identifications obtained at two adjacent times are identical, at least one piece of the location information obtained by positioning during the two adjacent times of obtaining the vehicle identification is determined as the location information when the vehicle identification is acquired. In this way, the client terminal obtains a mapping relationship between one vehicle identification and at least one piece of location information during one period of the time interval.

It should be noted that, if the carrier of the vehicle identification is an RFID tag, and if there are a plurality of vehicle identifications acquired at the same time for a client terminal, the client terminal may establish a mapping relationship between the plurality of vehicle identifications and at least one piece of location information. Here, the location information corresponding to different vehicle identifications may be the same or different, which is not specifically limited herein.

Specifically, if the carrier carrying the vehicle identification is an in-vehicle fee-charging terminal (or the WIFI device), after the boarding request is sent to the in-vehicle fee-charging terminal (or the WIFI device is accessed), the location information is positioned periodically or in real time, and at least one piece of location information obtained from positioning is determined as the location information when the vehicle identification of the target vehicle is acquired.

Since after the boarding request is sent to the in-vehicle fee-charging terminal (or the WIFI device is accessed), the user of the client terminal should be on the vehicle until a deboarding request is sent to the in-vehicle fee-charging terminal (or the coupling to the

WIFI device is disconnected), the client terminal does not need to perform the vehicle identification acquisition operation at this time, and the client terminal can position the location information periodically or in real time, so that the client terminal can position at least one piece of location information, in which case the at least one piece of location information obtained from positioning may be determined as the location information when the vehicle identification of the target vehicle is acquired.

It should be noted that determining the location information in step 102 may be performed at the same time as acquiring the vehicle identification in step 101, or step 102 may be performed after acquiring the vehicle identification in step 101, which is not specifically limited herein. The determined location information being the location information when the vehicle identification is acquired described in step 102 can be understood as that the time of acquiring the vehicle identification is the same as the time of obtaining the location information, and can also be understood as that there is a deviation between the time of acquiring the vehicle identification and the time of obtaining the location information, as long as the deviation is within a set range.

In step 103, the vehicle identification and the location information are sent to the server, such that the server determines a location of the target vehicle according to the location information.

In the embodiment of the present application, after acquiring the vehicle identification and the location information obtained from positioning, the client terminal may immediately send the vehicle identification and the location information to the server, or may send the vehicle identification and at least one piece of the location information corresponding to the vehicle identification to the server when a set sending time arrives.

Preferably, after determining the location information when the vehicle identification of the target vehicle is acquired, the client terminal stores the location information corresponding to the vehicle identification and the vehicle identification.

In the embodiment of the present application, since the client terminal may acquire more
5 than one vehicle identification at the same time, the client terminal may send the vehicle identifications and the location information in a form of (vehicle identifications, location information) to the server.

For example, if the client terminal acquires two vehicle identifications at the same time, the information sent by the client terminal to the server is (vehicle identification 1, vehicle
10 identification 2; location information).

Furthermore, when the set sending time arrives, the client terminal may acquire a plurality of vehicle identifications during the two adjacent sending times, and may also have a plurality of pieces of location information obtained from positioning. Then the client terminal sends information (vehicle identification 1; location information 1, location
15 information 2, ..., location information n) and (vehicle identification 2; location information 1) to the server. That is, during the two adjacent sending times, the vehicle corresponding to the identification 1 passes through the locations corresponding to the location information 1~the location information n, and during the two adjacent sending times, the vehicle corresponding to the identification 2 passes through the location corresponding to the
20 location information 1.

Through the technical solution provided by the embodiment of the present application, the client terminal acquires the vehicle identification of the target vehicle, determines the location information when the vehicle identification is acquired, and then sends the vehicle identification and the location information to the server, so that the server determines the
25 location of the target vehicle based on the location information. Compared with the

conventional solution for positioning the location of the vehicle by the GPS method, the client terminal can perform the technical solution provided by the embodiment of the present application to determine the location of the vehicle, thereby effectively avoiding the problem that since the GPS signal strength is weakened due to environmental factors, the vehicle location cannot be positioned. For the target vehicle, even in big cities with high-rise buildings and overpasses, by determining the location information when the vehicle identification is acquired through different client terminals, the success rate and effectiveness of the location information acquisition can be improved, thereby ensuring the continuity and accuracy of the location positioning of the target vehicle.

FIG. 2 is a schematic flowchart diagram of a method for positioning a location according to an embodiment of the present application. The method can be as follows. The performing entity of the embodiment of the present application is a server.

In step 201, a vehicle identification and location information sent by at least one client terminal are received.

In the embodiment of the present application, the client terminal may send the acquired vehicle identification and the location information obtained from positioning to the server according to the approaches described above, which will not be repeated herein.

In step 202, a location of the vehicle corresponding to the vehicle identification is determined according to the location information.

In an embodiment of the present application, the client terminal may send the acquired vehicle identification and the location information obtained from positioning to the server in real time, and then, when receiving the vehicle identification and location information sent by the client terminal, the server determines the target vehicle according to the vehicle identification. That is, the received location information is grouped according to the vehicle identifications, the location information corresponding to the same vehicle identification is

included into the same location information group, and the location information in the same location information group is processed to determine the location of the vehicle corresponding to the vehicle identification.

In practical applications, the server may determine a time period for determining the location of the vehicle. That is, for the target vehicle, location information corresponding to the vehicle identification of the target vehicle sent by the client terminal and received within the set time period is determined, and the received location information is processed; and according to the processing result, a location of the target vehicle corresponding to the vehicle identification is determined.

Since there may be a difference between the location of the client terminal and the actual location of the vehicle, and the location information of the same vehicle sent by different client terminals at the same time may also be different, an offset weight of each piece of location information received may be determined in the embodiment of the present application, and a processing result may be calculated based on the offset weights of the pieces of location information and the coordinates contained in the pieces of location information.

It should be noted that the offset weights described in the embodiments of the present application are used to represent the extent to which the location information deviates from the actual location of the target vehicle. A traveling location of the vehicle may be predicted based on the road on which the vehicle is currently traveling, in turn, a difference between the received location information and the predicted location is determined, and the offset weight is determined according to the size of the difference. In addition, in the embodiment of the application, the approach for determining the described offset weight may also be other approach, which is not specifically limited herein.

For example, if the target vehicle is a public transportation vehicle, it is determined whether the road corresponding to the location information sent by the client terminal is a main road, and if so, it indicates that it is of greater possibility that the client terminal is on the vehicle, and there is a small offset between the location information and the actual location of the vehicle, so that an offset weight value determined for the location information is large. Alternatively, it is determined whether a distance from the location information to a nearby main road is within an acceptable range. If so, it indicates that the client terminal is within a short range to the vehicle, and an offset between the location information and the actual location of the vehicle is relatively small, so that an offset weight value determined for the location information is large. Such determining method is applicable to the situation that user of the client terminal is a pedestrian in the vicinity of the vehicle. Alternatively, it is determined whether the road corresponding to the location information is a road dedicated to public transportation vehicles, and if so, it indicates that it is of greater possibility that the client terminal is on the vehicle, and there is a small offset between the location information and the actual location of the vehicle, so that an offset weight value determined for the location information is large.

Preferably, in an embodiment of the present application, since a number of pieces of location information for the same vehicle identification which are sent by the client terminal to the server within a set time period is larger than 1, before determining the location of the target vehicle corresponding to the vehicle identification according to the location information, the method further includes:

for the target vehicle, when a number of pieces of location information corresponding to the vehicle identification of the target vehicle which are sent by each client terminal and received within the set time period is larger than 1, performing the following operations on

the location information corresponding to the vehicle identification of the target vehicle sent by each client terminal:

determining a generation time of each piece of location information corresponding to the vehicle identification of the target vehicle sent by the client terminal;

5 according to the generation time, selecting, from the pieces of location information, location information satisfying a set condition; and

determining the selected location information as the location information corresponding to the vehicle identification of the target vehicle sent by the client terminal within the set time period.

10 Assuming that at a time instant T, the server receives a vehicle identification and location information corresponding to the vehicle identification sent by 3 client terminals, that is, (vehicle identification 1; location information 1) sent by a client terminal 1; (vehicle identification 1; location information 2, location information 3, location information 4) sent by a client terminal 2; and (vehicle identification 1; location information 5) sent by a client
15 terminal 3.

Since there is more than one piece of location information sent by the client terminal 2, to determine the location of the vehicle, it is necessary to determine the generation times of the location information 2, the location information 3 and the location information 4 sent by the client terminal 2, and select a piece of location information with a generation time most
20 recent to the current processing time of the server as the location information corresponding to the vehicle identification 1 sent by the client terminal 2. Assuming that the location information 4 is the location information satisfying the set condition, the server may determine the location of the vehicle corresponding to the vehicle identification 1 based on the location information 1, the location information 4 and the location information 5.

It should be noted that the set conditions here can be determined according to actual needs, which is not limited here.

The generation time described in the embodiment of the present application can be understood as the time when the client terminal obtains the location information from positioning. When the number of pieces of location information corresponding to the vehicle identification sent by the client terminal to the server is one, the generation time of the location information may not be sent. When the number of pieces of location information corresponding to the vehicle identification sent by the client terminal to the server is more than one, the generation times of the pieces of location information are also sent to the server when the vehicle identification and the location information are sent, so that the server can accurately determine the location of the vehicle.

In an embodiment of the present application, determining the location of the vehicle corresponding to the vehicle identification according to the location information includes:

determining, for the target vehicle, location information corresponding to the vehicle identification of the target vehicle sent by different client terminals and received within the set time period;

counting a number of occurrences of each piece of the location information; and

determining the location of the vehicle corresponding to the vehicle identification according to the location information that the number of occurrences is larger than a set threshold.

If the number of pieces of location information having a number of occurrences larger than the set threshold is more than 1, the location information may be determined by the above described clustering method, and the location corresponding to the location information is the location of the vehicle.

Preferably, in an embodiment of the present application, determining the location of the vehicle corresponding to the vehicle identification according to the location information includes:

5 determining, for the target vehicle, a generation time of each piece of location information corresponding to the received vehicle identification;

processing location information with the same generation time to obtain a location of the target vehicle at a time corresponding to the generation time; and

when a location of the target vehicle corresponding to each generation time is obtained, determining a moving track of the target vehicle based on each of the locations.

10 Table 1 is a list of location information received by the server for the vehicle identification 1.

Table 1

Client Terminal Identification	Generation Time T1	Generation Time T2	Generation Time T3	Generation Time T4	Generation Time T5
001	Location Information 1	Location Information 2	Location Information 3	Location Information 4	Location Information 5
010		Location Information 9		Location Information 7	
100	Location Information 8		Location Information 6		Location Information 10
101		Location Information 11		Location Information 14	

According to the above-described manner, it is possible to determine a processing result
15 1 of the location of the vehicle corresponding to the time instant T1 being (the location information 1 and the location information 8); determine a processing result 2 of the location

of the vehicle corresponding to the time instant T2 being (the location information 2, the location information 9 and the location information 11); determine a processing result 3 of the location of the vehicle corresponding to the time instant T3 being (the location information 3 and the location information 6); determine a processing result 4 of the location of the vehicle corresponding to the time instant T4 being (the location information 4, the location information 7 and the location information 14); and determine a processing result 5 of the location of the vehicle corresponding to the time instant T5 being (the location information 5 and the location information 10).

Further, according to the processing result 1, the processing result 2, the processing result 3, the processing result 4, and the processing result 5, the traveling route of the vehicle corresponding to the vehicle identification 1 can be planned.

It should be noted that the technical solutions described in the embodiments of the present application are applicable to public transportation systems such as buses and public bicycles, and drivers, passengers, and pedestrians in the vicinity of the vehicle can use the client terminal with the solution described in the embodiments of the present application, to acquire a vehicle identification and position location information, and report the vehicle identification and the location information to the server. Thereby, any user who has a demand for public transportation can obtain the real-time location of the desired target vehicle from the server.

Moreover, with the technical solution of the present application, the location information when the vehicle identification is acquired is determined by means of a client terminal, there is no need to modify the vehicle to install a GPS module as in the conventional positioning method, and there is no damage to the vehicle, thus causing no change to the vehicle layout and reducing the manufacturing cost. In addition, a carrier carrying the vehicle identification on the vehicle can be installed on the surface of the vehicle body or in the passenger

compartment, without modification to the original internal structure of the vehicle, thus lowering the cost.

FIG. 3 is a schematic structural diagram of a device for positioning a location according to an embodiment of the present application. The device for positioning a location includes
5 an acquiring unit 301, a determining unit 302 and a sending unit 303, wherein:

The acquiring unit 301 acquires vehicle identification of a target vehicle;

The determining unit 302 determines location information when the vehicle identification of the target vehicle is acquired;

The sending unit 303 sends the vehicle identification and the location information to a
10 server, such that the server determines a location of the target vehicle according to the location information.

In another embodiment of the present application, the acquiring unit 301 acquiring a vehicle identification of a target vehicle includes:

if a carrier carrying the vehicle identification of the target vehicle is detected, obtaining
15 the vehicle identification of the target vehicle from the carrier.

In another embodiment of the present application, the acquiring unit 301 obtaining the vehicle identification of the target vehicle from the carrier includes:

when the carrier is a radio frequency identification RFID tag, and when the RFID tag is detected, obtaining the vehicle identification of the target vehicle from the RFID tag.

20 In another embodiment of the present application, the acquiring unit 301 obtaining the vehicle identification of the target vehicle from the RFID tag includes:

obtaining the vehicle identification from the RFID tag at a fixed time interval.

The determining unit 302 determining location information when the vehicle identification of the target vehicle is acquired includes:

when vehicle identifications obtained at two adjacent times are identical, determining at least one piece of the location information obtained by positioning during the two adjacent times of obtaining the vehicle identification as the location information when the vehicle identification is acquired.

5 In another embodiment of the present application, the acquiring unit 301 acquiring the vehicle identification of the target vehicle includes:

 If the carrier is an in-vehicle fee-charging terminal, when a boarding request is sent to the in-vehicle fee-charging terminal, obtaining the vehicle identification of the target vehicle from the in-vehicle fee-charging terminal.

10 In another embodiment of the present application, the acquiring unit 301 obtaining the vehicle identification of the target vehicle from the in-vehicle fee-charging terminal includes:

 obtaining the vehicle identification of the target vehicle from the in-vehicle fee-charging terminal in a near field communication NFC mode.

 In another embodiment of the present application, the determining unit 302 determining
15 location information when the vehicle identification of the target vehicle is acquired includes:

 after the boarding request is sent to the in-vehicle fee-charging terminal, positioning the location information periodically or in real time; and

 determining at least one piece of location information obtained from positioning as the location information when the vehicle identification of the target vehicle is acquired.

20 In another embodiment of the present application, the acquiring unit 301 obtaining the vehicle identification of the target vehicle from the carrier includes:

 If the carrier is a wireless fidelity WIFI device provided by the target vehicle, obtaining the vehicle identification of the target vehicle from the WIFI device when the WIFI device is accessed.

In another embodiment of the present application, the acquiring unit 301 obtaining the vehicle identification of the target vehicle from the WIFI device includes:

taking a WIFI identification of the WIFI device as the vehicle identification of the target vehicle.

5 In another embodiment of the present application, the device for positioning a location further includes a storage unit 304, wherein:

After the location information when the vehicle identification of the target vehicle is acquired is determined, the storage unit 304 stores the vehicle identification and the location information corresponding to the vehicle identification.

10 The sending unit 303 sending the vehicle identification and the location information to the server includes:

sending the vehicle identification and at least one of the location information corresponding to the vehicle identification to the server when the set sending time arrives.

It should be noted that the device for positioning a location provided by the embodiment
15 of the present application may be implemented by software, or may be implemented by hardware, which is not specifically limited herein. The device for positioning a location provided by the embodiment of the present application acquires the vehicle identification of the target vehicle, determines the location information when the vehicle identification is acquired, and then sends the vehicle identification and the location information to the server,
20 so that the server determines the location of the target vehicle based on the location information. Compared with the conventional solution for positioning the location of the vehicle by the GPS method, the client terminal can perform the technical solution provided by the embodiment of the present application to determine the location of the vehicle, thereby effectively avoiding the problem that since the GPS signal strength is weakened due
25 to environmental factors, the vehicle location cannot be positioned. For the target vehicle,

even in big cities with high-rise buildings and overpasses, by determining the location information when the vehicle identification is acquired through different client terminals, the success rate and effectiveness of the location information acquisition can be improved, thereby ensuring the continuity and accuracy of the location positioning of the target vehicle.

5 FIG. 4 is a schematic structural diagram of a device for positioning a location according to an embodiment of the present application. The device for positioning a location includes: a receiving unit 401 and a positioning unit 402, wherein:

 The receiving unit 401 receives a vehicle identification and location information sent by at least one client terminal;

10 The positioning unit 402 determines a location of the vehicle corresponding to the vehicle identification is determined according to the location information.

 In another embodiment of the present application, the positioning unit 402 determining a location of the vehicle corresponding to the vehicle identification according to the location information includes:

15 determining, for the target vehicle, location information corresponding to the vehicle identification of the target vehicle sent by different client terminals and received within a set time period;

 processing the received location information; and

 determining a location of the target vehicle corresponding to the vehicle identification
20 according to the processing result.

 In another embodiment of the present application, the positioning unit 402 processing the received location information includes:

 determining an offset weight of each piece of location information received, the offset weight being used to represent an extent to which the location information deviates from the
25 actual location of the target vehicle; and

calculating a processing result based on the offset weight of each piece of location information and a coordinate contained in each piece of location information.

In another embodiment of the present application, the device for positioning a location further includes a screening unit 403, wherein:

- 5 before determining the location of the target vehicle corresponding to the vehicle identification according to the location information, if a number of pieces of location information corresponding to the vehicle identification of the target vehicle which is sent by each client terminal and received within the set time period is larger than 1 for the target vehicle, the screening unit 403 performs the following operations on the location information
- 10 corresponding to the vehicle identification of the target vehicle sent by each client terminal:
- determining a generation time of each piece of location information corresponding to the vehicle identification of the target vehicle sent by the client terminal;
- according to the generation time, selecting, from the pieces of location information, location information satisfying a set condition; and
- 15 determining the selected location information as the location information corresponding to the vehicle identification of the target vehicle sent by the client terminal within the set time period.

- In another embodiment of the present application, the positioning unit 402 determining the location of the vehicle corresponding to the vehicle identification according to the
- 20 location information includes:

 determining, for the target vehicle, location information corresponding to the vehicle identification of the target vehicle sent by different client terminals and received within a set time period;

 counting a number of occurrences of each piece of the location information; and

determining the location of the vehicle corresponding to the vehicle identification according to the location information that the number of occurrences is larger than a set threshold.

5 In another embodiment of the present application, the positioning unit 402 determining the location of the vehicle corresponding to the vehicle identification according to the location information includes:

determining, for the target vehicle, a generation time of each piece of location information corresponding to the received vehicle identification;

10 processing location information with the same generation time to obtain a location of the target vehicle at a time corresponding to the generation time; and

when a location of the target vehicle corresponding to each generation time is obtained, determining a moving track of the target vehicle based on each of the locations.

It should be noted that the device for positioning a location provided by the embodiment of the present application may be implemented by software, or may be implemented by
15 hardware, which is not specifically limited herein. The device for positioning a location provided by the embodiment of the present application determines the location information by different client terminals when the vehicle identification is acquired, which can improve the success rate and effectiveness of the location information acquisition, thereby ensuring the continuity and accuracy of the location positioning of the target vehicle.

20 An embodiment of the present application further provides an electronic device, including: at least one processor and a memory. The memory stores a program and is configured to perform, by the at least one processor, the following steps:

acquiring a vehicle identification of a target vehicle;

determining location information when the vehicle identification of the target vehicle is
25 acquired; and

sending the vehicle identification and the location information to a server, such that the server determines a location of the target vehicle according to the location information.

It should be noted that the electronic device has the functions of the above client terminal, which is not described in detail herein.

5 An embodiment of the present application also provides a computer readable storage medium including a program for use in conjunction with an electronic device. The program is executable by a processor to perform the following steps:

acquiring a vehicle identification of a target vehicle;

10 determining location information when the vehicle identification of the target vehicle is acquired; and

sending the vehicle identification and the location information to a server, such that the server determines a location of the target vehicle according to the location information.

It should be noted that the computer readable storage medium has the functions of the foregoing client terminal, which is not described in detail herein.

15 FIG. 5 is a schematic structural diagram of a system for positioning a location according to an embodiment of the present application. The system for positioning a location includes a carrier 501, a client terminal 502 and a server 503, wherein:

The carrier 501 is located on the vehicle and stores a vehicle identification of the vehicle;

20 The client terminal 502 acquires a vehicle identification of the vehicle from the carrier, determines location information when the vehicle identification of the vehicle is acquired, and sends the vehicle identification of the vehicle and the location information corresponding to the vehicle identification to a server;

25 The server 503 receives the vehicle identification and the location information corresponding to the vehicle identification sent by the client terminal, and determines the location of the vehicle according to the location information.

In the 1990s, improvements to a technology could be clearly distinguished between hardware improvements (for example, improvements to circuit architectures such as diodes, transistors, switches, etc.) or software improvements (improvements to steps of a method). However, as technologies advance, for many of today's methods, improvements to steps have been seen as direct improvements in hardware circuit architectures. Designers almost always get a corresponding hardware architecture by programming the improved method steps into a hardware circuit. Therefore, it cannot be said that improvement to steps of a method cannot be implemented by physical hardware modules. For example, a Programmable Logic Device (PLD) (such as a Field Programmable Gate Array (FPGA)) is an integrated circuit with a logic function determined by a user programming the device. Designers program by themselves to “integrate” a digital system on a single PLD without requiring a chip manufacturer to design and fabricate a dedicated integrated circuit chip. Moreover, instead of manually making integrated circuit chips, such programming is currently mostly implemented using "logic compiler" software, which is similar to a software compiler used in programming development, while original codes before compiling have to be written in a specific programming language, which is called Hardware Description Language (HDL). There is not just one HDL, but there are many kinds, such as ABEL (Advanced Boolean Expression Language), AHDL (Altera Hardware Description Language), Confluence, CUPL (Cornell University Programming Language), HDCal, JHDL (Java Hardware Description Language), Lava, Lola, MyHDL, PALASM, RHDL (Ruby Hardware Description Language), etc. Currently, the most commonly used is VHDL (Very-High-Speed Integrated Circuit Hardware Description Language) and Verilog. It should also be apparent to those skilled in the art that method steps just need to be subject to a little logic programming using the above HDLs and programmed into an integrated circuit, and a hardware circuit that implements the logic method steps can be easily obtained.

The controller can be implemented in any suitable manner. For example, the controller can be in a form of, for example, a microprocessor or processor and a computer readable medium, for storing computer readable program codes (e.g., software or firmware) executable by the (micro)processor, a logic gate, a switch, an Application Specific Integrated
5 Circuit (ASIC), a programmable logic controller, and an embedded microcontroller. Examples of controllers include, but are not limited to, the following micro-controls: ARC 625D, Atmel AT91SAM, Microchip PIC18F26K20 and Silicone Labs C8051F320. The memory controller can also be implemented as a part of the control logic of the memory. Those skilled in the art will also appreciate that in addition to implementing the controller in
10 purely computer readable program codes, the controller can implement the same functions in a form of a logic gate, a switch, an ASIC, a programmable logic controller, and an embedded microcontroller by logically programming the method steps. Thus, such a controller can be considered as a hardware component, and the means for implementing various functions included therein can also be considered as a structure within the hardware
15 component. Or, the means for implementing various functions can even be considered as either a software module that implements a method or a structure within a hardware component.

The system, the apparatus, the module or the unit set forth in the above embodiments may be implemented by a computer chip or an entity, or by a product having a certain
20 function. A typical implementation device is a computer. Specifically, the computer can be, for example, a personal computer, a laptop computer, a cellular phone, a camera phone, a smart phone, a personal digital assistant, a media player, a navigation device, an email device, a game console, a tablet, a wearable device, or a combination of any of these devices.

For the convenience of description, the above apparatus is described in various units divided by function. However, the functions of the various units may be implemented in one or more pieces of software and/or hardware in the implementation of the present application.

Those skilled in the art will appreciate that embodiments of the present invention can be provided as a method, a system, or a computer program product. Thus, the present invention can take the form of an entirely hardware embodiment, an entirely software embodiment, or an embodiment combining software and hardware. Moreover, the present invention can take a form of a computer program product embodied on one or more computer usable storage media (including but not limited to a disk storage, a CD-ROM, an optical storage, etc.) in which computer usable program codes are included.

The present invention is described with reference to flowcharts and/or block diagrams of the method, the device (system) and the computer product according to the embodiments of the present invention. It will be understood that each step and/or block of the flowcharts and/or block diagrams, and combinations of the steps and/or blocks in the flowcharts and/or block diagrams may be implemented in computer program instructions. Such computer program instructions can be provided to a processor of a general purpose computer, a special purposed computer, an embedded processor, or other programmable data processing device to produce a machine, such that an apparatus for implementing the functions designated in one or more steps in the flowchart and/or one or more blocks in the block diagram is produced by the processor of the computer or other programmable data processing device executing the instructions.

Such computer program instructions can also be stored in a computer readable memory which can guide a computer or other programmable data processing device to operate in a particular manner, causing instructions stored in the computer readable memory to produce an article of manufacture of an instruction device. The instruction device implements

functions designated in one or more steps in the flowchart and/or one or more blocks in the block diagram.

These computer program instructions can also be loaded onto a computer or other programmable data processing devices so that a series of operational steps are executed on the computer or other programmable data processing devices to produce processing implemented by a computer. Therefore, the instructions executed on the computer or other programmable data processing device provide steps implementing functions designated in one or more steps in the flowchart and/or one or more blocks in the block diagram.

In a typical configuration, a computing device includes one or more processors (CPUs), an input/output interface, a network interface, and a memory.

The memory may include a non-permanent memory in a computer readable medium, a random access memory (RAM) and/or a non-volatile memory, such as a read only memory (ROM) or a flash memory (flash RAM). The memory is an example of a computer readable medium.

The computer readable medium including permanent and non-permanent, removable and non-removable media may implement information storage by any method or technology. The information may be computer readable instructions, data structures, modules of a program, or other data. Examples of the computer storage medium include, but are not limited to, a phase change memory (PRAM), a static random access memory (SRAM), a dynamic random access memory (DRAM), other types of random access memory (RAM), a read only memory (ROM), an electrically erasable programmable read only memory (EEPROM), a flash memory or other memory technologies, a CD-ROM, a digital versatile disc (DVD) or other optical storage, a magnetic cassette, a magnetic tape or disc storage or other magnetic storage device, or any other non-transportable medium that can be used to store information accessed by a computing device. As defined herein, the computer readable

medium does not include transitory computer readable media (transitory media), such as modulated data signals and carrier waves.

It is also to be understood that the terms "include" or "comprise" or any other variations are intended to encompass a non-exclusive inclusion, so a process, a method, an article, or a device that includes a series of elements includes not only those elements but also other elements that are not explicitly listed, or elements that are inherent to such a process, a method, an article, or a device. An element defined by the phrase "comprising a ...," without further limitation, does not exclude the presence of additional identical elements in the process, the method, the article, or the device including the element.

The present application can be described in a general context of computer-executable instructions executed by a computer, such as program modules. Generally, the program modules include routines, programs, objects, components, data structures, and the like that perform particular tasks or implement particular abstract data types. The present application can also be practiced in distributed computing environments where tasks are performed by remote processing devices that are connected through a communication network. In a distributed computing environment, program modules can be located in both local and remote computer storage media including the storage device.

The various embodiments in the present specification are described in a progressive manner, and identical or similar parts of the various embodiments may be referred to each other, and each embodiment focuses on differences from other embodiments. In particular, for the system embodiment, since it is basically similar to the method embodiment, the description is relatively simple, and the relevant parts can be referred to the description of the method embodiment.

The above description is only embodiments of the present application and is not intended to limit the present application. Various changes and modifications can be made to the

present application by those skilled in the art. Any modifications, equivalent substitutions, improvements, etc. made within the spirit and scope of the present application shall be included within the scope of the appended claims.

CLAIMS

1. A method for positioning a location, comprising:

acquiring a vehicle identification of a target vehicle;

determining location information when the vehicle identification of the target vehicle

5 is acquired; and

sending the vehicle identification and the location information to a server, such that the server determines a location of the target vehicle according to the location information.

2. The method for positioning a location according to claim 1, wherein acquiring a vehicle identification of a target vehicle comprises:

10 when a carrier carrying the vehicle identification of the target vehicle is detected, obtaining the vehicle identification of the target vehicle from the carrier.

3. The method for positioning a location according to claim 2, wherein obtaining the vehicle identification of the target vehicle from the carrier comprises:

15 when the carrier is a radio frequency identification RFID tag, and when the RFID tag is detected, obtaining the vehicle identification of the target vehicle from the RFID tag.

4. The method for positioning a location according to claim 3, wherein obtaining the vehicle identification of the target vehicle from the RFID tag comprises:

obtaining the vehicle identification from the RFID tag at a fixed time interval; and

determining location information when the vehicle identification of the target vehicle

20 is acquired comprises:

when vehicle identifications obtained at two adjacent times are identical, determining at least one piece of the location information obtained by positioning during the two adjacent times of obtaining the vehicle identification as the location information when the vehicle identification is acquired.

5. The method for positioning a location according to claim 2, wherein obtaining the vehicle identification of the target vehicle from the carrier comprises:

when the carrier is an in-vehicle fee-charging terminal, obtaining the vehicle identification of the target vehicle from the in-vehicle fee-charging terminal when a boarding request is sent to the in-vehicle fee-charging terminal.

6. The method for positioning a location according to claim 5, wherein obtaining the vehicle identification of the target vehicle from the in-vehicle fee-charging terminal comprises:

obtaining the vehicle identification of the target vehicle from the in-vehicle fee-charging terminal in a near field communication NFC mode.

7. The method for positioning a location according to claim 6, wherein determining location information when the vehicle identification of the target vehicle is acquired comprises:

after the boarding request is sent to the in-vehicle fee-charging terminal, positioning the location information periodically or in real time; and

determining at least one piece of location information obtained from positioning as the location information when the vehicle identification of the target vehicle is acquired.

8. The method for positioning a location according to claim 2, wherein obtaining the vehicle identification of the target vehicle from the carrier comprises:

when the carrier is a wireless fidelity WIFI device provided by the target vehicle, obtaining the vehicle identification of the target vehicle from the WIFI device when the WIFI device is accessed.

9. The method for positioning a location according to claim 8, wherein obtaining the vehicle identification of the target vehicle from the WIFI device comprises:

taking a WIFI identification of the WIFI device as the vehicle identification of the target vehicle.

10. The method for positioning a location according to claim 1, 4 or 7, further comprising:

5 after the location information when the vehicle identification of the target vehicle is acquired is determined, storing the vehicle identification and the location information corresponding to the vehicle identification; and

sending the vehicle identification and the location information to a server comprises:

10 sending the vehicle identification and at least one of the location information corresponding to the vehicle identification to the server when the set sending time arrives.

11. A method for positioning a location, comprising:

receiving a vehicle identification and location information sent by at least one client terminal; and

15 determining a location of the vehicle corresponding to the vehicle identification according to the location information.

12. The method for positioning a location according to claim 11, wherein determining a location of a target vehicle corresponding to the vehicle identification according to the location information comprises:

20 determining, for the target vehicle, location information corresponding to the vehicle identification of the target vehicle sent by different client terminals and received within a set time period;

processing the received location information; and

determining a location of the target vehicle corresponding to the vehicle identification according to the processing result.

13. The method for positioning a location according to claim 12, wherein processing the received location information comprises:

determining an offset weight of each piece of location information received, the offset weight being used to represent an extent to which the location information deviates from the actual location of the target vehicle; and

calculating a processing result based on the offset weight of each piece of location information and a coordinate contained in each piece of location information.

14. The method for positioning a location according to claim 11 or 12, wherein before determining the location of the target vehicle corresponding to the vehicle identification according to the location information, the method further comprises:

for the target vehicle, when a number of pieces of location information corresponding to the vehicle identification of the target vehicle which is sent by each client terminal and received within the set time period is larger than 1, performing the following operations on the location information corresponding to the vehicle identification of the target vehicle sent by each client terminal:

determining a generation time of each piece of location information corresponding to the vehicle identification of the target vehicle sent by the client terminal;

according to the generation time, selecting, from the pieces of location information, location information satisfying a set condition; and

determining the selected location information as the location information corresponding to the vehicle identification of the target vehicle sent by the client terminal within the set time period.

15. The method for positioning a location according to claim 11, wherein determining the location of the vehicle corresponding to the vehicle identification according to the location information comprises:

determining, for the target vehicle, location information corresponding to the vehicle identification of the target vehicle sent by different client terminals and received within a set time period;

counting a number of occurrences of each piece of the location information; and

5 determining the location of the vehicle corresponding to the vehicle identification according to the location information that the number of occurrences is larger than a set threshold.

16. The method for positioning a location according to claim 11, wherein determining the location of the vehicle corresponding to the vehicle identification according to the
10 location information comprises:

determining, for the target vehicle, a generation time of each piece of location information corresponding to the received vehicle identification;

processing location information with the same generation time to obtain a location of the target vehicle at a time corresponding to the generation time; and

15 when a location of the target vehicle corresponding to each generation time is obtained, determining a moving track of the target vehicle based on each of the locations.

17. A device for positioning a location, comprising:

an acquiring unit for acquiring a vehicle identification of a target vehicle;

a determining unit for determining location information when the vehicle identification
20 of the target vehicle is acquired; and

a sending unit for sending the vehicle identification and the location information to a server, such that the server determines a location of the target vehicle according to the location information.

18. The device for positioning a location according to claim 17, wherein the acquiring
25 unit acquiring a vehicle identification of a target vehicle comprises:

when a carrier carrying the vehicle identification of the target vehicle is detected, obtaining the vehicle identification of the target vehicle from the carrier.

19. The device for positioning a location according to claim 18, wherein the acquiring unit obtaining the vehicle identification of the target vehicle from the carrier comprises:

5 when the carrier is a radio frequency identification RFID tag, and when the RFID tag is detected, obtaining the vehicle identification of the target vehicle from the RFID tag.

20. The device for positioning a location according to claim 19, wherein the acquiring unit obtaining the vehicle identification of the target vehicle from the RFID tag comprises:

obtaining the vehicle identification from the RFID tag at a fixed time interval; and

10 the determining unit determining location information when the vehicle identification of the target vehicle is acquired comprises:

when vehicle identifications obtained at two adjacent times are identical, determining at least one piece of the location information obtained by positioning during the two adjacent times of obtaining the vehicle identification as the location information when the vehicle
15 identification is acquired.

21. The device for positioning a location according to claim 18, wherein the acquiring unit obtaining the vehicle identification of the target vehicle from the carrier comprises:

when the carrier is an in-vehicle fee-charging terminal, obtaining the vehicle identification of the target vehicle from the in-vehicle fee-charging terminal when a boarding
20 request is sent to the in-vehicle fee-charging terminal.

22. The device for positioning a location according to claim 21, wherein the acquiring unit obtaining the vehicle identification of the target vehicle from the in-vehicle fee-charging terminal comprises:

obtaining the vehicle identification from the in-vehicle fee-charging terminal in a near
25 field communication NFC mode.

23. The device for positioning a location according to claim 22, wherein the determining unit determining location information when the vehicle identification of the target vehicle is acquired comprises:

after the boarding request is sent to the in-vehicle fee-charging terminal, positioning the
5 location information periodically or in real time; and

determining at least one piece of location information obtained from positioning as the location information when the vehicle identification of the target vehicle is acquired.

24. The device for positioning a location according to claim 18, wherein the acquiring unit obtaining the vehicle identification of the target vehicle from the carrier comprises:

10 when the carrier is a wireless fidelity WIFI device provided by the target vehicle, obtaining the vehicle identification of the target vehicle from the WIFI device when the WIFI device is accessed.

25. The device for positioning a location according to claim 24, wherein the acquiring unit obtaining the vehicle identification of the target vehicle from the WIFI device comprises:

15 taking a WIFI identification of the WIFI device as the vehicle identification of the target vehicle.

26. The device for positioning a location according to claim 17, 20 or 23, further comprising: a storage unit, wherein

after the location information when the vehicle identification of the target vehicle is
20 acquired is determined, the storage unit stores the vehicle identification and the location information corresponding to the vehicle identification; and

the sending unit sending the vehicle identification and the location information to a server comprises:

sending the vehicle identification and at least one of the location information
25 corresponding to the vehicle identification to the server when the set sending time arrives.

27. A device for positioning a location, comprising:

a receiving unit for receiving a vehicle identification and location information sent by at least one client terminal; and

a positioning unit for determining a location of the vehicle corresponding to the vehicle identification according to the location information.

28. The device for positioning a location according to claim 27, wherein the positioning unit determining a location of the vehicle corresponding to the vehicle identification according to the location information comprises:

determining, for a target vehicle, location information corresponding to the vehicle identification of the target vehicle sent by different client terminals and received within a set time period;

processing the received location information; and

determining a location of the target vehicle corresponding to the vehicle identification according to the processing result.

29. The device for positioning a location according to claim 28, wherein the positioning unit processing the received location information comprises:

determining an offset weight of each piece of location information received, the offset weight being used to represent an extent to which the location information deviates from the actual location of the target vehicle; and

calculating a processing result based on the offset weight of each piece of location information and a coordinate contained in each piece of location information.

30. The device for positioning a location according to claim 27 or 28, further comprising a screening unit, wherein

before determining the location of the target vehicle corresponding to the vehicle identification according to the location information, for the target vehicle, when a number of

pieces of location information corresponding to the vehicle identification of the target vehicle which is sent by each client terminal and received within the set time period is larger than 1, the screening unit performs the following operations on the location information corresponding to the vehicle identification of the target vehicle sent by each client terminal:

5 determining a generation time of each piece of location information corresponding to the vehicle identification of the target vehicle sent by the client terminal;

 according to the generation time, selecting, from the pieces of location information, location information satisfying a set condition; and

 determining the selected location information as the location information
10 corresponding to the vehicle identification of the target vehicle sent by the client terminal within the set time period.

31. The device for positioning a location according to claim 27, wherein the positioning unit determining the location of the vehicle corresponding to the vehicle identification according to the location information comprises:

15 determining, for the target vehicle, location information corresponding to the vehicle identification of the target vehicle sent by different client terminals and received within a set time period;

 counting a number of occurrences of each piece of the location information; and

 determining the location of the vehicle corresponding to the vehicle identification
20 according to the location information that the number of occurrences is larger than a set threshold.

32. The device for positioning a location according to claim 27, wherein the positioning unit determining the location of the vehicle corresponding to the vehicle identification according to the location information comprises:

determining, for the target vehicle, a generation time of each piece of location information corresponding to the received vehicle identification;

processing location information with the same generation time to obtain a location of the target vehicle at a time corresponding to the generation time; and

5 when a location of the target vehicle corresponding to each generation time is obtained, determining a moving track of the target vehicle based on each of the locations.

33. An electronic device, comprising: at least one processor and a memory for storing a program and configured to perform the following steps by the at least one processor:

acquiring a vehicle identification of a target vehicle;

10 determining location information when the vehicle identification of the target vehicle is acquired; and

sending the location information and the vehicle identification to a server, such that the server determines a location of the target vehicle according to the location information.

34. A computer readable storage medium, comprising a program for use in conjunction
15 with an electronic device, the program being executable by a processor to perform the following steps:

acquiring a vehicle identification of a target vehicle;

determining location information when the vehicle identification of the target vehicle is acquired; and

20 sending the location information and the vehicle identification to a server, such that the server determines a location of the target vehicle according to the location information.

35. A system for positioning a location, comprising:

a carrier, located on a vehicle, for storing a vehicle identification of the vehicle;

a client terminal for acquiring the vehicle identification of the vehicle from the carrier,

25 determining location information when the vehicle identification of the vehicle is acquired,

and sending the vehicle identification of the vehicle and the location information corresponding to the vehicle identification to a server; and

a server for receiving the vehicle identification and the location information corresponding to the vehicle identification sent by the client terminal, and determining the

5 location of the vehicle according to the location information.