COMMUNICATION METHOD AND APPARATUS, AND DEVICE

TECHNICAL FIELD

[0001] Embodiments of the present disclosure relate to the field of electronics technology and, in particular to a communication method and apparatus, and a device.

BACKGROUND

[0002] In a data transceiving system of wireless devices, data exchange can be realized between a data source device and various forms of wireless transceiving devices.

[0003] At present, as user demand increases, the wireless transceiving device connected to the data source device has gradually shifted from a single wireless transceiving device to dual wireless transceiving devices or even multiple wireless transceiving devices. In many application scenarios, data from a data source device needs to be transmitted to multiple wireless transceiving devices. For example, a mobile phone needs to transmit audio to two Bluetooth earbuds. When data from a data source device needs to be transmitted to multiple wireless transceiving devices, the data source device first pairs with a primary wireless transceiving device among the multiple wireless transceiving devices and establishes a connection, the data source device transmits the data to the primary wireless transceiving device, and then the primary wireless transceiving device transmits the data to a secondary wireless transceiving device. However, when a failure occurs in the primary wireless transceiving device, the data source device cannot transmit the data to the multiple wireless transceiving devices, resulting in poor communication reliability.

SUMMARY

[0004] Embodiments of the present disclosure provide a communication method and apparatus, and a device, which improve the reliability of communication.

[0005] In a first aspect, an embodiment of the present disclosure provides a communication method, including:

pairing a first device with a data source device through an identifier of a device

group to obtain pairing information, where the first device is any device in the device group, and the pairing information is information based on which a connection between a device in the device group and the data source device is established; and

synchronizing, by the first device, the pairing information with at least one second device in the device group.

[0006] In a possible implementation, the pairing information includes a link key.

[0007] In a possible implementation, after pairing the first device with the data source device through the identifier of the device group to obtain the pairing information, the method further includes:

establishing a connection between the first device and the data source device according to the pairing information.

[0008] In a possible implementation, the pairing information is used to enable the second device to establish a connection with the data source device according to the pairing information; or,

the pairing information is used to enable the second device to establish a connection with the data source device according to the pairing information when a preset condition is met.

[0009] In a possible implementation, the preset condition includes at least one of the following conditions:

a link between the first device and the data source device being malfunctioning;

battery power of the first device being less than a first threshold;

device status of the first device being abnormal; or

signal quality between the first device and the data source device being less than a second threshold.

[0010] In a possible implementation, synchronizing, by the first device, the pairing information with the at least one second device in the device group includes:

storing, by the first device, the pairing information in a preset storage area accessible to the at least one second device.

[0011] In a possible implementation, synchronizing, by the first device, the pairing information with the at least one second device in the device group includes:

transmitting, by the first device, the pairing information to the at least one second device.

[0012] In a possible implementation, the at least one second device is a device except the

first device in the device group.

[0013] In a possible implementation, after pairing the first device with the data source device through the identifier of the device group to obtain the pairing information, the method further includes:

transmitting, by the first device, a notification message to other devices in the device group except the first device, where the notification message is used to update status of the other devices to be invisible to a device outside the device group.

[0014] In a possible implementation, before pairing the first device with the data source device through the identifier of the device group to obtain the pairing information, status of each device in the device group is visible to a device outside the device group.

[0015] In a possible implementation, an identifier of a device in the device group that is visible to a device outside the device group is the identifier of the device group.

[0016] In a possible implementation, before pairing the first device with the data source device through the identifier of the device group to obtain the pairing information, the method further includes:

pairing and connecting the first device with other devices in the device group to construct the device group.

[0017] In a possible implementation, the identifier of the device group is determined according to a preset addressing rule.

[0018] In a possible implementation, the identifier of the device group is same as an identifier of one device in the device group.

[0019] In a possible implementation, the device in the device group is a wireless transceiving device or a wired transceiving device.

[0020] In a possible implementation, the wireless transceiving device is a Bluetooth device.

[0021] In a possible implementation, the Bluetooth device is a Bluetooth audio device.

[0022] In a possible implementation, the Bluetooth audio device is a Bluetooth earbud or a Bluetooth speaker.

[0023] In a second aspect, an embodiment of the present disclosure provides a communication method, including:

obtaining, by a second device, pairing information synchronized by a first device, where the first device and the second device are both devices in a same device group, and the pairing information is generated by pairing the first device with a data source device through

an identifier of the device group; and

establishing a connection between the second device and the data source device according to the pairing information.

[0024] In a possible implementation, establishing the connection between the second device and the data source device according to the pairing information includes:

establishing a connection between the second device and the data source device according to the pairing information, when a preset condition is met.

[0025] In a possible implementation, the preset condition includes at least one of the following conditions:

a link between the first device and the data source device being malfunctioning;

battery power of the first device being less than a first threshold;

device status of the first device being abnormal; or

signal quality between the first device and the data source device is less than a second threshold.

[0026] In a possible implementation, obtaining, by the second device, the pairing information synchronized by the first device includes:

obtaining, by the second device, the pairing information in a preset storage area, where the pairing information is stored in the preset storage area by the first device.

[0027] In a possible implementation, obtaining, by the second device, the pairing information synchronized by the first device includes:

receiving, by the second device, the pairing information transmitted by the first device.

[0028] In a possible implementation, after obtaining, by the second device, the pairing information synchronized by the first device, the method further includes:

receiving, by the second device, a notification message transmitted by the first device; and

updating, by the second device, status of the second device to be invisible to a device outside the device group according to the notification message.

[0029] In a third aspect, an embodiment of the present disclosure provides a communication apparatus which is applied to a first device, and the apparatus includes a processing module and a transceiving module, where

the processing module is paired with a data source device through an identifier of a device group to obtain pairing information, the first device is any device in the device

group, and the pairing information is information based on which a connection between a device in the device group and the data source device is established; and

the transceiving module is configured to synchronize the pairing information with at least one second device in the device group.

[0030] In a possible implementation, the pairing information includes a link key.

[0031] In a possible implementation, the processing module is further configured to establish a connection with the data source device according to the pairing information after the processing module is paired with the data source device through the identifier of the device group to obtain the pairing information.

[0032] In a possible implementation, the pairing information is used to enable the second device to establish a connection with the data source device according to the pairing information; or,

the pairing information is used to enable the second device to establish a connection with the data source device according to the pairing information when a preset condition is met.

[0033] In a possible implementation, the preset condition includes at least one of the following conditions:

a link between the first device and the data source device being malfunctioning;

battery power of the first device being less than a first threshold;

device status of the first device being abnormal; or

signal quality between the first device and the data source device being less than a second threshold.

[0034] In a possible implementation, the transceiving module is specifically configured to:

store the pairing information in a preset storage area accessible to the at least one second device.

[0035] In a possible implementation, the transceiving module is specifically configured to:

transmit the pairing information to the at least one second device.

[0036] In a possible implementation, the at least one second device is a device except the first device in the device group.

[0037] In a possible implementation, the transceiving module is further configured to: after the processing module is paired with the data source device through the identifier of the

device group to obtain the pairing information, transmit a notification message to other devices in the device group except the first device, where the notification message is used to update status of the other devices to be invisible to a device outside the device group.

[0038] In a possible implementation, before the processing module is paired with the data source device through the identifier of the device group to obtain the pairing information, status of each device in the device group is visible to a device outside the device group.

[0039] In a possible implementation, an identifier of a device in the device group that is visible to a device outside the device group is the identifier of the device group.

[0040] In a possible implementation, the processing module is further configured to be paired and connected with other devices in the device group to construct the device group before the processing module is paired with the data source device through the identifier of the device group to obtain the pairing information.

[0041] In a possible implementation, the identifier of the device group is determined according to a preset addressing rule.

[0042] In a possible implementation, the identifier of the device group is same as an identifier of one device in the device group.

[0043] In a possible implementation, the device in the device group is a wireless transceiving device or a wired transceiving device.

[0044] In a possible implementation, the wireless transceiving device is a Bluetooth device.

[0045] In a possible implementation, the Bluetooth device is a Bluetooth audio device.

[0046] In a possible implementation, the Bluetooth audio device is a Bluetooth earbud or a Bluetooth speaker.

[0047] In a fourth aspect, an embodiment of the present disclosure provides a communication apparatus which is applied to a second device, and the apparatus includes a processing module and a transceiving module, where

the transceiving module is configured to obtain pairing information synchronized by a first device, the first device and the second device are both devices in a same device group, and the pairing information is generated by pairing the first device with a data source device through an identifier of the device group; and

the processing module is configured to establish a connection with the data source device according to the pairing information.

[0048] In a possible implementation, the processing module is specifically configured to

establish the connection with the data source device according to the pairing information when a preset condition is met.

[0049] In a possible implementation, the preset condition includes at least one of the following conditions:

a link between the first device and the data source device being malfunctioning;

battery power of the first device being less than a first threshold;

device status of the first device being abnormal; or

signal quality between the first device and the data source device being less than a second threshold.

[0050] In a possible implementation, the transceiving module is specifically configured to obtain the pairing information in a preset storage area, where the pairing information is stored by the first device in the preset storage area.

[0051] In a possible implementation, the transceiving module is specifically configured to receive the pairing information transmitted by the first device.

[0052] In a possible implementation, the transceiving module is further configured to receive a notification message transmitted by the first device after the transceiving module obtains the pairing information synchronized by the first device; and

the processing module is further configured to update status of the second device to be invisible to a device outside the device group according to the notification message.

[0053] In a fifth aspect, an embodiment of the present disclosure provides a communication apparatus, including a memory and a processor, where the processor executes program instructions in the memory to implement the communication method described in any item of the first aspect.

[0054] In a sixth aspect, an embodiment of the present disclosure provides a communication apparatus, including a memory and a processor, where the processor executes program instructions in the memory to implement the communication method described in any item of the second aspect.

[0055] In a seventh aspect, an embodiment of the present disclosure provides a device group including the communication apparatus described in the fifth aspect and at least one communication apparatus described in the sixth aspect.

[0056] In an eighth aspect, an embodiment of the present disclosure provides a communication system, including the device group and the data source device described in the seventh aspect, where a device in the device group is configured to be paired with the

data source device through the identifier of the device group.

[0057] In a ninth aspect, an embodiment of the present disclosure provides a computer-readable storage medium including a computer program stored thereon, where, when the program is executed by a processor, the communication method according to any one of the first aspect or the second aspect is implemented.

[0058] According to the communication method and apparatus and the device provided in the embodiments of the present disclosure, a first device, after obtaining pairing information by pairing with a data source device through an identifier of a device group, transmits the pairing information to at least one second device in the device group to enable the second device to establish a connection with the data source device according to the pairing information. When the second device establishes a connection with the data source device, the second device does not need to pair with the data source device, and the connection with the data source device can be established according to the pairing information, improving the reliability of communication. Since the second device does not need to pair with the data source device when establishing a connection with the data source device, the connection can be realized without user awareness. This not only improves user experience, but also increases efficiency in establishing a connection, thereby improving the communication efficiency.

BRIEF DESCRIPTION OF DRAWING(S)

[0059] In order to illustrate the technical solutions in the embodiments of the present disclosure or in the prior art more clearly, the following will briefly introduce the drawings required for describing the embodiments or the prior art. Obviously, the drawings described below show some embodiments of the present disclosure. For those of ordinary skill in the art, other drawings may still be derived from these drawings without creative efforts.

[0060] [Fig. 1] is an architecture diagram of a communication system according to an embodiment of the present disclosure;

[0061] [Fig. 2] is a schematic diagram of an application scenario according to an embodiment of the present disclosure;

[0062] [Fig. 3] is a schematic flowchart of a communication method according to an embodiment of the present disclosure;

[0063] [Fig. 4A] is a schematic diagram of a device connection according to an embodiment of the present disclosure;

[0064] [Fig. 4B] is a schematic diagram of another device connection according to an embodiment of the present disclosure;

[0065] [Fig. 4C] is a schematic diagram of yet another device connection according to an embodiment of the present disclosure;

[0066] [Fig. 4D] is a schematic diagram of yet another device connection according to an embodiment of the present disclosure;

[0067] [Fig. 5] is a schematic flowchart of another communication method according to an embodiment of the present disclosure;

[0068] [Fig. 6] is a schematic diagram of a communication process according to an embodiment of the present disclosure;

[0069] [Fig. 7] is a schematic structural diagram of a communication apparatus according to an embodiment of the present disclosure;

[0070] [Fig. 8] is a schematic structural diagram of another communication apparatus according to an embodiment of the present disclosure;

[0071] [Fig. 9] is a schematic diagram of a hardware structure of a communication apparatus according to the present disclosure; and

[0072] [Fig. 10] is a schematic diagram of a hardware structure of a communication apparatus according to the present disclosure.

DESCRIPTION OF EMBODIMENTS

[0073] [Fig. 1] is an architecture diagram of a communication system according to an embodiment of the present disclosure. Device 1, device 2, ..., device N and a data source device are included therein. Among them, device 1, device 2, ..., and device N are paired and connected with each other to form a device group, and devices in the device group can communicate with each other, so that data can be transmitted between the devices in the device group. That is, the devices in the device group can obtain same data. After the device group is constructed, an identifier of the device group can be generated and is used to uniquely identify the device group.

[0074] The data source device may be a device that provides data to devices in the device group, and the data may be multimedia data (for example, audio data, etc.). The data source device can establish a connection with at least one device in the device group, and transmit data to the at least one device, so that the at least one device transmits the data to other devices in the device group, and thus the devices in the device group can receive the same

data. Alternatively, the data source device may also separately establish a connection with each device in the device group, and respectively transmit data to each device in the device group, so that the devices in the device group can receive the same data.

[0075] Any first device in the device group may pair with the data source device through the identifier of the device group to generate pairing information, and establish a connection with the data source device according to the pairing information. The first device can also transmit the pairing information to other devices in the device group (for example, a second device), so that when the second device in the device group needs to establish a connection with the data source device (for example, when the first device is malfunctioning), the second device does not need to pair with the data source device, and the connection with the data source device can be established according to the pairing information, improving the reliability of communication. Since the second device does not need to pair with the data source device when establishing the connection with the data source device, the connection can be realized without user awareness. This not only improves user experience, but also increases efficiency in establishing a connection, thereby improving the communication efficiency.

[0076] [Fig. 2] is a schematic diagram of an application scenario according to an embodiment of the present disclosure. Referring to [Fig. 2], a left Bluetooth earbud, a right Bluetooth earbud and a Bluetooth mobile phone are included therein. The left Bluetooth earbud and the right Bluetooth earbud can be paired and connected with each other to form a Bluetooth earbud device group, and an identifier of the Bluetooth earbud device group is generated.

[0077] The Bluetooth mobile phone is used to provide same audio data to the left Bluetooth earbud and the right Bluetooth earbud. In an actual application process, the left Bluetooth earbud can be paired with the Bluetooth mobile phone through the identifier of the Bluetooth earbud group to generate pairing information, and establish a connection with the Bluetooth mobile phone according to the pairing information. After the left Bluetooth earbud is connected to the Bluetooth mobile phone, the left Bluetooth earbud can receive data from the Bluetooth mobile phone and synchronize the received data to the right Bluetooth earbud.

[0078] The left Bluetooth earbud can also transmit the pairing information to the right Bluetooth earbud, so that when the left Bluetooth earbud is malfunctioning, the right Bluetooth earbud can establish a connection with the Bluetooth mobile phone according to the pairing information, thereby avoiding the problem that the right Bluetooth earbud is

unable to receive the data transmitted by the Bluetooth mobile phone when the left Bluetooth earbud is malfunctioning, and thus improving the reliability of communication. In the process of establishing a connection with the Bluetooth mobile phone, the right Bluetooth earbud does not need to be paired with the Bluetooth mobile phone, so that the connection between the right earbud and the Bluetooth mobile phone can be established without user awareness. This not only improves user experience, but also increases efficiency in establishing a connection, thereby improving the communication efficiency.

[0079] It should be noted that [Fig. 2] only illustrates an application scenario in the form of an example, and is not a limitation to the application scenario. In an actual application process, the application scenario can be set according to actual needs, which is not specifically limited in embodiments of the present disclosure.

[0080] The technical solutions of the present disclosure will be described below in detail through specific embodiments. It should be noted that the following specific embodiments can be combined with each other, and same or similar content will not be repeated in different embodiments.

[0081] [Fig. 3] is a schematic flowchart of a communication method according to an embodiment of the present disclosure. Referring to [Fig. 3], the method may include:

S301, a first device is paired with a data source device through an identifier of a device group to obtain pairing information.

[0082] The device group includes at least two devices, and the first device is any one of the devices in the device group.

[0083] The at least two devices in the device group can communicate with each other so that data can be transmitted among the devices in the device group. In the following, the connection (a wired or wireless communication connection) between the at least two devices in the device group will be described with reference to [Fig. 4A] – [Fig. 4D].

[0084] [Fig. 4A] is a schematic diagram of a device connection according to an embodiment of the present disclosure. Referring to [Fig. 4A], devices in a device group are connected in sequence. For example, device 1 is connected to device 2, device 2 is connected to device 3, and device N-1 is connected to device N. In this way, after any one of devices in the device group receives data, the data can be transmitted to other devices in turn through the connection between the devices.

[0085] [Fig. 4B] is a schematic diagram of another device connection according to an embodiment of the present disclosure. Referring to [Fig. 4B], one device in a device group is

connected to all other devices separately, and the device can be a device that establishes a connection with a data source device. For example, device 1 is connected to device 2, device 3, ..., device N, respectively. In this way, after device 1 in the device group receives data, the data can be transmitted to other devices in the group respectively.

[0086] [Fig. 4C] is a schematic diagram of yet another device connection according to an embodiment of the present disclosure. Referring to [Fig. 4C], the devices in the device group are connected in pairs. For example, in device 1, device 2, device 3, and device 4, a connection is established between every two devices. In this way, after any one of devices in the device group receives data, the data can be transmitted to other devices through the connection between the devices.

[0087] [Fig. 4D] is a schematic diagram of yet another device connection according to an embodiment of the present disclosure. Referring to [Fig. 4D], each device in a device group is connected to at least one other device. For example, device 1 is connected to device 2 and device 3 respectively, and device 4 is connected to device 3 and device 5, respectively. In this way, after any one of devices in the device group receives data, the data can be transmitted to other devices through the connection between the devices.

[0088] It should be noted that the above [Fig. 4A] – [Fig. 4D] only illustrate the connection relationship between the devices in the device group by way of examples, and are not a limitation to the connection relationship. In an actual application process, the connection relationship between devices in a device group can be determined according to actual needs.

[0089] Optionally, the device in the device group is a wireless transceiving device or a wired transceiving device. That is, the device in the device group has a receiving function and/or a transmitting function. The wireless transceiving device may be a Bluetooth device, for example, a Bluetooth audio device. The Bluetooth audio device may be a Bluetooth earbud or a Bluetooth speaker.

[0090] Optionally, the identifier of the device group is determined according to a preset addressing rule. For example, the preset addressing rule may indicate at least one of a format and a length of the identifier of the device group.

[0091] Optionally, the identifier of the device group is the same as an identifier of one device in the device group. The identifier of the device may be an address of the device. For example, when the device is a Bluetooth device, the identifier of the device may be the Bluetooth address of the device. For example, an identifier of any device in the device group

can be determined as the identifier of the device group. Alternatively, an identifier of a specified device in the device group may be determined as the identifier of the device group. The specified device may be the first one joining the device group, or the last one joining the device group, etc.

[0092] Each device in the device group may have stored therein device group information of the device group. For example, the device group information may be stored in the device in the form of a data structure. Optionally, the device group information includes the identifier of the device group and an identifier of each device in the device group.

[0093] For example, it is assumed that a device group includes 3 devices, which are respectively marked as device 1, device 2, and device 3. The device group information can be as shown in Table 1.

[Table 1]

Device group information	
Identifier of device group	Identifiers of devices included in device group
Group identifier	Identifier 1 of device 1
	Identifier 2 of device 2
	Identifier 3 of device 3

[0094] It should be noted that [Table 1] merely illustrates the device group information in the form of an example, and is not a limitation to the device group information.

[0095] Optionally, before the first device is paired with the data source device through the identifier of the device group, status of each device in the device group is visible to a device outside the device group. An identifier of a device in the device group that is visible to a device outside the device group is the identifier of the device group, and an identifier of a device in the device group that is visible to a device inside the device group may be the identifier of the device.

[0096] The data source device is a device outside the device group. Since the identifier of each device in the device group that is visible to the data source device is the identifier of the device group, the data source device can discover a device in the device group through the identifier of the device group. Because the identifier of each device in the device group that is visible to the data source device is the same, the device discovered by the data source device according to the identifier of the device group is any device in the device group.

[0097] Assuming that the data source device discovers the first device in the device group according to the identifier of the device group, the data source device can be paired with the first device through the identifier of the device group. The process of pairing the data source device with the first device is a process of authentication.

[0098] The process of pairing the data source device with the first device may be as follows. Verification information of the first device may be set, where the verification information of the first device may be verification information of the device group. When the data source device is paired with the first device, the verification information of the first device may be input into the data source device, and the data source device transmits to the first device a pairing request including the verification information. When the first device determines that the verification information in the pairing request is the same as the verification information of the first device, the pairing is successful. Alternatively, the verification information of the data source device may be set. When the data source device is paired with the first device, the verification information of the data source device may be input into the first device, and the first device transmits to the data source device a pairing request including the verification information. When the data source device determines that the verification information in the pairing request is the same as the verification information of the data source device, the pairing is successful.

[0099] The pairing information is generated after the first device is paired with the data source device through the identifier of the device group. Optionally, the pairing information may be generated according to the identifier of the device group and the identifier of the data source device. Of course, the process of generating the pairing information may also be based on other information, which is not specifically limited in the embodiments of the present disclosure.

[0100] The pairing information is information based on which a connection between a device in the device group and the data source device is established. That is, the pairing information is needed by any device in the device group for establishing a connection with the data source device.

[0101] Optionally, the pairing information may include a link key, and the link key is needed by any device in the device group for establishing a connection with the data source device. Of course, the pairing information may also include other content, which is not specifically limited in the embodiments of the present disclosure.

[0102] It should be noted that after the first device obtains the pairing information

generated upon pairing of the first device with the data source device, the first device and the data source device may establish a connection according to the pairing information.

[0103] S302, the first device synchronizes the pairing information with at least one second device in the device group.

[0104] Optionally, the at least one second device may be one or multiple in number. The at least one second device may also be all devices in the device group except the first device.

[0105] When the at least one second device is M in number, the M second devices can be any M devices in the device group except the first device, or M specified devices in the device group except the first device. M is an integer greater than or equal to 1.

[0106] Optionally, the first device may synchronize the pairing information with the at least one second device through at least the following two feasible implementations.

[0107] One feasible implementation:

a preset storage area may be allocated for the devices in the device group, and all devices in the device group may access the preset storage area. The first device may store the pairing information in the preset storage area, and accordingly, other devices in the device group may read the pairing information from the preset storage area.

[0108] In this feasible implementation, the first device can synchronize the pairing information with the at least one second device through the preset storage area, so that the first device does not need to transmit the pairing information to each second device separately, allowing power consumption of the first device to be small.

[0109] Another feasible implementation:

the first device transmits the pairing information to the at least one second device. The first device may transmit the pairing information to the at least one second device in a wired manner and/or a wireless manner.

[0110] Optionally, the first device may directly transmit the pairing information to the second device. For example, the first device transmits the pairing information to each second device separately. The first device may also indirectly transmit the pairing information to the second device. For example, the first device transmits the pairing information to one of the second devices, and the second device transmits the pairing information to other second devices.

[0111] S303, the second device establishes a connection with the data source device according to the pairing information.

[0112] Optionally, when a preset condition is met, a connection between the second

device and the data source device is established according to the pairing information.

[0113] Optionally, the preset condition may include at least one of the following conditions: a link between the first device and the data source device being malfunctioning; battery power of the first device being less than a first threshold; device status of the first device being abnormal; signal quality between the first device and the data source device being less than a second threshold.

[0114] The device status of the first device being abnormal may mean that the first device is in a disabled status, a malfunctioning status, or the like. For example, when the first device is a Bluetooth earbud, the status of the first device may be a detached earbud status, that is, the first device is not in the ear of a user.

[0115] The signal quality between the first device and the data source device may include signal strength of the signal between the first device and the data source device, or the like.

[0116] Optionally, the data source device may detect the preset condition. When the data source device determines that the preset condition is met, the data source device requests to establish a connection to the second device. After the second device receives the connection establishing request, the second device establishes a connection with the data source device according to the pairing information.

[0117] Optionally, the second device may detect the preset condition. When the second device determines that the preset condition is met, the second device transmits a connection establishing request to the data source device. The connection establishing request includes the pairing information. The data source device receives the connection establishing request from the second device according to the pairing information, so as to establish a connection between the second device and the data source device.

[0118] According to the communication method provided in the embodiment of the present disclosure, a first device, after obtaining pairing information by pairing with a data source device through an identifier of a device group, transmits the pairing information to at least one second device in the device group to enable the second device to establish a connection with the data source device according to the pairing information. When the second device establishes a connection with the data source device, the second device does not need to pair with the data source device, and the connection with the data source device can be established according to the pairing information, improving the reliability of communication. Since the second device does not need to pair with the data source device when establishing a connection with the data source device, the connection can be realized

without user awareness. This not only improves user experience, but also increases efficiency in establishing a connection, thereby improving the communication efficiency.

[0119] On the basis of any of the foregoing embodiments, the communication method will be described below with reference to [Fig. 5], taking the device group including the first device and the second device as an example.

[0120] [Fig. 5] is a schematic flowchart of another communication method according to an embodiment of the present disclosure. Referring to [Fig. 5], the method may include:

S501, constructing a device group which includes a first device and at least one second device.

[0121] Optionally, the device group may be obtained by pairing and connecting multiple devices (including the first device and the at least one second device) by the manufacturer before leaving the factory, or by a user during use.

[0122] Optionally, in the process of constructing the device group, or after the completion of constructing the device group, the identifier of the device group is generated. A device group may be uniquely identified through the identifier of the device group. The identifier of the device group may be as shown in S301, which will not be repeated here.

[0123] The device group may be constructed by at least the following two feasible implementations.

[0124] One feasible implementation: the device group includes two devices.

[0125] In this feasible implementation, an instruction to construct the device group is input, and the two devices are paired and connected to construct the device group.

[0126] For example, it is assumed that the device group includes a left Bluetooth earbud and a right Bluetooth earbud. When the device group is being constructed, the instruction to construct the device group may be firstly input into the left Bluetooth earbud. For example, a press operation may be performed on a first preset button of the left Bluetooth earbud for inputting the instruction to construct the device group. After the instruction to construct the device group is input, the left Bluetooth earbud and the right Bluetooth earbud may be paired and connected with each other. After the left Bluetooth earbud and the right Bluetooth earbud are successfully paired and connected with each other, the device group is successfully constructed. For example, the left Bluetooth earbud and the right Bluetooth earbud may be paired and connected with each other by pressing preset buttons of the left Bluetooth earbud and the right Bluetooth earbud.

[0127] In another feasible implementation, the device group includes more than two

devices.

[0128] In this feasible implementation, an instruction to construct the device group is input, and two of the devices are paired to join the device group, and then other devices are paired and connected with the devices in the device group to join the device group. After the construction of the device group is completed, an instruction of completing the construction of the device group may also be input.

[0129] For example, it is assumed that the device group includes Bluetooth speaker 1, Bluetooth speaker 2, and Bluetooth speaker 3. When the device group is being constructed, the instruction to construct the device group may be firstly input into Bluetooth speaker 1. For example, a first press operation may be performed on a preset button of Bluetooth speaker 1 for inputting the instruction to construct the device group. After the instruction to construct the device group is input, Bluetooth speaker 1 and Bluetooth speaker 2 may be paired and connected with each other. After Bluetooth speaker 1 and Bluetooth speaker 2 are successfully paired and connected with each other, a device group including Bluetooth speaker 1 and Bluetooth speaker 2 is constructed. Then Bluetooth speaker 3 and the Bluetooth speaker 1 are paired and connected with each other to join Bluetooth speaker 3 into the device group. After the construction of the device group is completed, an instruction of completing the construction of the device group may also be input. For example, a second press operation may be performed on a preset button for inputting the instruction of completing the construction of the device group.

[0130] It should be noted that the foregoing is only an illustrative and non-limiting example of a way for constructing the device group. In an actual application process, the device group may be constructed according to actual needs, which is not specifically limited in the embodiments of the present disclosure.

[0131] S502, the first device is paired with a data source device through an identifier of the device group to obtain pairing information.

[0132] It should be noted that, reference for the execution process of S502 may be made to the execution process of S301, which will not be repeated here.

[0133] S503, the first device establishes a connection with the data source device according to the pairing information.

[0134] Optionally, the first device may request the data source device to establish a connection. For example, the first device may transmit a connection establishing request to the data source device, where the connection establishing request includes the pairing

information. The data source device accepts the connection establishing request from the first device according to the pairing information to realize the connection establishment between the first device and the data source device.

[0135] Optionally, the data source device may request the first device to establish a connection. For example, the data source device may transmit a connection establishing request to the first device. The connection establishing request includes an identifier of the data source device. The first device accepts the connection establishing request from the data source device according to the identifier of the data source device and the pairing information to realize the connection establishment between the first device and the data source device.

[0136] S504, the data source device transmits data to the first device.

[0137] For example, when the first device is a Bluetooth earbud, the data transmitted by the data source device to the first device may be Bluetooth audio data.

[0138] S505, the first device synchronizes the received data with the second device.

[0139] It should be noted that after the connection between the first device and the data source device is established, the data source device may transmit data to the first device, and the first device synchronizes the received data with other devices in the device group.

[0140] Optionally, the first device may synchronize the received data with the second device through multiple feasible implementations.

[0141] One feasible implementation:

a shared memory may be allocated to the devices in the device group, and all devices in the device group can access the shared memory. The first device may store the pairing information in the shared memory, and accordingly, other devices in the device group may read the pairing information from the shared memory.

[0142] In this feasible implementation, the first device may synchronize the received data with at least one second device via the shared memory, so that the first device does not need to transmit the received data to each second device separately, allowing power consumption of the first device to be small.

[0143] Another feasible implementation:

the first device transmits the received data to the second device. The first device may transmit the received data to the second device in a wired manner and/or a wireless manner.

[0144] It should be noted that S404-S405 may be optional steps.

[0145] S506, the first device transmits a notification message to the second device.

[0146] The notification message is used for instructing the second device to update the status to be invisible to a device outside the device group.

[0147] Optionally, the second device is all devices in the device group except the first device. That is, the first device transmits the notification message to all other devices in the device group except the first device.

[0148] S507, the second device updates status to be invisible to a device outside the device group according to the notification message.

[0149] After the second device updates the status to be invisible to a device outside the device group, the data source device cannot discover the second device. In this way, the data source device and the second device can be prevented from being paired and connected with each other.

[0150] Optionally, after the first device is paired with the data source device, the first device may also update the status to be invisible to a device outside the device group.

[0151] S508, the first device synchronizes the pairing information with the at least one second device.

[0152] It should be noted that, reference for the execution process of S508 may be made to the execution process of S302, which will not be repeated here.

[0153] S509, the second device establishes a connection with the data source device according to the pairing information when a preset condition is met.

[0154] It should be noted that, reference for the execution process of S509 may be made to the execution process of S303, which will not be repeated here.

[0155] S510, the data source device transmits data to the second device.

[0156] It should be noted that the embodiments of the present disclosure do not limit the execution order between the above steps. For example, S504-S505, S506-S507, and S508 may be executed sequentially or in parallel.

[0157] In the embodiment shown in [Fig. 5], a first device, after obtaining pairing information by pairing with a data source device through an identifier of a device group, transmits the pairing information to at least one second device in the device group. When a preset condition is met, the second device may establish a connection with the data source device according to the pairing information. When the second device establishes a connection with the data source device, the second device does not need to pair with the data source device, and the connection with the data source device can be established according to the pairing information, improving the reliability of communication. Since the second device

does not need to pair with the data source device when establishing a connection with the data source device, the connection can be realized without user awareness. This not only improves user experience, but also increases efficiency in establishing a connection, thereby improving the communication efficiency.

[0158] The above communication method will be described below in detail with reference to [Fig. 6] through a specific example, in which the first device is a left Bluetooth earbud, the second device is a right Bluetooth earbud, and the data source device is a Bluetooth mobile phone.

[0159] [Fig. 6] is a schematic diagram of a communication process according to an embodiment of the present disclosure. Referring to [Fig. 6], processes 601- 606 are included therein.

[0160] Referring to process 601, the left Bluetooth earbud and the right Bluetooth earbud form a Bluetooth earbud device group by pairing and connecting.

[0161] Referring to process 602, the left Bluetooth earbud may be paired with the Bluetooth mobile phone through the identifier of the device group (the identifier of the Bluetooth earbud device group) to obtain pairing information, and the left Bluetooth earbud and the Bluetooth mobile phone establish a connection through the pairing information.

[0162] Referring to process 603, the left Bluetooth earbud transmits the pairing information obtained by pairing with the Bluetooth mobile phone to the right Bluetooth earbud.

[0163] Referring to process 604, the Bluetooth mobile phone transmits audio data to the left Bluetooth earbud, and the left Bluetooth earbud transmits the audio data to the right Bluetooth earbud.

[0164] Referring to process 605, when the left Bluetooth earbud is malfunctioning, the right Bluetooth earbud and the Bluetooth mobile phone establish a connection through the pairing information.

[0165] Referring to process 606, the Bluetooth mobile phone transmits the audio data to the right Bluetooth earbud.

[0166] In the above processes, the right Bluetooth earbud and the left Bluetooth earbud may be paired and connected with each other to construct the Bluetooth earbud device group. The left Bluetooth earbud is paired with the Bluetooth mobile phone through the identifier of the device group to obtain the pairing information, and the pairing information is transmitted to the right Bluetooth earbud. After the left Bluetooth earbud and the Bluetooth mobile phone

establish a connection through the pairing information, the Bluetooth mobile phone may transmit the audio data to the left Bluetooth earbud, and the left Bluetooth earbud transmits the data to the right Bluetooth earbud. When the left Bluetooth earbud is malfunctioning, the right Bluetooth earbud and the Bluetooth mobile phone may directly establish a connection through the pairing information, so that the Bluetooth mobile phone may transmit the audio data to the right Bluetooth earbud. When the left Bluetooth earbud is malfunctioning, the right Bluetooth earbud may establish a connection with the Bluetooth mobile phone and receive the audio data transmitted by the Bluetooth mobile phone, improving the reliability of communication. When the right Bluetooth earbud establishes a connection with the Bluetooth mobile phone, the connection can be established directly according to the pairing information, and there is no need to pair again, so that the connection can be realized without user awareness. This not only improves user experience, but also increases efficiency in establishing a connection, thereby improving the communication efficiency.

[0167] [Fig. 7] is a schematic structural diagram of a communication apparatus according to an embodiment of the present disclosure. A communication apparatus 10 may be applied to a first device. The communication apparatus 10 includes a processing module 11 and a transceiving module 12.

[0168] The processing module 11 is paired with a data source device according to an identifier of a device group to obtain pairing information, the first device is any device in the device group, and the pairing information is information based on which a connection between a device in the device group and the data source device is established.

[0169] The transceiving module 12 is configured to synchronize the pairing information with at least one second device in the device group.

[0170] The communication apparatus provided in the embodiment of the present disclosure can execute the technical solutions shown in the foregoing method embodiments; and implementation principles and beneficial effects therebetween are similar, and details are not repeated herein.

[0171] In a possible implementation, the pairing information includes a link key.

[0172] In a possible implementation, the processing module 11 is further configured to establish a connection with the data source device according to the pairing information after the processing module 11 is paired with the data source device through the identifier of the device group to obtain the pairing information.

[0173] In a possible implementation, the pairing information is used to enable the second

device to establish a connection with the data source device according to the pairing information; or,

the pairing information is used to enable the second device to establish a connection with the data source device according to the pairing information when a preset condition is met.

[0174] In a possible implementation, the preset condition includes at least one of the following conditions:

a link between the first device and the data source device being malfunctioning;

battery power of the first device being less than a first threshold;

device status of the first device being abnormal; or

signal quality between the first device and the data source device being less than a second threshold.

[0175] In a possible implementation, the transceiving module 12 is specifically configured to:

store the pairing information in a preset storage area accessible to the at least one second device.

[0176] In a possible implementation, the transceiving module 12 is specifically configured to:

transmit the pairing information to the at least one second device.

[0177] In a possible implementation, the at least one second device is a device except the first device in the device group.

[0178] In a possible implementation, the transceiving module 12 is further configured to: after the processing module 11 is paired with the data source device through the identifier of the device group to obtain the pairing information, transmit a notification message to other devices in the device group except the first device, where the notification message is used to update status of the other devices to be invisible to a device outside the device group.

[0179] In a possible implementation, before the processing module 11 is paired with the data source device through the identifier of the device group to obtain the pairing information, status of each device in the device group is visible to a device outside the device group.

[0180] In a possible implementation, an identifier of a device in the device group that is visible to a device outside the device group is the identifier of the device group.

[0181] In a possible implementation, the processing module 11 is further configured to be paired and connected with other devices in the device group to construct the device group

before the processing module 11 is paired with the data source device through the identifier of the device group to obtain the pairing information.

[0182] In a possible implementation, the identifier of the device group is determined according to a preset addressing rule.

[0183] In a possible implementation, the identifier of the device group is same as an identifier of one device in the device group.

[0184] In a possible implementation, the device in the device group is a wireless transceiving device or a wired transceiving device.

[0185] In a possible implementation, the wireless transceiving device is a Bluetooth device.

[0186] In a possible implementation, the Bluetooth device is a Bluetooth audio device.

[0187] In a possible implementation, the Bluetooth audio device is a Bluetooth earbud or a Bluetooth speaker.

[0188] The communication apparatus provided in the embodiment of the present disclosure can execute the technical solutions shown in the foregoing method embodiments; implementation principles and beneficial effects therebetween are similar, and details are not repeated herein.

[0189] [Fig. 8] is a schematic structural diagram of another communication apparatus according to an embodiment of the present disclosure. A communication apparatus 20 may be applied to a second device. The communication apparatus 20 includes a transceiving module 21 and a processing module 22.

[0190] The transceiving module 21 is configured to obtain pairing information synchronized by a first device, the first device and the second device are both devices in a same device group, and the pairing information is generated by pairing the first device with a data source device through an identifier of the device group.

[0191] The processing module 22 is configured to establish a connection with the data source device according to the pairing information.

[0192] The communication apparatus provided in the embodiment of the present disclosure can execute the technical solutions shown in the foregoing method embodiments; implementation principles and beneficial effects therebetween are similar, and details are not repeated herein.

[0193] In a possible implementation, the processing module 22 is specifically configured to establish the connection with the data source device according to the pairing information

when a preset condition is met.

[0194] In a possible implementation, the preset condition includes at least one of the following conditions:

a link between the first device and the data source device being malfunctioning;

battery power of the first device being less than a first threshold;

device status of the first device being abnormal; or

signal quality between the first device and the data source device being less than a second threshold.

[0195] In a possible implementation, the transceiving module 21 is specifically configured to obtain the pairing information in a preset storage area, where the pairing information is stored in the preset storage area by the first device.

[0196] In a possible implementation, the transceiving module 21 is specifically configured to receive the pairing information transmitted by the first device.

[0197] In a possible implementation, the transceiving module 21 is further configured to receive a notification message transmitted by the first device after the transceiving module 21 obtains the pairing information synchronized by the first device.

[0198] The processing module 22 is further configured to update status of the second device to be invisible to a device outside the device group according to the notification message.

[0199] [Fig. 9] is a schematic diagram of a hardware structure of a communication apparatus according to the present disclosure. Referring to [Fig. 9], a communication apparatus 30 includes: a memory 31, a processor 32, and a transceiver 33, where the memory 31 and the processor 32 communicate with each other; for example, the memory 31, the processor 32, and the transceiver 33 may communicate with each other through a communication bus 34; the memory 31 is used to store a computer program, and the processor 32 executes the computer program to implement the above-mentioned communication method. For example, the processor 32 executes related steps executed by the first device in the foregoing method embodiments.

[0200] [Fig. 10] is a schematic diagram of a hardware structure of a communication apparatus according to the present disclosure. Referring to [Fig. 10], a communication apparatus 40 includes: a memory 41, a processor 42, and a transceiver 43, where the memory 41 and the processor 42 communicate with each other; for example, the memory 41, the processor 42 and the transceiver 43 may communicate with each other through a

communication bus 44; the memory 41 is used to store a computer program, and the processor 42 executes the computer program to implement the above-mentioned communication method. For example, the processor 42 executes related steps executed by the second device in the foregoing method embodiments.

[0201] Optionally, the foregoing processor may be a central processing unit (CPU), or other general-purpose processors, digital signal processors (DSP), application specific integrated circuits (ASIC) or the like. The general-purpose processor may be a microprocessor or the processor may also be any conventional processor or the like. The steps in the embodiments of the communication method disclosed in the present disclosure can be directly embodied as being executed by a hardware processor, or executed by a combination of hardware and software modules in the processor.

[0202] An embodiment of the present disclosure also provides a device group, which includes the communication apparatus shown in the embodiment of [Fig. 9] and at least one communication apparatus shown in the embodiment of [Fig. 10]. For example, the device group may include the first device and the at least one second device.

[0203] An embodiment of the present disclosure also provides a communication system, including the above-mentioned device group and data source device, where a device in the device group is configured to pair with the data source device through the identifier of the device group. The device group and the data source device can also establish a connection, transmit and receive data, etc. Reference for the process can be made to the foregoing method embodiments, which will not be repeated here.

[0204] An embodiment of the present disclosure also provides a computer-readable storage medium including a computer program stored thereon, where when the program is executed by a processor, the communication method described in any of the foregoing method embodiments is implemented.

[0205] All or part of the steps in the foregoing method embodiments may be implemented by means of using a program to instruct relevant hardware. The aforementioned program may be stored in a readable memory. When the program is executed, the steps including the foregoing method embodiments are performed; and the foregoing memory (storage medium) includes: a read-only memory (ROM), a RAM, a flash memory, a hard disk, a solid state drive, a magnetic tape, a floppy disk, an optical disc and any combination thereof.

[0206] The embodiments of the present disclosure are described with reference to the

flowcharts and/or block diagrams of the methods, the devices (systems), and computer program products according to the embodiments of the present disclosure. It should be understood that each process and/or block in the flowchart and/or block diagram, and the combination of processes and/or blocks in the flowchart and/or block diagram can be realized by computer program instructions. These computer program instructions can be provided to the processing unit of a general-purpose computer, a special-purpose computer, an embedded processor, or other programmable data processing device to generate a machine, so that an apparatus for implementing a function specified in one process or multiple processes in the flowchart and/or one block or multiple blocks in the block diagram is generated via the instructions executed by the processing unit of the computer or other programmable data processing device.

[0207] These computer program instructions may also be stored in a computer-readable memory that can direct a computer or other programmable data processing device to work in a specific manner, so that the instructions stored in the computer-readable memory produce an article of manufacture including an instruction apparatus. The instruction apparatus implements a function specified in one process or multiple processes in the flowchart and/or one block or multiple blocks in the block diagram.

[0208] These computer program instructions may also be loaded on a computer or other programmable data processing device, so that a series of operation steps are executed on the computer or other programmable device to produce computer-implemented processing, so that instructions executed on the computer or other programmable device provide steps for implementing a function specified in one flow or multiple flows in the flowchart and/or one block or multiple blocks in the block diagram.

[0209] Obviously, those skilled in the art can make various variations and modifications to the embodiments of the present disclosure without departing from the spirit and scope of the present disclosure. In this way, if these modifications and variations to the embodiments of the present disclosure fall within the scope of the claims of the present disclosure and their equivalent technologies, the present disclosure is also intended to include these modifications and variations.

[0210] In the present disclosure, the term “include” and its variations may refer to non-limiting inclusion; the term “or” and its variations may refer to “and/or”. The terms “first”, “second”, etc. in the present disclosure are used to distinguish similar objects, and are not necessarily used to describe a specific sequence or order. In the present disclosure,

"plurality" means two or more. "And/or" describes the association relationship of the associated objects, indicating that there may be three types of relationships, for example, A and/or B, which may mean: A exists alone, A and B exist simultaneously, and B exists alone. The character "/" generally indicates that the associated objects before and after the character are in an "or" relationship.

CLAIMS

[Claim 1] A communication method, comprising:

pairing a first device with a data source device through an identifier of a device group to obtain pairing information, wherein the first device is any device in the device group, and the pairing information is information based on which a connection between a device in the device group and the data source device is established; and

synchronizing, by the first device, the pairing information with at least one second device in the device group.

[Claim 2] The method according to claim 1, wherein the pairing information comprises a link key.

[Claim 3] The method according to claim 1 or 2, wherein after pairing the first device with the data source device through the identifier of the device group to obtain the pairing information, the method further comprises:

establishing a connection between the first device and the data source device according to the pairing information.

[Claim 4] The method according to any one of claims 1 to 3, wherein

the pairing information is used to enable the second device to establish a connection with the data source device according to the pairing information; or,

the pairing information is used to enable the second device to establish a connection with the data source device according to the pairing information when a preset condition is met.

[Claim 5] The method according to claim 4, wherein the preset condition comprises at least one of the following conditions:

a link between the first device and the data source device being malfunctioning;

battery power of the first device being less than a first threshold;

device status of the first device being abnormal; or

signal quality between the first device and the data source device being less than a second threshold.

[Claim 6] The method according to any one of claims 1 to 5, wherein synchronizing, by the first device, the pairing information with the at least one second device in the device group comprises:

storing, by the first device, the pairing information in a preset storage area accessible to

the at least one second device.

[Claim 7] The method according to any one of claims 1 to 5, wherein synchronizing, by the first device, the pairing information with the at least one second device in the device group comprises:

transmitting, by the first device, the pairing information to the at least one second device.

[Claim 8] The method according to any one of claims 1 to 7, wherein the at least one second device is a device except the first device in the device group.

[Claim 9] The method according to any one of claims 1 to 8, wherein after pairing the first device with the data source device through the identifier of the device group to obtain the pairing information, the method further comprises:

transmitting, by the first device, a notification message to other devices in the device group except the first device, wherein the notification message is used to update status of the other devices to be invisible to a device outside the device group.

[Claim 10] The method according to claim 9, wherein before pairing the first device with the data source device through the identifier of the device group to obtain the pairing information, status of each device in the device group is visible to a device outside the device group.

[Claim 11] The method according to claim 9 or 10, wherein an identifier of a device in the device group that is visible to a device outside the device group is the identifier of the device group.

[Claim 12] The method according to any one of claims 1 to 11, wherein before pairing the first device with the data source device through the identifier of the device group to obtain the pairing information, the method further comprises:

pairing and connecting the first device with other devices in the device group to construct the device group.

[Claim 13] The method according to any one of claims 1 to 12, wherein the identifier of the device group is determined according to a preset addressing rule.

[Claim 14] The method according to any one of claims 1 to 12, wherein the identifier of the device group is same as an identifier of one device in the device group.

[Claim 15] The method according to any one of claims 1 to 14, wherein the device in the device group is a wireless transceiving device or a wired transceiving device.

[Claim 16] The method according to claim 15, wherein the wireless transceiving device

is a Bluetooth device.

[Claim 17] The method according to claim 16, wherein the Bluetooth device is a Bluetooth audio device.

[Claim 18] The method according to claim 17, wherein the Bluetooth audio device is a Bluetooth earbud or a Bluetooth speaker.

[Claim 19] A communication method, comprising:

obtaining, by a second device, pairing information synchronized by a first device, wherein the first device and the second device are both devices in a same device group, and the pairing information is generated by pairing the first device with a data source device through an identifier of the device group; and

establishing a connection between the second device and the data source device according to the pairing information.

[Claim 20] The method according to claim 19, wherein establishing the connection between the second device and the data source device according to the pairing information comprises:

establishing the connection between the second device and the data source device according to the pairing information, when a preset condition is met.

[Claim 21] The method according to claim 20, wherein the preset condition comprises at least one of the following conditions:

a link between the first device and the data source device being malfunctioning;

battery power of the first device being less than a first threshold;

device status of the first device being abnormal; or

signal quality between the first device and the data source device being less than a second threshold.

[Claim 22] The method according to any one of claims 19 to 21, wherein obtaining, by the second device, the pairing information synchronized by the first device comprises:

obtaining, by the second device, the pairing information in a preset storage area, wherein the pairing information is stored in the preset storage area by the first device.

[Claim 23] The method according to any one of claims 19 to 21, wherein obtaining, by the second device, the pairing information synchronized by the first device comprises:

receiving, by the second device, the pairing information transmitted by the first device.

[Claim 24] The method according to claims 19 to 23, wherein after obtaining, by the second device, the pairing information synchronized by the first device, the method further

comprises:

receiving, by the second device, a notification message transmitted by the first device; and

updating, by the second device, status of the second device to be invisible to a device outside the device group according to the notification message.

[Claim 25] A communication apparatus, applied to a first device, comprising a processing module and a transceiving module, wherein

the processing module is paired with a data source device through an identifier of a device group to obtain pairing information, the first device is any device in the device group, and the pairing information is information based on which a connection between a device in the device group and the data source device is established; and

the transceiving module is configured to synchronize the pairing information with at least one second device in the device group.

[Claim 26] The apparatus according to claim 25, wherein the pairing information comprises a link key.

[Claim 27] The apparatus according to claim 25 or 26, wherein

the processing module is further configured to establish a connection with the data source device according to the pairing information after the processing module is paired with the data source device through the identifier of the device group to obtain the pairing information.

[Claim 28] The apparatus according to any one of claims 25 to 27, wherein

the pairing information is used to enable the second device to establish a connection with the data source device according to the pairing information; or,

the pairing information is used to enable the second device to establish a connection with the data source device according to the pairing information when a preset condition is met.

[Claim 29] The apparatus according to claim 28, wherein the preset condition comprises at least one of the following conditions:

a link between the first device and the data source device being malfunctioning;

battery power of the first device being less than a first threshold;

device status of the first device being abnormal; or

signal quality between the first device and the data source device being less than a second threshold.

[Claim 30] The apparatus according to any one of claims 25 to 29, wherein the transceiving module is specifically configured to:

store the pairing information in a preset storage area accessible to the at least one second device.

[Claim 31] The apparatus according to any one of claims 25 to 29, wherein the transceiving module is specifically configured to:

transmit the pairing information to the at least one second device.

[Claim 32] The apparatus according to any one of claims 25 to 31, wherein the at least one second device is a device except the first device in the device group.

[Claim 33] The apparatus according to any one of claims 25 to 32, wherein

the transceiving module is further configured to: after the processing module is paired with the data source device through the identifier of the device group to obtain the pairing information, transmit a notification message to other devices in the device group except the first device, wherein the notification message is used to update status of the other devices to be invisible to a device outside the device group.

[Claim 34] The apparatus according to claim 33, wherein before the processing module is paired with the data source device through the identifier of the device group to obtain the pairing information, status of each device in the device group is visible to a device outside the device group.

[Claim 35] The apparatus according to claim 33 or 34, wherein an identifier of a device in the device group that is visible to a device outside the device group is the identifier of the device group.

[Claim 36] The apparatus according to any one of claims 25 to 35, wherein

the processing module is further configured to be paired and connected with other devices in the device group to construct the device group before the processing module is paired with the data source device through the identifier of the device group to obtain the pairing information.

[Claim 37] The apparatus according to any one of claims 25 to 36, wherein the identifier of the device group is determined according to a preset addressing rule.

[Claim 38] The apparatus according to any one of claims 25 to 36, wherein the identifier of the device group is same as an identifier of one device in the device group.

[Claim 39] The apparatus according to any one of claims 25 to 38, wherein the device in the device group is a wireless transceiving device or a wired transceiving device.

[Claim 40] The apparatus according to claim 39, wherein the wireless transceiving device is a Bluetooth device.

[Claim 41] The apparatus according to claim 40, wherein the Bluetooth device is a Bluetooth audio device.

[Claim 42] The apparatus according to claim 41, wherein the Bluetooth audio device is a Bluetooth earbud or a Bluetooth speaker.

[Claim 43] A communication apparatus, applied to a second device, comprising a processing module and a transceiving module, wherein

the transceiving module is configured to obtain pairing information synchronized by a first device, the first device and the second device are both devices in a same device group, and the pairing information is generated by pairing the first device with a data source device through an identifier of the device group; and

the processing module is configured to establish a connection with the data source device according to the pairing information.

[Claim 44] The apparatus according to claim 43, wherein

the processing module is specifically configured to establish the connection with the data source device according to the pairing information when a preset condition is met.

[Claim 45] The apparatus according to claim 44, wherein the preset condition comprises at least one of the following conditions:

a link between the first device and the data source device being malfunctioning;

battery power of the first device being less than a first threshold;

device status of the first device being abnormal; or

signal quality between the first device and the data source device being less than a second threshold.

[Claim 46] The apparatus according to any one of claims 43 to 45, wherein the transceiving module is specifically configured to obtain the pairing information in a preset storage area, wherein the pairing information is stored by the first device in the preset storage area.

[Claim 47] The apparatus according to any one of claims 43 to 45, wherein the transceiving module is specifically configured to receive the pairing information transmitted by the first device.

[Claim 48] The apparatus according to claims 43 to 47, wherein

the transceiving module is further configured to receive a notification message

transmitted by the first device after the transceiving module obtains the pairing information synchronized by the first device; and

the processing module is further configured to update status of the second device to be invisible to a device outside the device group according to the notification message.

[Claim 49] A communication apparatus, comprising a memory and a processor, wherein the processor executes program instructions in the memory to implement the communication method according to any one of claims 1 to 18.

[Claim 50] A communication apparatus, comprising a memory and a processor, wherein the processor executes program instructions in the memory to implement the communication method according to any one of claims 19 to 24.

[Claim 51] A device group, comprising the communication apparatus according to claim 49 and at least one communication apparatus according to claim 50.

[Claim 52] A communication system, comprising the device group according to claim 51 and a data source device, wherein a device in the device group is configured to be paired with the data source device through the identifier of the device group.

[Claim 53] A computer-readable storage medium comprising a computer program stored thereon, where when the program is executed by a processor, the communication method according to any one of claims 1 to 24 is implemented.