Notice

DESCRIPTION CN110958475A

A cross-device content projection method and electronic device

[0001]

Technical Field

[0002]

The present application relates to the field of terminals, and in particular to a cross-device content projection method and an electronic device.

[0003]

Background Art

[0004]

With the development of smart terminal technology, a user or a family often has multiple electronic devices, and the user often needs to switch between the multiple electronic devices.
For example, a user watches a video on a mobile phone and may want to switch the video to the TV to continue watching after returning home.
For another example, a user may use a laptop computer to work at home, and when the user leaves home, he or she may want to switch files in the laptop computer to a mobile phone to continue working.

[0005]

In this cross-device interaction scenario, users are usually required to manually project content from one device to another or more devices.
For example, users can connect mobile phones, smart TVs, speakers and other electronic devices to the same Wi-Fi network. When users need to project content in their mobile phones to other electronic devices, they can use the screen projection function in their mobile phones or screen projection software to search for multiple electronic devices in the current Wi-Fi network.
Furthermore, the user may select a target device to receive the projection content this time from among the multiple electronic devices searched. In this way, the mobile phone can project pictures, videos, audio and other content to the target device through the Wi-Fi network. Obviously, this process of switching projection content between multiple devices is time-consuming and cumbersome, and the user experience is not good.

[0006]

Summary of the invention

[0007]

The present application provides a cross-device content projection method and an electronic device, whereby the electronic device can conveniently and quickly project the projection content to multiple other electronic devices for playback, thereby improving the collaborative work efficiency between multiple devices during content projection.

[0008]

In order to achieve the above purpose, this application adopts the following technical solutions:

[0009]

In a first aspect, the present application provides a cross-device content projection method, including: a first electronic device starts playing a first content, for example, the first content may include display content and/or audio content; then, when the distance between the first electronic device and the NFC tag is close enough, the first electronic device can obtain N (N is an integer greater than 1) second electronic devices bound to the NFC tag from the NFC tag; in this way, the first electronic device can project the first content to at least one of the N second electronic devices according to a preset projection strategy to continue playing.

[0010]

That is to say, by reading the second electronic device bound to the NFC tag, the first electronic device can easily and quickly determine the multiple target devices for this content projection, and automatically start projecting the projection content to the multiple target devices, which simplifies the user's operation process when projecting content across devices, improves and enriches the user's experience, and at the same time improves the work efficiency of collaboration between multiple devices during content projection.

[0011]

The first content projected by the first electronic device to the second electronic device may include part or all of the display content currently displayed in the display interface of the first electronic device.
For example, the first electronic device may project all displayed content in the first interface (eg, desktop) being displayed as first content to the second electronic device.
For another example, the first electronic device may project an image in a video in a playback interface being displayed as the first content to the second electronic device.

[0012]

Alternatively, the first content projected by the first electronic device to the second electronic device may also include audio content being played by the first electronic device, such as music being played by the first electronic device or audio being played in synchronization with a video.
Of course, after the first electronic device projects the first content to the second electronic device, if the first electronic device starts playing other content (such as the second content) in response to a user operation, the first electronic device can continue to project the second content to the second electronic device for playback.

[0013]

In one possible implementation, a first electronic device obtains N second electronic devices bound to an NFC tag from an NFC tag, including: in response to a tap operation in which the first electronic device approaches or contacts the NFC tag, the first electronic device reads the identifiers of the N second electronic devices stored in the NFC tag to determine the N second electronic devices bound to the NFC tag; or, after the first electronic device detects an NFC signal from the NFC tag using an NFC chip of the first electronic device, the first electronic device reads the identifiers of the N second electronic devices stored in the NFC tag through the NFC signal to determine the N second electronic devices bound to the NFC tag.

[0014]

That is to say, the user can trigger the first electronic device to read the identifier of the second electronic device stored in the NFC tag through the NFC function by approaching or touching the NFC tag, thereby determining the N second electronic devices that are projecting content with the first electronic device this time.

[0015]

In a possible implementation, the first electronic device projects the first content to at least one of the N second electronic devices for continued playback according to a preset projection strategy, including: the first electronic device sends the first content to at least one of the N second electronic devices for playback according to a preset projection strategy. That is to say, the first electronic device can be used as the main device for content projection this time to control the second electronic device to project the content.

[0016]

Exemplarily, the N second electronic devices may include a first speaker and a second speaker; wherein the first electronic device sends the first content to at least one of the N second electronic devices for playback according to a preset projection strategy, including: the first electronic device sends the first content to the first speaker for playback, and the first speaker is the speaker closest to the first electronic device; or, the first electronic device sends the first content to the first speaker and the second speaker for playback.

[0017]

For example, the first electronic device may compare the distance between itself and the first speaker and the second speaker.
If the distance between the first speaker and the first electronic device is less than a preset value, and the distance between the second speaker and the first electronic device is greater than a preset value, it means that the first speaker is closer to the first electronic device and the second speaker is farther away from the first electronic device. In this case, the first electronic device can send the first content to the first speaker for playback to complete the content projection.

[0018]

For another example, if the distance between the first speaker and the first electronic device is less than a preset value, and the distance between the second speaker and the first

electronic device is also less than the preset value, it means that the first speaker and the second speaker are very close to the first electronic device. The first electronic device can send the first content to both the first speaker and the second speaker, thereby projecting the first content to the first speaker and the second speaker for playback.
Of course, the first electronic device may also determine, based on the stored projection strategy, to which specific device or devices the first content is to be sent for playback, and the embodiment of the present application does not impose any limitation on this.

[0019]

In one possible implementation, the first electronic device sends the first content to the first speaker and the second speaker for playback, including: the first electronic device sends the first audio component in the first content to the first speaker for playback; and the first electronic device sends the second audio component in the first content to the second speaker for playback.
Of course, if the N second electronic devices further include a third speaker, the mobile phone can send the third audio component in the first content to the third speaker for playback.
That is to say, the first electronic device can send the corresponding audio component in the projected content to each speaker, so that multiple speakers play the received audio components respectively to achieve stereo or surround sound playback effects.

[0020]

In one possible implementation, the N second electronic devices may include a speaker (there may be one or more speakers) and a television (there may be one or more televisions); wherein the first electronic device sends the first content to at least one of the N second electronic devices for playback according to a preset projection strategy, including: the first electronic device may send the display content (such as an image or video) in the first content to the television for playback; and the first electronic device sends the audio content in the first content to the speaker for playback; or, the first electronic device may send the display content in the first content to the television for playback; and the first electronic device sends the audio content in the first content to the television and the speaker for playback.

[0021]

In a possible implementation, after the first electronic device obtains N second electronic devices bound to the NFC tag from the NFC tag, it also includes: the first electronic device

determines a master device among the N second electronic devices; wherein the first electronic device projects the first content to at least one second electronic device among the N second electronic devices according to a preset projection strategy for continued playback, including: the first electronic device sends the first content to the master device, so that the master device controls at least one second electronic device among the N second electronic devices to play the first content according to the preset projection strategy.
That is to say, the first electronic device may determine a master device among the N second electronic devices, and the master device controls the N second electronic devices to realize the current content projection.

[0022]

Exemplarily, the N second electronic devices mentioned above may include a television and a lamp; wherein the first electronic device determines the main device among the N second electronic devices, including: the first electronic device determines the television as the main device among the N second electronic devices mentioned above; at this time, the preset projection control strategy may include: the television plays the display content and audio content in the first content, and the television sends control instructions to the lamp according to the first content to control the brightness or color of the lamp to achieve different lamp effects.

[0023]

In a possible implementation manner, after the first electronic device determines the master device among the N second electronic devices, the method further includes: the first electronic device sending the stored projection strategy to the master device.
Of course, the main device can also obtain the above projection strategy from other electronic devices or servers.

[0024]

In a possible implementation, before the first electronic device projects the first content to at least one of N second electronic devices according to a preset projection strategy for continued playback, the process further includes: the first electronic device performs time synchronization with the N second electronic devices; wherein the first content sent by the first electronic device carries a timestamp, and the timestamp is used to indicate the playback progress of the first content.
Since the time of each device is synchronized after the first electronic device is synchronized with the N second electronic devices, when the second electronic device plays the projected

content according to the timestamp in the first content, the playback progress of each second electronic device can be guaranteed to be the same.

[0025]

In a possible implementation, after the first electronic device obtains N second electronic devices bound to the NFC tag from the NFC tag, the method further includes: the first electronic device receives projection strategies input by a user for the N second electronic devices.
That is to say, the user can manually set corresponding projection strategies for multiple devices participating in content projection during the content projection process.

[0026]

In a second aspect, the present application provides a cross-device content projection method, including: a first electronic device displays a binding interface of an NFC tag, the binding interface including a list of candidate devices waiting to be bound to the NFC tag, the candidate devices in the candidate device list and the first electronic device being located in the same communication network; if the first electronic device detects a first operation of a user selecting M (M is an integer greater than 0) second electronic devices in the above-mentioned candidate device list, then in response to the first operation, the first electronic device may prompt the user to bring the first electronic device close to or into contact with the above-mentioned NFC tag, so that the first electronic device can write the identifications of the above-mentioned M second electronic devices into the NFC tag to establish a binding relationship between the NFC tag and the M second electronic devices.

[0027]

In this way, when the first electronic device needs to perform content projection later, it can determine one or more second electronic devices bound to the NFC tag, that is, the target devices for content projection, by reading the identifier of the bound device in the NFC tag.

[0028]

In one possible implementation, the first electronic device displays the binding interface of the NFC tag, including: the first electronic device reads a preset flag bit in the NFC tag; if the value in the flag bit is a first preset value, it means that the NFC tag has not been bound to any electronic device, and the first electronic device can open a preset projection application to display the binding interface of the NFC tag.

[0029]

In a possible implementation, after the first electronic device writes the identifiers of the M second electronic devices into the NFC tag, the process further includes: the first electronic device modifies the value of the flag bit from a first preset value to a second preset value, thereby indicating that the NFC tag has been bound to one or more electronic devices.

[0030]

In a possible implementation, after the first electronic device writes the identifiers of the M second electronic devices into the NFC tag, it also includes: the first electronic device displays a setting interface for the projection strategy; the first electronic device receives the projection strategy input by the user for the M second electronic devices in the setting interface, and saves the projection strategy.
That is, after the first electronic device establishes the corresponding binding relationship in the NFC tag, the user can continue to set the projection strategy of the M second electronic devices bound to the NFC tag when performing content projection in the projection application.

[0031]

For example, when M=1, the projection strategy may include a correspondence between different NFC operations and projection instructions.
For example, touching the NFC tag once corresponds to projection instruction 1; touching the NFC tag twice corresponds to projection instruction 2.

[0032]

For another example, when M>1, the projection strategy may include content projection rules set for each second electronic device.
For example, the M second electronic devices include a television, a speaker, and a lamp, and the user can set specific projection rules for projecting to the television, the speaker, and the lamp respectively in the setting interface.

[0033]

Exemplarily, when the M second electronic devices include a first speaker and a second speaker, the projection strategy may be: using the speaker closest to the source device to

play the projection content, or the projection strategy may be: using the first speaker to play the first audio component in the projection content and using the second speaker to play the second audio component in the projection content;

[0034]

For another example, when the M second electronic devices include a television and a speaker, the projection strategy may be: using the television to play the display content in the projection content, and using the speaker to play the audio content in the projection content; or using the television to play the display content in the projection content, and using the speaker and the television to play the audio content in the projection content;

[0035]

For another example, when the M second electronic devices include a television and a lamp, the projection strategy is: using the television to play the projection content, and the television to control the lighting effect of the lamp.

[0036]

In a possible implementation, after the first electronic device writes the identifiers of the M second electronic devices into the NFC tag, the method further includes: the first electronic device sends the binding relationship between the NFC tag and the M second electronic devices to other electronic devices or a server.
In this way, the first electronic device can share the binding relationship with other electronic devices for use, or the user can also obtain the binding relationship when logging into the server using other electronic devices.

[0037]

Exemplarily, the candidate devices in the candidate device list and the first electronic device may be located in the same Wi-Fi network, or the candidate devices in the candidate device list and the first electronic device may be bound to the same account.

[0038]

Exemplarily, the first electronic device writes the identifier of the second electronic device into the NFC tag, including: in response to a tap operation in which the first electronic device approaches or contacts the NFC tag, the first electronic device writes the identifier of the

second electronic device into the NFC tag; or, after the first electronic device detects an NFC signal from the NFC tag using its NFC chip, the first electronic device may write the identifier of the second electronic device into the NFC tag.
That is, the user can trigger the first electronic device to write the identifier of the second electronic device into the NFC tag by approaching or touching the NFC tag.

[0039]

Similarly, the first electronic device reads a preset flag bit in the NFC tag, including: in response to a tap operation in which the first electronic device approaches or contacts the NFC tag, the first electronic device can read the preset flag bit in the NFC tag; or, after the first electronic device uses its NFC chip to detect an NFC signal from the NFC tag, it can read the preset flag bit in the NFC tag.
That is to say, the user can trigger the first electronic device to read the preset flag bit in the NFC tag by approaching or touching the NFC tag.

[0040]

In a third aspect, the present application provides a content projection system, comprising a first electronic device, N second electronic devices and an NFC tag, where N is an integer greater than 1; the NFC tag stores a binding relationship between the NFC tag and the above-mentioned N second electronic devices; wherein the first electronic device is used to execute any of the above-mentioned cross-device content projection methods.

[0041]

In a possible implementation, the N second electronic devices include a master device, wherein the master device is used to: receive first content sent by a first electronic device; and control at least one second electronic device among the N second electronic devices to play the first content according to a preset projection strategy.
Alternatively, the first electronic device may serve as a master device and control at least one of the N second electronic devices to play the first content according to a preset projection strategy.

[0042]

In a fourth aspect, the present application provides an electronic device, comprising: a touch screen, a communication interface, one or more processors, a memory, and one or more computer programs; wherein the processor is coupled to the touch screen, the communication interface, and the memory, and the one or more computer programs are

stored in the memory, and when the electronic device is running, the processor executes the one or more computer programs stored in the memory so that the electronic device executes any of the cross-device content projection methods described above.

[0043]

In a fifth aspect, the present application provides a computer storage medium, including computer instructions, which, when executed on an electronic device, enables the electronic device to execute any one of the above-described cross-device content projection methods.

[0044]

In a sixth aspect, the present application provides a computer program product, which, when executed on an electronic device, enables the electronic device to execute any one of the above-described cross-device content projection methods.

[0045]

It can be understood that the content projection system described in the third aspect, the electronic device described in the fourth aspect, the computer-readable storage medium described in the fifth aspect, and the computer program product described in the sixth aspect are all used to execute the corresponding methods provided above. Therefore, the beneficial effects that can be achieved can refer to the beneficial effects in the corresponding methods provided above, and will not be repeated here.

[0046]

BRIEF DESCRIPTION OF THE DRAWINGS

[0047]

FIG1 is a schematic diagram of an architecture of a content projection system provided by an embodiment of the present application;

[0048]

FIG. 2 is a second schematic diagram of the architecture of a content projection system provided by an embodiment of the present application;

[0049]

FIG3 is a third schematic diagram of the architecture of a content projection system provided by an embodiment of the present application;

[0050]

FIG4 is a fourth schematic diagram of the architecture of a content projection system provided in an embodiment of the present application;

[0051]

FIG5 is a first structural diagram of an electronic device provided in an embodiment of the present application;

[0052]

FIG6 is a schematic diagram of the architecture of an operating system in an electronic device provided in an embodiment of the present application;

[0053]

FIG. 7 is a schematic diagram of an application scenario of a cross-device content projection method provided by an embodiment of the present application;

[0054]

FIG8 is a flowchart diagram 1 of a cross-device content projection method provided by an embodiment of the present application;

[0055]

FIG9 is a second schematic diagram of an application scenario of a cross-device content projection method provided by an embodiment of the present application;

[0056]

FIG10 is a third schematic diagram of an application scenario of a cross-device content projection method provided by an embodiment of the present application;

[0057]

FIG. 11 is a fourth schematic diagram of an application scenario of a cross-device content projection method provided by an embodiment of the present application;

[0058]

FIG12 is a fifth schematic diagram of an application scenario of a cross-device content projection method provided by an embodiment of the present application;

[0059]

FIG13 is a sixth schematic diagram of an application scenario of a cross-device content projection method provided by an embodiment of the present application;

[0060]

FIG. 14 is a seventh schematic diagram of an application scenario of a cross-device content projection method provided by an embodiment of the present application;

[0061]

FIG15 is a schematic diagram of an application scenario eight of a cross-device content projection method provided by an embodiment of the present application;

[0062]

FIG. 16 is a second flow chart of a cross-device content projection method provided in an embodiment of the present application;

[0063]

FIG. 17 is a ninth schematic diagram of an application scenario of a cross-device content projection method provided by an embodiment of the present application;

[0064]

FIG. 18 is a schematic diagram of an application scenario of a cross-device content projection method provided by an embodiment of the present application;

[0065]

FIG. 19 is a schematic diagram eleven of an application scenario of a cross-device content projection method provided by an embodiment of the present application;

[0066]

FIG. 20 is a schematic diagram twelfth of an application scenario of a cross-device content projection method provided by an embodiment of the present application;

[0067]

FIG. 21 is a schematic diagram thirteen of an application scenario of a cross-device content projection method provided by an embodiment of the present application;

[0068]

FIG. 22 is a second structural schematic diagram of an electronic device provided in an embodiment of the present application.

[0069]

DETAILED DESCRIPTION

[0070]

The implementation of this embodiment will be described in detail below with reference to the accompanying drawings.

[0071]

A cross-device content projection method provided in an embodiment of the present application may be applied to a communication system (also referred to as a content projection system) 100 shown in FIG. 1 .
As shown in FIG. 1 , the communication system 100 may include N (N is an integer greater than 1) electronic devices.
These N electronic devices can be interconnected via a communication network.

[0072]

Exemplarily, the above communication network may be a wired network or a wireless network.
For example, the communication network may be a local area network (LAN) or a wide area network (WAN), such as the Internet.
The above-mentioned communication network can be implemented using any known network communication protocol, and the above-mentioned network communication protocol can be various wired or wireless communication protocols, such as Ethernet, universal serial bus (USB), FIREWIRE, global system for mobile communications (GSM),

general packet radio service (GPRS), code division multiple access (CDMA), wideband code division multiple access (WCDMA), time division code division multiple access (TD-SCDMA), long term evolution (LTE), Bluetooth, wireless fidelity (Wi-Fi), NFC, voice over Internet protocol (VoIP), communication protocols supporting network slicing architecture or any other suitable communication protocols.

[0073]

For example, in some embodiments, a Wi-Fi connection may be established between various electronic devices in the communication system 100 via a Wi-Fi protocol.
In other embodiments, each electronic device in the communication system 100 can be interconnected through one or more servers after logging into the same account (such as a Huawei account).

[0074]

Exemplarily, the communication system 100 may include a first electronic device 101 and a second electronic device 102 .
For example, as shown in (a) of FIG. 2 , the first electronic device 101 may serve as a source device, and the second electronic device 102 may serve as a target device of the first electronic device 101 .
The electronic device 101 may project the displayed or played content to the second electronic device 102 .
In subsequent embodiments, the specific content projected from one electronic device to another electronic device may be referred to as projected content. For example, the projected content may include text, pictures, videos, audio, animations, lighting effects, or web pages.
For example, an electronic device may send projection content such as text, pictures, videos, audio, animations or web pages to another electronic device for display or playback; alternatively, an electronic device may send light control instructions as projection content to another electronic device, thereby controlling the light to produce corresponding lighting effects.

[0075]

In some embodiments, the first electronic device 101 may have multiple target devices.
For example, the communication system 100 may further include a third electronic device 103 in addition to the first electronic device 101 and the second electronic device 102 .

As shown in (b) of FIG. 2 , when the first electronic device 101 is a source device, the second electronic device 102 and the third electronic device 103 can both serve as target devices of the first electronic device 101 to receive the projection content sent by the first electronic device 101 .
In this way, the first electronic device 101 can simultaneously project the projection content to multiple electronic devices for display or playback.
For example, a mobile phone can cast its audio files to multiple speakers at the same time.
For another example, the mobile phone can project the displayed video screen to the TV for display, and at the same time project the audio content corresponding to the video screen to the speaker for playback.

[0076]

That is, the source device in the communication system 100 can project the projection content to one or more target devices, thereby achieving cross-device interaction when content is projected between multiple devices.

[0077]

In the embodiment of the present application, an electronic tag bound to one or more electronic devices may also be provided in the communication system 100, which may also be referred to as a radio frequency tag or RFID (radio frequency identification) tag.
Electronic devices can read the information stored in electronic tags by sending radio frequency signals.

[0078]

To facilitate understanding by those skilled in the art, the working principle of the electronic tag is introduced in the embodiment of the present application.

[0079]

Exemplarily, the electronic tag may include three implementation forms, namely: a passive tag, a semi-active tag and an active tag.
In the embodiment of the present application, the electronic tag may be any one of a passive tag, a semi-active tag or an active tag.

[0080]

(1) Passive tag: When the electronic tag is a passive tag, there is no internal power supply in the electronic tag.

When the electronic tag is close to the NFC (near field communication) chip of other devices, it can receive the electromagnetic wave information sent by the NFC chip of other devices. At this time, the internal integrated circuit (IC) of the electronic tag is driven by the received electromagnetic wave signal.
When the electronic tag receives an electromagnetic wave signal of sufficient strength, it can send the data stored in the electronic tag to the NFC chip of other devices, such as the device information of the above-mentioned laptop.

[0081]

(2) Semi-active tags: The working mode of semi-active tags is similar to that of passive tags. When the electronic tag is a semi-active tag, the electronic tag includes a small battery, and the power of the small battery is sufficient to drive the internal IC of the electronic tag so that the IC is in a working state.
Since the semi-active tag includes the small battery mentioned above, the semi-active tag has a faster response speed than the passive tag.

[0082]

(3) Active tag: When the electronic tag is an active tag, it includes an internal power supply to supply the power required by the internal IC to generate external signals.
Generally speaking, active tags allow radio frequency communication over longer distances, and active tags have larger storage space that can be used to store data transmitted from NFC chips of other devices.

[0083]

As shown in FIG. 3 , the electronic tag may specifically be an NFC tag 301 implemented using NFC technology (the NFC tag may also be referred to as an NFC patch).
When the NFC chip in an electronic device (such as a mobile phone) is in contact with or close to the NFC tag 301, the NFC chip in the mobile phone can detect the NFC signal emitted by the NFC tag 301, and then read the information stored in the NFC tag 301 through the NFC signal.
That is, the mobile phone can respond to a tap operation of approaching or contacting the NFC tag 301 and obtain the information stored in the NFC tag 301 from the NFC tag 301 .

[0084]

Exemplarily, the NFC tag 301 is generally provided with a coil, and the binding relationship between the NFC tag 301 and one or more electronic devices can be stored through the coil.

An electronic device can be bound to one or more NFC tags 301 .
For example, each NFC tag 301 uniquely corresponds to an NFC card number, so the NFC card number and the identifier of the electronic device A can be written into the coil of the NFC tag 301 in advance, thereby establishing a binding relationship between the NFC tag 301 and the electronic device A in the NFC tag 301 .

[0085]

It is understandable that the binding relationship stored in the NFC tag 301 can be pre-set when the NFC tag 301 leaves the factory, or can be manually set by the user when using (for example, using for the first time) the NFC tag 301, and the embodiment of the present application does not impose any limitation on this.

[0086]

Taking the example of binding the NFC tag 301 with the TV (also called a smart TV) in the communication system 100, as shown in Figure 3, when the user needs to project the content displayed or played in the source device (such as a mobile phone) as projection content to the smart TV (i.e., the target device), the user can turn on the NFC function of the mobile phone and approach or touch the NFC tag 301.
When the distance between the mobile phone and the NFC tag 301 is close enough, the mobile phone can read the binding relationship between the NFC tag 301 and the smart TV from the NFC tag 301 by transmitting a near field signal.
For example, the mobile phone can read the identification of the smart TV from the NFC tag 301 .
The identifier may be a MAC (media access control) address, a device name, or an IP address of the smart TV.

[0087]

That is to say, the mobile phone can determine that the target device for content projection this time is the smart TV by reading the above binding relationship.
Then, the mobile phone, as a source device, can start sending the projection content to the smart TV according to the read identifier of the smart TV, so that the smart TV can display or play the projection content as a target device, completing the content projection process.

[0088]

The above-mentioned TV (or smart TV) may be an analog TV that works using analog signals, or a digital TV that works using digital signals, or any display output device that can play images, audio or video.
In some scenarios, the above-mentioned TV (or smart TV) may also be referred to as a smart screen or a large-screen device.

[0089]

In some embodiments, the NFC tag 301 may record the binding relationship between the NFC tag 301 and multiple electronic devices.
For example, the NFC tag 301 can be bound to both a smart TV and a speaker (also referred to as a smart speaker).
Then, as shown in FIG. 4 , when the user turns on the NFC function of the mobile phone and approaches or touches the NFC tag 301 , the logos of the smart TV and the smart speaker can be read, indicating that the user wants to project the content in the mobile phone to the smart TV and the smart speaker this time.
Furthermore, the mobile phone can project the display content in the projection content to the smart TV for display according to the preset strategy, and project the audio content in the projection content to the smart speaker for playback, thereby completing the content projection process.

[0090]

It can be seen that by using the method of "touching" the source device with the NFC tag, the source device can easily and quickly determine the target device for this content projection, and then automatically start projecting the projection content to the target device, which simplifies the user's operation process when projecting content across devices, improves and enriches the user's experience, and at the same time improves the work efficiency of collaboration between multiple devices during content projection.

[0091]

Exemplarily, the electronic device in the above-mentioned communication system 100 can be a mobile phone, a tablet computer, a television, a laptop computer, a smart home device, a wearable electronic device, a vehicle-mounted device, a virtual reality device, etc., and the embodiments of the present application do not impose any restrictions on this.
Among them, smart home devices can specifically be: TV, speakers, air conditioners (also called smart air conditioners), refrigerators (also called smart refrigerators), lights (also called smart lights or smart bulbs) or curtains (also called smart curtains), etc.

[0092]

Taking a mobile phone as an example of the above electronic device, FIG5 shows a schematic structural diagram of the mobile phone.

[0093]

The mobile phone may include a processor 110, an external memory interface 120, an internal memory 121, a universal serial bus (USB) interface 130, an antenna 1, an antenna 2, a mobile communication module 150, a wireless communication module 160, an audio module 170, a speaker 170A, a receiver 170B, a microphone 170C, an earphone interface 170D, a sensor module 180, etc.

[0094]

It is understandable that the structure illustrated in the embodiment of the present invention does not constitute a specific limitation on the mobile phone.
In other embodiments of the present application, the mobile phone may include more or fewer components than those shown in the figure, or combine some components, or separate some components, or arrange the components differently.
The components shown in the figures may be implemented in hardware, software or a combination of software and hardware.

[0095]

The processor 110 may include one or more processing units. For example, the processor 110 may include an application processor (AP), a modem processor, a graphics processor (GPU), an image signal processor (ISP), a controller, a memory, a video codec, a digital signal processor (DSP), a baseband processor, and/or a neural-network processing unit (NPU), etc. Among them, different processing units can be independent devices or integrated into one or more processors.

[0096]

The processor 110 may also be provided with a memory for storing instructions and data.
In some embodiments, the memory in processor 110 is a cache memory.
The memory may store instructions or data that the processor 110 has just used or is recycling.
If the processor 110 needs to use the instruction or data again, it can be directly called from the memory.

Repeated access is avoided, the waiting time of the processor 110 is reduced, and the efficiency of the system is improved.

[0097]

In some embodiments, processor 110 may include one or more interfaces.
The interface may include an inter-integrated circuit (I2C) interface, an inter-integrated circuit sound (I2S) interface, a pulse code modulation (PCM) interface, a universal asynchronous receiver/transmitter (UART) interface, a mobile industry processor interface (MIPI), a general-purpose input/output (GPIO) interface, a subscriber identity module (SIM) interface, and/or a universal serial bus (USB) interface, etc.

[0098]

The wireless communication function of the mobile phone can be realized through antenna 1, antenna 2, mobile communication module 150, wireless communication module 160, modem processor and baseband processor.

[0099]

Antenna 1 and antenna 2 are used to transmit and receive electromagnetic wave signals.
Each antenna in a mobile phone can be used to cover a single or multiple communication frequency bands.
Different antennas can also be reused to improve antenna utilization.
For example, antenna 1 may be reused as a diversity antenna for a wireless local area network.
In other embodiments, the antenna may be used in conjunction with a tuning switch.

[0100]

The mobile communication module 150 can provide wireless communication solutions including 2G/3G/4G/5G etc. applied on mobile phones.
The mobile communication module 150 may include at least one filter, a switch, a power amplifier, a low noise amplifier (LNA), etc.
The mobile communication module 150 can receive electromagnetic waves through the antenna 1, filter, amplify and process the received electromagnetic waves, and transmit them to the modem processor for demodulation.
The mobile communication module 150 can also amplify the signal modulated by the modem processor and convert it into electromagnetic waves for radiation through the antenna 1.

In some embodiments, at least some functional modules of the mobile communication module 150 may be set in the processor 110 .
In some embodiments, at least some functional modules of the mobile communication module 150 and at least some modules of the processor 110 may be provided in the same device.

[0101]

The wireless communication module 160 can provide wireless communication solutions for use on mobile phones, including wireless local area networks (WLAN) (such as wireless fidelity (Wi-Fi) networks), Bluetooth (BT), global navigation satellite system (GNSS), frequency modulation (FM), near field communication technology (NFC), infrared technology (IR), etc. The wireless communication module 160 may be one or more devices integrating at least one communication processing module.
The wireless communication module 160 receives electromagnetic waves via the antenna 2 , modulates and filters the electromagnetic wave signals, and sends the processed signals to the processor 110 .
The wireless communication module 160 can also receive the signal to be sent from the processor 110, modulate the frequency of the signal, amplify the signal, and convert it into electromagnetic waves for radiation through the antenna 2.

[0102]

In some embodiments, the mobile phone's antenna 1 is coupled to the mobile communication module 150, and the antenna 2 is coupled to the wireless communication module 160, so that the mobile phone can communicate with the network and other devices through wireless communication technology.
The wireless communication technology may include global system for mobile communications (GSM), general packet radio service (GPRS), code division multiple access (CDMA), wideband code division multiple access (WCDMA), time-division code division multiple access (TD-SCDMA), long term evolution (LTE), BT, GNSS, WLAN, NFC, FM, and/or IR technology, etc.
The GNSS may include a global positioning system (GPS), a global navigation satellite system (GLONASS), a Beidou navigation satellite system (BDS), a quasi-zenith satellite system (QZSS) and/or a satellite based augmentation system (SBAS).

[0103]

The mobile phone realizes display functions through GPU, display screen 194, and application processor.
The GPU is a microprocessor for image processing, which connects the display screen 194 and the application processor.
The GPU is used to perform mathematical and geometric calculations for graphics rendering. Processor 110 may include one or more GPUs that execute program instructions to generate or change display information.

[0104]

Display screen 194 is used to display images, videos, etc.
Display screen 194 includes a display panel.
The display panel can adopt liquid crystal display (LCD), organic light-emitting diode (OLED), active matrix organic light emitting diode or active matrix organic light emitting diode (AMOLED), flexible light emitting diode (FLED), Miniled, MicroLed, Micro-oLed, quantum dot light-emitting diodes (QLED), etc.
In some embodiments, the mobile phone may include 1 or N display screens 194 , where N is a positive integer greater than 1.

[0105]

The mobile phone can realize the shooting function through ISP, camera 193, video codec, GPU, display 194 and application processor.

[0106]

The ISP is used to process data fed back by the camera 193 .
For example, when taking a photo, the shutter is opened, and light is transmitted through the lens to the camera's photosensitive element. The light signal is converted into an electrical signal, and the camera's photosensitive element transmits the electrical signal to the ISP for processing and converts it into an image visible to the naked eye.
ISP can also perform algorithm optimization on image noise, brightness, and skin color.
ISP can also optimize the exposure, color temperature and other parameters of the shooting scene.
In some embodiments, the ISP may be provided in the camera 193 .

[0107]

The camera 193 is used to capture still images or videos.

The object generates an optical image through the lens and projects it onto the photosensitive element.
The photosensitive element can be a charge coupled device (CCD) or a complementary metal-oxide-semiconductor (CMOS) phototransistor.
The photosensitive element converts the light signal into an electrical signal, which is then transmitted to the ISP for conversion into a digital image signal.
ISP outputs the digital image signal to DSP for processing.
DSP converts digital image signals into standard image signals in RGB, YUV and other formats.
In some embodiments, the mobile phone may include 1 or N cameras 193 , where N is a positive integer greater than 1.

[0108]

Digital signal processors are used to process digital signals. In addition to processing digital image signals, they can also process other digital signals.
For example, when the mobile phone selects a frequency point, the digital signal processor is used to perform Fourier transform on the frequency point energy.

[0109]

Video codecs are used to compress or decompress digital video.
A phone may support one or more video codecs.
In this way, the mobile phone can play or record videos in multiple encoding formats, such as: Moving Picture Experts Group (MPEG) 1, MPEG2, MPEG3, MPEG4, etc.

[0110]

The external memory interface 120 can be used to connect an external memory card, such as a Micro SD card, to expand the storage capacity of the mobile phone.
The external memory card communicates with the processor 110 via the external memory interface 120 to implement a data storage function.
For example, save music, videos and other files in an external storage card.

[0111]

The internal memory 121 may be used to store computer executable program codes, wherein the executable program codes include instructions.
The processor 110 executes instructions stored in the internal memory 121 to perform various functional applications and data processing of the mobile phone.

The internal memory 121 may include a program storage area and a data storage area.
The program storage area may store an operating system, an application program required for at least one function (such as a sound playback function, an image playback function, etc.), and the like.
The storage data area can store data created during the use of the mobile phone (such as audio data, phone book, etc.).
In addition, the internal memory 121 may include a high-speed random access memory and may also include a non-volatile memory, such as at least one disk storage device, a flash memory device, a universal flash storage (UFS), etc.

[0112]

The mobile phone can implement audio functions through the audio module 170, the speaker 170A, the receiver 170B, the microphone 170C, the earphone interface 170D, and the application processor.
Such as music playing, recording, etc.

[0113]

The audio module 170 is used to convert digital audio information into analog audio signal output, and is also used to convert analog audio input into digital audio signals.
The audio module 170 may also be used to encode and decode audio signals.
In some embodiments, the audio module 170 may be disposed in the processor 110 , or some functional modules of the audio module 170 may be disposed in the processor 110 .

[0114]

The speaker 170A, also called a "horn", is used to convert audio electrical signals into sound signals.
The mobile phone can listen to music through the speaker 170A, or listen to hands-free calls.

[0115]

The receiver 170B, also called a "handset", is used to convert audio electrical signals into sound signals.
When the mobile phone receives a call or voice message, the voice can be heard by placing the receiver 170B close to the human ear.

[0116]

Microphone 170C, also called "microphone" or "microphone", is used to convert sound signals into electrical signals.
When making a call or sending a voice message, the user can speak by bringing his or her mouth close to the microphone 170C, and the voice signal is input into the microphone 170C. The mobile phone may be provided with at least one microphone 170C.
In other embodiments, the mobile phone may be provided with two microphones 170C, which can not only collect sound signals but also realize noise reduction function.
In other embodiments, the mobile phone may be provided with three, four or more microphones 170C to collect sound signals, reduce noise, identify the sound source, realize directional recording function, etc.

[0117]

The earphone jack 170D is used to connect a wired earphone.
The earphone interface 170D may be a USB interface 130, or a 3.5 mm open mobile terminal platform (OMTP) standard interface or a cellular telecommunications industry association of the USA (CTIA) standard interface.

[0118]

The sensor module 180 may include a pressure sensor, a gyro sensor, an air pressure sensor, a magnetic sensor, an acceleration sensor, a distance sensor, a proximity light sensor, a fingerprint sensor, a temperature sensor, a touch sensor, an ambient light sensor, a bone conduction sensor, and the like.

[0119]

Of course, the mobile phone may also include a charging management module, a power management module, a battery, buttons, indicators, and one or more SIM card interfaces, etc., and the embodiments of the present application do not impose any restrictions on this.

[0120]

The software system of the above mobile phone can adopt a layered architecture, an event-driven architecture, a micro-kernel architecture, a micro-service architecture, or a cloud architecture.
The embodiment of the present application takes the Android system with a layered architecture as an example to illustrate the software structure of a mobile phone.

[0121]

Still taking a mobile phone as the above-mentioned electronic device as an example, FIG6 shows a software structure block diagram of the mobile phone according to an embodiment of the present application.

[0122]

The layered architecture divides the software into several layers, each with clear roles and division of labor.
The layers communicate with each other through software interfaces.
In some embodiments, the Android system is divided into four layers, namely, from top to bottom, an application layer, an application framework layer, an Android runtime and system library, and a kernel layer.

[0123]

The application layer can include a range of applications.

[0124]

As shown in FIG6 , the application layer may be installed with apps such as calls, memos, browsers, contacts, cameras, galleries, calendars, maps, Bluetooth, music, videos, and short messages.

[0125]

In the embodiment of the present application, as still shown in FIG. 6 , a projection application may also be installed in the application layer.
Users can open the projection application from the desktop, settings function or drop-down menu.

[0126]

The above-mentioned projection application can serve as a bridge between the mobile phone (ie, the source device) and other electronic devices (ie, the target device) when projecting content, and sends the projection content in the application to be projected in the mobile phone to the target device.
For example, the projection application can receive screen projection events reported by the application framework layer, and then the projection application can interact with the running application (such as a video APP) and send the content being displayed or played in the application as projection content to the target device via wireless communication methods such as Wi-Fi.

[0127]

In addition, the user can also use the above-mentioned projection application to set up a binding relationship between the NFC tag and one or more electronic devices.
For example, you can set an option in the Cast app to bind an NFC tag.
After the phone detects that the user has turned on this option, the projection application can display a list of electronic devices to be bound.
After the user selects one or more electronic devices to be bound in the list, the user can place the mobile phone close to the NFC tag to be bound.
In this way, the mobile phone can write the identifier of the electronic device selected by the user in the projection application into the NFC tag through the NFC signal, thereby establishing a binding relationship between the NFC tag and one or more electronic devices in the NFC tag.

[0128]

The application framework layer provides an application programming interface (API) and a programming framework for applications in the application layer.
The application framework layer includes some predefined functions.

[0129]

In an embodiment of the present application, as shown in FIG6 , an NFC service may be run in the application framework layer.

[0130]

Exemplarily, after the NFC function is enabled on the mobile phone, the NFC service can be started in the application framework layer.
When the mobile phone approaches or touches the NFC tag, the NFC service can call the NFC driver of the kernel layer to read the binding relationship stored in the NFC tag, thereby obtaining the target device for this content projection.
Furthermore, the NFC service can report the projection event to the projection application, thereby triggering the projection application to send the content currently displayed or played by the mobile phone as the projection content to the target device, thereby starting the content projection process.

[0131]

Of course, as shown in Figure 6, the application framework layer can also include Wi-Fi service, window manager, content provider, view system, phone manager, resource manager, etc., and the embodiments of the present application do not impose any restrictions on this.

[0132]

Among them, Wi-Fi services can be used to provide Wi-Fi related functions such as joining a Wi-Fi network or establishing a Wi-Fi P2P connection with other electronic devices.
The above-mentioned window manager is used to manage window programs.
The window manager can obtain the display size, determine whether there is a status bar, lock the screen, take screenshots, etc.
The above content providers are used to store and retrieve data and make the data accessible to applications. The data may include video, images, audio, calls made and received, browsing history and bookmarks, phonebooks, etc. The above-mentioned view system includes visual controls, such as controls for displaying text, controls for displaying pictures, etc. The view system can be used to build applications. The display interface can be composed of one or more views. For example, a display interface including a text message notification icon may include a view for displaying text and a view for displaying a picture.
The above-mentioned phone manager is used to provide the communication function of the mobile phone. For example, the management of call status (including answering, hanging up, etc.). The above resource managers provide various resources for applications, such as localized strings, icons, images, layout files, video files, etc.

[0133]

As shown in FIG. 6 , the system library may include multiple functional modules.
For example: surface manager, media library, 3D graphics processing library (for example: OpenGL ES), 2D graphics engine (for example: SGL), etc.

[0134]

The surface manager is used to manage the display subsystem and provide the fusion of 2D and 3D layers for multiple applications.
The media library supports playback and recording of a variety of commonly used audio and video formats, as well as static image files, etc. The media library can support multiple audio and video encoding formats, such as: MPEG4, H.264, MP3, AAC, AMR, JPG, PNG, etc. The 3D graphics processing library is used to implement 3D graphics drawing, image rendering, compositing, and layer processing.

2

A 2D graphics engine is a drawing engine for 2D drawings.

[0135]

Android Runtime includes core libraries and virtual machines.
Android runtime is responsible for scheduling and management of the Android system.

[0136]

The core library consists of two parts: one part is the function that needs to be called by the Java language, and the other part is the Android core library.

[0137]

The application layer and the application framework layer run in virtual machines.
The virtual machine executes the Java files of the application layer and the application framework layer as binary files.
The virtual machine is used to perform functions such as object life cycle management, stack management, thread management, security and exception management, and garbage collection.

[0138]

The kernel layer is the layer between hardware and software.
The kernel layer includes at least a display driver, a camera driver, an audio driver, a sensor driver, etc., and the embodiments of the present application do not impose any restrictions on this.

[0139]

A cross-device content projection method provided by an embodiment of the present application will be described in detail below with reference to the accompanying drawings.

[0140]

Exemplarily, as shown in FIG. 7 , each NFC tag 701 may store its own NFC card number in the NFC tag 701 when it leaves the factory.

Furthermore, as shown in FIG. 7 , a flag bit may be pre-set in each NFC tag 701 , and the flag bit may be used to indicate whether a binding relationship has been established between the NFC tag 701 and the electronic device.
For example, when the flag bit in the NFC tag 701 is 00, it indicates that the NFC tag 701 has not been bound to an electronic device; when the flag bit in the NFC tag 701 is 01, it indicates that the NFC tag 701 has been bound to one or more electronic devices.

[0141]

When the user uses the NFC tag 701 for the first time, the user can use a preset projection application to establish a binding relationship between the NFC tag 701 and one or more electronic devices in the NFC tag 701 .

[0142]

Taking the mobile phone having the projection application installed as an example, as shown in FIG8 , the method of using the projection application to establish the binding relationship in the NFC tag 701 may include the following steps:

[0143]

S801. The mobile phone displays an NFC tag binding interface of the projection application, which includes a list of devices to be bound.

[0144]

For example, when a user uses the NFC tag 701 for the first time, the user may turn on the NFC function of the mobile phone and approach or touch the NFC tag 701 .
At this time, the mobile phone and the NFC tag 701 can interact through the NFC signal, so that the mobile phone can read the NFC card number and the preset flag bit in the NFC tag 701.
If the flag bit is 00, it means that the NFC tag 701 has not been bound to the electronic device.
Furthermore, as shown in FIG. 9 , the mobile phone may prompt the user to establish a binding relationship between the NFC tag 701 and one or more electronic devices.

[0145]

If it is detected that the user clicks the confirmation button 901 shown in FIG. 9 , as shown in FIG. 10 , the mobile phone may open the projection application and automatically jump to the binding interface 1001 of the NFC tag 701 .

In the binding interface 1001 , the mobile phone may display a device list 1002 consisting of one or more electronic devices.
The electronic devices in the device list 1002 are all devices that can be bound to the NFC tag 701 . For example, the electronic devices in the device list 1002 may be one or more devices logged in to the same account (eg, a Huawei account) as the mobile phone. For another example, the electronic devices in the device list 1002 may be one or more devices connected to the same Wi-Fi network as the mobile phone. The user can select the electronic device that needs to be bound to the NFC tag 701 in the device list 1002 .

[0146]

In the embodiment of the present application, the NFC tag 701 can be bound to one or more electronic devices.
That is, the user can select one or more electronic devices in the device list 1002 as binding devices of the NFC tag 701 .

[0147]

Alternatively, as shown in FIG. 11 , a binding option 1101 for a single electronic device and a binding option 1102 for multiple electronic devices may be pre-set in the projection application.
If the user selects the binding option 1101 , the mobile phone may prompt the user to select an electronic device from the device list to bind to the NFC tag 701 in the corresponding binding interface. If the user selects the binding option 1102, as still shown in FIG. 11, the mobile phone may display one or more pre-set device groups 1103 in the corresponding binding interface, each device group including multiple electronic devices. For example, smart TV and smart speaker 1 are one device group, smart speaker 1 and smart speaker 2 are one device group, and smart TV and smart light bulb are one device group. In this way, the user can trigger the mobile phone to bind the NFC tag 701 with multiple electronic devices in the device group by selecting a device group in the binding interface.

[0148]

S802. The mobile phone receives a first operation of the user selecting a binding device in the device list.

[0149]

In step S802 , after the mobile phone displays the binding interface of the projection application, the user can select one or more electronic devices bound to the NFC tag 701 from the device list or device group listed in the binding interface.
The one or more electronic devices selected by the user may be referred to as binding devices of the NFC tag 701 .
After the mobile phone detects that the user has selected a binding device on the binding interface, the following steps S803-S804 may be continued.

[0150]

S803 . In response to the first operation, the mobile phone prompts the user to bring the mobile phone close to the NFC tag 701 to be bound.

[0151]

Taking the binding devices as a smart TV and a smart light bulb as an example, after the mobile phone detects that the user has selected the smart TV and the smart light bulb in the above binding interface, the binding relationship between the NFC tag 701 and the smart TV and the smart light bulb can be determined.
At this time, the mobile phone needs to write the binding relationship into the NFC tag 701. Since the mobile phone and the NFC tag 701 need to communicate through a short-distance NFC signal, as shown in FIG12 , if the mobile phone does not detect the NFC signal emitted by the NFC tag 701, the mobile phone may display a prompt 1201 in the projection application, and the prompt 1201 is used to guide the user to bring the mobile phone close to or touch the NFC tag 701 waiting to be bound to the smart TV and the smart bulb.

[0152]

S804: The mobile phone writes the identification of the binding device into the NFC tag 701 to establish a binding relationship between the NFC tag 701 and the binding device.

[0153]

Exemplarily, the user may move the mobile phone close to or in contact with the NFC tag 701 according to the prompt shown in FIG. 12 .
When the distance between the mobile phone and the NFC tag 701 is close enough, the mobile phone can detect the NFC signal sent by the NFC tag 701 .
Furthermore, as shown in FIG. 13 , the mobile phone may write the identifier of the binding device set by the user in the binding interface into the NFC tag 701 . For example, the mobile phone can write the MAC address, device name or IP address of the bound device into the

NFC tag 701. In this way, a binding relationship between the NFC tag 701 and the binding device is established in the NFC tag 701. Subsequently, a source device such as a mobile phone that performs content projection can determine one or more electronic devices bound to the NFC tag 701, that is, the target device for content projection, by reading the identifier of the bound device in the NFC tag 701.

[0154]

In addition, after the mobile phone writes the identification of the above-mentioned bound device into the NFC tag 701, the NFC tag 701 can modify the preset flag bit from 00 to 01 to indicate that the current NFC tag 701 has been bound to one or more electronic devices.

[0155]

In some embodiments, after the mobile phone writes the identifier of the bound device into the NFC tag 701, the user can continue to set the projection strategy of the bound device bound to the NFC tag 701 when performing content projection in the projection application.

[0156]

Taking the binding device of NFC tag 701 as a smart TV as an example, after the mobile phone writes the logo of the smart TV into NFC tag 701, the user can be prompted to set the projection strategy when projecting content to the smart TV in the projection application.
As shown in FIG. 14 , the mobile phone may provide different projection instructions corresponding to different NFC operations in the setting interface 1301 for the user to select.
For example, the user may set that when the NFC tag 701 is touched once, the corresponding projection instruction is to start projection.
For example, the user may set that when the NFC tag 701 is touched twice in succession, the corresponding projection instruction is to play the next episode (or the next song). For another example, the user may set that when the NFC tag 701 is touched for more than a preset time, the corresponding projection instruction is to exit the current content projection.

[0157]

Then, after receiving the projection strategy set by the user in the setting interface 1301, the mobile phone can establish an association relationship between the NFC tag 701, the smart TV and the above projection strategy.

Subsequently, the mobile phone can be triggered to project content to the smart TV according to the projection strategy set by the user by approaching or touching the NFC tag 701, thereby simplifying the operation process when projecting content across devices.

[0158]

Taking the example of a smart TV, a smart speaker and a smart light bulb as the bound devices of NFC tag 701, after the mobile phone writes the identifiers of the smart TV, the smart speaker and the smart light bulb into NFC tag 701, the user can also be prompted in the projection application to set a projection strategy for projecting content to these three bound devices.
For example, as shown in FIG. 15 , the user can set in the setting interface 1401 that when projecting content to a smart TV, smart speaker, and smart light bulb, the display content of the source device can be projected to the smart TV for display, and the audio content of the source device can be projected to the smart speaker for playback, and the smart light bulb can change the lighting effect according to the display content or audio content. Of course, the user can further set a specific projection strategy when projecting display content in the smart TV, a specific projection strategy when projecting audio content in the speaker, etc., and the embodiment of the present application does not impose any restrictions on this.

[0159]

Similarly, after the mobile phone receives the projection strategy set by the user in the setting interface 1401, it can establish an association relationship between the NFC tag 701, the bound device (i.e., the smart TV, smart speaker and smart bulb) and the above projection strategy.
Subsequently, the mobile phone can be triggered to project content to the above three bound devices according to the projection strategy set by the user by approaching or touching the NFC tag 701, thereby simplifying the operation process when projecting content across devices.

[0160]

It should be noted that the projection strategy of the device bound to the NFC tag 701 when projecting content can be manually set by the user using the projection application, or can be pre-set by the mobile phone according to information such as the type, location, and device capabilities of the bound device.

For example, when the bound devices of NFC tag 701 are smart speaker 1 and smart speaker 2, the default projection strategy of the mobile phone can be to use the smart speaker closest to the user to project content.

[0161]

In other embodiments, the above projection strategy may also be dynamically set by the source device during the process of projecting content to the device bound to the NFC tag 701 .
For example, when a mobile phone projects content to a device bound to the NFC tag 701 (such as a smart TV and a smart speaker), the audio playback capabilities of the smart TV and the smart speaker can be dynamically acquired. Furthermore, the mobile phone can determine to project the audio content on the smart TV and/or smart speaker based on the audio playback capabilities of the smart TV and smart speaker. The embodiments of the present application do not impose any restrictions on the specific content of the projection strategy and the specific setting method of the projection strategy.

[0162]

Exemplarily, the user can set one or more corresponding binding devices for different NFC tags according to the above method.
When the user needs to project content on one or a group of bound devices, the user can turn on the NFC function of the source device and bring it close to or touch the corresponding NFC tag, so as to start the content projection process by using one or more bound devices bound to the NFC tag as the target devices for this content projection.

[0163]

The following will take a mobile phone as an example of a source device to illustrate a method for projecting content to a target device by touching an NFC tag 701 with the mobile phone. As shown in FIG. 16 , the method may include the following steps:

[0164]

S1501 . In response to a tapping operation between a mobile phone and an NFC tag 701 , the mobile phone obtains one or more bound devices bound to the NFC tag 701 .

[0165]

Exemplarily, through the above steps S801 - S804 , the mobile phone has set a corresponding binding device for the NFC tag 701 .

Then, when the user wants to project the content (such as display content, audio content) in the mobile phone (i.e., the source device) to the bound device of the NFC tag 701, as shown in Figure 17, the user can turn on the NFC function of the mobile phone and touch (or approach) the NFC tag 701, that is, perform a touch operation between the mobile phone and the NFC tag 701.

[0166]

In response to the touch operation between the mobile phone and the NFC tag 701, the mobile phone can read the identifiers of one or more bound devices bound to the NFC tag 701 from the NFC tag 701, and the bound devices can participate in the content projection as the target devices of the mobile phone.
In other words, the user can use the source device to touch the NFC tag through a tap operation, which can trigger the source device to obtain the target device participating in this content projection, thereby automatically completing the subsequent content projection process with the target device, simplifying the operation process during content projection and improving the efficiency of multi-device collaboration.

[0167]

Of course, if the NFC tag 701 does not store the identifier of the bound device, the mobile phone can establish a corresponding relationship between the NFC tag 701 and the corresponding bound device by executing the above steps S801-S804.

[0168]

S1502: When the bound device of the NFC tag 701 is an electronic device, the mobile phone sends the projection content to the bound device to start the current content projection.

[0169]

When the mobile phone reads the identification of only one bound device in the NFC tag 701, it means that there is only one bound device bound to the NFC tag 701, and the target device for content projection this time is the bound device.

[0170]

Taking the bound device as a smart TV as an example, after the mobile phone reads the logo of the smart TV in the NFC tag 701, as shown in Figure 18, the mobile phone can use the smart TV as the target device for this content projection and send the projection content to the smart TV to start content projection.

The projected content may include the content being played by the mobile phone, for example, the audio content and/or display content being played by the mobile phone.
The displayed content may include pictures, scenes in a video, or part or all of the content in the current display interface.

[0171]

For example, the mobile phone can query whether the currently connected Wi-Fi network includes the smart TV according to the identification of the smart TV.
If a smart TV is included, it means that the smart TV has been connected to the Wi-Fi network. Then, the mobile phone can dynamically send the projection content to the smart TV through the Wi-Fi network.
If the smart TV is not included, it means that the smart TV has not yet been connected to the Wi-Fi network where the mobile phone is located. The mobile phone can prompt the user to connect the smart TV to the same Wi-Fi network where the mobile phone is located. Furthermore, the mobile phone can dynamically send the projection content to the smart TV through the Wi-Fi network.

[0172]

Alternatively, if the Wi-Fi network where the mobile phone is located does not include the smart TV, the mobile phone can also automatically establish a wireless communication connection with the smart TV according to the read identification of the smart TV (such as the MAC address of the smart TV).
For example, a mobile phone may establish a Bluetooth connection or a Wi-Fi P2P connection with a smart TV, and the embodiments of the present application do not impose any restrictions on this.

[0173]

In addition, the projection content sent by the mobile phone to the smart TV may include the display content of the mobile phone.
For example, a mobile phone can send each frame of the real-time displayed image to a smart TV through mirroring, and the smart TV will synchronously display the display interface of the mobile phone.
For another example, a mobile phone can send partial display content such as videos and pictures in the mobile phone display interface to a smart TV for display through DLNA (digital living network alliance) screen projection.

[0174]

Exemplarily, when a mobile phone contacts or approaches the above-mentioned NFC tag 701, if the mobile phone is displaying the playback interface of video A, then when the bound device of the NFC tag 701 is a smart TV, the mobile phone can act as a source device to send the entire playback interface (i.e., all displayed content in the display interface) as projection content to the smart TV, or the mobile phone can act as a source device to send the video image of video A in the playback interface (i.e., part of the displayed content in the display interface) as projection content to the smart TV.

[0175]

For another example, when a mobile phone touches or approaches the NFC tag 701, if the mobile phone is displaying a playlist of a video APP, then when the bound device of the NFC tag 701 is a smart TV, the mobile phone can also act as a source device to send the displayed playlist to the smart TV as projection content.
Subsequently, if the mobile phone detects that the user selects to play video A in the above play list, the mobile phone can continue to send the play interface of video A or the video image of video A as the projection content to the smart TV.

[0176]

Of course, the projection content sent by the mobile phone to the smart TV may also include the audio content being played by the mobile phone. For example, the audio content may be an audio file corresponding to the video picture being displayed by the mobile phone.
After receiving the projection content sent by the mobile phone in real time, the smart TV can display or play the projection content to complete the content projection.

[0177]

In some embodiments, still taking the target device for content projection as a smart TV, when a mobile phone is projecting content to the smart TV, the user can trigger the mobile phone to send a corresponding projection instruction to the smart TV through interaction between the mobile phone and the NFC tag 701, thereby realizing the corresponding control function during the content projection process.

[0178]

Exemplarily, when the user sets a binding device for the NFC tag 701 in the projection application, the projection strategy associated with the NFC tag 701 and the binding device may be pre-set.

For example, the projection strategy includes different projection instructions corresponding to different NFC operations.
Exemplarily, the projection instruction corresponding to the NFC operation of the mobile phone touching the NFC tag 701 twice continuously can be set to play the next episode (or the next song).

[0179]

Then, during the process of projecting content from the mobile phone to the smart TV, if the mobile phone detects that the user inputs an operation of touching the NFC tag 701 twice in succession, the mobile phone can send a projection instruction to play the next episode (or next song) to the smart TV.
The smart TV can respond to the projection instruction to play the next episode (or the next song).
That is to say, during the content projection process, the user can use the source device to input different NFC operations to the NFC tag to implement corresponding control functions, thereby enriching the user experience in the content projection scenario.

[0180]

S1503: When the NFC tag 701 is bound to multiple electronic devices, the mobile phone determines the main device for current content projection.

[0181]

The master device (master) for this content projection may be a source device (ie, a mobile phone), or may be one of a plurality of bound devices bound to the NFC tag 701 .
The master device can be used as a control node to connect and interact with other devices (i. e., slave devices) through a star topology.

[0182]

In some embodiments, when there are multiple bound devices to the NFC tag 701, the mobile phone can determine the specific master device according to information such as device types and device capabilities of the multiple bound devices.
For example, the mobile phone can query the computing capabilities of the multiple bound devices and determine the bound device with the strongest computing capability as the main device for this content projection. At this time, the mobile phone and other bound devices can serve as slave devices of the main device.

[0183]

In other embodiments, the mobile phone may be pre-set with specific master devices corresponding to different content projection scenarios.
For example, when the bound devices are a smart TV and a smart light bulb, the master device can be set to be the smart TV, and the slave devices to be the mobile phone and the smart light bulb.
For another example, when the bound devices are smart speaker 1 and smart speaker 2, the master device can be set to be a mobile phone, and the slave devices to be smart speaker 1 and smart speaker 2.
For another example, when the bound devices are a smart TV and a smart speaker, the master device can be set to be a mobile phone, and the slave devices can be set to be the smart TV and the smart speaker. Then, the mobile phone can determine the specific master device corresponding to the content projection scene composed of the multiple bound devices according to the identifiers of the multiple bound devices read from the NFC tag 701.

[0184]

S1504: If the mobile phone is the main device, the mobile phone sends the projection content to each bound device according to the projection strategy.

[0185]

If the mobile phone determines that the main device for this content projection is the mobile phone (i.e., the source device), the mobile phone can serve as the control node for this content projection, and send the projection content to each bound device (i.e., the target device) in real time according to a certain projection strategy, so that each bound device starts to play or display the projection content after receiving it.
Among them, the above-mentioned projection strategy can be pre-set by the user when binding the NFC tag 701, or it can be pre-set by the mobile phone according to the device type, device capabilities and other information of the bound device, or it can be dynamically generated after the mobile phone determines that it is the main device. The embodiment of the present application does not impose any restrictions on this.

[0186]

Exemplarily, as shown in Figure 19, when the bound devices of NFC tag 701 are smart speaker 1 and smart speaker 2, the mobile phone can act as the master device when projecting content to smart speaker 1 and smart speaker 2, and smart speaker 1 and smart speaker 2 can act as slave devices of the mobile phone.

In this projection scenario, the projection strategy can be set to be related to the distance between the mobile phone and smart speaker 1 and smart speaker 2.

[0187]

For example, the mobile phone can detect the distance between the mobile phone and smart speaker 1 and smart speaker 2 respectively.
When the distance between the mobile phone and the smart speaker 1 is less than the preset value, and the distance between the mobile phone and the smart speaker 2 is greater than the preset value, it means that the user is closer to the smart speaker 1 and farther away from the smart speaker 2.
Then, the mobile phone can act as a master device to send the projection content to the smart speaker 1, and the smart speaker 1 plays the projection content to complete the content projection. Of course, the mobile phone can also send the projected content to the smart speaker closest to the mobile phone by default.

[0188]

Alternatively, if the distances between the mobile phone and smart speaker 1 and smart speaker 2 are both less than the preset values, it means that the distances between the user and smart speaker 1 and smart speaker 2 are both relatively close.
Then, the mobile phone can send the projection content to smart speaker 1 and smart speaker 2 respectively according to the projection strategy of stereo playback. For example, the mobile phone can send the low-frequency components in the projected content to smart speaker 1, and smart speaker 1 plays the low-frequency components in the projected content. At the same time, the mobile phone can send the high-frequency components in the projected content to smart speaker 2, and smart speaker 2 plays the high-frequency components in the projected content. For another example, the mobile phone can send the audio file corresponding to the left channel in the projected content to smart speaker 1, and at the same time send the audio file corresponding to the right channel in the projected content to smart speaker 2, so that smart speaker 1 and smart speaker 2 play the audio files of the left channel and right channel in the projected content respectively. Of course, if the above-mentioned bound devices also include more smart speakers in addition to smart speaker 1 and smart speaker 2, the mobile phone can send the corresponding audio components in the projected content to each smart speaker according to the above method, so that multiple speakers can play the received audio components respectively to achieve stereo or surround sound playback effects.

[0189]

For example, before the mobile phone sends the projection content to smart speaker 1 and smart speaker 2, it can also send a synchronization instruction to smart speaker 1 and smart speaker 2. Smart speaker 1 and smart speaker 2 can synchronize the time with the mobile phone according to the synchronization instruction to ensure that the playback progress of smart speaker 1 and smart speaker 2 is the same.
For example, the mobile phone may mark one or more timestamps in the projection content to be sent, and send the projection content and the timestamps in the projection content to smart speakers 1 and 2. Since the time of smart speaker 1, smart speaker 2 and mobile phone is synchronized after the time synchronization, smart speaker 1 and smart speaker 2 can play each projected content according to the timestamp in the projected content, ensuring that the playback progress of smart speaker 1 and smart speaker 2 is the same.

[0190]

In addition, the mobile phone can also calculate the transmission delay when smart speaker 1 and smart speaker 2 respond to the above synchronization instructions.
For example, the transmission delay when smart speaker 1 responds to the above synchronization command is 300ms, and the transmission delay when smart speaker 2 responds to the above synchronization command is 500ms. Then, the mobile phone can calculate the distance between the mobile phone and smart speaker 1 and smart speaker 2 respectively according to the transmission delay. Of course, the mobile phone can also detect the distance between the mobile phone and the smart speakers 1 and 2 through distance sensors, infrared sensors, etc., and the embodiments of the present application do not impose any restrictions on this.

[0191]

In some embodiments, in order to ensure that smart speaker 1 and smart speaker 2 can synchronously play the projection content sent by the mobile phone, the mobile phone can also send the projection content to smart speaker 1 and smart speaker 2 respectively according to the transmission delay of smart speaker 1 and smart speaker 2.
Still taking the example that the transmission delay of smart speaker 1 is 300ms and the transmission delay of smart speaker 2 is 500ms, the mobile phone can send the same projection content to smart speaker 2 200ms in advance before sending the projection content to smart speaker 1. In this way, smart speaker 1 and smart speaker 2 can receive the projection content sent by the mobile phone at the same time and start content projection.

[0192]

Alternatively, as still shown in Figure 19, when the mobile phone is the main device for this content projection, and smart speaker 1 and smart speaker 2 are slave devices of the mobile phone, the mobile phone can display the setting interface of the projection strategy.
In this setting interface, users can manually set which smart speaker will be used to play the projected content sent from the mobile phone during this content projection. In addition, the mobile phone can save the projection strategies set by the user for the mobile phone, smart speaker 1 and smart speaker 2. Later, when the mobile phone again acts as the main device to project content to smart speaker 1 and smart speaker 2, the mobile phone can project content according to the above-mentioned stored projection strategies. That is to say, the user can manually set corresponding projection strategies for multiple devices participating in content projection during the content projection process.

[0193]

Exemplarily, as shown in FIG20 , when the bound devices of the NFC tag 701 are smart TVs and smart speakers, the mobile phone can act as a master device when projecting content to the smart TVs and smart speakers, and the smart TVs and smart speakers can act as slave devices of the mobile phone.
In this projection scenario, the projection strategy can be set to use the smart TV to play the display content in the projection content, and use the smart speaker to play the audio content in the projection content.

[0194]

Then, the mobile phone can serve as a master device to send the display content in this projection to the smart TV, and the smart TV starts to display the display content.
At the same time, the mobile phone can send the audio content in this projection to the smart speaker, and the smart speaker starts playing the audio content.

[0195]

Alternatively, the mobile phone can serve as a master device to send the display content and audio content in the current projection content to the smart TV, and the smart TV plays the display content and audio content.
At the same time, the mobile phone can send the audio content in this projection to the smart speaker, and the smart speaker starts playing the audio content. That is, the smart TV and smart speaker can play the projected audio content at the same time. Among them, the

above-mentioned smart TVs may include one or more, and the above-mentioned smart speakers may also include one or more, and the embodiments of the present application do not impose any restrictions on this.

[0196]

Similarly, in order to ensure that the display content displayed by the smart TV is synchronized with the audio content played by the smart speaker, the mobile phone can perform time synchronization with the smart TV and the smart speaker before sending the above display content and audio content to the smart TV and the smart speaker. Furthermore, the mobile phone can send the display content and audio content with timestamps to the smart TV and smart speaker respectively, so that the smart TV and smart speaker can synchronously project the content according to the timestamps.

[0197]

Alternatively, the projection strategy when the mobile phone projects content to the smart TV and smart speaker can be set dynamically.
For example, a mobile phone can act as a master device to obtain the device capabilities of smart TVs and smart speakers. Taking the example of a smart TV having display and audio playback capabilities and a smart speaker having audio playback capabilities, the mobile phone can dynamically determine to project the display content in this projection to the smart TV for display, and project the audio content in this projection to the smart TV and the smart speaker for playback at the same time. Furthermore, the mobile phone can act as a master device to send the display content and audio content in the current projection content to the smart TV, and at the same time send the audio content in the current projection content to the smart speaker.

[0198]

S1505: If the mobile phone is not the master device, the mobile phone sends the projection content to the master device, and the master device controls other bound devices to start the content projection according to the projection strategy.

[0199]

If the mobile phone determines that the main device for this content projection is one of the multiple bound devices of the NFC tag 701, the mobile phone can send the current projection content to the main device, and the main device controls other bound devices to start content projection according to a certain projection strategy.

[0200]

Exemplarily, as shown in FIG. 21 , when the bound devices of the NFC tag 701 are a smart TV and a smart light bulb, the smart TV can be used as a master device for content projection, and the smart light bulb can be used as a slave device of the smart TV.
In this projection scenario, the projection strategy can be set to use the smart TV to display and play the projection content, and the smart TV can control the lighting effect of the smart bulb.

[0201]

Then, the mobile phone (ie, the source device) can send the projection content that needs to be projected this time to the smart TV (ie, the main device).
Of course, the mobile phone can also send the projection strategy of this content projection to the smart TV.
Alternatively, the smart TV may pre-store the projection strategy when the slave device is a smart light bulb, and the embodiment of the present application does not impose any restrictions on this.
Furthermore, the smart TV can act as a master device to start displaying and playing the projection content sent from the mobile phone. At the same time, the smart TV can send corresponding control instructions to the smart light bulb according to the projected content, so that the smart light bulb can project different lighting effects during the content projection process.

[0202]

For example, when a smart TV starts to display and play projected content, the smart TV can send a light-off command to a smart light bulb to control the smart light bulb to turn off the light source.
For another example, a smart TV can obtain the type of video being played. If a horror video is being played, the smart TV can control the smart light bulb to display a blue light source; if a love video is being played, the smart TV can control the smart light bulb to display a pink light source, etc., so that the user can get a better scene experience during the content projection process.

[0203]

In other embodiments, when the mobile phone obtains that there are multiple bound devices bound to the NFC tag 701 by reading the NFC tag 701, the mobile phone may also

default to itself as the main device in this content projection process. At this time, the mobile phone does not need to execute the above steps S1503 and S1505, and can send the projection content to each bound device according to the projection strategy according to the relevant method in step S1504 to complete this content projection.

[0204]

It can be seen that in the content projection method provided in the embodiment of the present application, the user can conveniently and quickly project the projection content in the source device to the target device required by the user by touching the NFC tag, thereby realizing the "touch and cast" function.
In addition, the source device can project the projection content to multiple target devices at the same time, and achieve different projection effects in different projection scenarios through the coordinated cooperation of multiple target devices, thereby improving the user experience and the collaborative work efficiency between multiple devices.

[0205]

In some embodiments, after the user sets the binding device of the NFC tag 701 in the projection application of the mobile phone, the mobile phone can also back up the binding relationship between the NFC tag 701 and the binding device to the application server of the projection application.
For example, the mobile phone can send the NFC card number of the NFC tag 701 and the identifiers of one or more binding devices bound to the NFC tag 701 to the application server, so that the application server establishes a binding relationship between the NFC tag 701 and the corresponding binding device.

[0206]

In this way, when the user changes the mobile phone (ie, the source device), the user can install and log in to the projection application on the new source device, and then the new source device can re-acquire the binding relationship between the NFC tag 701 and the corresponding binding device from the application server of the projection application. Then, when the user touches the NFC tag 701 with a new source device, the new source device can also execute the above steps S1501-S1505 to project the content to the corresponding bound device.

[0207]

In some embodiments, after the user sets the binding device and projection strategy of the NFC tag 701 in the projection application of the mobile phone, the user can also share the NFC tag 701, the corresponding binding device and the corresponding projection strategy with other users.
For example, user A can share the NFC tag 701, the bound device, and the projection strategy with user A's family (eg, user A's parents) via WeChat or other means.
Then, after receiving the shared content, the mobile phone of the parent of user A can save the corresponding relationship between the NFC tag 701, the bound device and the projection strategy. Subsequently, when the parent of user A touches the NFC tag 701 with his/her mobile phone, the mobile phone can also execute the above steps S1501-S1505 to project the content to the corresponding bound device.

[0208]

In addition, when the user sets a projection strategy for the device bound to the NFC tag 701, the user may also set specific projection content, projection time, etc. in the projection strategy.
For example, the user can set the projection content corresponding to the NFC tag 701 for his or her child to be learning video A, and the projection time is 1 hour. Then, when the user touches the NFC tag 701 with his mobile phone, or when the user shares the projection strategy with his parents and the parents touch the NFC tag 701 with their mobile phone, the mobile phone can project the content to the corresponding bound device according to the projection content and projection time set by the user in the projection strategy, so that the mobile phone can complete the content projection in a targeted manner, reducing the difficulty of operation for the elderly and children when performing content projection.

[0209]

An embodiment of the present application discloses an electronic device, including a processor, and a memory, a communication interface, an input device, and an output device connected to the processor.
The input device and the output device may be integrated into one device. For example, a touch sensor may be used as an input device, a display screen may be used as an output device, and the touch sensor and the display screen may be integrated into a touch screen.

[0210]

At this time, as shown in Figure 22, the above-mentioned electronic device may include: a touch screen 2201, the touch screen 2201 includes a touch sensor 2206 and a display screen

2207; one or more processors 2202; a memory 2203; one or more applications (not shown); a communication interface 2208; and one or more computer programs 2204, and the above-mentioned devices can be connected via one or more communication buses 2205.
The one or more computer programs 2204 are stored in the memory 2203 and configured to be executed by the one or more processors 2202 . The one or more computer programs 2204 include instructions, and the instructions can be used to execute the various steps in the above embodiments. Among them, all relevant contents of each step involved in the above method embodiment can be referred to the functional description of the corresponding physical device, and will not be repeated here.

[0211]

Exemplarily, the processor 2202 may be specifically the processor 110 shown in FIG. 5 , the memory 2203 may be specifically the internal memory 121 shown in FIG. 5 , the display screen 2207 may be specifically the display screen 194 shown in FIG. 5 , and the touch sensor may be specifically the touch sensor in the sensor module 180 shown in FIG. 5 , and the embodiments of the present application do not impose any restrictions on this.

[0212]

Through the description of the above implementation methods, technical personnel in the relevant field can clearly understand that for the convenience and simplicity of description, only the division of the above-mentioned functional modules is used as an example. In actual applications, the above-mentioned functions can be assigned to different functional modules as needed, that is, the internal structure of the device can be divided into different functional modules to complete all or part of the functions described above.
The specific working processes of the systems, devices and units described above can refer to the corresponding processes in the aforementioned method embodiments, which will not be repeated here.

[0213]

The functional units in the various embodiments of the present application may be integrated into one processing unit, or each unit may exist physically separately, or two or more units may be integrated into one unit.
The above integrated unit can be implemented in the form of hardware or in the form of software functional unit.

[0214]

If the integrated unit is implemented in the form of a software functional unit and sold or used as an independent product, it can be stored in a computer-readable storage medium. Based on this understanding, the technical solution of the embodiments of the present application can essentially be embodied in the form of a software product, or in other words, the part that contributes to the prior art or all or part of the technical solution. The computer software product is stored in a storage medium and includes a number of instructions for enabling a computer device (which can be a personal computer, a server, or a network device, etc.) or a processor to execute all or part of the steps of the methods described in the embodiments of the present application.
The aforementioned storage media include: flash memory, mobile hard disk, read-only memory, random access memory, magnetic disk or optical disk and other media that can store program codes.

[0215]

The above is only a specific implementation of the embodiment of the present application, but the protection scope of the embodiment of the present application is not limited to this. Any changes or substitutions within the technical scope disclosed in the embodiment of the present application should be covered within the protection scope of the embodiment of the present application.
Therefore, the protection scope of the embodiments of the present application shall be based on the protection scope of the claims.

Notice

CLAIMS CN110958475A

1.

A cross-device content projection method, characterized by comprising:
The first electronic device starts playing the first content;
The first electronic device obtains N second electronic devices bound to the NFC tag from the NFC tag, where N is an integer greater than 1;
The first electronic device projects the first content to at least one second electronic device among the N second electronic devices according to a preset projection strategy for continuous playback.

2.

The method according to claim 1 is characterized in that the first electronic device obtains N second electronic devices bound to the NFC tag from the NFC tag, comprising:
In response to a bump operation in which the first electronic device approaches or contacts the NFC tag, the first electronic device reads the identifiers of the N second electronic devices stored in the NFC tag to determine the N second electronic devices bound to the NFC tag; or,
After the first electronic device detects the NFC signal from the NFC tag using the NFC chip, it reads the identifiers of the N second electronic devices stored in the NFC tag to determine the N second electronic devices bound to the NFC tag; wherein the NFC chip is included in the first electronic device.

3.

The method according to claim 1 or 2, characterized in that the first electronic device projects the first content to at least one of the N second electronic devices for continuous playback according to a preset projection strategy, comprising:
The first electronic device sends the first content to at least one second electronic device among the N second electronic devices for playback according to a preset projection strategy.

4.

The method according to claim 3, characterized in that the N second electronic devices include a first speaker and a second speaker;
The first electronic device sends the first content to at least one of the N second electronic devices for playback according to a preset projection strategy, including:
The first electronic device sends the first content to the first speaker for playing, and the first speaker is the speaker closest to the first electronic device; or
The first electronic device sends the first content to the first speaker and the second speaker for playing.

5.

The method according to claim 4, wherein the first electronic device sends the first content to the first speaker and the second speaker for playing, comprising:
The first electronic device sends the first audio component in the first content to the first speaker for playing; and the first electronic device sends the second audio component in the first content to the second speaker for playing.

6.

The method according to claim 3, characterized in that the N second electronic devices include speakers and televisions;
The first electronic device sends the first content to at least one of the N second electronic devices for playback according to a preset projection strategy, including:
The first electronic device sends the display content in the first content to the television for playing; and the first electronic device sends the audio content in the first content to the speaker for playing; or
The first electronic device sends the display content in the first content to the television for playing; and the first electronic device sends the audio content in the first content to the television and the speaker for playing.

7.

The method according to claim 1 or 2, characterized in that after the first electronic device obtains N second electronic devices bound to the NFC tag from the NFC tag, it also includes:
The first electronic device determines a master device among the N second electronic devices;
The first electronic device projects the first content to at least one of the N second electronic devices for continuous playback according to a preset projection strategy, including:
The first electronic device sends the first content to the master device, so that the master device controls at least one second electronic device among the N second electronic devices to play the first content according to a preset projection strategy.

8.

The method according to claim 7, characterized in that the N second electronic devices include a television and a lamp;
The first electronic device determines a master device among the N second electronic devices, including:
The first electronic device determines the television as a master device among the N second electronic devices;
The preset projection strategy includes: the television plays the display content and audio content in the first content, and the television sends a control instruction to the lamp according to the first content to control the brightness or color of the lamp.

9.

The method according to claim 7 or 8, characterized in that after the first electronic device determines the master device among the N second electronic devices, it further comprises:
The first electronic device sends the stored projection strategy to the main device.

10.

The method according to any one of claims 3 to 9, characterized in that before the first electronic device projects the first content to at least one of the N second electronic devices for continued playback according to a preset projection strategy, it further comprises:
The first electronic device performs time synchronization with the N second electronic devices;
The first content sent by the first electronic device carries a timestamp, and the timestamp is used to indicate the playback progress of the first content.

11.

The method according to any one of claims 1 to 10, characterized in that after the first electronic device obtains N second electronic devices bound to the NFC tag from the NFC tag, it also includes:
The first electronic device receives a projection strategy input by a user to the N second electronic devices.

12.

A cross-device content projection method, characterized by comprising:
The first electronic device displays a binding interface of a near field communication NFC tag, wherein the binding interface includes a list of candidate devices waiting to be bound to the NFC tag, and the candidate devices in the candidate device list are located in the same communication network as the first electronic device;
The first electronic device detects a first operation of a user selecting M second electronic devices in the candidate device list, where M is an integer greater than 0;
In response to the first operation, the first electronic device prompts the user to bring the first electronic device close to or in contact with the NFC tag;
The first electronic device writes the identifiers of the M second electronic devices into the NFC tag to establish a binding relationship between the NFC tag and the M second electronic devices.

13.

The method according to claim 12, wherein the first electronic device displays a binding interface of the NFC tag, comprising:
The first electronic device reads a preset flag bit in the NFC tag;
If the value in the flag bit is a first preset value, the first electronic device opens a preset projection application to display a binding interface of the NFC tag.

14.

The method according to claim 13, characterized in that after the first electronic device writes the identifiers of the M second electronic devices into the NFC tag, it also includes:
The first electronic device modifies the value of the flag bit from the first preset value to a second preset value.

15.

The method according to any one of claims 12 to 14, characterized in that after the first electronic device writes the identifiers of the M second electronic devices into the NFC tag, it further comprises:
The first electronic device displays a setting interface for the projection strategy;
The first electronic device receives projection strategies input by a user for the M second electronic devices in the setting interface, and saves the projection strategies.

16.

The method according to claim 15, characterized in that, when M=1, the projection strategy includes a correspondence between different NFC operations and projection instructions.

17.

The method according to claim 15, characterized in that, when M>1, the projection strategy includes content projection rules set for each second electronic device.

18.

The method according to claim 17, characterized in that
When the M second electronic devices include a first speaker and a second speaker, the projection strategy is: using the speaker closest to the source device to play the projection content, or the projection strategy is: using the first speaker to play the first audio component in the projection content and using the second speaker to play the second audio component in the projection content;
When the M second electronic devices include a television and a sound box, the projection strategy is: using the television to play the display content in the projection content, and using the sound box to play the audio content in the projection content; or using the television to play the display content in the projection content, and using the sound box and the television to play the audio content in the projection content;
When the M second electronic devices include a television and a lamp, the projection strategy is: using the television to play the projection content, and controlling the lighting effect of the lamp by the television.

19.

The method according to any one of claims 12 to 18, characterized in that after the first electronic device writes the identifiers of the M second electronic devices into the NFC tag, it further comprises:

The first electronic device sends the binding relationship between the NFC tag and the M second electronic devices to other electronic devices or a server.

20.

The method according to any one of claims 12 to 19, characterized in that
The candidate devices in the candidate device list and the first electronic device are located in the same Wi-Fi network, or the candidate devices in the candidate device list and the first electronic device are bound to the same account; or,
The first electronic device writes the identification of the second electronic device into the NFC tag, comprising: in response to a bump operation of the first electronic device approaching or contacting the NFC tag, the first electronic device writes the identification of the second electronic device into the NFC tag; or, the first electronic device detects an NFC signal from the NFC tag using an NFC chip, and then writes the identification of the second electronic device into the NFC tag, the NFC chip being included in the first electronic device; or,
The first electronic device reads a preset flag bit in the NFC tag, including: in response to a tap operation in which the first electronic device approaches or contacts the NFC tag, the first electronic device reads a preset flag bit in the NFC tag; or, the first electronic device reads a preset flag bit in the NFC tag after detecting an NFC signal from the NFC tag using an NFC chip.

21.

A content projection system, characterized in that it includes a first electronic device, N second electronic devices and an NFC tag, N is an integer greater than 1; the NFC tag stores a binding relationship between the NFC tag and the N second electronic devices; wherein the first electronic device is used to execute the cross-device content projection method as described in any one of claims 1-11 or claims 12-20.

22.

The system according to claim 21, wherein the N second electronic devices include a master device;
The master device is used to: receive the first content sent by the first electronic device; and control at least one of the N second electronic devices to play the first content according to a preset projection strategy.

23.

An electronic device, comprising:
A touch screen, comprising a touch sensor and a display screen;
one or more processors;
Communication interface;
Memory;
Wherein, one or more computer programs are stored in the memory, and the one or more computer programs include instructions. When the instructions are executed by the electronic device, the electronic device executes the cross-device content projection method as described in any one of claims 1-11 or claims 12-20.

24.

A computer-readable storage medium having instructions stored therein, characterized in that when the instructions are executed on an electronic device, the electronic device executes the cross-device content projection method as described in any one of claims 1-11 or claims 12-20.

25.

A computer program product comprising instructions, characterized in that when the computer program product is run on an electronic device, the electronic device executes the cross-device content projection method as described in any one of claims 1-11 or claims 12-20.