

# **METHODS, APPARATUSES, DEVICES AND SYSTEMS FOR MANAGING GAME DEVICES**

## **TECHNICAL FIELD**

**[0001]** The present disclosure relates to the field of operation and maintenance management technology, and in particular to methods, apparatuses, devices and systems for managing game devices.

## **BACKGROUND**

**[0002]** With the development of technology, there are various intelligent game devices. These intelligent game devices integrate a variety of functions, and various software programs can also be installed in the game devices. At present, when managing these intelligent game devices, such as powering on and off the game device, software installation and upgrading, system file modification, etc., need to be manually operated on each game device. However, most game devices have no interactive interface, which are difficult to be operated, and require high technical level of managers. And the game devices in entertainment places are often in bulk and in large quantities. Therefore, the management of game device is difficult and labor-intensive.

## **SUMMARY**

**[0003]** The present disclosure provides a method, an apparatus, a device and a system for managing game devices.

**[0004]** According to a first aspect of embodiments of the present disclosure, there is provided a system for managing game devices, the system includes a plurality of game devices to be managed and a management device for managing the plurality of game devices, for each of the plurality of game devices, the game device is configured with a first service, the management device is configured with a second service, the first service is provided with a Remote Procedure Call RPC interface for the second service to call, the second service is configured to: obtain an management instruction input through an interactive interface of the management device, wherein the management instruction includes identification information of one or more of the plurality of game devices, and send the management instruction to the first service through the RPC interface in the one or more of the plurality of game devices based on the identification information, such that the first service configured in the one or more of the plurality of game devices executes the management instruction in response to receiving the management instruction.

**[0005]** According to a second aspect of embodiments of the present disclosure, there is provided a method of managing a game device, the method is executed by a first service pre-configured in the game device, the first service is provided with a Remote Procedure Call RPC interface for a second service configured in a management device to call, and the management device is configured to manage the game device, the method includes: receiving a management instruction, through the RPC interface, sent by the second service based on identification information of the game device, where the management instruction is input through an interactive interface of the management device, and the management instruction includes the identification information; executing the management instruction.

**[0006]** In some embodiments, the method further includes: after the game device is powered on, sending a registration request to the second service through the RPC interface, where the registration request at least includes the identification information of the game device and address information of the RPC interface of the game device, such that the second service stores the identification information and the address information of the RPC interface in association.

**[0007]** In some embodiments, the management instruction includes an instruction for controlling a system of the game device, and executing the management instruction includes: calling a local system interface of the game device to execute the management instruction; and/or the management instruction includes an instruction for managing an application in the game device, and executing the management instruction includes: calling an Application Program Interface API provided by an application schedule platform in the game device to execute the management instruction.

**[0008]** In some embodiments, the instruction for controlling the system of the game device includes one or more of: an instruction of powering on, an instruction of powering off, or an instruction of modifying system files; and/or the instruction for managing an application in the game device includes one or more of: installing an application, uninstalling an application, upgrading an application, restarting an application, or modifying configuration parameters of an application.

**[0009]** In some embodiments, the management instruction includes an instruction for managing an application in the game device, and executing the management instruction includes: in response to detecting that the application is in a use state, storing the management instruction and continuously detecting the use state of the application; in

response to detecting that the application is not in the use state, obtaining and executing the stored management instruction.

**[0010]** According to a third aspect of embodiments of the present disclosure, there is provided a method of managing game devices, the method is executed by a second service configured in a management device, the management device is configured to manage a plurality of game devices, where, for each of the plurality of game devices, the game device is configured with a first service, and the first service is provided with a Remote Procedure Call RPC interface for the second service to call, the method includes: obtaining a management instruction input through an interactive interface of the management device, where the management instruction includes identification information of a game device to be managed; sending the management instruction, through a RPC interface of the game device to be managed, to the first service of the game device to be managed based on the identification information, such that the first service of the game device to be managed executes the management instruction in response to receiving the management instruction.

**[0011]** In some embodiments, the method further includes: receiving a registration request sent by the game device after the game device is powered on, where the registration request includes identification information of the game device and address information of an RPC interface of the game device; storing the identification information and the address information of the RPC interface in association.

**[0012]** In some embodiments, the management instruction includes an instruction for controlling a system of the game device to be managed, and/or the management instruction includes an instruction for managing an application in the game device to be managed; where the instruction for controlling the system of the game device to be managed includes one or more of: an instruction of powering on, an instruction of powering off, or an instruction of modifying system files; the instruction for managing an application in the game device to be managed includes one or more of: installing an application, uninstalling an application, upgrading an application, restarting an application, or modifying configuration parameters of an application.

**[0013]** In some embodiments, in response to detecting that state information of the game device is updated, updated state information is obtained through the RPC interface, and the obtained state information is displayed on the interactive interface of the management device.

**[0014]** In some embodiments, in response to determining that the game device is abnormal based on the obtained state information of the game device, alarm information is sent, where the alarm information includes the identification information of the abnormal game device.

**[0015]** In some embodiments, the method further includes: obtaining an image of the game device captured by an image capture device, and displaying the image of the game device on the interactive interface of the management device, to determine whether to manage the game device based on the image of the game device.

**[0016]** According to a fourth aspect of embodiments of the present disclosure, there is provided an apparatus for managing a game device, the apparatus is configured in a game device, the apparatus is provided with a Remote Procedure Call RPC interface for a second service configured in a management device to call, the management device is configured to manage the game device, and the apparatus includes: a receiving module configured to receive a management instruction, through the RPC interface, sent by the second service based on identification information of the game device, where the management instruction is input through an interactive interface of the management device, and the management instruction includes the identification information; and an executing module configured to execute the management instruction.

**[0017]** According to a fifth aspect of embodiments of the present disclosure, there is provided an apparatus for managing game devices, the apparatus is configured in a management device, the management device is configured to manage a plurality of game devices, for each of the plurality of game devices, the game device is configured with a first service, and the first service is provided with a Remote Procedure Call RPC interface for the apparatus to call, the apparatus includes: an obtaining module configured to obtain a management instruction input through an interactive interface of the management device, where the management instruction includes the identification information of the game device to be managed; a sending module configured to send the management instruction, through the RPC interface of the game device to be managed, to the first service of the game device to be managed based on the identification information, such that the first service of the game device to be managed executes the management instruction in response to receiving the management instruction.

**[0018]** According to a sixth aspect of embodiments of the present disclosure, there is provided an electronic device, where the device includes one or more processors, one or more memories, and computer instructions stored in the one or more memories for execution

by the one or more processors, when executed by the one or more processors, cause the one or more processors to implement the method according to the second aspect or the fourth aspect of the present disclosure.

**[0019]** In the embodiments of the present disclosure, a first service can be pre-configured in each of the plurality of game devices to be managed, and a second service can be configured in a management device, where the first service provides an RPC interface for the second service to call. When a user needs to manage a game device, a management instruction including identification information of the game device to be managed can be input through the interactive interface of the management device. After the second service obtains the management instruction, the management instruction can be sent to the first service on the game device to be managed through the RPC interface of the game device to be managed, such that the first service can execute the management instruction in response to receiving the management instruction. By configuring services in the management device and game devices in advance and using services to cooperate work, a remote management of batch game devices can be realized without manually operating the game devices one by one, thereby saving manpower, and facilitating operations of the user by providing a visual user interactive interface.

**[0020]** It should be understood that the above general descriptions and the below detailed descriptions are merely examples and explanation, and does not intend to limit the present disclosure.

### **BRIEF DESCRIPTION OF DRAWINGS**

**[0021]** The accompanying drawings, which are incorporated in and constitute a part of this specification, drawings illustrate examples consistent with the present disclosure and, together with the description, serve to explain the principles of the disclosure.

**[0022]** FIG. 1 is a schematic diagram of a system for managing game devices according to embodiments of the present disclosure.

**[0023]** FIG. 2 is a schematic diagram of a method of managing game devices according to embodiments of the present disclosure.

**[0024]** FIG. 3 (a) is a schematic diagram of game tables placement according to embodiments of the present disclosure.

**[0025]** FIG. 3 (b) is a schematic diagram of a user interface according to embodiments of the present disclosure.

**[0026]** FIG. 4 is a schematic diagram of a system for managing game devices according to embodiments of the present disclosure.

**[0027]** FIG. 5 is a logical structure diagram of a management apparatus according to embodiments of the present disclosure.

**[0028]** FIG. 6 is a logical structure schematic diagram of another management apparatus according to embodiments of the present disclosure.

**[0029]** FIG. 7 is a logical structure schematic diagram of a device according to embodiments of the present disclosure.

### **DETAILED DESCRIPTION**

**[0030]** Various embodiments will be described in detail herein, examples of which are illustrated in the accompanying drawings. When the following descriptions involve the drawings, like numerals in different drawings represent like or similar elements unless stated otherwise. The embodiments described in the following examples do not represent all embodiments consistent with the present disclosure. Rather, they are merely examples of apparatuses and methods consistent with some aspects of the present disclosure as detailed in the appended claims.

**[0031]** The terms used in the present application are for the purpose of describing particular examples only, and are not intended to limit the present disclosure. Terms like “a,” “the,” and “said” in their singular forms in the present disclosure and the appended claims are also intended to include plurality, unless clearly indicated otherwise in the context. It is to be understood that the term “and/or” as used herein is and includes any and all possible combinations of one or more of associated listed items. In addition, the term “at least one” herein refers to any combination of any one of the plurality or at least two of the plurality.

**[0032]** It is to be understood that, although terms “first,” “second,” “third,” and the like can be used in the present disclosure to describe various information, such information should not be limited to these terms. These terms are only used to distinguish one category of information from another. For example, without departing from the scope of the present disclosure, first information can be referred as second information; and similarly, second information can also be referred as first information. Depending on the context, the word “if” as used herein can be interpreted as “when,” or “upon,” or “in response to determining”.

**[0033]** In order to make those skilled in the art better understand the technical scheme in the embodiments of the present disclosure and make the above objectives, features and advantages of the embodiment of the present disclosure more obvious and easier to be

understood, the technical scheme in the embodiments of the present disclosure is further described in detail below in combination with the accompanying drawings.

**[0034]** With the development of technology, there are more and more intelligent game devices. These game devices integrate more functions, and various software applications can be installed in the game devices. For example, taking card games as an example, some card games need a specific game table. A camera can be set above the game table to capture an image of the game table, a state of a game played on the game table can be determined based on the captured image, and scores of respective players in the game can be counted based on the captured image. In order to make the game table realize various functions, various software applications can be installed on the game table.

**[0035]** In order to ensure stable operating of one or more game devices, it is necessary to carry out operation and maintenance managements for the one or more game devices, such as controlling powering on and off of a game device, installing and upgrading a software, system file modification, fault repair, etc. At present, these management operations require manual operations to respective game devices one by one. Some game devices do not have a visual interactive interface, when performing management operations, it is cumbersome to implement management operations, and the game devices have high requirements for the technical level of operation and maintenance personnel. In addition, a game place usually has game devices in bulk, and a management way of operating the game devices one by one is very labor-consuming. And when operating a game device, the use of the game device needs to be suspended, thereby affecting the player experience.

**[0036]** Based on this, embodiments of the present disclosure provide a management system and a management method for managing game devices, which can remotely control and manage a plurality of game devices through a management device.

**[0037]** A management system of an embodiment of the present disclosure is shown in FIG. 1. It should be noted that FIG. 1 is only an exemplary example, and a management device in the embodiment of the present disclosure is not limited to FIG. 1. The management system includes a management device 12 and a plurality of game devices 11 to be managed. Each game device 11 can pre-configured with one or more services, hereinafter referred to as first service, and the management device 12 can pre-configured with one or more services, hereinafter referred to as second service. The first service and the second service can cooperate together to complete a remote batch management of the game devices 11. The first service is provided with one or more RPC (Remote Procedure Call) interfaces for the

second service to call, and the second service can issue a management instruction to the first service through the RPC interfaces. In order to facilitate user operation, the management device is provided with a visual interactive interface through which the user can input the management instruction. After the second service obtains the management instruction input by the user, the management instruction is sent to the first service through the RPC interfaces. After the management instruction is received, the first service can call a system interface of a game device to execute the management instruction.

**[0038]** The game device in the embodiment of the present disclosure can be various game devices that need to be managed, for example, game tables, game props, etc. The management device in the embodiment of the present disclosure can be various devices, such as mobile phones, tablets, servers, etc., that can be used to manage game devices.

**[0039]** The following describes a method of managing game devices according to the embodiment of the present disclosure from processing flows of the game devices and the management device respectively. FIG. 2 is a processing flowchart of the method of managing the game devices, and the method includes steps S202 to S208.

**[0040]** At S202, a second service of a management device obtains a management instruction input through an interactive interface of the management device, and the management instruction includes identification information of a game device to be managed.

**[0041]** In the step S202, the management device is provided with a visual interactive interface through which a user can input the management instruction. Since there are a plurality of game devices, the management instruction can control some of the plurality of game devices or all of the game devices. In order to distinguish which of the plurality of game devices is controlled by the management instruction, the management instruction can include the identification information of one or more game devices for which the user wants to perform the management operation. The identification information can be any information that can uniquely identify a game device, for example, the identification information can be device serial number, device number, MAC address, address of RPC interface of the game device, etc.

**[0042]** In some embodiments, the plurality of game devices can be placed in a target area in a certain position order. For example, as shown in FIG. 3 (a), a plurality of game tables are placed in a game place in a certain arrangement. In order to facilitate the user to intuitively determine which game device is currently managed, an image of the game devices arranged in the target area can be displayed in the interactive interface. When the

user needs to manage a game device in the target area, the user can directly click a corresponding game device in the image of the game devices displayed in the interactive interface, then input the management instruction subsequently. As shown in FIG. 3 (b), the user can click a numbered game device, such as game table 1 in the interactive interface to manage the game device.

**[0043]** The management device can be pre-configured with one or more second services for managing the game devices. In some embodiments, all functions related to managing the game devices can be integrated into one second service, and all functions related to managing the game devices can be realized through one second service. In some embodiments, the functions related to managing the game devices can be further subdivided into multiple sub-functions, and different second services can be configured for different sub-functions. For example, a front-end service can be configured, which is mainly configured to provide a visual user interactive interface for user operation, and a background service can be configured, which is configured to interact with the game devices and issue instructions, etc. With cooperation between first services in the game devices and the second services, the management of the game devices is realized.

**[0044]** At S204, the second service sends the management instruction, through the RPC interface of the game device to be managed, to a first service of the game device to be managed based on the identification information.

**[0045]** In the step S204, after obtaining the management instruction input by the user, the second service can determine the RPC interface of the game device to be managed according to the identification information of the game device to be managed included in the management instruction, and send the management instruction to the first service configured in the game device to be managed based on the RPC interface. For example, each game device includes an address that uniquely identifies an RPC interface of the game device. Therefore, the second service can determine the address of the RPC interface of the game device that the user wants to manage based on the identification information included by the management instruction, and send the management instruction to the first service configured in the game device based on the address of the RPC interface.

**[0046]** At S206, the first service receives the management instruction sent by the second service through the RPC interface.

**[0047]** In the step 206, the first service configured in the game device can receive the management instruction sent by the second service through the RPC interface. The first

service can include one or more first services. In some embodiments, all functions related to a management of a game device can be integrated into one first service. In some embodiments, different first services can be set for different sub-functions, which can be set according to actual needs.

**[0048]** At S208, the first service executes the management instruction in response to receiving the management instruction.

**[0049]** In the step S208, after receiving the management instruction, the first service can execute the management instruction. In order to facilitate the user to know an execution result of the management instruction, after the management instruction is executed, the first service can return the execution result to the second service, such that the second service can display the execution result to the user on the interactive interface of the management device.

**[0050]** In some embodiments, the management instruction can be an instruction for controlling a system of a game device, for example, the management instruction can be an instruction of powering on, an instruction of powering off, or an instruction of modifying system files, etc.

**[0051]** In some embodiments, the management instruction can be an instruction for controlling an application of a game device, for example, the management instruction can be an instruction of installing an application, an instruction of uninstalling an application, an instruction of upgrading an application, an instruction of restarting an application, and an instruction of modifying configuration parameters of an application.

**[0052]** In some embodiments, if the management instruction is an instruction for controlling a system of a game device, when the management instruction is executed, a local system interface of the game device can be directly called to execute the management instruction, such as controlling powering on and off, modifying the system file of the game device, etc.

**[0053]** Generally, there is an application schedule platform in the game device, and all applications in the game device are installed in and scheduled by the application schedule platform. For example, take a game device with Linux system as an example, a kubernetes service is running on the Linux system, and all software applications are installed in kubernetes and scheduled by Kubernetes. Therefore, in some embodiments, if the management instruction is an instruction for managing an application in the game device, when the management instruction is executed, an API interface provided by the application

schedule platform can be called to execute the management instruction to complete installation, uninstallation, upgrade, restart, etc. of the application.

**[0054]** Since each game device has an RPC interface, when the second service issues a management instruction, in order to accurately issue the management instruction to the game device that the user wants to manage, the second service needs to determine address information of the RPC interface corresponding to each game device. In some embodiments, each correspondence between the RPC interface address information of a game device and the identification information of the game device can be stored in the management device in advance, and the second service can determine the address information of the RPC interface based on the stored correspondence when issuing a management instruction.

**[0055]** In some embodiments, each time the game device is powered on, the first service sends a registration request to the second service through the RPC interface, the registration request at least includes the identification information of the game device and the address information of the RPC interface of the game device. After the second service receives the registration request, the identification information and the address information of the RPC interface can be stored in association. After the game device is powered off (i.e., offline), the stored identification information of the game device and the stored address information of the RPC interface can also be deleted, so as to save a storage space of the management device.

**[0056]** In addition, the game device sends a registration request to the second service after each time the game device is powered on, and the second service can determine which game devices are currently online by retrieving the stored identification information. For example, after obtaining the management instruction input by the user, the management device can retrieve the stored identification information, if the identification information included by the management instruction is found out, it indicates that the game device to be managed is online, such that the management instruction can be sent based on the address of the RPC interface corresponding to the identification information. If the identification information included by the management instruction is not found, it indicates that the game device to be manage is offline, such that a prompt that the game device is not online yet can be sent to the user.

**[0057]** In some embodiments, if the management instruction is an instruction for managing an application in a game device, such as upgrading an application, modifying configuration parameters, etc., if a player is playing with the application in the game device at this time,

when the management instruction is executed, the game will be interrupted, thereby bring bad experience to the player. In order to avoid the above problems, the first service can detect a current use state of the application before executing the management instruction, in response to detecting that the application is in the use state, the management instruction is not executed, and prompt information that the application is being used by the player is returned to the second service, such that the second service can display the prompt information to the user. In some embodiments, when the first service detects that the application is currently in the use state, the first service can store the management instruction first and detect the use state of the application in real time, in response to detecting that the application is not in the use state, the first service can call and execute the stored management instruction.

**[0058]** In some embodiments, the second service can detect state information in the game device in real time, in response to detecting that the state information is updated, the second service obtains the updated state information and displays the updated state information to the user on the interactive interface of the management device, such that the user can determine the current state of the game device. The state information can be whether the game device is currently, whether the application in the game device is running, whether the game device is abnormal, etc.

**[0059]** In some embodiments, after obtaining the state information of the game device, the second service in the management device can determine whether the game device is abnormal based on the state information, and if it is determined that the game device is abnormal, alarm information is sent to the user. Some abnormality determination rules can be preset in the second service, if the state information of the game device complies with the abnormality determination rules, it is determined that the game device is abnormal. After determining that the game device is abnormal, the alarm information can be sent to the user, for example, the alarm information can be sent to the user through email, QQ, WeChat and other instant communication tools. The alarm information can include the identification information of the abnormal game device, such that the user can receive the alarm information in time after the game device is abnormal, and the game device that is abnormal is determined based on the identification information in the alarm information, so as to deal with the abnormality in time.

**[0060]** In some embodiments, for some game devices, cameras can be set around or near the game devices to capture images of the game devices. For example, for a game table of

a card game, an image capture device can be set on or above or near the game table to capture the image of the game table, and the current state of the game can be determined, and the game results can be counted, etc., based on the image of the game table. In this scenario, in order to not affect a player using the game device when the user manages the game device, the second service can obtain the image of the game device captured by the image capture device and display the image of the game device to the user on the interactive interface of the management device, such that the user can determine whether to manage the game device according to the image of the game device. For example, if the user finds that a player is currently using the game device according to the image of the game device, other management operations such as powering off, restarting will not be applied to the game device at this time to avoid affecting the use of the player. If the user finds that there are no players around the game device according to the image, it can be determined that the game device is not in the use state, and management operations such as powering off, restarting and application upgrading can be applied to the game device. In this way, the game device can be managed more reasonably with an assistance of the existing image capture device around the game device, and the use of players will not be affected.

**[0061]** In order to further explain the method of managing game devices provided by the embodiments of the present disclosure, it is explained below in combination with a specific embodiment.

**[0062]** In the game field, there are a certain number of game devices in a game place, these game devices work alone to provide intelligent services for players. Long-term and stable work of the game devices are inseparable from effective operation and maintenance management, such as online and offline of old and new game devices, software upgrading, fault handling, etc. At present, the operation and maintenance management of the game devices requires manual operations for respective game devices one by one, and the operation and maintenance personnel need to have a computer knowledge with a certain depth, which is very labor-intensive. In addition, when operating a game device, the running of the game device needs to be suspended, affecting the use of players. Based on this, the present embodiment provides a method and a management system for managing game devices remotely. Details refer to FIG. 4.

**[0063]** The management system includes a plurality of game devices and a cloud server for managing the plurality of game devices. Each of the plurality of game devices is pre-configured with one or more services, hereinafter referred to as first services, and the cloud

server is pre-configured with one or more services, hereinafter referred to as second services. Through cooperation between the first services and the second services, a remote batch management of the game devices is realized. The first services provide a series of RPC interfaces for the second services to call. The cloud server includes a visual user interactive interface. Users can enter management instructions through the interactive interface to manage the game devices, operations are simple.

**[0064]** After each game device is powered on, a first service in the game device sends a registration request to a second service of the cloud server, the registration request includes identification information and address information of the RPC interface of the game device, the second service stores the identification information and the address information of the RPC interface in association. When operation and maintenance personnel input a management instruction through the interactive interface of the cloud server, the management instruction can include identification information of a game device to be managed, the second service can determine the address information of the RPC interface corresponding to the identification information based on the identification information in the management instruction, and issue the management instruction to a corresponding game device based on the address information. After the management instruction is executed, the game device can return an execution result to the second service, such that the second service can display the execution result to the operation and maintenance personnel on the interactive interface.

**[0065]** The management of the game devices by the cloud server includes the following three aspects.

**[0066]** (1) Management of software applications in game devices.

**[0067]** An operating system of a game device can be a Linux operating system, a kubernetes platform is running on the operating system, all software applications (including the first service) are installed on and scheduled by the kubernetes platform. The first service exposes an external network open port and provides a series of RPC interfaces. After receiving the management instruction sent by the second service in the cloud server through the RPC interface, the first service can call the API interface provided by kubernetes platform to execute the management instruction to complete the installation, upgrading, configuration modification, restarting and other operations of the application in the game device.

**[0068]** (2) Control of systems of game devices.

**[0069]** The user inputs a remote system control instruction through the visual interactive interface in the cloud server. The control instruction is transmitted by the second service to the first service through the RPC interface. At this time, the first service executes Linux system commands to complete remote powering off, restarting, modifying system files and other operations, and return execution results to the second service.

**[0070]** (3) Monitoring of states of game devices.

**[0071]** A first service in a game device can collect state information of the game device in real time. The second service in the cloud server can capture the state information in real time and display the state information of the game device to the user through the visual interactive interface, such that the user can view a current state, such as offline or online, of the game device. In addition, the cloud server can further predefine alarm rules. In response to determining that the game device is abnormal based on the obtained state information of the game device, the cloud server can send alarm email or message to operation and maintenance personnel's mobile phone or other terminals through the second service, such that the operation and maintenance personnel can deal with the abnormality in time. The alarm email can include the identification information of the abnormal game device, such that the operation and maintenance personnel can locate and deal with the game device that is abnormal.

**[0072]** In the past, when managing game devices, the operation and maintenance personnel were required to perform complex Linux command-line operations, and the technical requirements for the operation and maintenance personnel were high. The management system for managing game devices provided in this embodiment can provide a visual interactive interface, which merely requires the operation and maintenance personnel to simply click on the interactive interface, and the technical requirements for the operation and maintenance personnel are low. In addition, in a case of a large number of game devices, it does not need to spend a lot of repeated labor time. The management system supports batch execution of same operations on game devices, including installation an application, upgrading an application, configuration modification, restarting, etc., and players are insensitive to the operations, so there is no need to stop running of game devices at all. In addition, the management system provided by this embodiment has a monitoring alarm function, which can timely notify the operation and maintenance personnel when the game device is abnormal, thereby greatly reducing a failure and downtime time of the game device.

**[0073]** Corresponding to the above-mentioned method, the embodiments of the present disclosure further provide an apparatus for managing a game device, the apparatus is configured in a game device, the apparatus is provided with a Remote Procedure Call RPC interface for a second service configured in a management device to call, the management device is configured to manage the game device. As shown in FIG. 5, the apparatus for managing the game device includes: a receiving module 51 configured to receive a management instruction, through the RPC interface, sent by the second service based on identification information of the game device, where the management instruction is input through an interactive interface of the management device, and the management instruction includes the identification information; and an executing module 52 configured to execute the management instruction.

**[0074]** The implementation of the apparatus for managing the game device can refer to the description in the above-mentioned method embodiments, which will not be repeated here. In addition, the embodiments of the present disclosure further provide another apparatus for managing game devices, the apparatus for managing game devices is configured in a management device, the management device is configured to manage a plurality of game devices, each of the plurality of game devices is configured with a first service, and the first service is provided with an RPC interface for the apparatus to invoke, as shown in FIG. 6, the apparatus for managing the game devices includes an obtaining module 61 configured to obtain a management instruction input through an interactive interface of the management device, where the management instruction includes the identification information of a game device to be managed; a sending module 62 configured to send the management instruction, through the RPC interface of the game device to be managed, to the first service of the game device to be managed based on the identification information, such that the first service of the game device to be managed executes the management instruction in response to receiving the management instruction.

**[0075]** The implementation of the apparatus for managing the game devices can refer to the description in the above-mentioned method embodiments, which will not be repeated here.

**[0076]** Further, the embodiments of the present disclosure provide an electronic device. As shown in FIG. 7, the electronic device 70 includes a processor 71, a memory 72 and computer instructions stored in the memory 72 for execution by the processor 71. If the electronic device is a management device in the above embodiments, when executing the

computer instructions, the processor implements the method executed by the management device according to any of the above embodiments. If the electronic device is a game device in the above embodiments, when executing the computer instruction, the processor can implement the method executed by the game device according to any of the above embodiments.

**[0077]** The embodiments of the present disclosure further provide a non-transitory computer-readable storage medium having computer programs stored thereon, when executed by a processor, the methods described in any of the above-mentioned embodiments are implemented.

**[0078]** Computer-readable media includes permanent and non-persistent, removable and non-removable media. Information storage can be accomplished by any method or technology. Information can be computer readable instructions, data structures, modules of a program, or other data. Examples of computer storage media include, but are not limited to, phase change memory (PRAM), static random access memory (SRAM), dynamic random access memory (DRAM), other types of random access memory (RAM), and read-only memory (ROM), electrically erasable programmable read-only memory (EEPROM), flash memory or other memory technology, read-only disc read-only memory (CD-ROM), digital versatile disc (DVD) or other optical storage, magnetic tape cartridges, magnetic tape storage or other magnetic storage devices or any other non-transmitting medium which can be used to store information that can be accessed by a computing device. Based on the definition in the present disclosure, computer-readable media does not include transitory computer-readable media (transitory media), such as modulated data signals and carrier waves.

**[0079]** It can be known from the description of the foregoing embodiments that those skilled in the art can clearly understand that the embodiments of the present disclosure can be implemented by means of software plus a necessary universal hardware platform. Based on such an understanding, the technical solution of the embodiments of the present disclosure can be embodied in the form of a software product that is essentially or contributes to the existing technology. The computer software product can be stored in a storage medium such as ROM/RAM, magnetic disks, optical disks, and the like which includes instructions for causing a computer device (which can be a personal computer, a server, or a network device, etc.) to execute the methods described in the various embodiments or portions of the embodiments of the present disclosure.

**[0080]** The system, apparatus, module, or unit described in the above-mentioned embodiments can be implemented by a computer chip or entity, or can be implemented by using a product with a certain function. An example of a device is a computer, and the form of the computer can be a personal computer, a laptop computer, a cellular phone, a camera phone, a smart phone, a personal digital assistant, a media player, a navigation device, an email sending and receiving device, a game console, a tablet computer, a wearable device, or a combination of any of these devices.

**[0081]** Each embodiment in the present disclosure is described in a progressive manner, and the same or similar parts between the various embodiments can be referred to each other. Each embodiment focuses on the differences from other embodiments. In particular, with respect to the apparatus examples, since they are basically similar to the method examples, the description thereof is relatively simple. For the related parts, reference can be made to the description of the method examples. The apparatus examples described above are merely illustrative, where the modules described as separate components may or may not be physically separated. During the implementation of the solutions according to the examples of the present specification, the function of each module can be realized in the same one or more software and/or hardware. Some or all of the modules can also be selected according to actual needs to achieve the objective of the solution of this embodiment. Those of ordinary skill in the art can understand and implement the present disclosure without any creative effort.

**[0082]** The above are only specific embodiments of the examples of the present specification. It should be noted that for those of ordinary skill in the art, without departing from the principle of the examples of the present specification, some improvements and modifications can be made. These improvements and modifications should also be regarded to fall within the protection scope of the examples of the present specification.

## CLAIMS

1. A system for managing game devices, comprising:

a plurality of game devices to be managed, and

a management device for managing the plurality of game devices,

wherein, for each of the plurality of game devices, the game device is configured with a first service, the management device is configured with a second service, the first service is provided with a remote procedure call RPC interface for the second service to call,

the second service is configured to:

obtain a management instruction input through an interactive interface of the management device, wherein the management instruction comprises identification information of one or more of the plurality of game devices, and

send the management instruction to the first service through the RPC interface in the one or more of the plurality of game devices based on the identification information, such that the first service configured in the one or more of the plurality of game devices executes the management instruction in response to receiving the management instruction.

2. A method of managing a game device, wherein the method is executed by a first service pre-configured in the game device, the first service is provided with a Remote Procedure Call RPC interface for a second service configured in a management device to call, and the management device is configured to manage the game device, the method comprises:

receiving a management instruction, through the RPC interface, sent by the second service based on identification information of the game device, wherein the management instruction is input through an interactive interface of the management device, and the management instruction comprises the identification information; and

executing the management instruction.

3. The method of claim 2, further comprises:

in response to determining that the game device is powered on, sending a registration request to the second service through the RPC interface, wherein the registration request at least comprises the identification information of the game device and address information of the RPC interface of the game device, such that the second service stores the identification information and the address information of the RPC interface in association.

4. The method of claim 2 or 3, wherein the management instruction comprises an instruction for controlling a system of the game device, and executing the management instruction comprises:

calling a local system interface of the game device to execute the management instruction; and/or

the management instruction comprises an instruction for managing an application in the game device, and executing the management instruction comprises:

calling an Application Program Interface API provided by an application schedule platform in the game device to execute the management instruction.

5. The method of claim 4, wherein the instruction for controlling the system of the game device comprises one or more of: an instruction of powering on, an instruction of powering off, or an instruction of modifying system files; and/or

the instruction for managing an application in the game device comprises one or more of: installing an application, uninstalling an application, upgrading an application, restarting an application, or modifying configuration parameters of an application.

6. The method of claim 2, wherein the management instruction comprises an instruction for managing an application in the game device, and executing the management instruction comprises:

in response to detecting that the application is in a use state, storing the management instruction and continuously detecting the use state of the application; and

in response to detecting that the application is not in the use state, obtaining and executing the stored management instruction.

7. A method of managing game devices, wherein the method is executed by a second service configured in a management device, the management device is configured to manage a plurality of game devices, for each of the plurality of game devices, the game device is configured with a first service, and the first service is provided with a Remote Procedure Call RPC interface for the second service to call, the method comprises:

obtaining a management instruction input through an interactive interface of the management device, wherein the management instruction comprises identification information of a game device to be managed; and

sending the management instruction, through the Remote Procedure Call interface of the game device to be managed, to the first service of the game device to be managed based on the identification information, such that the first service of the game device to be managed executes the management instruction in response to receiving the management instruction.

8. The method of claim 7, further comprises:

receiving a registration request sent by the game device after the game device is powered on, wherein the registration request at least comprises identification information of the game device and address information of the RPC interface of the game device; and

storing the identification information and the address information of the RPC interface in association.

9. The method of claim 7 or 8, wherein the management instruction comprises an instruction for controlling a system of the game device to be managed, and/or the management instruction comprises an instruction for managing an application in the game device to be managed;

wherein the instruction for controlling the system of the game device to be managed comprises one or more of: an instruction of powering on, an instruction of powering off, or an instruction of modifying system files; and

the instruction for managing an application in the game device to be managed comprises one or more of: installing an application, uninstalling an application, upgrading an application, restarting an application, or modifying configuration parameters of an application.

10. The method of any one of claims 7-9, further comprising:

in response to detecting that state information of the game device is updated, obtaining the updated state information through the RPC interface; and

displaying the obtained state information on the interactive interface of the management device.

11. The method of any one of claims 7-10, further comprising:

in response to determining that the game device is abnormal based on the obtained state information of the game device, sending alarm information, wherein the alarm information comprises the identification information of the abnormal game device.

12. The method of any one of claims 7-11, further comprising:

obtaining an image of the game device captured by an image capture device; and

displaying the image of the game device on the interactive interface of the management device, to determine whether to manage the game device based on the image of the game device.

13. An apparatus for managing a game device, wherein the apparatus is configured in a game device, the apparatus is provided with a Remote Procedure Call RPC interface for a second service configured in a management device to call, the management device is configured to manage the game device, and the apparatus comprises:

a receiving module configured to receive a management instruction, through the RPC interface, sent by the second service based on identification information of the game device, wherein the management instruction is input through an interactive interface of the management device, and the management instruction comprises the identification information; and

an executing module configured to execute the management instruction.

14. An apparatus for managing game devices, wherein the apparatus is configured in a management device, the management device is configured to manage a plurality of game devices, for each of the plurality of game devices, the game device is configured with a first service, and the first service is provided with a Remote Procedure Call RPC interface for the apparatus to call, the apparatus comprises:

an obtaining module configured to obtain a management instruction input through an interactive interface of the management device, wherein the management instruction comprises the identification information of a game device to be managed; and

a sending module configured to send the management instruction, through the RPC interface of the game device to be managed, to the first service of the game device to be

managed based on the identification information, such that the first service of the game device to be managed executes the management instruction in response to receiving the management instruction.

15. An electronic device, comprising:

one or more processors,

one or more memories, and

computer instructions stored in the one or more memories for execution by the one or more processors, when executed by the one or more processors, cause the one or more processors to implement the method according to any one of claims 2-6 or claims 7-12.