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(54) **Title:** METHOD AND APPARATUS ENABLING BROWSERS TO PERFORM SECURITY SCAN OF DEVICES

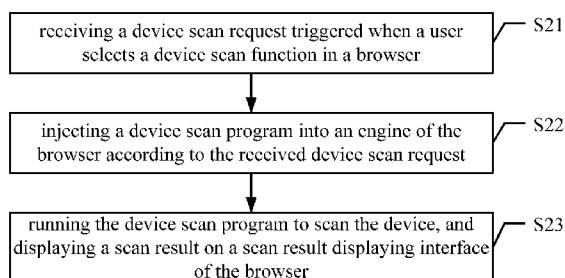


Fig. 2

(57) **Abstract:** Examples of the present disclosure provide a method and an apparatus enabling browsers to perform security scan of devices. The method includes: receiving a device scan request triggered when a device scan function in a browser is selected by a user; injecting a pre-defined device scan program into an engine of the browser according to the received device scan request, running the device scan program; and displaying a scan result on a scan result displaying interface of the browser. Examples of the present disclosure implement security scan in the prevalent browser application, which not only adds new functions to the browser, but also exempts users from downloading dedicated device checking and management software and makes it easier for users to check and manage their intelligent user terminals.



METHOD AND APPARATUS ENABLING BROWSERS TO PERFORM SECURITY SCAN OF DEVICES

Related documents

[0001] The present disclosure claims priority of Chinese patent application No. 201210541227.8 titled "Method and apparatus enabling browsers to perform security scan of devices" and filed on December 12th, 2012 with the Patent Office of the People's Republic of China, the disclosure of which is incorporated by reference.

Technical Field

[0002] The present disclosure relates to Internet browsers, and particularly, to a method and apparatus enabling browsers to perform security scan of devices.

Background

[0003] The mobile Internet and hardware techniques of various smart terminal devices, e.g., mobile phones, tablets, and the like are evolving rapidly, and smart terminal devices are equipped with higher-performance hardware and are capable of running more and more diversified application programs.

[0004] In conventional art, professional applications are generally adopted to check and manage software and hardware in smart terminal devices, and mainly provide functions of examination, monitoring, optimization of the devices, virus prevention, security scan and so on. The professional applications are a good assistant of users in management of smart terminal devices.

Summary

[0005] Examples of the present disclosure provide a method and an apparatus enabling browsers to perform security scan of devices.

[0006] A method enabling browsers to perform security scan of devices may include:

receiving a device scan request triggered when a user selects a device scan function provided by a browser;

injecting a pre-defined device scan program into an engine of the browser according to the device scan request received; and

running the device scan program to scan a device, and displaying a scan result in a displaying interface of the browser.

[0007] An apparatus enabling browsers to perform security scan of devices may comprise:

a receiving module, adapted to receive a device scan request triggered when a user selects a device scan function provided by a browser;

a processing module, adapted to inject a pre-defined device scan program into an engine of the browser according to the device scan request received, and run the device scan program to scan a device;

a displaying module, adapted to display a scan result on a scan result displaying interface of the browser.

[0008] Examples of the present disclosure implement security scan in the prevalent browser application, which not only adds new functions to the browser, but also exempts users from downloading dedicated device check and management software and makes it easier for users to check and manage their smart user terminals.

Brief Description of the Drawings

[0009] Features of the present disclosure are illustrated by way of example and not limited in the following figures, in which like numerals indicate like elements, in which:

[0010] Fig. 1 is a schematic diagram illustrating an example of a computing device.

[0011] Fig. 2 is a flowchart illustrating a method enabling browsers to perform security scan of devices according to an example of the present disclosure;

[0012] Fig. 3 is a flowchart illustrating a method enabling browsers to perform security scan of devices according to an example of the present disclosure;

[0013] Fig. 4 is a schematic diagram illustrating a device checking page presented by a browser according to an example of the present disclosure;

[0014] Fig. 5 is a schematic diagram illustrating a page presenting a checking process in a browser according to an example of the present disclosure;

[0015] Fig. 6 is a schematic diagram illustrating a page presenting a check result in a browser according to an example of the present disclosure;

[0016] Fig. 7 is a schematic diagram illustrating a scan result after an optimization process performed by a browser according to an example of the present disclosure;

[0017] Fig. 8 is a flowchart illustrating an apparatus enabling browsers to perform security scan of devices according to an example of the present disclosure;

[0018] Fig. 9 is a flowchart illustrating an apparatus enabling a browser to perform security scan according to an example of the present disclosure.

Detailed Descriptions

[0019] For simplicity and illustrative purposes, the present disclosure is described by referring mainly to an example thereof. In the following description, numerous specific details are set forth in order to provide a thorough understanding of the present disclosure. It will be readily apparent however, that the present disclosure may be practiced without limitation to these specific details. In other instances, some methods and structures have not been described in detail so as not to unnecessarily obscure the present disclosure. As used herein, the term “includes” means includes but not limited to, the term “including” means including but not limited to. The term “based on” means based at least in part on. Due to characteristics of the Chinese language, quantities of an element, unless specifically mentioned, may be one or a plurality of, or at least one.

[0020] In an example, a computing device may execute methods and software systems of the present disclosure. Fig. 1 is a schematic diagram illustrating an example of a computing device. As shown in Fig. 1, computing device 100 may be capable of executing a method and apparatus of the present disclosure. The computing device 100 may, for example, be a device such as a personal desktop computer or a portable device, such as a laptop computer, a tablet computer, a cellular telephone, or a smart phone. The computing device 100 may also be a server that connects to the above devices locally or via a network.

[0021] The computing device 100 may vary in terms of capabilities or features. Claimed subject matter is intended to cover a wide range of potential variations. For example, the computing device 100 may include a keypad/keyboard 156. It may also include a display 154, such as a liquid crystal display (LCD), or a display with a high degree of functionality, such as a touch-sensitive color 2D or 3D display. In contrast, however, as another example, a web-enabled computing device 100 may include one or more physical or virtual keyboards, and mass storage medium 130.

[0022] The computing device 100 may also include or may execute a variety of operating systems 141, including an operating system, such as a Windows™ or Linux™, or a mobile operating system, such as iOSTM, Android™, or Windows Mobile™. The computer 100 may include or may execute a variety of possible applications 142, such as a browser 145. The browser 145 may be enabled to perform security scan of the computing device 100.

[0023] Further, the computing device 100 may include one or more non-transitory processor-readable storage media 130 and one or more processors 122 in communication with the non-transitory processor-readable storage media 130. For example, the non-transitory processor-readable storage media 130 may be a RAM memory, flash memory, ROM memory, EPROM memory, EEPROM memory, registers, hard disk, a removable disk, a CD-ROM, or any other form of non-transitory storage medium known in the art. The one or more non-transitory processor-readable storage media 130 may store sets of instructions, or units and/or modules that comprise the sets of instructions, for conducting operations described in the present application. The one or more processors may be configured to execute the sets of instructions and perform the operations in

examples of the present application.

[0024] Fig. 2 is a flowchart illustrating a method enabling browsers to perform security scan of devices according to an example of the present disclosure. The method may be applied to a browser in a smart terminal device such as a smart phone, a tablet computer to implement security scan of the smart terminal device. The method may include the following procedures.

[0025] In block S21, a device scan request (also referred to as device check request or device examination request) triggered when a user selects a device scan function (also referred to as device check function or device examination function) provided by a browser is received.

[0026] In an example, the browser may be associated with one or multiple pre-defined device scan programs (also referred to as device check programs or device examination programs). For example, the one or multiple pre-defined device scan programs may be embedded in the browser, or may be encapsulated into APIs as java class files so that the browser may obtain a device scan program by calling an API.

[0027] The device scan programs may include, but not limited to, a program for scanning and displaying a device name, a program for scanning currently running programs and displaying the number of the running programs, a program for scanning device memory and displaying occupied memory and available memory, a program for scanning trash data and displaying the amount of trash data, a program for scanning and displaying installed software, a program for scanning and displaying a trojan, and so on.

[0028] An interface to the device scan function may be set on a blank starting page in the browser, e.g., a button or a device scan window may be provided so that when the user clicks on the button or the device scan window, a device scan request triggered by the selection of the device scan function in the browser by the user may be received, which then triggers the following procedures in blocks S22 and S23 to perform corresponding device scan operations.

[0029] In block S22, a pre-defined device scan program is injected into an engine of the browser according to the device scan request received.

[0030] In block S23, the device scan program is triggered to scan the device, and a scan result is displayed on a scan result displaying interface of the browser.

[0031] If the device scan programs are embedded in the browser, the device scan programs embedded in the browser are called and injected into the engine of the browser in block S22 to run the device scan programs so as to scan and display current conditions about power usage of the device, memory usage, trash data in the cache, currently-running programs and so on.

[0032] If the browser is associated with the device scan programs via APIs, an API is called to obtain a pre-defined device scan program based on the received device scan request in block S22, and

the device scan program is injected into the engine of the browser. Then the device scan program is started in block S23 to scan and display current conditions of power consumption, memory usage, trash data in the cache, currently-running programs and so on. The block S22 may include: calling an API according to the received device scan request to obtain a pre-defined device scan program; injecting the obtained device scan program into the engine of the browser.

[0033] In an example, if the device scan program includes a check and optimization program, the procedure of triggering the device scan program in block S23 may include: running the check and optimization program to check the device, and displaying a check progress and a check result or the check result on a check result displaying interface of the browser; after receiving an optimizing request from the user, running the check and optimization program to optimize the device based on the check result, and displaying an optimization result on a scan result displaying interface of the browser as the scan result.

[0034] In an example, if the device scan program includes a device check program, the procedure of triggering the device scan program may include: running the device check program, and displaying a check progress and a check result or the check result on the scan result displaying interface of the browser as the scan result.

[0035] If only device check is performed, the procedure of displaying the check result in block S103 may include: displaying the amount of remaining power, the amount of occupied memory, the amount of trash data in the cache, and the like.

[0036] If both device check and device optimization are performed, the amount of battery life prolonged by enabling a battery saving function, the amount of freed memory, the amount of deleted trash data in the cache, and the like may be displayed in block S23.

[0037] From the above it can be seen that various examples of the present disclosure have the following merits.

[0038] Examples of the present disclosure implement security scan in the prevalent browser application, which not only adds new functions to the browser, but also exempts users from downloading software dedicated to device check and management, thus makes it easier for users to check and manage their smart terminal devices.

[0039] Fig. 3 is a flowchart illustrating a method enabling browsers to perform security scan of devices according to an example of the present disclosure. The method may be applied to a browser in a smart terminal device such as a smart phone, a tablet computer to implement security scan of the smart terminal device. The method may include the following procedures.

[0040] In block S31, at least one device scan program is pre-defined, and prompt information for each of the at least one device scan program is generated.

[0041] Device check and optimization items to be provided by the browser for the user may be determined based on a check scheme, programs corresponding to the items may be encapsulated into APIs in the form of class files so that the browser may call device scan programs by using the APIs. Prompt information is generated for each of the device scan programs.

[0042] In block S32, the prompt information generated for each of the at least one device scan program is displayed in the browser so that the user can select a device scan function based on the prompt information and trigger a device scan request which includes prompt information corresponding to one of the at least one device scan program.

[0043] In block S33, a device scan request triggered when a user selects a device scan function provided by the browser is received.

[0044] The browser may provide an interface to the device scan functions in a blank starting page. The interface may be a button or a device scan window. The prompt information generated may also be displayed in the blank starting page. For example, prompt text “get knowledge of phone quickly” may be displayed under the button or the device scan window to inform the user that the user can use the option to get knowledge of usage of the battery and the memory card of the phone; prompt text “One-key release of system memory” may be displayed to inform the user that the user can use the option to check and release memory space.

[0045] If the user clicks on the button or the device scan window and has selected prompt information corresponding to a device scan program, the browser may receive a device scan request triggered by the user selecting the device scan function in the browser. Procedures in blocks S304 to S36 are performed to perform corresponding device scan process.

[0046] In block S34, a device scan program identified by the prompt information in the device scan request is selected and obtained from pre-defined device scan programs.

[0047] The procedure of selecting and obtaining a device scan program identified by the prompt information in the device scan request from pre-defined device scan programs may include: selecting from device scan programs embedded in the browser and obtaining the device scan program identified by the prompt information in the device scan request; or calling an API corresponding to the device scan program identified by the prompt information in the device scan request to obtain the device scan program.

[0048] In block S35, the device scan program identified by the prompt information is injected into the engine of the browser.

[0049] In block S36, the device scan program is started up to scan the device, and a scan result is displayed on a scan result displaying interface of the browser.

[0050] In an example, if the device scan program includes a check and optimization program, the

procedure of starting the device scan program in block S36 may include: running the check and optimization program to check the device, and displaying a check progress and a check result or merely the check result on a check result displaying interface of the browser; after an optimization request is received from the user, running the check and optimization program to optimize the device based on the check result, and displaying an optimization result on the scan result displaying interface of the browser as the scan result.

[0051] In an example, if the device scan program includes a device check program, the procedure of starting the device scan program may include: running the device check program, and displaying a check progress and a check result or merely the check result on the scan result displaying interface of the browser as the scan result.

[0052] If only device check is performed, the procedure of displaying the check result in block S36 may include: displaying the amount of remaining battery power, the amount of occupied memory space, the amount of trash data in the cache, and the like.

[0053] If both device check and device optimization are performed, the amount of battery life prolonged by enabling a battery saving function, the amount of freed memory space, the amount of deleted trash data in the cache, and the like may be displayed in block S36.

[0054] Several examples of the method enabling browsers to perform security scan of devices are described by reference to Figs. 4 to 7.

[0055] Fig. 4 is a schematic diagram illustrating a device check page presented by a browser according to an example of the present disclosure. As shown in Fig. 4, buttons are provided on a starting page of the browser, and prompt information about device scan programs is also displayed for the user to make a choice. After the user selects a device scan program and clicks on “check now”, a device scan request is triggered. The browser starts a check procedure after receiving the device scan request.

[0056] Fig. 5 is a schematic diagram illustrating a page presenting a checking process in a browser according to an example of the present disclosure. The browser calls an API to obtain a device scan program and injects the device scan program into the engine of the browser to run the device scan program. The device scan program may include a device check and optimization program for checking the smart terminal device in which the browser is installed. The checking procedure may include checking battery consumption, occupied memory space, usage of a memory card, and the like. A check result is displayed on the page as shown in Fig. 6.

[0057] Fig. 6 is a schematic diagram illustrating a page presenting a check result in the browser. Information about memory usage, memory card usage, battery power and so on is displayed. A button for “One-key acceleration” is provided to inform the user that further optimization may be performed.

[0058] Fig. 7 is a schematic diagram illustrating a scan result after an optimization process

performed by a browser. After the user clicks on the one-key acceleration, the browser calls the device scan program which includes the device checking and optimization program again to optimize the memory space, the memory card and the battery, and a final scan result obtained is displayed on the scan result displaying interface of the browser.

[0059] From the above it can be seen that various examples of the present disclosure have the following merits:

[0060] Examples of the present disclosure implement security scan in the prevalent browser application, which not only adds new functions to the browser, but also exempts users from downloading dedicated device checking and management software and makes it easier for users to check and manage their intelligent user terminals. Further, the user can select one or multiple device scan functions from a webpage of the browser to implement targeted scanning and management, which is more convenient for the user.

[0061] The following is a detailed description of an apparatus enabling browsers to perform security scan of devices according to an example of the present disclosure.

[0062] Fig. 8 is a schematic diagram illustrating an apparatus enabling browsers to perform security scan of devices according to an example of the present disclosure. The apparatus may be configured in a smart terminal device such as a smart phone, a tablet computer and the like. The apparatus may include the following components.

[0063] A receiving module 11 is adapted to receive a device scan request triggered when a user selects a device scan function provided by a browser.

[0064] A processing module 12 is adapted to inject a pre-defined device scan program into an engine of the browser according to the device scan request received, and run the device scan program.

[0065] A displaying module 13 is adapted to display a scan result on a scan result displaying interface of the browser.

[0066] In an example, the browser may be associated with one or multiple pre-defined device scan programs. For example, the one or multiple pre-defined device scan programs may be embedded in the browser, or may be encapsulated into APIs as java class files so that the browser may obtain a device scan program by calling an API when necessary.

[0067] The device scan program may include, but not limited to, a program for scanning and displaying a device name, a program for scanning currently-running programs and displaying the number of running programs, a program for scanning device memory and displaying the amount of occupied memory space and available memory space, a program for scanning trash data in the cache and displaying the amount of trash data, a program for scanning and displaying installed software, a program for scanning and displaying trojans, and so on.

[0068] An interface to the device scan function may be set on a blank starting page in the browser, e.g., a button or a device scan window may be provided so that when the user clicks on the button or the device scan window, the receiving module 11 may receive a device scan request triggered by the selection of the device scan function in the browser by the user, and trigger the processing module 12 and the displaying module 13 to perform corresponding device scan operations.

[0069] If the device scan programs are embedded in the browser, the processing module 12 may call the device scan programs embedded in the browser and inject the device scan programs into the engine of the browser to run the device scan programs so as to scan and display current conditions about power consumption, memory usage, trash data in the cache, currently-running programs in the device and so on.

[0070] If the browser is associated with the device scan programs via APIs, the processing module 12 may call an API to obtain a pre-defined device scan program based on the received device scan request, and inject the device scan program into the engine of the browser to run the device scan program to scan and display current conditions of power consumption, memory usage, trash data in the cache, currently-running programs in the device and so on.

[0071] In an example, if the device scan program includes a check and optimization program, the processing module 12 may run the check and optimization program to check the device, and display a check progress and a check result or the check result on a check result displaying interface of the browser; after an optimization request is received from the user, run the check and optimization program to optimize the device based on the check result, and display an optimization result on the scan result displaying interface of the browser as the scan result.

[0072] In an example, if the device scan program includes a device check program, the processing module 12 may run the device check program, and display a check progress and a check result or the check result on the scan result displaying interface of the browser as the scan result.

[0073] If only device check is performed, the displaying module 13 may: display remaining battery life, the amount of occupied memory space, the amount of trash data in the cache, and the like.

[0074] If both device check and device optimization are performed, the displaying module 13 may display the amount of battery life prolonged by enabling a battery saving function, the amount of freed memory space, the amount of trash data deleted from the cache, and the like.

[0075] From the above it can be seen that various examples of the present disclosure have the following merits:

[0076] Examples of the present disclosure implement security scan in the prevalent browser application, which not only adds new functions to the browser, but also exempts users from downloading dedicated device checking and management software and makes it easier for users to check and manage their intelligent user terminals.

[0077] Fig. 9 is a schematic diagram illustrating an apparatus enabling a browser to perform security scan according to an example of the present disclosure. The apparatus may be embedded in a smart terminal device such as a cellphone, a tablet computer and so on. The apparatus may include the receiving module 11, the processing module 12 and the displaying module 13 as shown in Fig. 7. In an example, the receiving module 11 may include the following components.

[0078] A first checking module 111 is adapted to check whether a device scan button presented on a page describing functions of the browser or presented in a function list of the browser is clicked on by the user.

[0079] A first receiving module 112 is adapted to take a command corresponding to the selected device scan button as the device scan request received.

[0080] When an interface to the device scan functions provided by the browser is a button for device scan on a page presenting functions of the browser or a button for device scan in a function list of the browser, the first checking module 111 and the first receiving module 112 are adapted to obtain the device scan request.

[0081] In an example, when the interface to the device scan functions set in the browser is a web address for enabling the device scan functions, the receiving module 11 may also include the following components.

[0082] A second checking module is adapted to check whether a pre-defined web address has been inputted by the user into the browser.

[0083] A second receiving module is adapted to take a request for visiting the web address as the device scan request if the second checking module determines the pre-defined web address has been inputted by the user into the browser.

[0084] In an example, the processing module 12 may include the following components.

[0085] A calling module 121 is adapted to call an API to obtain the pre-defined device scan program according to the device scan request.

[0086] A processing module 122 is adapted to inject the device scan program obtained into the engine of the browser, and run the device scan program.

[0087] If the browser is associated with the device scan programs via APIs, the processing module 121 may call an API to obtain a pre-defined device scan program based on the received device scan request, the processing module 122 injects the obtained device scan program into the engine of the browser to run the device scan program to scan current conditions of battery life, memory usage, trash data in the cache, currently-running programs in the device and so on.

[0088] In an example, if the device scan program run by the processing module 12 includes a device check and optimization program, the processing unit 122 is adapted to run the device check and

optimization program to check the device, and run the device check and optimization program to optimize the device based on a check result after receiving an optimization request from the user. The displaying module 13 is adapted to display a check progress and a check result or the check result on a check result displaying interface of the browser, and display an optimization result of the processing unit 122 on the scan result displaying interface of the browser as the device scan result.

[0089] In various examples, if the device scan program run by the processing module 12 includes a check program, the processing unit 122 is adapted to run the check program, and the displaying module 13 is adapted to display a check progress and a check result or the check result on the scan result displaying interface as the device scan result.

[0090] In an example, the apparatus may also include:

[0091] a pre-configuring module 14, adapted to pre-define at least one device scan program, and generate prompt information for each of the at least one device scan program.

[0092] The displaying module 13 is further adapted to display the prompt information generated for each of the at least one device scan program in the browser so that the user can select the device scan function based on the prompt information and trigger a device scan request which includes prompt information corresponding to one of the at least one device scan program.

[0093] In an example, the displaying module 14 may display the prompt information generated for each of the at least one device scan program while displaying a button for device scan in a page presenting functions of the browser or in a function list of the browser, so that the user can select the device scan function according to the prompt information and trigger the device scan request which includes the prompt information corresponding to the device scan function.

[0094] The processing module 12 is adapted to select from the at least one pre-defined device scan program and obtain a device scan program corresponding to the prompt information in the received device scan request, inject the obtained device scan program into the engine of the browser, and run the device scan program.

[0095] From the above it can be seen that various examples of the present disclosure have the following merits:

[0096] Examples of the present disclosure implement security scan in the prevalent browser application, which not only adds new functions to the browser, but also exempts users from downloading dedicated device checking and management software and makes it easier for users to check and manage their intelligent user terminals. Further, the user can select one or multiple device scan functions from a webpage of the browser to implement targeted scanning and management, which is more convenient for the user.

[0097] It should be understood that in the above processes and structures, not all of the procedures

and modules are necessary. Certain procedures or modules may be omitted according to the needs. The order of the procedures is not fixed, and can be adjusted according to the needs. The modules are defined based on function simply for facilitating description. In implementation, a module may be implemented by multiple modules, and functions of multiple modules may be implemented by the same module. The modules may reside in the same device or distribute in different devices. The “first”, “second” in the above descriptions are merely for distinguishing two similar objects, and have no substantial meanings.

[0098] In various embodiments, a hardware module may be implemented mechanically or electronically. For example, a hardware module may comprise dedicated circuitry or logic that is permanently configured (e.g., as a special-purpose processor, such as a field programmable gate array (FPGA) or an application-specific integrated circuit (ASIC)) to perform certain operations. A hardware module may also comprise programmable logic or circuitry (e.g., as encompassed within a general-purpose processor or other programmable processor) that is temporarily configured by software to perform certain operations. It will be appreciated that the decision to implement a hardware module mechanically, in dedicated and permanently configured circuitry, or in temporarily configured circuitry (e.g., configured by software) may be driven by cost and time considerations.

[0099] A machine-readable storage medium is also provided, which is to store instructions to cause a machine to execute a method as described herein. Specifically, a system or apparatus having a storage medium which stores machine-readable program codes for implementing functions of any of the above examples and which may make the system or the apparatus (or CPU or MPU) read and execute the program codes stored in the storage medium. In addition, instructions of the program codes may cause an operating system running in a computer to implement part or all of the operations. In addition, the program codes implemented from a storage medium are written in a storage device in an extension board inserted in the computer or in a storage in an extension unit connected to the computer. In this example, a CPU in the extension board or the extension unit executes at least part of the operations according to the instructions based on the program codes to realize the technical scheme of any of the above examples.

[0100] The storage medium for providing the program codes may include floppy disk, hard drive, magneto-optical disk, compact disk (such as CD-ROM, CD-R, CD-RW, DVD-ROM, DVD-RAM, DVD-RW, DVD+RW), magnetic tape drive, Flash card, ROM and so on. Optionally, the program code may be downloaded from a server computer via a communication network.

[0101] The scope of the claims should not be limited by the embodiments set forth in the examples, but should be given the broadest interpretation consistent with the description as a whole.

Claims

1. A method enabling browsers to perform security scan of devices, comprising:

receiving a device scan request triggered when a user selects a device scan function provided by a browser;

injecting a pre-defined device scan program into an engine of the browser according to the device scan request received; and

running the device scan program to scan a device, and displaying a scan result in a scan result displaying interface of the browser.

2. The method of claim 1, wherein the receiving a device scan request triggered when a user selects a device scan function provided by a browser comprises:

if a click on a device scan button presented on a page providing functions of the browser or presented in a function list of the browser is detected, taking a command corresponding to the device scan button as the device scan request received; or

if it is detected that the user has inputted a pre-defined web address into the browser, taking a request for visiting the web address as the device scan request received.

3. The method of claim 2, wherein injecting a pre-defined device scan program into an engine of the browser according to the device scan request received comprises:

calling an Application Programming Interface (API) to obtain the pre-defined device scan program according to the device scan request;

injecting the device scan program obtained into the engine of the browser.

4. The method of claim 3, wherein when the device scan program comprises a device check and optimization program, the step of running the device scan program and displaying a scan result on a scan result displaying interface of the browser comprises:

running the device check and optimization program to check the device, and displaying a scan progress and a check result or the check result on a check result displaying interface of the browser;

running the device check and optimization program after an optimization request is received from the user to optimize the device based on the check result, and displaying an optimization result on the scan result displaying interface of the browser as the scan result.

5. The method of claim 3, wherein when the device scan program comprises a device check program, the step of running the device scan program and displaying a scan result on a scan result displaying interface of the browser comprises:

running the device check program, and displaying a checking progress and a checking result or the checking result on the scan result displaying interface of the browser as the scan result.

6. The method of any of claims 1-5, further comprising: before receiving a device scan request triggered when a user selects a device scan function provided by a browser,

pre-defining at least one device scan program, and generating prompt information for each of the at least one device scan program;

displaying the prompt information generated for each of the at least one device scan program in the browser so that the user can select the device scan function based on the prompt information and trigger a device scan request which includes prompt information corresponding to one of the at least one device scan program.

7. The method of claim 6, wherein injecting a pre-defined device scan program into an engine of the browser according to the device scan request received comprises:

selecting from the at least one pre-defined device scan program and obtaining a device scan program which is identified by the prompt information in the device scan request;

injecting the device scan program identified by the prompt information into the engine of the browser.

8. An apparatus enabling browsers to perform security scan of devices, comprising:

a receiving module, adapted to receive a device scan request triggered when a user selects a device scan function provided by a browser;

a processing module, adapted to inject a pre-defined device scan program into an engine of the browser according to the device scan request received, and run the device scan program to scan a device;

a displaying module, adapted to display a scan result on a scan result displaying interface of the browser.

9. The apparatus of claim 8, wherein the receiving module comprises:

a first checking module, adapted to check whether a device scan button presented on a page describing functions of the browser or presented in a function list of the browser is selected by a click of the user;

a first receiving module, adapted to take a command corresponding to the selected device scan button as the device scan request received if the first checking module determines the device scan button is selected;

or, the receiving module comprises:

a second checking module, adapted to check whether a pre-defined web address has been inputted by the user into the browser;

a second receiving module, adapted to take a request for visiting the web address as the device scan request if the second checking module determines the pre-defined web address has been inputted by the user into the browser.

10. The apparatus of claim 9, wherein the processing module comprises:

a calling module, adapted to call an Application Programming Interface (API) to obtain the pre-defined device scan program according to the device scan request;

a processing module, adapted to inject the device scan program obtained into the engine of the browser, and run the device scan program.

11. The apparatus of claim 10, wherein when the device scan program comprises a device check and optimization program,

the processing module is adapted to run the device check and optimization program to check the device, run the device check and optimization program after an optimization request is received from the user to optimize the device based on a check result;

the displaying module is adapted to display a check progress and a check result provided by the processing module or the check result on a check result displaying interface of the browser, and display an optimization result provided by the processing module on the scan result displaying interface as the scan result.

12. The apparatus of claim 10, wherein when the device scan program comprises a device check program,

the processing module is adapted to run the device check program;

the displaying module is adapted to display a checking progress and a checking result or the checking result on the scanning result displaying interface of the browser as the scanning result.

13. The apparatus of any of claims 8-12, further comprising:

a pre-configuring module, adapted to pre-define at least one device scan program, and generate prompt information for each of the at least one device scan program;

the displaying module is further adapted to display the prompt information generated for each of the at least one device scan program in the browser so that the user can select the device scan function based on the prompt information and trigger a device scan request which includes prompt information corresponding to one of the at least one device scan program.

14. The apparatus of claim 13, wherein the processing module is adapted to select from the at least one pre-defined device scan program and obtain a device scan program corresponding to the prompt information in the received device scan request, inject the obtained device scan program into the engine of the browser, and run the device scan program to scan the device.

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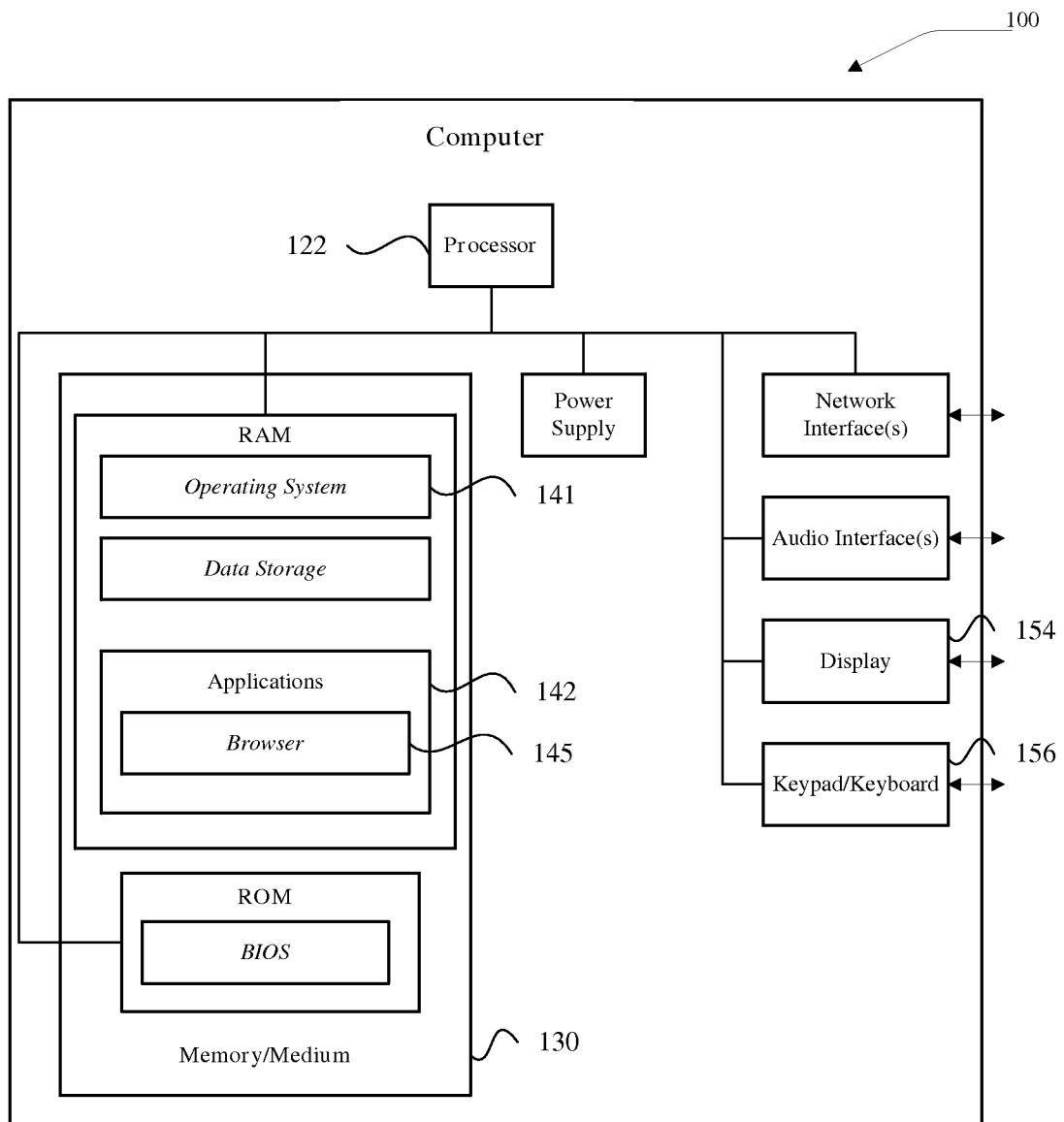


Fig. 1

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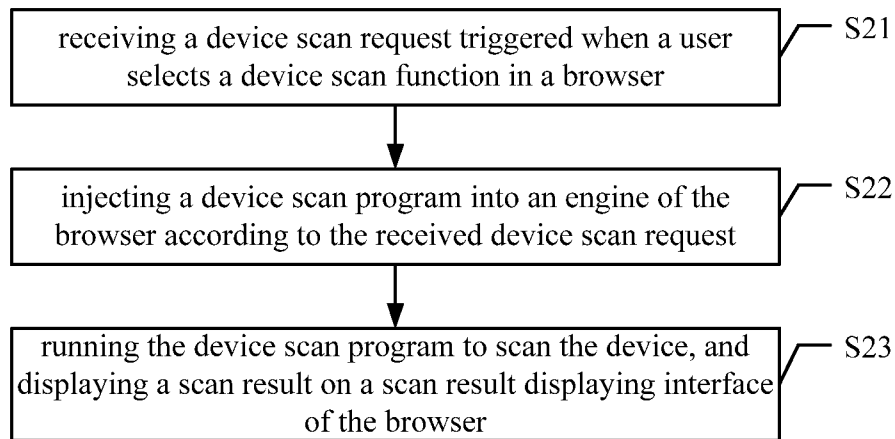


Fig. 2

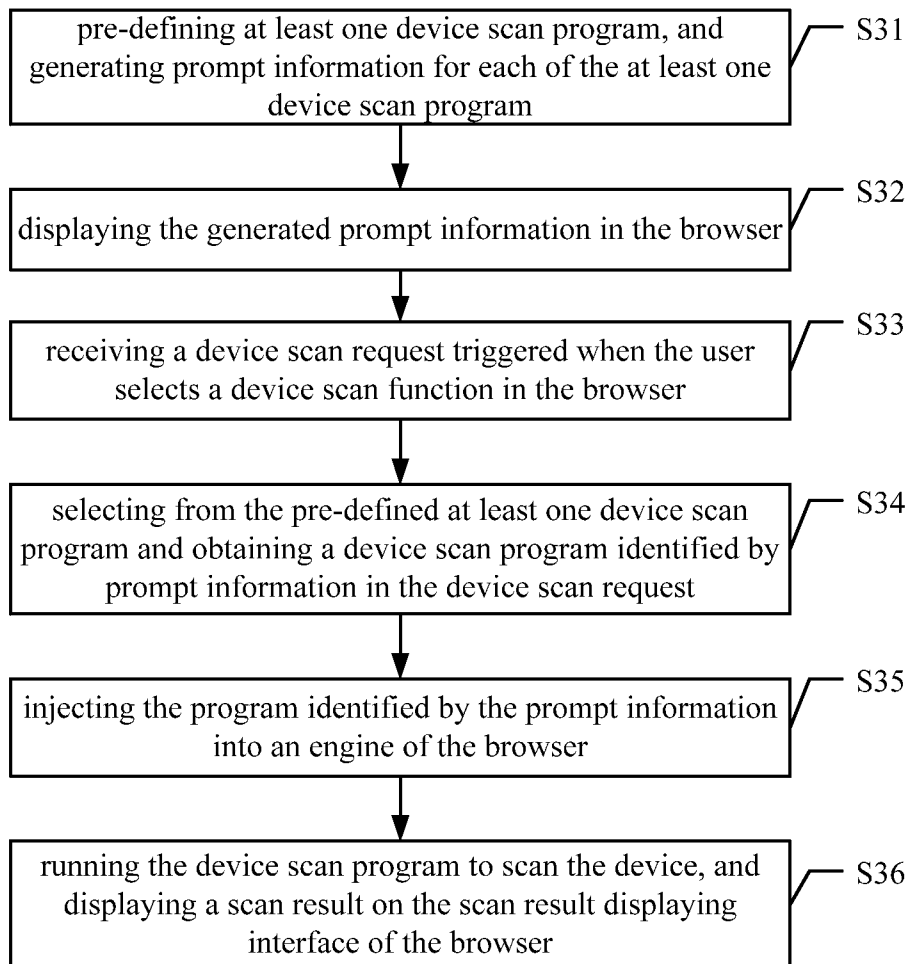
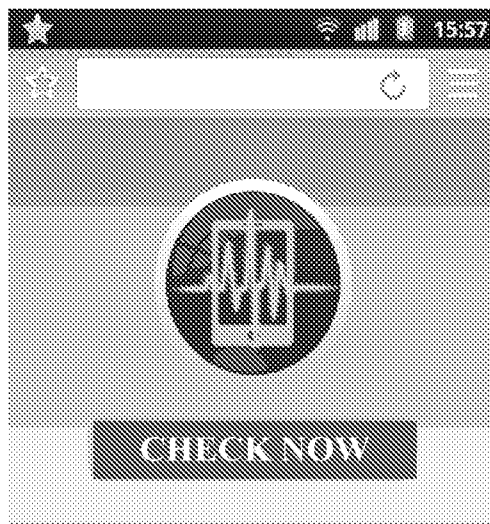


Fig. 3

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-  Phone conditions
-  One-key release memory
-  Phone acceleration

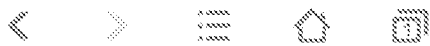
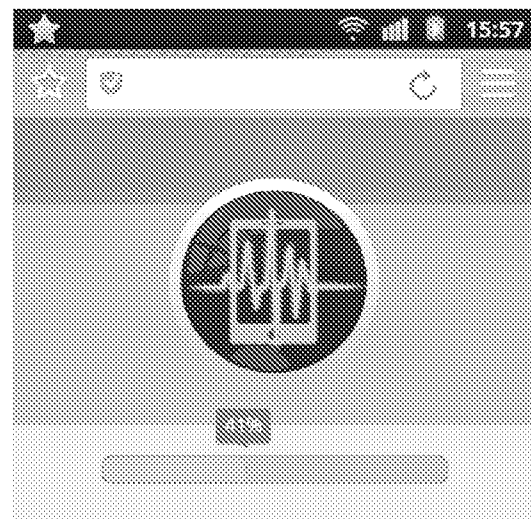


Fig. 4



currently- running applications 12
trash data in cache 10MB
old installation packages 
installed applications

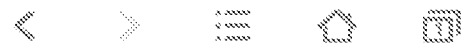


Fig. 5

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Fig. 6



Fig. 7

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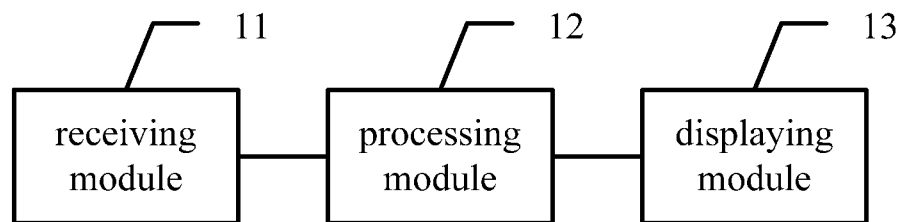


Fig. 8

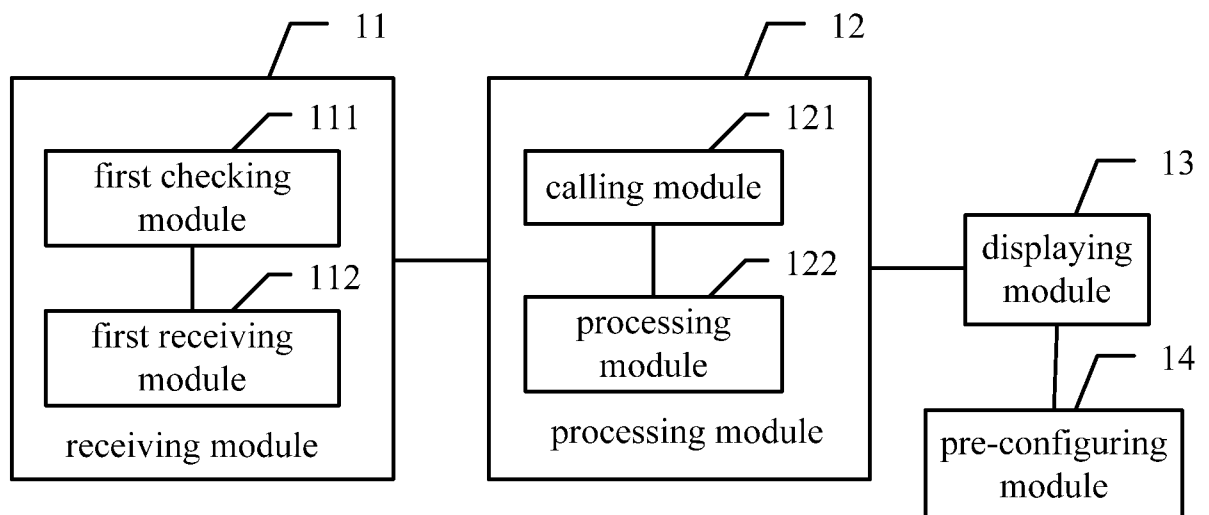


Fig. 9

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2013/087470

A. CLASSIFICATION OF SUBJECT MATTER

G06F 21/55 (2013.01) i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC: G06F 21/-

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

CNABS, VEN: browser, scan+, security, TENCENT

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2010019918 A1 (QUALYS INC et al.) 18 February 2010(18.02.2010) see description, paragraphs [0016]-[0026], [0029], [0031] and [0033]-[0036] and figures 1-6	1-14
X	US 8161559 B2 (AT&T INTELLECTUAL PROPERTY I LP) 17 April 2012(17.04.2012) see description, column 4 line 7 to column 5, line 26, column 6, lines 36-62, column 7, line 59 to column 8, line 7 and figures 1-3P	1-14
X	US 7178166 B1(INTERNET SECURITY SYSTEMS INC) 13 February 2007(13.02.2007) see description, column 2, lines 33-50, column 3, lines 3-46, column 6, line 36 to column 8, line 24 and figures 1-3	1-14
X	CN 1833228 A(NOKIA CORP) 13 September 2006(13.09.2006) see description, page 6, line 18 to page 7, line 25, page 9, line 13 to page 10, line 24 and figures 1 and 5-8	1-14

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

* Special categories of cited documents:	“T” later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
“A” document defining the general state of the art which is not considered to be of particular relevance	“X” document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
“E” earlier application or patent but published on or after the international filing date	“Y” document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
“L” document which may throw doubts on priority claim (S) or which is cited to establish the publication date of another citation or other special reason (as specified)	“&” document member of the same patent family
“O” document referring to an oral disclosure, use, exhibition or other means	
“P” document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search 30 January 2014(30.01.2014)	Date of mailing of the international search report 27 Feb. 2014 (27.02.2014)
Name and mailing address of the ISA/CN The State Intellectual Property Office, the P.R.China 6 Xitucheng Rd., Jimen Bridge, Haidian District, Beijing, China 100088 Facsimile No. 86-10-62019451	Authorized officer WANG Yue Telephone No. (86-10)62411848

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2013/087470

Patent Documents referred in the Report	Publication Date	Patent Family	Publication Date
WO 2010019918 A1	18.02.2010	US 2010175134 A1	08.07.2010
		US 8281396 B2	02.10.2012
		US 2012233700 A1	13.09.2012
US 8161559 B2	17.04.2012	US 2010333205 A1	30.12.2010
		US 7810159 B2	05.10.2010
		US 2006294587 A1	28.12.2006
US 7178166 B1	13.02.2007	None	
CN 1833228 A	13.09.2006	JP 2007520763 A	26.07.2007
		EP 1644832 A2	12.04.2006
		WO 2004114048 A3	16.06.2005
		WO 2004114048 A2	29.12.2004
		JP 2011044167 A	03.03.2011
		US 7591017 B2	15.09.2009
		CN 1833228B	02.05.2012
		US 2004268145 A1	30.12.2004