(54) Title: DEVICE, SYSTEM AND METHOD FOR AUTOMATED INSTALLATION AND OPERATING ENVIRONMENT CONFIGURATION OF A COMPUTER SYSTEM

(57) Abstract: A booting device for assisting an administrator in the installation and operating environment configuration of a computer system, comprising at least one special-purpose processor, wherein the at least one special-purpose processor is operative to run a set of instructions of a dedicated installation and configuration software resulting in the implementation of a booting engine; and wherein the booting engine installs and configures a plurality of operating modules of the operating environment.
DEVICE, SYSTEM AND METHOD FOR AUTOMATED INSTALLATION AND OPERATING ENVIRONMENT CONFIGURATION OF A COMPUTER SYSTEM

FIELD

[0001] Embodiments disclosed herein relate in general to devices, systems and methods for operating environment installation and configuration. In addition, embodiments disclosed herein relate to videoconferencing devices, system and methods.

BACKGROUND

[0002] As computer information technology or IT systems have become more affordable over the years, they have also become more complex as they provide an ever increasing number of functions and tasks that need to be accomplished locally or remotely, for instance by local servers, desktop computers, and/or remotely by employing cloud-based computing. Before a computer system of, for example, a business IT environment can be put into use, a slate of server software products located at and/or remotely from the business IT environment, including a server operating system (e.g. windows server) has to be installed and configured. Due to its high complexity, the installation and configuration of software products and operating environment is an arduous, costly and time-consuming task. Therefore, the installation and configuration of such systems is usually performed by skilled information technology IT professionals that has to make numerous configuration decisions in order to ensure the interoperability of the system’s various computerized devices.

SUMMARY

[0003] Example 1 includes a booting device for assisting an administrator in the installation and operating environment configuration of a computer system, comprising at least one special-purpose processor, wherein the at least one
special-purpose processor is operative to run a set of instructions of a dedicated installation and configuration software resulting in the implementation of a booting engine; and wherein the booting engine installs and configures a plurality of operating modules of the operating environment.

[0004] Example 2 includes the subject matter of example 1 and, optionally, wherein the booting device comprises only processors that are special purpose processors.

[0005] Example 3 includes the subject matter of examples 1 or 2 and, optionally, wherein the at least one special-purpose processor employs reduced-instruction set computing (RISC) architecture that allow embedded implementations of at least one respective operating module. In an embodiment, booting device comprises only processors that solely employ RISC architecture.

[0006] Example 4 includes the subject matter of any of the examples 1 to 3 and, optionally, wherein the operating module comprises an email server module, a web server module, a video conferencing module, a data backup module, a file-user management module, a camera surveillance module, and input/output module, a power module, a Wi-Fi access point module, an anti-virus module, a firewall module and/or a proxy server module.

[0007] Example 5 includes the subject matter of any of examples 1 to 4 and, optionally, wherein the booting engine is selectively operable in a fully automatic or in a semi-automatic operating mode.

[0008] Example 6 includes the subject matter of example 5 and, optionally, wherein in the fully automatic operating mode, the installation and configuration of the system is accomplished in 20 minutes or less for a computer system 20 end-user devices or less.

[0009] Example 7 includes the subject matter of example 5 and, optionally, wherein in the fully automatic operating mode, the average installation and configuration time per end-user device for establishing a system may be 2 minutes or less, 2.25 minutes or less, 1.5 minutes or less, 1.125 minutes or less, 1 minute or less, 0.75 minutes or less, 0.66 minutes or less, 0.5 minutes or less, 0.375 minutes or less, 0.33 minutes or less; 0.25 minutes or less, 0.15 minutes or less; or 0.125 minutes or less.

[0010] Example 8 includes the subject matter of any of examples 1 to 7 and, optionally, wherein the booting device is operative to establish, using a graphics
processor, a videoconferencing system which comprises a plurality of end-user devices.

[0011] Example 9 includes the subject matter of example 8 and, optionally, wherein the graphics processor has signal conversion capabilities for converting a signal encoding High Definition Television (HDTV) protocol into a signal encoding Internet Protocol (IP).

[0012] Example 10 includes the subject matter of any of examples 1 to 9 and, optionally, further comprises a cooling packing assembly for the cooling of electronic components employed by the booting device, wherein the cooling packaging assembly comprises a Peltier-based heat pump.

[0013] Examples 11 includes a method for installing and configuring installation an operating environment, comprising: executing, by at least one special-purpose processor, a set of instructions of a dedicated installation and configuration computer program product, wherein the execution of the set of instructions results in the implementation of a booting engine which installs and configures a plurality of operating modules of the operating environment.

[0014] Example 12 includes a non-transitory computer readable storage medium storing a set of instructions that are executable by at least one special-purpose processor of a computerized device to cause the device to perform a method for installing and configuring installation of an operating environment, the method comprising: installing; and configuring a plurality of operating modules of the operating environment.

[0015] Example 13 includes a videoconferencing device for setting up a videoconferencing system comprising a plurality of end-user devices, the videoconferencing device comprising: an adaptor for receiving HDTV signals and for converting the received HDTV signals into IP communication signals; and a graphics processor for processing the IP communication signals for their transmission to the plurality of end-user devices of the system.

[0016] Example 14 includes the subject matter of example 13 and, optionally, wherein the videoconferencing device comprises only processors that are graphics processors.

[0017] This summary is provided to introduce a selection of concepts in a simplified form that are further described below in the Detailed Description. This summary is not intended to identify key features or essential features of the
claimed subject matter, nor is it intended to be used to limit the scope of the claimed subject matter.

**BRIEF DESCRIPTION OF THE DRAWINGS**

[0018] The invention is herein described, by way of example only, with reference to the accompanying drawings, wherein:

[0019] **FIG. 1** is a schematic block diagram illustration of booting device for installing and configuring an operating environment configuration of a computerized system, according to an embodiment;

[0020] **FIG. 2** is a schematic block diagram illustration showing a videoconferencing device for setting up a videoconferencing system, according to an embodiment; and

[0021] **FIG. 3A** is a schematic block diagram illustration of a cooling packaging assembly for the cooling of electronic components of the booting device and/or the videoconferencing device, according to an embodiment; and

[0022] **FIG. 3B** is block diagram illustration of a Peltier-based heat pump employed by the cooling packaging assembly, according to an embodiment.

**DETAILED DESCRIPTION**

[0023] The following description relates to automated booting devices, systems and methods for the installation and configuration of a computerized environment, which may include a videoconferencing system. The description herein below of the devices, systems and/or methods is given with reference to particular examples, with the understanding that such device, systems and methods are not limited to these examples.

[0024] Referring to **FIG. 1**, a computerized system, herein referenced by alphanumeric label “1100”, may include an Internet Provider **1300**, one or more end-user devices **1400** and a booting device **1200** that enables the automated installation and/or configuration of software and/or modules to render the various parts and/or devices of computerized system **1100** operable. Booting device **1200**
may for example include a plurality of operating modules including, e.g., an email server module 1202, a web server module 1204, a firewall module 1206, a data backup module 1208, a file/user management module 1210, a video conferencing module 1212, an anti-virus module 1214, a proxy server module 1216 and/or a surveillance module 1218, which may be a closed-circuit camera surveillance module; and an Wi-Fi access point module 1230.

[0025] Web server module 1204 may include a webdesign module (not shown) for assisting the administrator in designing a business webportal associated with computerized system 1100. Booting device 1200, internet provider 1300 and end-user device(s) 1400 may be configurable to communicate with one another over a communication network 1900. In general, data may be provided from internet provider 1300 and/or clients 1400 over network 1900 and pass proxy server module 1216, firewall module 1206, antivirus module 1214 and an internal/external IP switch 1232 for assigning the data to the respective modules (e.g., tasks) of booting device 1200. (and to connect to the external PC clients (if not via Wi-Fi))

[0026] Booting device 1200 may employ a plurality of embedded or special-purpose processors 1236 (e.g., 1236A and 1236B) that employ, e.g., reduced-instruction set computing (RISC) architecture or any other processor architecture (e.g., ARM® processors) that allows embedded or special-purpose implementation by the processors of booting device 1200.

[0027] In embodiment, booting device 1200 the processors comprised in booting device 1200 may only or solely be special-purpose processors. Booting device 1200 may thus be free of any general-purpose processors. In an embodiment, booting device 1200 comprises only processors that solely employ RISC architecture.

[0028] In an embodiment, the plurality of special-purpose processors, when executing a set of instructions stored in a storage device (not shown) of booting device 1200, may result in the execution of the aforementioned modules. In other words, the modules may be implemented by a plurality of (e.g., RISC or CISC) special purpose processors or groups of special purpose processors executing a respective set of instructions. In an embodiment, the modules may solely be implemented by a plurality of (e.g., RISC or CISC) special purpose processors or groups of special purpose processors executing a respective set of instructions.
[0029] In some embodiments, each module may be implemented by a respective dedicated special-purpose processor and/or dedicated group of special-purpose processors such that a special-purpose processor or group of special-purpose processors employed for the implementation of a first module is not employed, even partially, for the implementation of a second module. In other words, booting device 1200 may be considered to be a computerized device that employs a plurality of dedicated embedded processors (suitable processor dependent on the module function) for implementing processes and/or functions of the modules. The special-purpose processors used for implementing the modules may be mounted onto single motherboard (not shown) included booting device 1200.

[0030] Booting device 1200 may include an input/output module 1220 embodying, for example, a graphic and/or audio user interface, for guiding an administrator of booting device 1200 to configure the modules and the operating environment of system 1100. Booting device 1200 may further include a power module 1226 enabling the powering the various modules. Power module 1226 may include a power supply 1234 (e.g., for connecting booting device 1200 to an electric grid) and, optionally, a power backup battery 1235 implemented, for example, by an uninterruptible power source or UPS for providing backup in case of power supply failure received by power supply 1234 from a power grid. Booting device 1200 may further include a communication module (not shown).

[0031] In an embodiment, the modules of booting device 1200 are pre-installed, thereby obviating the need of installing any additional software that may otherwise be required for the configuration of system 1100.

[0032] Booting device 1200 is configured such that the powering thereof causes the initiation of a predetermined system configuration sequence, which may be executed fully automatically (also: “automatic mode”) or semi-automatically (also: “semi-automatic mode”), as outlined herein below. In an embodiment, booting device 1200 is selectively operable in the automatic or semi-automatic operating mode. The terms “mode” and “operating mode” may be used interchangeably. The configuration sequence may include, in an initial process, the operable connection of booting device 1200 with internet provider 1300. When in the automatic mode, booting device 1200 may automatically detect that it is connected with internet provider 1300 and provide the latter with the necessary identifiers (e.g., Internet Protocol (IP) address associated with booting device 1200). When
set to operate in the semi-automatic mode, input/output module 1220 may prompt the administrator to provide the IP address or to give authorization to make use of the detected IP address. In the automatic mode, authorization of the detected IP address occurs by default. Once connected, in the semi-automatic mode, input module may present the administrator with a web-based configuration interface and prompt him/her to enter the static IP address and, optionally, authorization credentials such as the Username and Password that was obtained by the administrator from Internet provider 1300. Correspondingly, booting device 1200 may guide the administrator in the configuration of web server module 1204. In the automatic mode, the static IP-Address may be automatically detected by booting device 1200.

[0033] In an embodiment, in the automatic mode, authorization credentials may be assigned automatically. For instance, based on pre-stored names of users, usernames may be created automatically. In an embodiment, passwords and/or other challenge-response authentication protections may be automatically created (e.g., randomly or in a pseudo-random manner), and respectively assigned to the automatically created usernames.

[0034] It is noted that the terms "associated" and "assigned" may be used interchangeably.

[0035] Once authorized, in the semi-automatic mode, booting device 1200 may prompt the administrator to define Wi-Fi access. In the automatic mode, default definitions may be assigned by booting device 1200 defining the Wi-Fi Access.

[0036] Thereafter, in the semi-automatic mode, booting device 1200 may prompt the administrator, all via user interface 1220, to configure the users’ mailbox addresses (i.e., Email server module 1202) and further prompt the administrator to associate an electronic file (i.e., configure file/user management module 1210) and allocate backup storage for data created by the users of system 1100 (i.e., configure data backup module 1208). In the (fully) automatic mode, the users’ mailbox addresses may be defined automatically (e.g., based on a pre-stored domain and the usernames). In the automatic mode, electronic file association as well as allocation of backup storage to each one of the users may be accomplished according to predefined default settings.

[0037] In addition, booting device 1200 may prompt the administrator to define the system permission and/or authorization for the users of system 1100. For that
purpose, booting device 1200 may present the administrator with a variety of options and/or permission levels (e.g., enabling or disabling remote access) via input/output module 1120 configurable and respectively assignable to users of end-user devices 1400 by the administrator. Moreover, booting device 1200 may prompt the administrator to define the configurations of firewall module 1206, antivirus module 1214, proxy server module 1216 and camera surveillance module 1218. In an embodiment, in the automatic mode, a default authorization and/or security level may be associated with each username, along with a default configuration file/user management configuration. For instance, in the automatic mode, system permission and/or authorization may be defined identically for each “regular” user according to predefined settings. However, the system permission and/or authorization definitions may be different for a user who is identified as “administrator” than for the “regular” or non-administrator user(s). The permission/authorization definitions for a user defined as “administrator” may also be configured automatically according to predefined settings. In an embodiment, various permission/authorization configuration settings may be predefined by booting device 1200 and presented to the administrator for assigning respective different levels of authorization. Moreover, in the automatic mode, firewall module 1206, antivirus module 1214, proxy server module 1216 and camera surveillance module 1218, may be automatically configured according to predefined settings stored in booting memory 1222.

[0038] In some embodiments, in the semi-automatic mode, booting device 1200 may prompt the administrator to configure videoconferencing module 1212. Additional or alternative modules may be configurable by booting device 1200 via user interface 1220 to ensure proper operability of system 1100. In the automatic mode, default settings may be predefined and employed for configuring videoconferencing module 1212. As will be outlined herein below in more detail with respect to FIG. 2, videoconferencing module 1212 may be operative to establish a videoconferencing system.

[0039] All configurations and services of system 1100, except those that are pre-defined by internet provider 1300, may be definable at and/or through booting device 1200 via user interface 1220 without the need of employing cloud-based services for example. Considering the aforesaid, optionally excluding storage, booting device 1200 alone may fully incorporate and provide a full gamut of server
functionalities and services of a computerized system such as, e.g., system 1100, for example, of a business environment. In an embodiment, storage may exclusively be incorporated in a local server (not shown). In an embodiment, in the automatic mode, the automated installation and operating environment configuration may, for example, take about 60 minutes or less, 45 minutes or less, 30 minutes or less, 20 minutes or less, 15 minutes or less, 10 minutes or less, or 5 minutes or less, for, e.g., 20 end-user devices 1400 or less.

[0040] In an embodiment, in the automatic mode, the automated installation and operating environment configuration may, for example, take about 60 minutes or less, 45 minutes or less, 30 minutes or less, 20 minutes or less, 15 minutes or less, 10 minutes or less, or 5 minutes or less, for, e.g., 30 end-user devices 1400 or less.

[0041] In an embodiment, in the automatic mode, the automated installation and operating environment configuration may, for example, take about 60 minutes or less, 45 minutes or less, 30 minutes or less, 20 minutes or less, 15 minutes or less, 10 minutes or less, or 5 minutes or less for, e.g., 40 end-user devices 1400 or less.

[0042] In an embodiment, in the automatic mode, the automated installation and operating environment configuration may, for example, take about 60 minutes or less, 45 minutes or less, 30 minutes or less, 20 minutes or less, 15 minutes or less, 10 minutes or less, or 5 minutes or less for, e.g., 50 end-user devices 1400 or less.

[0043] In an embodiment, in the automatic mode, the automated installation and operating environment configuration may, for example, take about 60 minutes or less, 45 minutes or less, 30 minutes or less, 20 minutes or less, 15 minutes or less, 10 minutes or less, or 5 minutes or less for, e.g., 60 end-user devices 1400 or less.

[0044] In an embodiment, in the automatic mode, the automated installation and operating environment configuration may, for example, take about 60 minutes or less, 45 minutes or less, 30 minutes or less, 20 minutes or less, 15 minutes or less, 10 minutes or less, or 5 minutes or less for, e.g., 100 end-user devices 1400 or less.
[0045] The average setup time per end-user device 1400 may be thus be the total
time divided by the number of end-user devices 1400 automatically installed and
configured by booting device 1200 according to any of the above-noted examples.

[0046] In an embodiment, the average automatic installation and configuration time
per end-user device 1400 for establishing a system like system 1100 may thus for
example be 3 minutes or less, 2 minutes or less, 2.25 minutes or less, 1.5 minutes
or less, 1.125 minutes or less, 1 minute or less, 0.75 minutes or less, 0.66 minutes
or less, 0.5 minutes or less, 0.375 minutes or less, 0.33 minutes or less; 0.25
minutes or less, 0.15 minutes or less; or 0.125 minutes or less.

[0047] A booting memory 1222 of booting device 1200 may include a set of
instruction which, when executed e.g. by the respective (e.g., RISC) processors,
may cause the execution of the method, process and/or operation automated
and/or guided installation and configuration of computerized system 1100. Such
method, process and/or operation may herein be implemented by a booting engine
1224 coordinating the configuration sequence for the different modules. The set of
instructions may be of a dedicated and particular software that may be web-based.
The set of instructions of the dedicated software may be executed by the booting
device to install and configure all of the modules of the system according to the
requirements and/or constraints imposed, for example, by the administrator and/or
clients 1400 (e.g. via a web-based GUI). In some embodiments, the modules may
be set up independently from one another by executing respective sets of
instructions of various software.

[0048] In an embodiment, computerized system 1100 may refer to a system
comprised in a vehicular device, such as, for example, an operating system of a
car; a stationary device; and/or in a residence. In an embodiment, booting device
1200 may be onboard a vehicle (not shown) and operative to provide, for example,
guidance for setting up an operating system of the vehicle including, for example,
a vehicle entertainment and/or communication system.

[0049] In an embodiment, booting device 1200 may be employed for setting up of
building automation (e.g., alarm system, motion detectors, temperature sensors,
humidity sensors, fire alarm sensors, air-conditioning systems, lighting, an
entertainment and/or communication system, surveillance cameras, watering, pet
feeding and/or the like. Reverting to FIG. 1, home automation configuration by
booting device 1200 shall not be construed to be limited to surveillance module 1218 for instance.

[0050] In an embodiment, components of booting device 1200 may be housed in a ruggedized casing (not shown) allowing booting device 1200 to be deployable and employable under harsh environmental conditions.

[0051] Reference is now made to FIG. 2, schematically illustrating a block diagram illustration of a videoconferencing setup (also: videoconferencing) device 2100 for establishing a videoconferencing system 2000, according to an embodiment. Upon establishment of videoconferencing system 2000, videoconferencing device 2100 may be comprised in system 2000.

[0052] A videoconferencing device 2100 is configurable to communicate with a plurality of computerized end-user devices 1400 via a communication network 1900. Although the present description shows only two end-user devices 1400A-1400B, this should by no means to be construed as limiting. Accordingly, videoconferencing system 2000 may in some embodiments comprise and serve more end user devices 1400. The number of end-user devices 1400 comprised in videoconferencing system 2000 may change over a period of time. Otherwise stated, the number of end-user devices 1400 that may be communicably coupled with each other may vary over time.

[0053] Videoconferencing device 2100 may include a graphics processor 2102 employing, e.g., RISC architecture, a graphics memory 2104, a communication module 2110 comprising an IP communication engine 2111 and a power module 2112 for powering the components of videoconferencing device 2100.

[0054] In an embodiment, the processors comprised in videoconferencing device 2100 may be solely graphics processors.

[0055] Memory 2104 may include instruction which, when executed by graphics processor 2102 may result in videoconferencing engine 2106. In some embodiments, videoconferencing device 2100 may only employ a processor or processors that is/are a graphics processor(s). IP Communication module 2111 may for example have local area network (LAN) and/or any other IP protocol based communication connectivity. Graphics processor 2102 may be an embedded graphics processing unit (GPU)-accelerated computing processor.
[0056] The various components of videoconferencing device 2100 and end-user devices 1400 may communicate with each other over one or more communication buses (not shown) and/or signal lines (not shown).

[0057] In an embodiment, graphics processor 2102 is operative to decode a signal based on an IP communication protocol. Accordingly, graphics processor 2102 is configured to run an IP stack such that other devices (e.g., computerized end-user devices 1400, which may include mobile devices) can connect with videoconferencing device 2100 through an IP communication protocol. For that purpose, end-user devices 1400 may employ an (optionally dedicated) IP communication module 2111 over which end-user devices 1400 and videoconferencing device 2100 communicate. First end-user device 1400A and second end-user device 1400B may communicate with each other using videoconferencing features provided by videoconferencing device 2100. Thus, videoconferencing device 2100 provides through the employment of graphics processor 2102 video-server functionalities and/or processes for end-user devices 1400. In some embodiments, a desktop device (e.g., desktop telephone) may be adapted such to employ graphics processor 2102 in a manner such that the desktop telephone is turned into videoconferencing device 2100. In any case, graphic processor 2102 is employed and configurable with other components such that the device employing the graphics processor provides videoconferencing server features.

[0058] According to some embodiments, graphics processor 2102 may have signal conversion capabilities for converting a signal encoding a current or any future High Definition Television (HDTV) protocol into a signal encoding Internet Protocol (IP). Graphics processor 2102 may, inter alia, act as an HDTV/IP protocol or signal converter. IP protocol-encoding signals are processed by graphics processor 2102 for further communication with end-user devices 1400. Graphics processor 2102 of videoconferencing device 2100 is configured to process audio and video data. The core (not shown) of graphics processor 2102 may for example include an HDTV/IP signal adaptor 2103, which may herein also be referred to as an I/O interface. Adaptor 2103 receiving HDTV signals converts them into IP communication signals, which are then processed by graphics processor 2102 for transmission to an end-user device 1400.
[0059] In an embodiment, videoconferencing system 2000 may be set up by booting device 1200 shown in FIG. 1 which boots videoconferencing module 1212. In an embodiment, videoconferencing module 1212 may employ the components shown to be comprised in videoconferencing device 2100. In an embodiment, the terms "videoconferencing module 1212" and "videoconferencing device 2100" may be used interchangeably. In an embodiment, videoconferencing system 2000 may be established by booting videoconferencing module 1212 of booting device 1200 schematically shown in FIG. 1.

[0060] A computerized end-user device (client) may include a multifunction mobile communication device also known as "smartphone", a personal computer, a laptop computer, a tablet computer, a server, personal digital assistant, a workstation, a wearable device, a handheld computer, a notebook computer, a vehicular device, a stationary device and/or a home appliances control system.

[0061] According to some embodiments, a memory such as memory 1222 and memory 2104 may include one or more types of computer-readable storage media such as, for example, may include transactional memory and/or long-term storage memory facilities and may function as file storage, document storage, program storage, or as a working memory. The latter may for example be in the form of a static random access memory (SRAM), dynamic random access memory (DRAM), read-only memory (ROM), cache or flash memory. As long-term memory, memory 1222 and memory 2104 may for example include a volatile or non-volatile computer storage medium, a hard disk drive, a solid state drive, a magnetic storage medium, a flash memory and/or other storage facility. A hardware memory facility may for example store a fixed information set (e.g., software code) including, but not limited to, a file, program, application, source code, object code, and the like.

[0062] A communication module such as, for example, communication module 2110 may include I/O device drivers (not shown) and network interface drivers (not shown). A device driver may for example, interface with a keypad or to a USB port. A network interface driver may for example execute protocols for the Internet, or an Intranet, Wide Area Network (WAN), Local Area Network (LAN) employing, e.g., Wireless Local Area Network (WLAN)), Metropolitan Area Network (MAN), Personal Area Network (PAN), extranet, 2G, 3G, 3.5G, 4G including for example Mobile WIMAX or Long Term Evolution (LTE) advanced,
and/or any other current or future communication network, standard, and/or system.

[0063] Graphics memory 2104 may include instructions which, when executed e.g. by respective graphics processor 2102, may cause the execution of the method, process and/or operation automated and/or guided installation and configuration of videoconferencing system 2000. Such method, process and/or operation may herein be implemented by videoconferencing engine 2106.

[0064] The various features and steps discussed above, as well as other known equivalents for each such feature or step, can be mixed and matched by one of ordinary skill in this art to perform methods in accordance with principles described herein. Although the disclosure has been provided in the context of certain embodiments and examples, it will be understood by those skilled in the art that the disclosure extends beyond the specifically described embodiments to other alternative embodiments and/or uses and obvious modifications and equivalents thereof. Accordingly, the disclosure is not intended to be limited by the specific disclosures of embodiments herein. For example, any digital computer system or device (e.g., Computerized System 1100) can be configured or otherwise programmed to implement a method disclosed herein, and to the extent that a particular digital computer system is configured to implement such a method, it is within the scope and spirit of the disclosure. Once a digital computer system is programmed to perform particular functions pursuant to computer-executable instructions from program software that implements a method disclosed herein, it in effect becomes a special purpose computer particular to an embodiment of the method disclosed herein. The techniques necessary to achieve this are well known to those skilled in the art and thus are not further described herein. The methods and/or processes disclosed herein may be implemented as a computer program product such as, for example, a computer program tangibly embodied in an information carrier, for example, in a non-transitory computer-readable or non-transitory machine-readable storage device and/or in a propagated signal, for execution by or to control the operation of, a data processing apparatus including, for example, one or more programmable processors and/or one or more computers. The terms "non-transitory computer-readable storage device" and "non-transitory machine-readable storage device" encompasses distribution media, intermediate storage media, execution memory of a computer, and any
other medium or device capable of storing for later reading by a computer program implementing embodiments of a method disclosed herein.

[0065] The term "non-transitory" is used to exclude transitory, propagating signals, but to otherwise include any volatile or non-volatile computer memory technology suitable to the application.

[0066] A computer program product can be deployed to be executed on one computer or on multiple computers at one site or distributed across multiple sites and interconnected by a communication network.

[0067] Computer executable instructions implementing an embodiment of a method disclosed herein can be distributed to users on a non-transitory computer-readable medium and are often copied onto a hard disk or other storage medium. When such a program of instructions is to be executed, it is usually loaded into the random access memory of the computer, thereby configuring the computer to act in accordance with a method disclosed herein. All these operations are well known to those skilled in the art and thus are not further described herein. The term "computer-readable medium" encompasses distribution media, intermediate storage media, execution memory of a computer, and any other medium or device capable of storing for later reading by a computer a computer program implementing embodiments of a method disclosed herein.

[0068] The term “engine” may comprise or be implemented one or more computer modules, wherein a module may be a self-contained hardware and/or software component that interfaces with a larger system (Alan Freedman, The Computer Glossary 268, (8th ed. 1998)). Such module may be embodied by a circuit or a controller programmed to cause the system to implement the method, process and/or operation as disclosed herein. A module comprises a machine or machines executable instructions. For example, a module may be implemented as a hardware circuit comprising, e.g., custom VLSI circuits or gate arrays, off-the-shelf semiconductors such as logic chips, transistors, or other discrete components. A module may also be implemented in programmable hardware devices such as field programmable gate arrays, programmable array logic, programmable logic devices or the like.

[0069] Additional reference is made to FIG. 3A. According to an embodiment, booting device 1200 may comprise a cooling packaging assembly 3000 for cooling electronic components of the booting device. The electronic components may be
housed within packaging assembly 3000. Packaging assembly 3000 employs thermoelectric cooling (also: “solid-state heat pumps”) that utilizes the Peltier effect for heat transfer. Packaging assembly 3000 may be free of any moving parts. Packing assembly 3000 may comprise an outer casing wall 3020 and an inner casing wall 3040 which may be part of a thermoelectric devices (TEDs) 3080 such as, for example, first and seconds TED 3060A and 3060B. Outer casing wall 3020 encloses inner casing wall 3040 and forms with inner casing wall an interstitial space or cavity 3070. As will be outlined herein in more detail, outer casing wall 3020 may act as a heat sink of a Peltier-based heat pump or TED 3080, while inner casing wall 3040 may act as a cooling plate of TED 3080. The TEDs 3080 may be driven by electric energy provided by power supply 1234. As shown schematically in FIG. 3A, the same heat sink 3020 and cooling plate 3040 may be shared amongst different TEDs 3080. For example, first TED 3080A and second TED 3080B may share the same heat sink 3020, embodied by the outer casing wall and may also share the same cooling plate 3040, embodied by the inner casing wall of cooling packaging assembly 3000.

[0070] In an embodiment, inner casing wall 3040 may be thermally coupled via heat conductive assembly elements 3060 with components of booting device 1200 (cf. FIG. 1) such as, for example, processors 1236. For example, electronic components of booting device 1200 such as, for example, processors 1236, may be mounted onto a printed circuit board 3100, which itself may be coupled with heat conductive assembly elements 3060. Accordingly, heat generated for example by processors 1236 may be removed via heat conductive elements 3060 from cooling plate 3040 to heat sink 3020 of the Peltier-based heat pump.

[0071] Turning now to FIG. 3B, a TED 3080 may comprise, in addition to heat sink 3020 and cooling plate 3040, two dissimilar materials forming a junction and which are coupled with a voltage source for passing electric current across the junction.

[0072] For instance, two layers 3200A and 3200B which may consist of dissimilar material may respectively comprise an N-Type and a P-Type Semiconductor material. The layers 3200A and 3200B may be laterally spaced apart from each other to form a gap 3210 and, at a “heat sink side”, respectively overlay laterally spaced apart “heat sink side” layers 3220A and 3220B of conductive material which may both overlay a common or shared electrical insulator 3240A. Shared electrical insulator 3240A is overlay heat sink 3020. Otherwise stated, conductive
“heat sink side” layers 3220A and 3220B may be sandwiched between dissimilar material layers 3200A and 3200B and electrical insulator 314. Further shared electrical insulator 3240A may be sandwiched between a portion of outer casing wall 3020 which may embody heat sink, and the conductive material layers 3220A and 3220B.

[0073] At a “cooling plate side”, conductive material 3220C may overlay both dissimilar material layers 3200A and 3200B, which itself may be overlay by a “cold side” electrical insulator 3240C. Accordingly, conductive material 3220C may be sandwiched between “cold side” electrical insulator 3240C and laterally spaced apart dissimilar material layers 3200A and 3200B. Electrical insulator 3240C may be sandwiched between a portion of inner casing wall 3040 which may embody the cooling plate. A DC voltage difference (Delta V) may be applied between first and second conductive materials 3220A and 3220B, as schematically illustrated herein.

[0074] Where applicable, although state diagrams, flow diagrams or both may be used to describe embodiments, the technique is not limited to those diagrams or to the corresponding descriptions. For example, flow need not move through each illustrated box or state, or in exactly the same order as illustrated and described.

[0075] It should be understood that where the claims or specification refer to "a" or "an" element, such reference is not to be construed as there being only one of that element.

[0076] Unless otherwise stated, the use of the expression “and/or” between the last two members of a list of options for selection indicates that a selection of one or more of the listed options is appropriate and may be made.
CLAIMS

What is claimed is:

1. A booting device for assisting an administrator in the installation and operating environment configuration of a computer system, comprising:
   at least one special-purpose processor, wherein the at least one special-purpose processor is operative to run a set of instructions of a dedicated installation and configuration software resulting in the implementation of a booting engine; and
   wherein the booting engine installs and configures a plurality of operating modules of the operating environment.

2. The booting device of claim 1, comprising only processors that are a special purpose processors.

3. The booting device of claim 1 or 2, comprising a plurality of special-purpose processors.

4. The booting device of any of the preceding claims, wherein the at least one special-purpose processor employs reduced-instruction set computing (RISC) architecture that allow embedded implementations of at least one respective operating module.

5. The booting device of claim 4, wherein the at least one operating module comprises one or more of an email server module, a web server module, a video conferencing module, a data backup module, a file-user management module, a camera surveillance module, and input/output module, a power module, a Wi-Fi access point module, an anti-virus module, a firewall module, a proxy server module, or any combination thereof.

6. The booting device according to any of the preceding claims, wherein the booting engine is selectively operable in a fully automatic or in a semi-automatic operating mode.
7. The booting according to claim 6, wherein in the fully automatic operating mode, the installation and configuration of the system is accomplished in 20 minutes or less for a computer system 20 end-user devices or less.

8. The booting device according to claim 6, wherein in the fully automatic operating mode, the average installation and configuration time per end-user device for establishing a system may be 2 minutes or less, 2.25 minutes or less, 1.5 minutes or less, 1.125 minutes or less, 1 minute or less, 0.75 minutes or less, 0.66 minutes or less, 0.5 minutes or less, 0.375 minutes or less, 0.33 minutes or less; 0.25 minutes or less, 0.15 minutes or less; or 0.125 minutes or less.

9. The booting device according to any of the preceding claims, wherein the booting device is operative to establish a videoconferencing system comprising a plurality of end-user devices using at least one graphics processor.

10. The booting device according to claim 9, wherein the at least one graphics processor has signal conversion capabilities for converting a signal encoding High Definition Television (HDTV) protocol into a signal encoding Internet Protocol (IP).

11. The booting device according to any of the preceding claims, comprising a cooling packing assembly for the cooling of electronic components employed by the booting device, wherein the cooling packaging assembly comprises a Peltier-based heat pump.

12. A method for installing and configuring installation an operating environment, comprising:

executing, by at least one special-purpose processor, a set of instructions of a dedicated installation and configuration computer program product, wherein the execution of the set of instructions results in the implementation of a booting engine which installs and configures a plurality of operating modules of the operating environment.
13. A non-transitory computer readable storage medium storing a set of instructions that are executable by at least one special-purpose processor of a computerized device to cause the device to perform a method for installing and configuring installation of an operating environment, the method comprising:

- installing; and
- configuring a plurality of operating modules of the operating environment.

14. A videoconferencing device for setting up a videoconferencing system comprising a plurality of end-user devices, the videoconferencing device comprising:

- an adaptor for receiving HDTV signals and for converting the received HDTV signals into IP communication signals; and
- at least one graphics processor for processing the IP communication signals for their transmission to the plurality of end-user devices of the system.

15. The videoconferencing device according to claim 14, comprising only processors that are graphics processors.

16. A method for setting up a videoconferencing system comprising a plurality of end-user devices, comprising:

- executing, by at least one graphics processor, a set of instructions of a dedicated installation and configuration computer program product, wherein the execution of the set of instructions results in the implementation of a videoconferencing engine sets up a videoconferencing system.
INTERNATIONAL SEARCH REPORT

Box No. II  Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1.  ☐ Claims Nos.:
    because they relate to subject matter not required to be searched by this Authority, namely:

2.  ☐ Claims Nos.:
    because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3.  ☐ Claims Nos.:
    because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III  Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1.  ☑ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2.  ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of additional fees.

3.  ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4.  ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐ The additional search fees were accompanied by the applicant’s protest and, where applicable, the payment of a protest fee.

☐ The additional search fees were accompanied by the applicant’s protest but the applicable protest fee was not paid within the time limit specified in the invitation.

☒ No protest accompanied the payment of additional search fees.

Form PCT/ISA/210 (continuation of first sheet (2)) (April 2005)
**INTERNATIONAL SEARCH REPORT**

**INTERNATIONAL APPLICATION NO**

PCT/EP2015/068161

**A. CLASSIFICATION OF SUBJECT MATTER**

INV. 606F9/44 606F9/445
ADD.

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)

606F

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)

EPO-Internal

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

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<th>Relevant to claim No.</th>
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Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents:
  * "A" document defining the general state of the art which is not considered to be of particular relevance
  * "E" earlier application or patent but published on or after the international filing date
  * "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)
  * "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

"**" 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

"*" 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

"**" 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

"*" document member of the same patent family

Date of the actual completion of the international search

4 December 2015

Date of mailing of the international search report

14/12/2015

Name and mailing address of the ISA/

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Fax. (+31-70) 340-3016

Authorized officer

Gafita, Cristinel
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This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-8, 11-13

   These claims are concerned with a booting device comprising at least one special-purpose processor running instructions that install and configure a plurality of operating modules of an operating environment.

2. claims: 9, 10, 14-16

   These claims regard a videoconferencing device comprising an adaptor for receiving and converting HDTV signals and a graphics processor for processing IP communication. Note that dependent claims 9 and 10, while being dependent on claim 1, define the same general inventive concept as independent claim 14 (second invention).