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## Synthetic and variable device identifications


### Abstract

A method, system, and computer program product to provide a synthetic device ID for a device is provided herein. The method includes receiving a request from the device to obtain a service from a vendor, where the device is associated with an internal device ID. The method further includes generating the synthetic device ID for the device and associating the device, the internal device ID, the vendor, and the synthetic device ID. The method also includes transmitting the synthetic device ID to the vendor, and internally tracking the request based on the association.



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## Background/Summary

CROSS REFERENCE TO RELATED APPLICATIONS (1) The present application is a continuation of U.S. patent application Ser. No. 17/509,452, Oct. 25, 2021, now U.S. Pat. No. 11,936,628, which is a continuation of U.S. patent application Ser. No. 16/109,064, filed on Aug. 22, 2018, now U.S. Pat. No. 11,159,491, each of which is incorporated herein by reference in its entirety.

BACKGROUND OF THE DISCLOSURE
(1) Vendors that provide services such as digital video, voice-to-text, or Internet (“web”) search requests, typically track devices requesting the services to build a usage profile for the devices or a user using the devices. An identifier (ID) associated with a device or a user of the device is usually used by the vendors to track the usage of the device. The usage profile tracks the user and their preferences.

## Description

BRIEF DESCRIPTION OF THE DRAWINGS/FIGURES
(1) The accompanying drawings, which are included to provide a further understanding of the disclosure and are incorporated in and constitute a part of this specification, illustrate embodiments of the disclosure and together with the description serve to explain the principles of the disclosure. In the drawings:
(2) FIG. **1** illustrates an example system according to an embodiment of the disclosure.
(3) FIG. **2** further illustrates a synthetic device ID generator according to an embodiment of the disclosure.

(4) FIG. **3** illustrates an example flowchart that illustrates steps performed by a headend to generate and update synthetic device IDs according to an embodiment of the disclosure.
(5) FIG. **4** illustrates an example flowchart illustrating steps performed by a device that uses synthetic device IDs according to an embodiment of the disclosure.
(6) FIG. **5** illustrates an example computer system to implement embodiments disclosed herein.
(7) The present disclosure will now be described with reference to the accompanying drawings. In the drawings, like reference numbers may indicate identical or functionally similar elements

## DETAILED DESCRIPTION OF THE DISCLOSURE

(8) In the following description, numerous specific details are set forth in order to provide a thorough understanding of the embodiments of the present disclosure. However, it will be apparent to those skilled in the art that the embodiments, including structures, systems, and methods, may be practiced without these specific details. The description and representation herein are the common means used by those experienced or skilled in the art to most effectively convey the substance of their work to others skilled in the art. In other instances, well-known methods, procedures, components, and circuitry have not been described in detail to avoid unnecessarily obscuring aspects of the disclosure.
(9) For the purposes of this discussion, the term “processor” or “processor circuitry” shall be understood to be one or more: circuit(s), processor(s), or a combination thereof. For example, a circuit can include an analog circuit, a digital circuit, state machine logic, other structural electronic hardware, or a combination thereof. A processor can include a microprocessor, a digital signal processor (DSP), or other hardware processor. The processor can be “hard-coded” with instructions to perform corresponding function(s) according to embodiments described herein. Alternatively, the processor can access an internal and/or external memory to retrieve instructions stored in the memory, which when executed by the processor, perform the corresponding function(s) associated with the processor. The systems and devices described herein may each include processor or processor circuitry to implement the embodiments presented herein.
(10) FIG. **1** illustrates an example system **100** according to an embodiment of the disclosure. System **100** includes a headend **102** coupled to devices **110** via a network **104**. Devices **110** include a local communication termination point (“LCTP”) **106** that is coupled to customer premise equipment (“CPE”) **108-1** to **108**-N(“CPE **108**”). A “device **110**” as referred to herein may be any of a CPE **108** or LCTP **106**. In an example, headend **102** is a cable modem termination system (“CMTS”) or a backend system. In an example, LCTP **106** is a set-top box. CPE devices **108-1** to **108**-N may be any type of electronic device that is capable of wired or wireless connection such as a cell phone, a laptop, a computer, or a smart television. In an example, headend **102** and/or devices **110** are in communication with vendors **112-1** to **112**-N (“vendor **112**”). Headend **102** includes a synthetic device ID generator **118** coupled to a processor **114**. Processor **114** is coupled to a memory **116**. Local communication termination point **106** includes a processor **120** coupled to a memory **122**. Each CPE **108** includes a processor coupled to a memory (not shown). Synthetic device ID generator **118** will be described in further detail with respect to FIG. **2** below.
(11) Vendors **112-1** to **112**-N may be any type of service provider such as, for example a digital video service provider such as Netflix™ or YouTube™, a cable television provider, a website or search engine such as Google™. In an example, the service provided by vendors **112** is a voice-to-text translation where audio is sent to the vendor and the vendor converts the audio into text in order to perform a search using the translated text. For example, a user of a CPE **108**, e.g. a digital television streaming box such as Apple TV™, may use a remote control coupled to the CPE **108** to request a voice search for “action movies” from a vendor **112**, e.g. Netflix™. The request may be sent either directly or via headend **102** to vendor **112**. The vendor **112** receives the request in audio format, converts it to text, performs a search for action movies, and returns the results either via headend **102** or directly to the CPE **108**. In another example, a vendor **112** might be a service provider that provides an electronic program guide for cable television channels. In a further

example, vendor **112** may be a search engine or a website. It is to be appreciated that a vendor **112** may be any type of service provider that can provide any type of service. In an example, vendors **112** may be referred to as “service providers” herein.

(12) A vendor **112** requests a device identifier (ID) associated with a device **110** (such as a CPE **108** or LCTP **106**) when providing a service to a device **110**. In an example, each device **110** is associated with an internal device ID that is unique. The internal device ID may be an ID that is assigned by headend **102**. In another example, the internal device ID may be the Media Access Control (MAC) ID, a device serial number, or an IP address. It is to be appreciated that the device ID may be any ID that is unique to a device **110**. A vendor **112** may track the activities of a user of a device **110** based on the internal device ID. For example, if a user of a device **110** requests a voice-to-text search for an action movie as in the example above, the vendor **112** providing the service might track the user's preference for action movies based on the search request. By tracking a usage of a device **110** a vendor **112** may be able to create a profile of the user's preferences and exploit the data collected regarding the preferences for either providing targeted advertising, targeted suggestions for further services, financial, or malicious gain. In an example, a user profile generated by a vendor may be sold to a third-party thereby violating the privacy of a user of a device **110**. In another example, a vendor **112** that is collecting data regarding the usage and preferences of a user may be hacked by a malicious third-party that may steal the user's profile and utilize the profile for unauthorized use. Therefore, it is an object of the embodiments presented herein to prevent vendors **112** from tracking usage of devices **110**. The embodiments presented herein provide a synthetic and variable device ID to third party vendors **112** for each device **110**. As will be further described below, synthetic and variable device IDs are generated so that each ID is unique, and has no correlation to an actual device ID of a device **110**. The lack of correlation prevents a vendor **112** from correlating the synthetic device ID with an actual device ID of a device **110** and determining an identity of the device **110** or that of a user of device **110**. Furthermore, in embodiments presented herein, each vendor **112** receives a different and unique synthetic device ID for a particular device **110** so that vendors **112** cannot communicate between themselves in order to correlate device IDs and thereby track usage of a device **110**. In addition, a device ID for a particular device **110** may be changed periodically, conditionally, or arbitrarily by headend **102**.

(13) In an example, vendors **112** may either communicate directly with devices **110** or via headend **102**. For example, when a device **110** requests a service from a vendor **112**, the request may be transmitted to headend **102**. Headend **102** then sends the request onto vendor **112** along with a device ID associated with the device **110**. In another example, a device **110** may communicate directly with a vendor **112**. For example, a device **110** may communicate directly with a vendor **112** to request a service. The embodiments presented herein provide a synthetic device ID for both cases when either a device **110** is requesting a service indirectly via headend **102** or when a device **110** is requesting a service directly from a vendor **112**.

(14) FIG. **2** further illustrates synthetic device ID generator **118** according to an embodiment of the disclosure. Synthetic device ID generator **118** generates, updates, and manages synthetic device IDs for devices **110** as will be described further below. Synthetic device ID generator **118** includes a profile manager and ID generator **200** coupled to an algorithm selector **204**, a database **202**, an event monitor **210**, a timer **208**, and a random seed generator **206**. Profile manager and ID generator **200** may use a table to associate a device **110**, an internal or “actual” device ID for the device **110**, vendors **112**, and synthetic device IDs associated with the vendors **112** for a particular device **110**. Table 1 below illustrates such as association.

(15) TABLE-US-00001 TABLE 1 Internal Vendor Vendor Vendor Device Device ID 112-1 112-2 . . . 112-N CPE 108-1 Device 1 ABC DEF XYZ CPE 108-2 Device 2 123 456 789 . . . . . CPE 108-N Device N . . . . . LCTP 106 STB 1 A12 B12 Z12

(16) As shown in Table 1, a device such as CPE **108-1** may have an internal device ID “Device 1.” However, for a vendor **112-1** a synthetic device ID such as “ABC” might be used. Similarly, for a

vendor **112-2**, the synthetic device ID associated with device **108-1** may be "DEF." In this manner, profile manager and ID generator **200** creates a set of synthetic device IDs for each device **110** and stores the association between a vendor **112**, the internal device ID, the device, and the synthetic device ID in Table 1. Table 1 may be stored in a database such as a database **202** or in memory **116**. When the requested service is received from the vendor it includes the synthetic device ID that was sent to the vendor. Using table 1, headend **102** internally tracks the request based on the association of the synthetic device ID and the device in Table 1. For example, when vendor **112-1** returns the results of a request along with synthetic device ID "ABC," headend **102** uses table 1 to determine that CPE **108-1** associated with internal ID "Device 1" is where the results are to be forwarded.

(17) In an example, profile manager and ID generator **200** transmits a profile to each device **110**. The profile includes, for example, the synthetic device IDs that a particular device **110** is to use for each corresponding vendor **110**. For example, a profile including table 2 below may be transmitted to CPE **108-1**. CPE **108-1** uses a synthetic device ID corresponding to a particular vendor **112** when communicating with the vendor **112**. For example, CPE **108-1** will send the synthetic device ID "DEF" when communicating with vendor **112-2**.

(18) TABLE-US-00002 TABLE 2 Internal Vendor Vendor Vendor Device Device ID 112-1 112-2 . . . 112-N CPE 108-1 Device 1 ABC DEF XYZ

(19) In an example, a device **110** sends the request for a service from a vendor **112** via headend **102**. In this case, headend **102** sends the synthetic device ID corresponding to the vendor **112** based on Table 1 along with the request. For example, if CPE **108-1** requests a service from a vendor **112-1** via headend **102**, profile manager and ID generator **200** sends the synthetic device ID "ABC" to vendor **112-1** along with the request. If CPE **108-1** is requesting service directly from vendor **112-1**, then CPE **1081-1** sends the synthetic device ID "ABC" to vendor **112-1** based on table 2 along with the request.

(20) In an example, profile manager and ID generator **200** updates one or more synthetic device IDs for one or more devices **110** based on a signal received from timer **208**. For example, timer **208** may periodically send a signal to profile manager and ID generator **200** to update the synthetic device IDs associated with one or more vendors **112** or one or more devices **110**. Profile manager and ID generator **200** may use algorithm selector **204** that selects an algorithm from a set of distinct algorithms stored in database **202** to generate synthetic device IDs. Algorithm selector **204** may use different algorithms for each device **110** or vendor **112**. In another example, a random seed generator **206** may be coupled to algorithm selector **204** that randomizes the algorithm selected by algorithm selector **204** for generating synthetic device IDs. The synthetic device ID is generated by profile manager and ID generator **200** based on the algorithm selected by the algorithm selector **204**. In an example, event monitor **210** sends a signal to profile manager and ID generator **200** to generate synthetic device IDs for one or more devices **110** or one or more vendors **112**. For example, if there has been a security breach either at the headend **202** or at a particular vendor **112**, event monitor **210** may send a signal to profile manager and ID generator **200** to update the synthetic device IDs for the device **110** or the vendor **112** that experienced the breach. Profile manager and ID generator **200** may send updated profiles to devices **110** upon an update of the synthetic device IDs. In another example, a device **110** may send a request to a headend **102** for an updated profile with updated synthetic device IDs for a particular vendor **112** each time a request for a service is sent that vendor **112**. For example, when requesting a service such as a search from a particular vendor **112**, a CPE **108** may send a request to headend **102** to generate an updated profile that has a new synthetic device ID for the vendor **112** for each such request.

(21) FIG. **3** illustrates an example flowchart **300** that illustrates steps performed by a headend **102** to generate and update synthetic device IDs according to an embodiment of the disclosure.

(22) In step **302**, a request is received for a first service from a first vendor. For example, a request for a first service, such as a voice-to-text search, from vendor **112-1** is received by headend **102** from CPE **108-1**.

(23) In step **304**, a first synthetic device ID is generated. For example, profile manager and ID generator **200**, based on an algorithm selected by algorithm selector **204** from database **202**, generates a synthetic device ID “ABC” corresponding to vendor **112-1**.
(24) In step **306**, the device, the internal device ID, the vendor, and the synthetic device ID are associated. For example, profile manager and ID generator **200** associates the internal device ID “Device 1,” the synthetic device ID “ABC,” CPE **108-1**, and vendor **112-1** using Table 1.
(25) In step **308**, the request for the first service is transmitted along with the first synthetic device ID to the vendor. For example, headend **102** transmits the synthetic device ID “ABC” to vendor **112-1** along with the request for the service received from CPE **108-1**.
(26) In step **310**, a request is received for a second service from a second vendor. For example, CPE **108-1** may request headend **102** for a service, such as a web search, from vendor **112-2**.
(27) In step **312**, a second synthetic device ID is generated. For example, profile manager and ID generator **200** may generate a second synthetic device ID for CPE **108-1** that corresponds to vendor **112-2**.
(28) In step **314**, the device, the internal device ID, the second vendor, and the second synthetic device ID are associated. For example, profile manager and ID generator **200** associates the internal device ID “Device 1,” the synthetic device ID “DEF” with CPE **108-1** and vendor **112-2** using table 1.
(29) In step **316**, the second synthetic device ID is transmitted to the second vendor along with the second request. For example, headend **202** transmits the second request along with the second synthetic device ID “DEF” to vendor **112-2**.
(30) In step **318**, a request is received for a second service from the first vendor. For example, CPE **108-1** may request a second voice-to-text search from vendor **112-1** via headend **102**.
(31) In step **320**, a second synthetic device ID is generated. For example, profile manager and ID generator **200** generates a second synthetic device ID associated with vendor **112-1** to service the second request.
(32) In step **322**, the first synthetic device ID is replaced with the second synthetic device ID. For example, the first synthetic ID “ABC” is replaced with a second synthetic ID, for example, “LMK.”
(33) In step **324**, the device, the internal device ID, the second vendor, and the second synthetic device ID are associated. For example, profile manager and ID generator **200** associates the internal device ID “Device 1,” the second synthetic device ID “LMK,” CPE **108-1**, and vendor **112-1** using table 1.
(34) In step **326**, the second synthetic device ID is transmitted to the vendor. For example, the second synthetic device ID “LMK” is transmitted to the vendor **112-1** along with the second request for service.
(35) In step **328**, a notification is received of a security breach. For example, event monitor **210** may receive a notification of a security breach for a vendor **112**, for a device **110**, or for headend **102** and send a signal to profile manager and ID generator **200**.
(36) In step **330**, new synthetic device IDs are generated for one or more devices or vendors affected by the security breach. For example, in response to receiving the signal, profile manager and ID generator **200** generates replacement synthetic device IDs for one or more vendors **112** or devices **110** affected by the breach.
(37) In step **332**, the new synthetic device IDs are associated with the corresponding devices and vendors. For example, profile manager and ID generator **200** associates the new synthetic device IDs, with respective devices **110**, internal device IDs, and vendors **112** using Table 1.
(38) In step **334**, the new synthetic device IDs are transmitted to respective devices and to vendors when a request for a service from the respective vendors is received. For example, headend **102** transmits the new synthetic device IDs to respective devices **110** and to respective vendors **112** affected by the breach when a request is received for a service from the respective vendors **112**.

(39) In step **336**, a signal may be received from a timer. For example, profile manager and ID generator **200** may receive a signal from timer **208**.
(40) In step **338**, new synthetic device IDs may be generated for one or more devices or for one or more vendors. For example, certain devices **108** or vendors **112** may be flagged to have synthetic device IDs associated with them to replaced periodically. In response to the signal received from timer **208**, profile manager and ID generator **200** generates new synthetic device IDs for one or more devices **108** or vendors **112**.
(41) In step **340**, the new synthetic device IDs are associated with the corresponding devices and vendors. For example, profile manager and ID generator **200** associates the new synthetic device IDs with respective devices **110**, internal device IDs, and vendors **112** using Table 1.
(42) In step **342**, the new synthetic device IDs are transmitted to respective devices and to vendors. For example, headend **102** transmits the new synthetic device IDs to respective devices **110** and to respective vendors **112** when a request is received for a service from the respective vendors **112**.
(43) In step **344**, a notification of a change in an account associated with the CPE may be received. For example, profile manager and ID generator **200** may receive a signal from event monitor **210** indicating a change in an account associated with CPE **108-2**.
(44) In step **346**, new synthetic device IDs are generated for each vendor associated with the device. For example, profile manager and ID generator **200** generates new synthetic device IDs for each vendor **112** associated with CPE **108-2**.
(45) In step **348**, the new synthetic device IDs are associated with the corresponding devices and vendors. For example, profile manager and ID generator **200** associates CPE **108-2**, the new synthetic device IDs, and corresponding vendors **112** using Table 1.
(46) In step **350**, the new synthetic device IDs are transmitted to the affected device and to vendors associated with the device when servicing a request from the device. For example, profile manager and ID generator **200** transmits the new synthetic device IDs to CPE **108-2** and to vendors **112** associated with CPE **108-2** when servicing requests from CPE **108-2**.
(47) In step **352**, a notification of cancellation of services associated with a vendor is received. For example, if services are no longer provided by a vendor **112** or a vendor **112** is no longer being used, then event monitor **210** sends a message to profile manager and ID generator **200** regarding the cancellation.
(48) In step **354**, further use of the synthetic device ID associated with the vendor is terminated. For example, if services associated with vendor **112-1** are cancelled, then synthetic device IDs such as “ABC,” “123,” or “A12” that were associated with vendor **112-1** are not used with any other vendors **112**.
(49) FIG. **4** illustrates an example flowchart **400** showing steps performed by a device **110** that uses synthetic device IDs according to an embodiment of the disclosure.
(50) In step **402**, a profile is received from a headend that includes synthetic device IDs corresponding to different vendors. For example, a device such as CPE **108-1** receives a profile that includes synthetic device IDs corresponding to different vendors as shown in Table 2.
(51) In step **404**, a first service to be provided by a first vendor is generated. For example, a device **110** may generate a request for a first service, such as a voice-to-text search request, to be provided by vendor **112-1**.
(52) In step **406**, a first synthetic device ID corresponding to the first vendor is determined. For example, CPE **108-1**, based on table 2 received in step **402**, determines that synthetic device ID “ABC” is to be used for requests corresponding to vendor **112-1**.
(53) In step **408**, the first request and the first synthetic device ID are transmitted to the first vendor. For example, CPE **108-1** transmits the request for the search to vendor **112-1** along with the synthetic device ID “ABC.”
(54) In step **410**, a request is generated for a second service to be received from a second vendor. For example, CPE **108-2** may generate a request for a second service, such as web search, from

vendor **112-2**.
(55) In step **412**, a second synthetic device ID corresponding to the second vendor is determined based on the profile received in step **402**. For example, a second synthetic device ID "DEF" corresponding to vendor **112-2** is determined from Table 2.
(56) In step **414**, the second request and the second CPE ID are transmitted to the second vendor. For example, CPE **108-1** transmits the second request to vendor **112-2** along with the second synthetic device ID "DEF."
(57) In step **416**, a request is received for a second service that is to be provided by the first vendor. For example, CPE **108-1** may request a second service such as a second voice-to-text search to be performed by the first vendor **112-1**.
(58) In step **418**, in response to the second request, an updated profile may be requested from the headend including a second synthetic device ID for the first vendor. For example, CPE **108-1** may request headend **102** for a second synthetic device ID for vendor **112-1**.
(59) In step **420**, an updated profile including a second synthetic device ID is received. For example, CPE **108-1** receives a new profile with a second synthetic device ID for requesting the second search from vendor **112-1**.
(60) In step **422**, the second synthetic device ID corresponding to the first vendor is determined. For example, CPE **108-1** determines the second synthetic device ID corresponding to vendor **112-1** based on the updated profile received in step **420**.
(61) In step **424**, the second request and the second synthetic device ID are transmitted to the first vendor. For example, CPE **108-1** transmits the second request and the second synthetic device ID to vendor **112-1**.
(62) In step **426**, an updated profile including updated synthetic device IDs for one or more vendors is periodically received from the headend. For example, CPE **108-1** may periodically receive an updated profile from headend **102** including a new set of synthetic device IDs for vendors **112** in table 2.
(63) In step **428**, the updated synthetic device IDs are used based on the updated profile. For example, CPE **108-1** use the updated synthetic device IDs when requesting a service from vendors **112**.
(64) In the examples presented above, the synthetic device ID is generated by headend **102**. However, it is to be appreciated by persons of skill in the art that in alternate embodiments the device IDs can be generated by each device **110**. In an example, each device **110** may generate the ID and register it with the profile manager and ID generator **200**.
(65) The following describes a general-purpose computer system that can be used to implement embodiments of the disclosure presented herein. The present disclosure can be implemented in hardware, or as a combination of software and hardware. Consequently, the disclosure may be implemented in the environment of a computer system or other processing system. An example of such a computer system **500** is shown in FIG. **5**. The computer system **500** includes one or more processors, such as processor **504**. Processor **504** can be a special purpose or a general-purpose digital signal processor. Processor **504** may be, for example, any of the processors described herein. The processor **504** is connected to a communication infrastructure **506** (for example, a bus or network). Various software implementations are described in terms of this exemplary computer system. After reading this description, it will become apparent to a person skilled in the relevant art how to implement the disclosure using other computer systems and/or computer architectures.
(66) Computer system **500** also includes a main memory **505**, preferably random access memory (RAM), and may also include a secondary memory **510**. The secondary memory **510** may include, for example, a hard disk drive **512**, and/or a RAID array **516**, and/or a removable storage drive **514**, representing a floppy disk drive, a magnetic tape drive, an optical disk drive, etc. The removable storage drive **514** reads from and/or writes to a removable storage unit **518** in a well-known manner. Removable storage unit **518** represents a floppy disk, magnetic tape, optical disk, etc. As

will be appreciated, the removable storage unit **518** includes a computer usable storage medium having stored therein computer software and/or data.

(67) In alternative implementations, secondary memory **510** may include other similar means for allowing computer programs or other instructions to be loaded into computer system **500**. Such means may include, for example, a removable storage unit **522** and an interface **520**. Examples of such means may include a program cartridge and cartridge interface (such as that found in video game devices), a removable memory chip (such as an EPROM, or PROM) and associated socket, and other removable storage units **522** and interfaces **520** which allow software (i.e., instructions) and data to be transferred from the removable storage unit **522** to computer system **500**.

(68) Computer system **500** may also include a communications interface **524**. Communications interface **524** allows software and data to be transferred between computer system **500** and external devices. Examples of communications interface **524** may include a modem, a network interface (such as an Ethernet card), a communications port, a PCMCIA slot and card, etc., that are coupled to a communications path **526**. The communications path **526** can be implemented using wire or cable, fiber optics, a phone line, a cellular phone link, an RF link and other communications links or channels.

(69) The terms “computer program medium” and “computer usable medium” are used herein to generally refer to media such as removable storage drive **514**, a hard disk installed in hard disk drive **512**, or other hardware type memory. These computer program products are means for providing or storing software (e.g. instructions) to computer system **500**.

(70) Computer programs (also called computer control logic) are stored in main memory **505** and/or secondary memory **510**. Computer programs may also be received via communications interface **524**. Such computer programs, when executed, enable the computer system **500** to implement the present disclosure as discussed herein. In particular, the computer programs, when executed, enable the processor **504** to implement the processes and/or functions of the present disclosure. For example, when executed, the computer programs enable processor **504** to implement part of or all of the steps described herein. Where the disclosure is implemented using software, the software may be stored in a computer program product and loaded into computer system **500** using raid array **516**, removable storage drive **514**, hard drive **512** or communications interface **524**.

(71) In other embodiments, features of the disclosure are implemented primarily in hardware using, for example, hardware components such as Application Specific Integrated Circuits (ASICs) and programmable or static gate arrays or other state machine logic. Implementation of a hardware state machine so as to perform the functions described herein will also be apparent to persons skilled in the relevant art(s).

CONCLUSION

(72) The aforementioned description of the specific embodiments will so fully reveal the general nature of the disclosure that others can, by applying knowledge within the skill of the art, readily modify and/or adapt for various applications such specific embodiments, without undue experimentation, without departing from the general concept of the present disclosure. Therefore, such adaptations and modifications are intended to be within the meaning and range of equivalents of the disclosed embodiments, based on the teaching and guidance presented herein. It is to be understood that the phraseology or terminology herein is for the purpose of description and not of limitation, such that the terminology or phraseology of the present specification is to be interpreted by the skilled artisan in light of the teachings and guidance.

(73) References in the specification to “one embodiment,” “an embodiment,” “an exemplary embodiment,” etc., indicate that the embodiment described may include a particular feature, structure, or characteristic, but every embodiment may not necessarily include the particular feature, structure, or characteristic. Moreover, such phrases are not necessarily referring to the same embodiment. Further, when a particular feature, structure, or characteristic is described in

connection with an embodiment, it is submitted that it is within the knowledge of one skilled in the art to affect such feature, structure, or characteristic in connection with other embodiments whether or not explicitly described.
(74) The exemplary embodiments described herein are provided for illustrative purposes, and are not limiting. Other exemplary embodiments are possible, and modifications may be made to the exemplary embodiments within the spirit and scope of the disclosure. Therefore, the specification is not meant to limit the disclosure. Rather, the scope of the disclosure is defined only in accordance with the following claims and their equivalents.
(75) Embodiments may be implemented in hardware (e.g., circuits), firmware, software, or any combination thereof. Embodiments may also be implemented as instructions stored on a machine-readable medium, which may be read and executed by one or more processors. A machine-readable medium may include any hardware mechanism for storing information in a form readable by a machine (e.g., a computing device). For example, a machine-readable medium may include read only memory (ROM); random access memory (RAM); magnetic disk storage media; optical storage media; flash memory devices; and other hardware implementations. Further, firmware, software, routines, instructions may be described herein as performing certain actions. However, it should be appreciated that such descriptions are merely for convenience and that such actions in fact results from computing devices, processors, controllers, or other devices executing the firmware, software, routines, instructions, etc. Further, any of the implementation variations may be carried out by a general-purpose computer.
(76) In embodiments having one or more components that include one or more processors, one or more of the processors can include (and/or be configured to access) one or more internal and/or external memories that store instructions and/or code that, when executed by the processor(s), cause the processor(s) to perform one or more functions and/or operations related to the operation of the corresponding component(s) as described herein and/or as would appreciated by those skilled in the relevant art(s).
(77) It is to be appreciated that the Detailed Description section, and not Abstract section, is intended to be used to interpret the claims. The Abstract section may set forth one or more but not all exemplary embodiments of the present disclosure as contemplated by the inventors, and thus, is not intended to limit the present disclosure and the appended claims in any way.
(78) The embodiments presented herein have been described above with the aid of functional building blocks illustrating the implementation of specified functions and relationships thereof. The boundaries of these functional building blocks have been arbitrarily defined herein for the convenience of the description. Alternate boundaries can be defined so long as the specified functions and relationships thereof are appropriately performed.

## Claims

1. An apparatus of a service provider network for providing a plurality of synthetic device identifications (IDs) for a device, the apparatus comprising: a memory that stores a table having an association between the device, an internal device ID for the device, and a plurality of synthetic device IDs for the device corresponding to a plurality of vendors, the plurality of synthetic device IDs being unique and different from one another; and a processor, coupled to the memory, configured to execute instructions stored in the memory, the instructions, when executed by the processor, configuring the processor to: receive a request from the device to obtain a service from a vendor from among the plurality of vendors; generate a synthetic device ID for the device that corresponds to the vendor; associate the device, the internal device ID, the synthetic device ID, and the vendor in the table; and transmit the synthetic device ID to the vendor to request the service from the vendor for the device using the synthetic device ID.
2. The apparatus of claim 1, wherein the plurality of vendors comprises a plurality of service

providers configured to provide a plurality of services, at least one service from among the plurality of services being a voice-to-text translation to convert audio into text.
3. The apparatus of claim 1, wherein the internal device ID comprises: a Media Access Control (MAC) ID of the device; a serial number of the device; or an Internet Protocol (IP) address of the device.
4. The apparatus of claim 1, wherein the instructions, when executed by the processor, further configure the processor to generate the synthetic device ID having no correlation with the internal device ID.
5. The apparatus of claim 1, wherein the instructions, when executed by the processor, further configure the processor to: receive a second request from the device to obtain a second service from a second vendor from among the plurality of vendors; generate a second synthetic device ID for the device that corresponds to the second vendor, the second synthetic device ID being different and unique from the synthetic device ID; associate the device, the internal device ID, the second synthetic device ID, and the second vendor in the table; and transmit the second synthetic device ID to the second vendor to request the second service from the second vendor for the device using the second synthetic device ID.
6. The apparatus of claim 1, wherein the instructions, when executed by the processor, further configure the processor to: receive an indication of a security breach; generate a new synthetic device ID for the device in response to receiving the indication of the security breach; and associate the device, the internal device ID, the new synthetic device ID, and the vendor in the table.
7. The apparatus of claim 1, wherein the instructions, when executed by the processor, further configure the processor to: receive a notification indicating a cancellation of the service; and disable further use of the synthetic device ID in response to the notification.
8. A method for providing a plurality of synthetic device identifications (IDs) for a device, the method comprising: receiving a request from the device to obtain a service from a vendor from among a plurality of vendors; retrieving a synthetic device ID for the device that corresponds to the vendor from a table, the table having an association between the device, an internal device ID for the device, and a plurality of synthetic device IDs for the device corresponding to the plurality of vendors, the plurality of synthetic device IDs being unique and different from one another; and transmitting the synthetic device ID to the vendor to request the service from the vendor for the device using the synthetic device ID.
9. The method of claim 8, further comprising: generating the synthetic device ID that corresponds to the vendor; and associating the device, the internal device ID, the synthetic device ID, and the vendor in the table.
10. The method of claim 9, wherein the generating comprises: generating the synthetic device ID having no correlation with the internal device ID.
11. The method of claim 8, further comprising: receiving a second request from the device to obtain a second service from a second vendor from among the plurality of vendors; retrieving a second synthetic device ID for the device that corresponds to the second vendor from the table, the second synthetic device ID being different and unique from the synthetic device ID; and transmitting the second synthetic device ID to the second vendor to request the second service from the second vendor for the device using the second synthetic device ID.
12. The method of claim 8, further comprising: receiving an indication of a security breach; generating a new synthetic device ID for the device in response to receiving the indication of the security breach; and associating the device, the internal device ID, the new synthetic device ID, and the vendor in the table.
13. The method of claim 8, further comprising: receiving a notification indicating a cancellation of the service; and disabling further use of the synthetic device ID in response to the notification.
14. An apparatus for providing a plurality of synthetic device identifications (IDs) for a device, the apparatus comprising: a memory that stores a table having an association between the device, an

internal device ID for the device, and a plurality of synthetic device IDs for the device corresponding to a plurality of vendors, the plurality of synthetic device IDs being unique and different from one another; and a processor, coupled to the memory, configured to execute instructions stored in the memory, the instructions, when executed by the processor, configuring the processor to: receive a request from the device to obtain a service from a vendor from among a the plurality of vendors, retrieve a synthetic device ID for the device that corresponds to the vendor from the table, and transmit the synthetic device ID to the vendor to request the service from the vendor for the device using the synthetic device ID.

15. The apparatus of claim 14, wherein the instructions, when executed by the processor, further configure the processor to: generate the synthetic device ID that corresponds to the vendor; and associate the device, the internal device ID, the synthetic device ID, and the vendor in the table.

16. The apparatus of claim 14, wherein the internal device ID comprises: a Media Access Control (MAC) ID of the device; a serial number of the device; or an Internet Protocol (IP) address of the device.

17. The apparatus of claim 14, wherein the instructions, when executed by the processor, configure the processor to generate the synthetic device ID having no correlation with the internal device ID.

18. The apparatus of claim 14, wherein the instructions, when executed by the processor, further configure the processor to: receive a second request from the device to obtain a second service from a second vendor from among the plurality of vendors; retrieve a second synthetic device ID for the device that corresponds to the second vendor from the table, the second synthetic device ID being different and unique from the synthetic device ID; and transmit the second synthetic device ID to the vendor to request the second service from the second vendor for the device using the second synthetic device ID.

19. The apparatus of claim 14, wherein the instructions, when executed by the processor, further configure the processor to: receive an indication of a security breach; generate a new synthetic device ID for the device in response to receiving the indication of the security breach; and associate the device, the internal device ID, the new synthetic device ID, and the vendor in the table.

20. The apparatus of claim 14, wherein the instructions, when executed by the processor, further configure the processor to: receive a notification indicating a cancellation of the service; and disable further use of the synthetic device ID in response to the notification.