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(54) **SYSTEMS AND METHODS FOR INTERFACING WITH SERVICE INFRASTRUCTURE**

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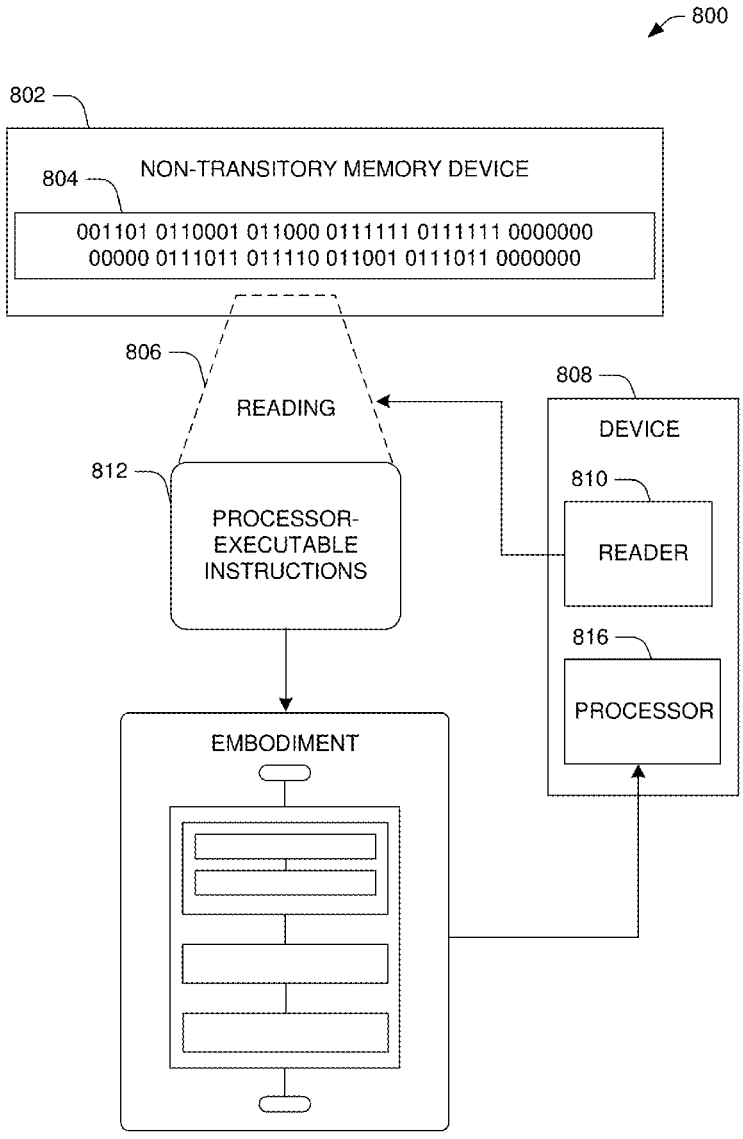
(57) **ABSTRACT**

An example method includes receiving a query comprising a first identifier of a first entity at a portal interface controlled by a second entity. The first entity is validated based on the first identifier to generate a validated first entity. A first credential is generated based on the validated first entity and a second identifier generated by the second entity for the first entity. The first credential is sent to the first entity. Service request data is sent to the first entity. An order request associated with the service request data and a second credential is received at the portal interface. Responsive to validating that the second credential matches the first credential, an order response corresponding to the order request is sent.



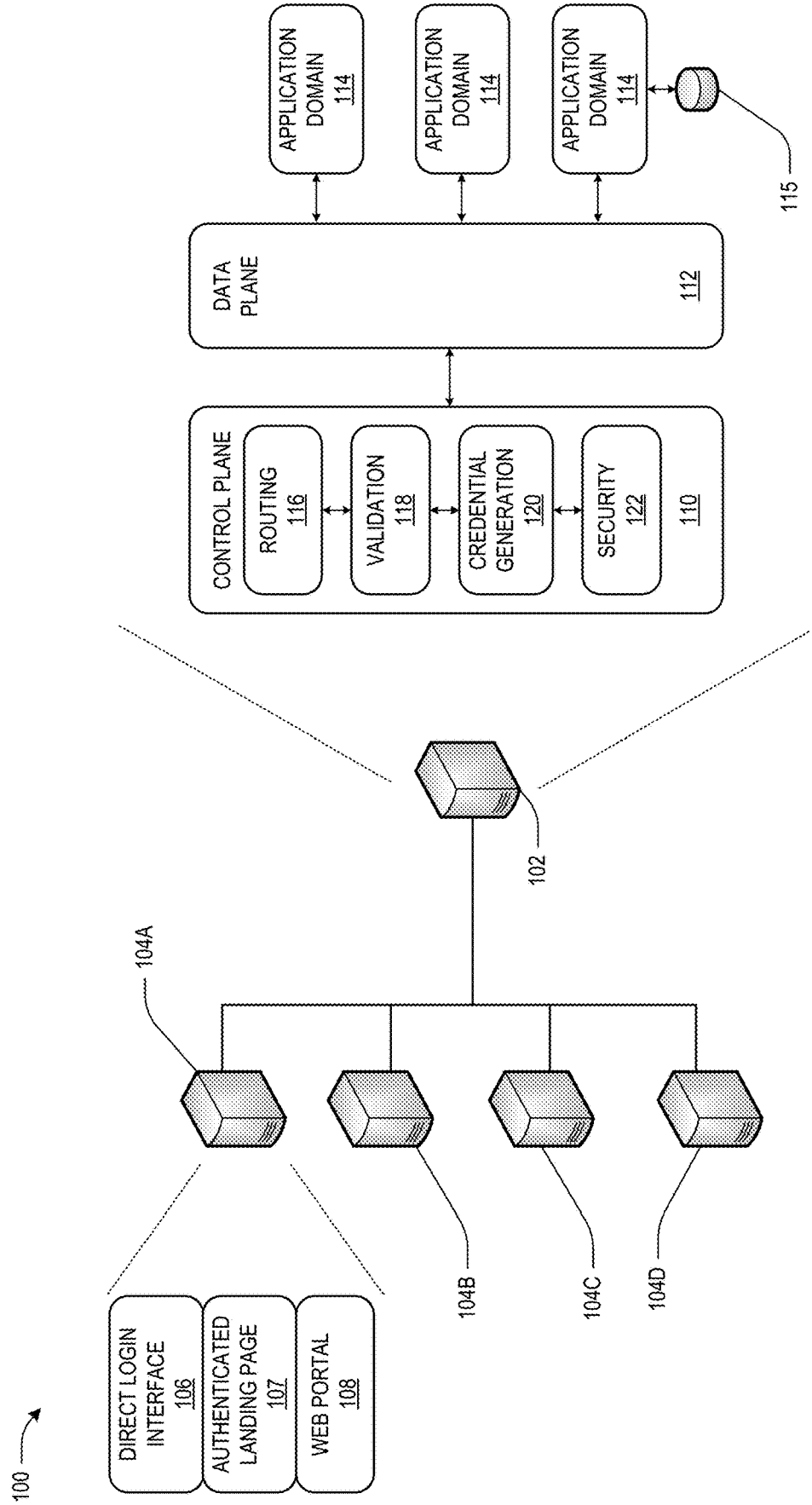

100
DIRECT LOGIN INTERFACE 106
AUTHENTICATED LANDING PAGE 107
WEB PORTAL 108
104A
104B
104C
104D
102
CONTROL PLANE
ROUTING 116
VALIDATION 118
CREDENTIAL GENERATION 120
SECURITY 122
110
DATA PLANE 112
APPLICATION DOMAIN 114
APPLICATION DOMAIN 114
APPLICATION DOMAIN 114
115

Fig. 1

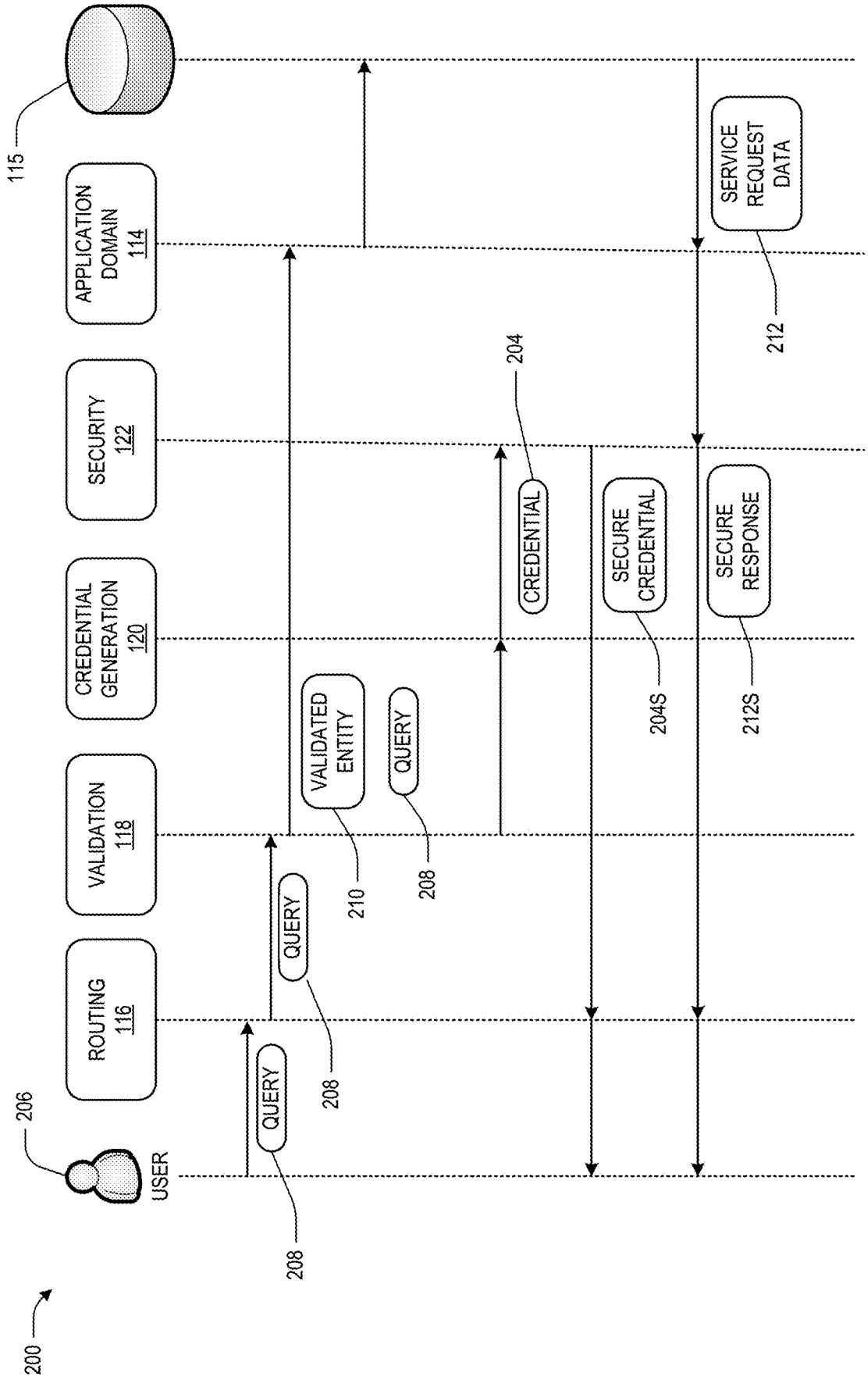

200
USER
206
ROUTING 116
VALIDATION 118
CREDENTIAL GENERATION 120
SECURITY 122
APPLICATION DOMAIN 114
115
QUERY
208
QUERY
208
VALIDATED ENTITY
210
QUERY
208
CREDENTIAL
204
SECURE CREDENTIAL
204S
SECURE RESPONSE
212S
SERVICE REQUEST DATA
212

Fig. 2A

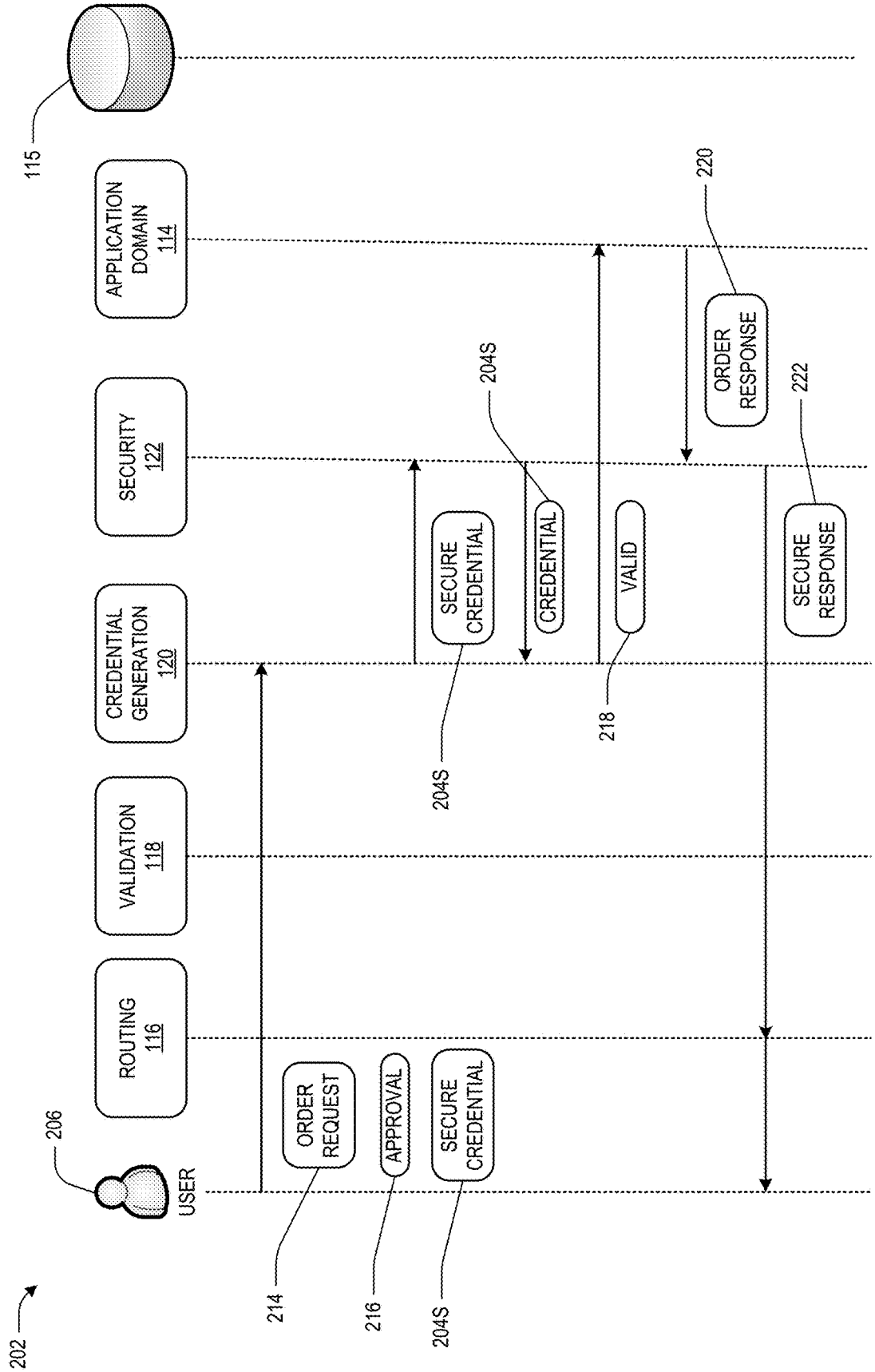

202
USER
206
ROUTING 116
VALIDATION 118
CREDENTIAL GENERATION 120
SECURITY 122
APPLICATION DOMAIN 114
115
ORDER REQUEST
214
APPROVAL
216
SECURE CREDENTIAL
204S
SECURE CREDENTIAL
204S
CREDENTIAL
204S
VALID
218
ORDER RESPONSE
220
SECURE RESPONSE
222

Fig. 2B

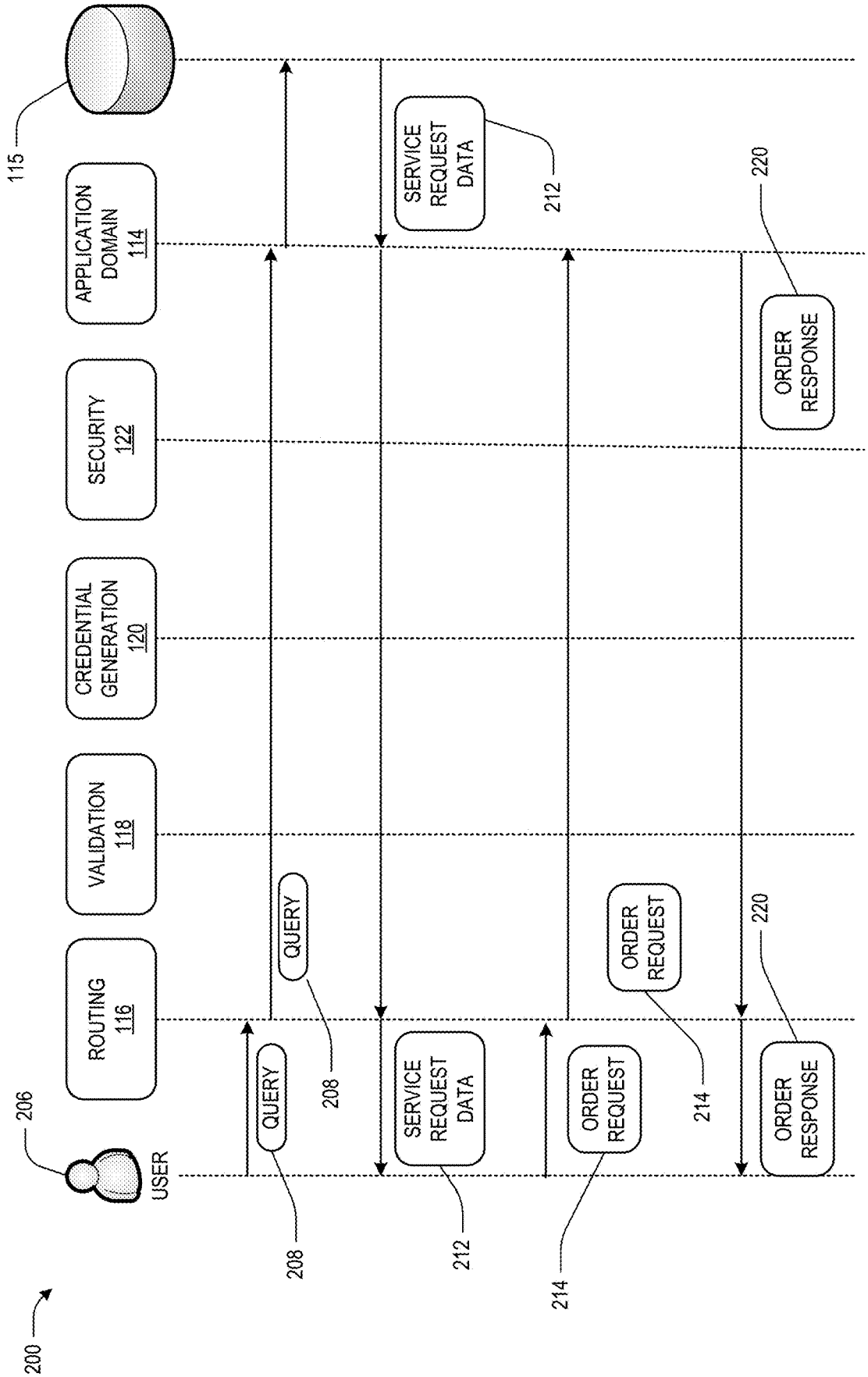

200
206
USER
ROUTING 116
VALIDATION 118
CREDENTIAL GENERATION 120
SECURITY 122
APPLICATION DOMAIN 114
115
QUERY
208
QUERY
208
SERVICE REQUEST DATA
212
SERVICE REQUEST DATA
212
ORDER REQUEST
214
ORDER REQUEST
214
ORDER RESPONSE
220
ORDER RESPONSE
220

Fig. 2C

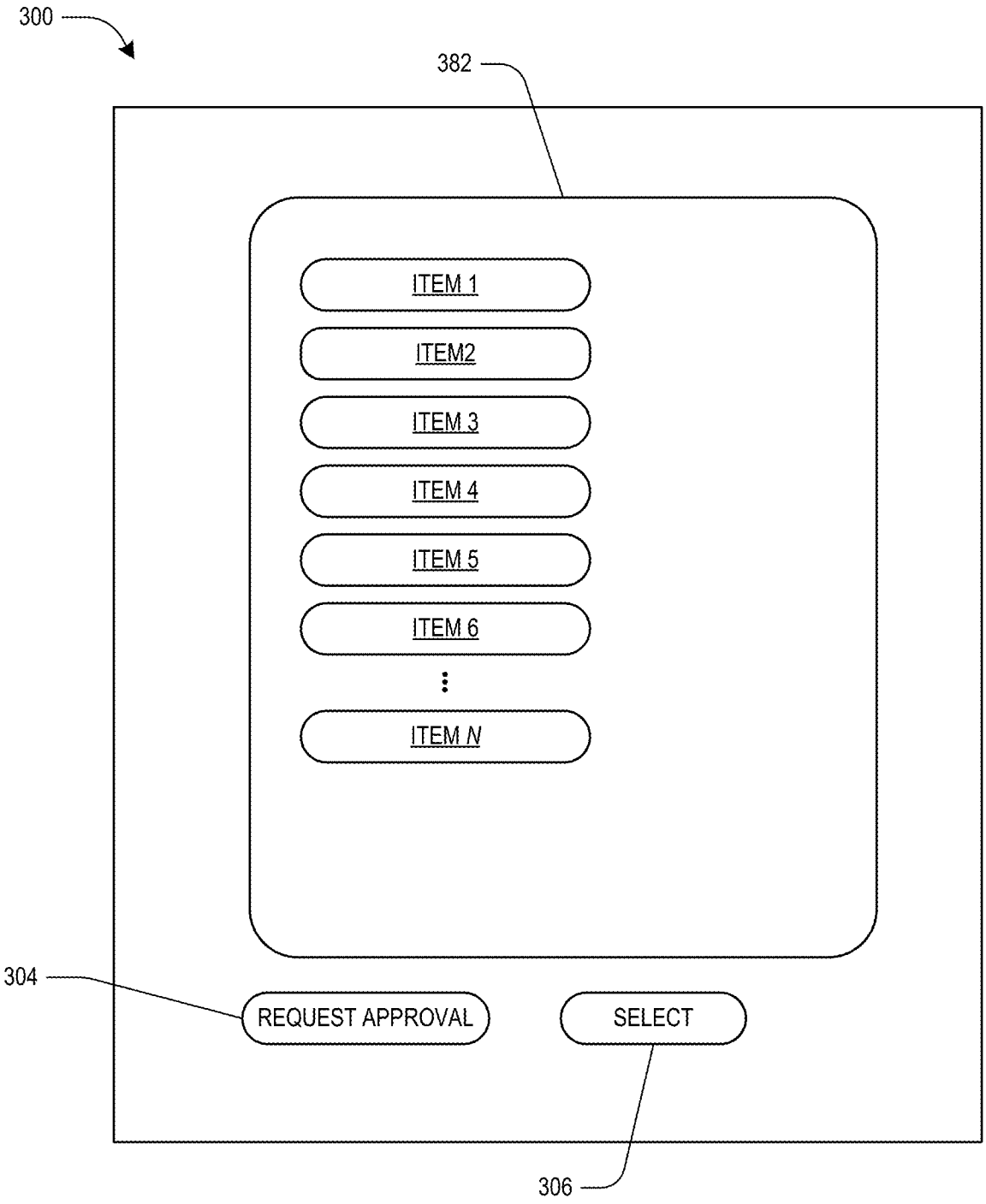

300
382
ITEM 1
ITEM2
ITEM 3
ITEM 4
ITEM 5
ITEM 6
ITEM N
304
REQUEST APPROVAL
SELECT
306

Fig. 3

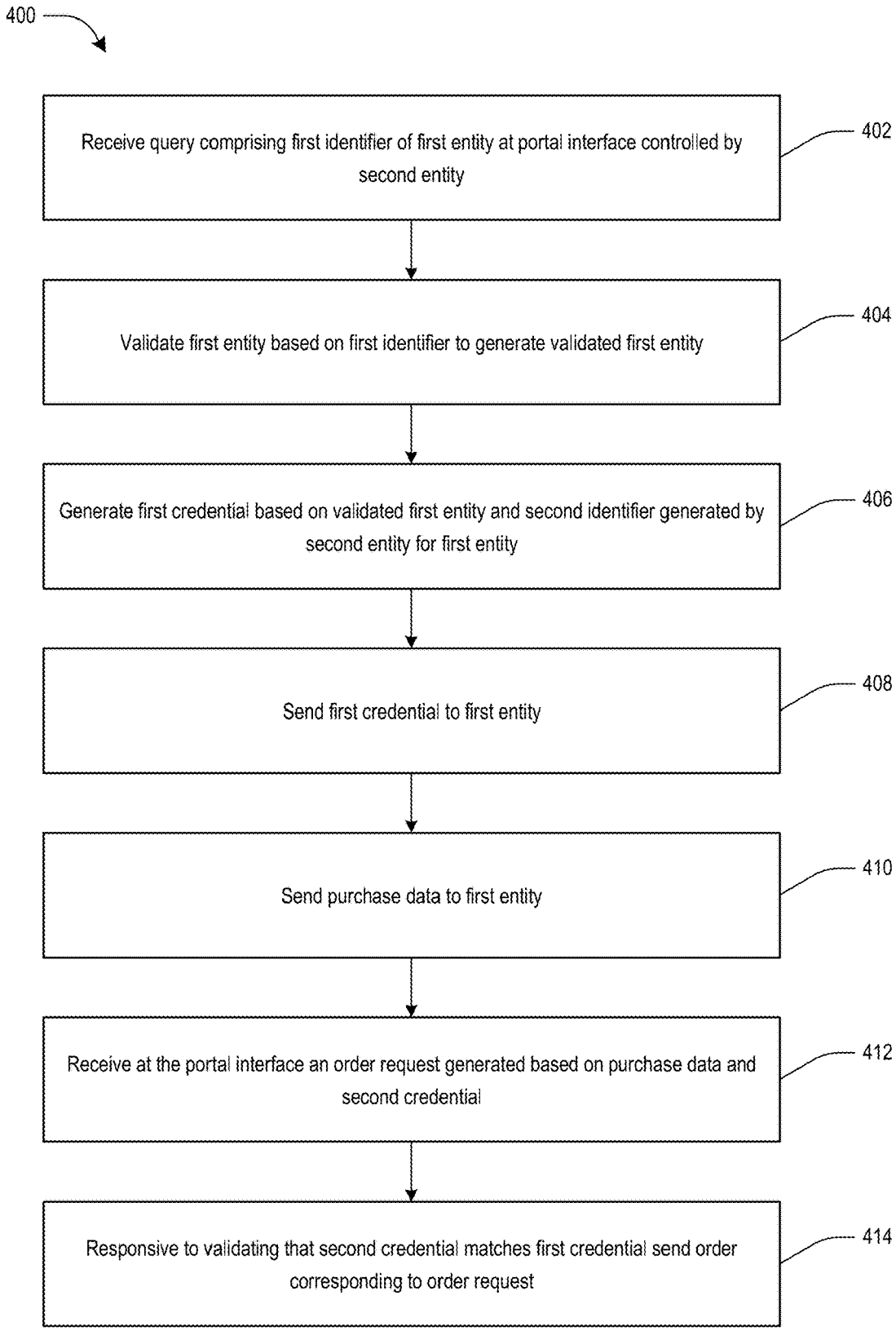

400
Receive query comprising first identifier of first entity at portal interface controlled by second entity
402
Validate first entity based on first identifier to generate validated first entity
404
Generate first credential based on validated first entity and second identifier generated by second entity for first entity
406
Send first credential to first entity
408
Send purchase data to first entity
410
Receive at the portal interface an order request generated based on purchase data and second credential
412
Responsive to validating that second credential matches first credential send order corresponding to order request
414

Fig. 4

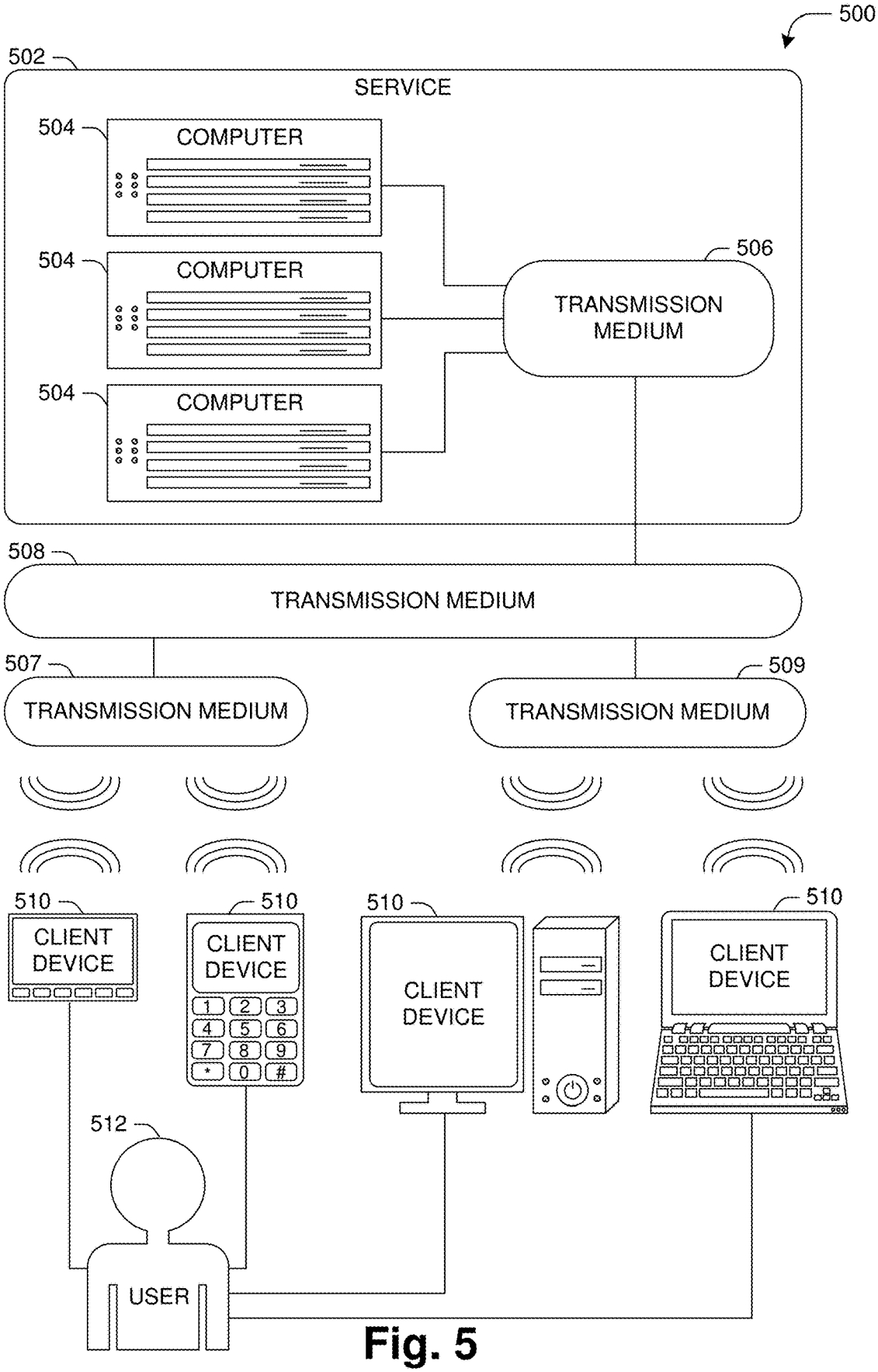

500
502
SERVICE
504
COMPUTER
504
COMPUTER
504
COMPUTER
506
TRANSMISSION MEDIUM
508
TRANSMISSION MEDIUM
507
TRANSMISSION MEDIUM
509
TRANSMISSION MEDIUM
510
CLIENT DEVICE
510
CLIENT DEVICE
1 2 3
4 5 6
7 8 9
* 0 #
510
CLIENT DEVICE
510
CLIENT DEVICE
512
USER

Fig. 5

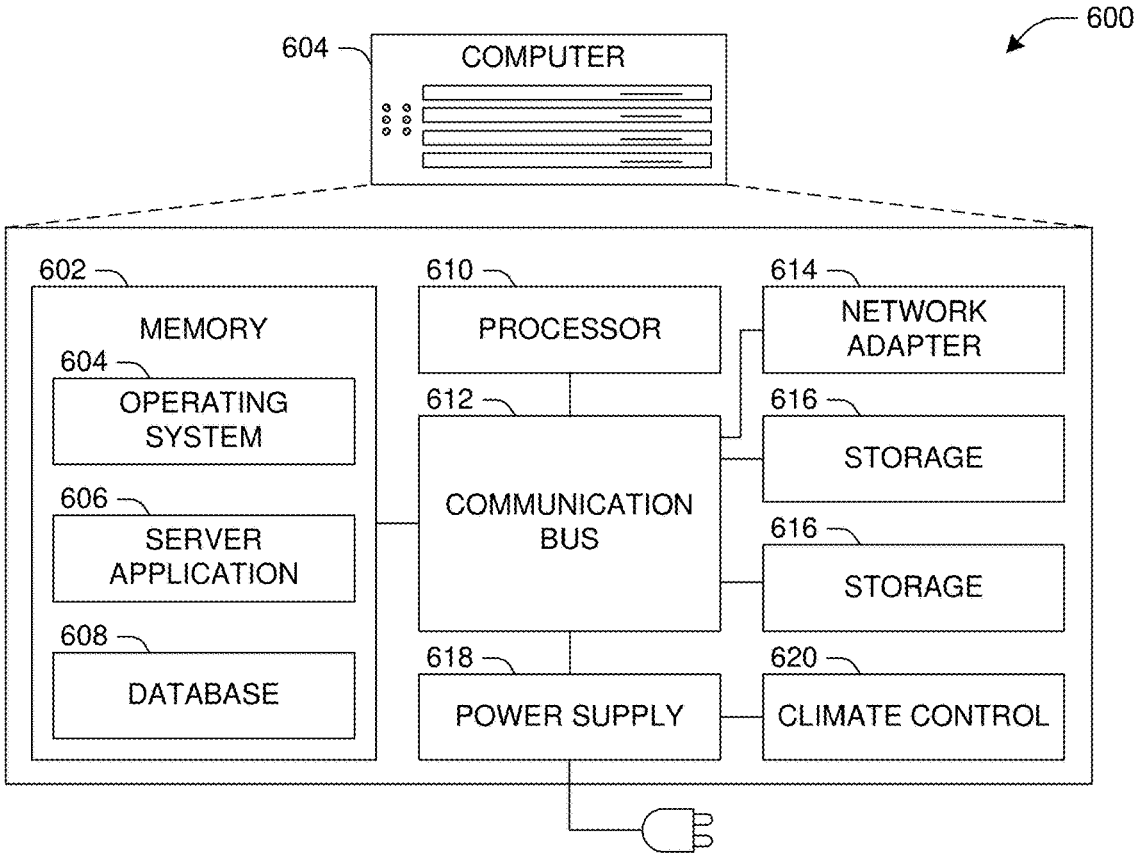

600
604
COMPUTER
602
MEMORY
604
OPERATING SYSTEM
606
SERVER APPLICATION
608
DATABASE
610
PROCESSOR
612
COMMUNICATION BUS
618
POWER SUPPLY
614
NETWORK ADAPTER
616
STORAGE
616
STORAGE
620
CLIMATE CONTROL

Fig. 6

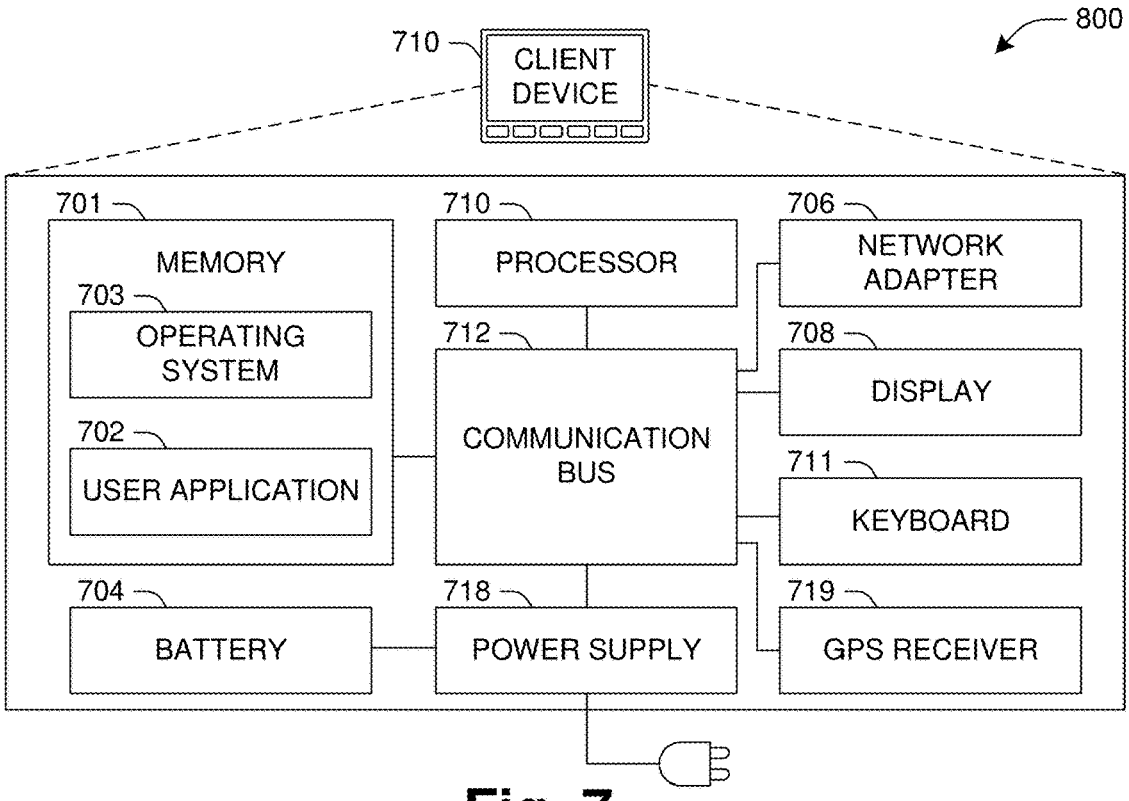

800
710
CLIENT DEVICE
701
MEMORY
703
OPERATING SYSTEM
702
USER APPLICATION
710
PROCESSOR
712
COMMUNICATION BUS
704
BATTERY
718
POWER SUPPLY
706
NETWORK ADAPTER
708
DISPLAY
711
KEYBOARD
719
GPS RECEIVER

Fig. 7

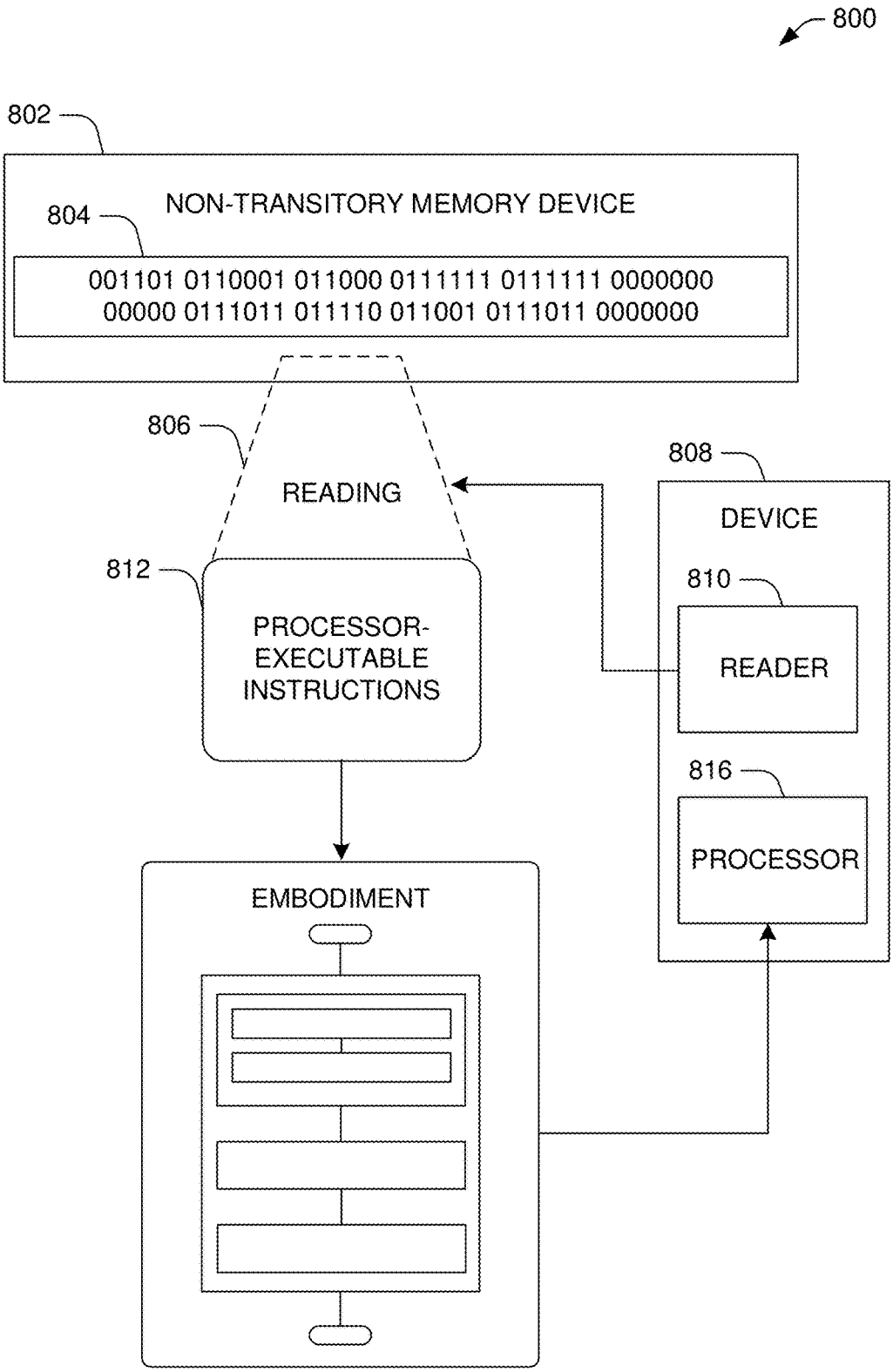

800
802
NON-TRANSITORY MEMORY DEVICE
804
001101 0110001 011000 0111111 0111111 0000000
00000 0111011 011110 011001 0111011 0000000
806
READING
808
DEVICE
812
PROCESSOR-
EXECUTABLE
INSTRUCTIONS
810
READER
816
PROCESSOR
EMBODIMENT

Fig. 8

SYSTEMS AND METHODS FOR INTERFACING WITH SERVICE INFRASTRUCTURE

BACKGROUND

[0001] Large entities commonly use multiple data systems to allow customers to access offered services. For example, a customer may log directly in to a website managed by the large entity to order a product. Alternatively, a customer may use a web portal not controlled by the large entity that interfaces with the website to complete service requests.

BRIEF DESCRIPTION OF THE DRAWINGS

[0002] While the techniques presented herein may be embodied in alternative forms, the particular embodiments illustrated in the drawings are only a few examples that are supplemental of the description provided herein. These embodiments are not to be interpreted in a limiting manner, such as limiting the claims appended hereto.

[0003] FIG. **1** is a diagram of a communication system environment in which some embodiments may be implemented.

[0004] FIGS. **2**A, **2**B, and **2**C are diagrams of message flows for interfacing with applications through a portal interface, according to some embodiments.

[0005] FIG. **3** a diagram of a user interface, according to some embodiments.

[0006] FIG. **4** is a flow chart illustrating an example method for interfacing with applications through a portal interface, according to some embodiments.

[0007] FIG. **5** is an illustration of a scenario involving various examples of transmission mediums that may be used to communicatively couple computers and clients, according to some embodiments.

[0008] FIG. **6** is an illustration of a scenario involving an example configuration of a computer that may utilize and/or implement at least a portion of the techniques presented herein, according to some embodiments.

[0009] FIG. **7** is an illustration of a scenario involving an example configuration of a client that may utilize and/or implement at least a portion of the techniques presented herein, according to some embodiments.

[0010] FIG. **8** is an illustration of a scenario featuring an example non-transitory machine readable medium, according to some embodiments.

DETAILED DESCRIPTION OF EXAMPLE EMBODIMENTS

[0011] Subject matter will now be described more fully hereinafter with reference to the accompanying drawings, which form a part hereof, and which show, by way of illustration, specific example embodiments. This description is not intended as an extensive or detailed discussion of known concepts. Details that are well known may have been omitted, or may be handled in summary fashion.

[0012] The following subject matter may be embodied in a variety of different forms, such as methods, devices, components, and/or systems. Accordingly, this subject matter is not intended to be construed as limited to any example embodiments set forth herein. Rather, example embodiments are provided merely to be illustrative. Such embodiments may, for example, take the form of hardware, software, firmware or any combination thereof. The following provides a discussion of some types of computing scenarios in which the disclosed subject matter may be utilized and/or implemented.

[0013] In some instances, an entity, such as a service provider, may implement multiple interfaces to allow users to access offered services. A portal interface may provide facilities to accommodate user access through multiple access types. For example, the portal interface may provide a facility to allow a user to access the service provider system directly. In another example, the portal interface may provide a facility to allow the user to access a service provider system through an aggregation facility provided by another service provider. The portal interface provides credential processing to enable the access to the requested service provider, such as for initial access and later access requests that may be associated with an authenticated session.

[0014] One or more embodiments described herein may include a method. Such a method includes receiving a query having a first identifier of a first entity at a portal interface controlled by a second entity, validating the first entity based on the first identifier to generate a validated first entity, generating a first credential based on the validated first entity and a second identifier generated by the second entity for the first entity, sending the first credential to the first entity, sending service request data to the first entity, receiving at the portal interface an order request associated with the service request data and a second credential at the portal interface, and responsive to validating that the second credential matches the first credential, sending an order response corresponding to the order request.

[0015] One or more embodiments described herein may include a communication system. Such a system includes a portal interface that has a routing module configured to receive a query having a first identifier of a first entity, a validation module configured to validate the first entity based on the first identifier to generate a validated first entity, and a credential generation module configured to generate a first credential based on the validated first entity and a second identifier generated by a second entity for the first entity, wherein the routing module is configured to send the first credential to the first entity, send service request data to the first entity, and receive at the portal interface an order request associated with the service request data and a second credential at the portal interface, the credential generation module is configured to validate that the second credential matches the first credential, and the routing module is configured to, responsive to the credential generation module validating that the second credential matches the first credential, send an order response corresponding to the order request.

[0016] One or more embodiments described herein may include a non-transitory computer-readable medium storing instructions thereon that when executed by a processor cause the processor to receive a query having a first identifier of a first entity at a portal interface controlled by a second entity, validate the first entity based on the first identifier to generate a validated first entity, generate a first credential based on the validated first entity and a second identifier generated by the second entity for the first entity, send the first credential to the first entity, send service request data to the first entity, receive at the portal interface an order request generated based on the service request data and a second credential at the portal interface, and responsive to validat-

ing that the second credential matches the first credential, send an order response corresponding to the order request.

[0017] FIG. **1** is a diagram of an example communication system environment **100** that may be useful for illustrating the implementation of some embodiments. The communication system **100** comprises a portal interface **102** communicating with independent systems **104**A, **104**B, **104**C, **104**D. The portal interface **102** may be implemented on a server, workstation, cloud computing service, or some other processing resource, which may be controlled by a service provider. Each system **104**A, **104**B, **104**C, **104**D may be implemented on one or more servers, workstations, cloud computing services, or some other processing resource managed by separate enterprises. Users associated with the enterprises operating the systems **104**A, **104**B, **104**C, **104**D may use the portal interface **102** to obtain access to one or more services offered by the service provider, as further described herein. In some embodiments, the users may access the portal interface using a direct login interface **106** controlled by the service provider, an authenticated landing page **107** operated by the enterprise and/or the service provider, or a web portal **108** operated by an aggregation facility.

[0018] The web portal **108** may allow users to access the services provided by multiple service provider systems (including the service provider that is implementing the portal interface **102**). Systems that provide these types of aggregation facilities are often referred to as "punchout" systems. Example punchout systems at the time of this application include ARIBA, HUBSPAN, ISOFT, or other similar systems.

[0019] According to some embodiments, the portal interface **102** implements routing, authentication, and/or security services for interactions between users and a service provider system that may include one or more applications. The portal interface **102** may include a control plane **110** that interfaces with a data plane **112**. The data plane **112** may provide a switching fabric to enable communications between the control plane **110** and application domains **114**. The portal interface **102** may communicate with one or more application domains **114** that may include the one or more applications. The applications may provide user interfaces that allow entity users to request and/or receive services. The application domains **114** may manage one or more data stores **115** for storing data regarding offered products and services, users, customer entities, and transactions. The example control plane **110** includes a routing module **116**, a validation module **118**, a credential generation module **120**, and a security module **122**. Although the routing module **116**, the validation module **118**, the credential generation module **120**, and the security module **122** are illustrated as separate modules, the functionalities of the modules may be integrated into less modules or implemented using more modules.

[0020] FIGS. **2**A, **2**B, and **2**C are diagrams of potential example message flows **200**, **202**, **203** for using the portal interface **102**, according to some embodiments. The message flows **200**, **202**, **203** of FIGS. **2**A, **2**B, and **2**C are directed to providing user access to a service provider through the portal interface **102**. In the example of FIG. **2**A, a user submits a query **208** through the web portal **108**. Referring to the message flow **200** of FIG. **2**A, a user **206** generates a query **208** associated with a service request. In some embodiments, the query **208** comprises a customer entity public identifier, such as a Dun & Bradstreet identifier (DUNS ID), a network identifier, such as an IP address of the system **104**A, **104**B, **104**C, **104**D employed by the user **206**, a user identifier, a query type indicating what services the user **206** is requesting, and a query address, such as a uniform resource locator (URL) referencing the services requested. In some implementations, the web portal **108** may generate (through specified mappings or identifiers) the query address based, for example, on the query type. The query **208** is routed to and received at the portal interface **102**.

[0021] In some instances, the query address included in the query **208** is invalid. For example, web portal **108** may have generated a query address based on out-of-date mappings/identifiers. As another example, a user **206** may have saved the query address used for a previous request, and reused it for the current request. This query address may no longer be current within the service provider's system. For example, the query address may target a particular location within an application domain **114**, which may have been modified by the service provider. Rather than generating an error due to an invalid query address, the portal interface **102** (through the routing module **116**) replaces the query address with a redirect query address corresponding to the modified resource location in the application domain **114**. For example, the routing module **116** may include a routing table that maps previously used addresses to current addresses. In this manner, the service provider may maintain configuration control and modify the application domain **114** while providing a seamless experience to the user **206**. The user need not be aware of the modification and the web portal **108** need not be modified due to service provider modifications.

[0022] The validation module **118** receives the query **208** and validates the user **206** to verify the correct customer entity. In some embodiments, the validation module **118** evaluates the customer entity public identifier and the network identifier to validate that the query **208** has been sent from an authorized location. For example, the validation module **118** may store a table of customers indexed by the customer entity public identifier and ranges of network addresses associated with the customer entity. If the network identifier does not correspond to an allowed address for the customer entity associated with the customer entity public identifier, the validation module **118** rejects the query **208**, and the portal interface **102** indicates a failure to the user **206**. If the network identifier does correspond to an allowed address for the customer entity associated with the customer entity public identifier, the validation module **118** generates a validated entity **210**, such as a flag, indicating that the query **208** has been authenticated. In some embodiments, the validation module **118** verifies that the query type is valid for the validated entity. If the query type is not authorized, the query **208** is rejected.

[0023] The validation module **118** passes the query **208** associated with the validated entity **210** to the resource in the application domain **114** targeted by the redirect address. The resource in the application domain **114** may then process the service request. In some implementations the resource may access the data store **115** to retrieve service request data **212** associated with the query **208**. In one example, the query type in the query **208** may indicate that the service request relates to a mobile device, such as a smartphone, and the service request data **212** includes information regarding the devices the user **206** is authorized to request. In some

embodiments, the user identifier in the query **208** is used to filter the items in the service request data **212** based on the role of the user **206**. For example, the devices in the service request data **212** may be filtered such that only devices within a predetermined price range are selected. In some embodiments, the actual list of services that may be obtained is not sent to the user **206**, but rather, the service request data **212** is a custom link address, such as a URL, that references the list of services associated with the service request. The list may be managed by the application domain **114** and stored in the data store **115** at a location corresponding to the link address.

[0024] Responsive to the validation module **118** identifying the validated entity **210**, the validation module **118** signals the credential generation module **120** to generate a credential **204** for the user **206** that provides security for subsequent message exchanges sent by the user **206**, such as a selection associated with a service request or authorization to execute the service. The credential **204** may have a limited duration such that is expires after a predetermined period of time. In some embodiments, the credential is generated based on user data associated with the user **206** and/or the customer entity and data maintained by the service provider. Example user fields that may be included in the credential include the customer entity public identifier (DUNS ID), the network identifier, the user identifier, or some other user data. Example service provider fields include a unique private customer identity identifier (i.e., not public), a random number, or other service provider data.

[0025] In some embodiments, the security module **122** provides encryption and decryption services for the portal interface **102**. The credential generation module sends the credential to the security module **122** for encryption. The security module **122** encrypts the credential **204** to generate a secure credential **204**S, and the service request data **212** may be encrypted to generate a secure response **212**S. For example, where the service request data **212** includes a custom link address to a list of available services, the custom link address may be encrypted as part of the secure response. The routing module **116** sends the secure credential **204**S and the secure response **212**S to the system **104**A, **104**B, **104**C, **104**D employed by the user **206** at the customer entity. In some embodiments, the security module **122** employs an elliptic curve cryptography (ECC) cryptographic technique, an asymmetric key encryption algorithm using a public key for encryption and a private key for decryption.

[0026] FIG. **3** is a diagram of an example user interface **300** that may be provided based on service request data, according to some embodiments. The displayed data may include a service request list **302** indicating the devices or services that may be selected by the user, a request approval control **304** and a select control **306**. Other structures and configurations of the user interface **300** are within the scope of the present disclosure. In some implementations, the user **206** may employ the custom link address from the secure response **212**S to provide the list of available services, and the data retrieved from the link is displayed on the user interface **300**.

[0027] In some embodiments, the user **206** may be required to get approval for the selection associated with the service request. For example, the web portal **108** may provide facilities to handle an approval process for service requests. Prior to allowing the user **206** to complete a service request, the web portal **108** may access approval data for the customer entity to determine whether a user **206** needs approval and individuals authorized to grant the approval. The user **206** may activate the request approval control **304** after a selection associated with a service request, such as ITEM2, and the web portal **108** may contact the approving individual to seek the approval. In some embodiments, the select control **306** may be deactivated until the approval is received.

[0028] A user may select an available service and issue an "order" to request the service. Referring to the message flow **202** of FIG. **2**B, the web portal **108** sends an order request **214**, an approval indicator **216** (if necessary, as noted above), and the secure credential **204**S to the portal server **102**. The portal interface **102** may use the credential generation module **120** to validate the secure credential. For example, the credential generation module **120** may send the secure credential **204**S to the security module **122** for decryption and receive back the credential **204**, which allows the credential generation module **120** to verify the credential **204**. Other verification processes may alternatively be used. Assuming the credential is determined to be valid, the credential generation module **120** sends a valid transaction flag **218** to the designated resource in application domain **114** (either in combination with the order request **214**, or as part of a separate message). The designated resource in application domain **114** may then perform a process to execute (or authorize the execution of) the service. The resource in application domain **114** may provide an order response **220**. The order response **220** may include service order related data (e.g., a status). In some implementations, the service order related data may include an order link (e.g., URL) which allows a user to access information associated with the requested service. The designated resource in application domain **114** sends the order response **220** to the security module **122** for encryption. A secure order message **222** is then sent by the routing module **116** to the user **206**.

[0029] The portal interface **102** also allows interoperation of access to service provider services with direct login processes that do not use a web portal **108**. Referring to the message flow **203** of FIG. **2**C, a user **206** generates a query **208** through the direct login interface **106** or authenticated landing page **107** associated with a service request. The direct login interface **106** may be an interface in which the user logs into a website of the service provider using identification and authentication information managed by the service provider. The authenticated landing page **107** may be an interface in which the user logs into a website of the entity associated with the user (e.g., an enterprise), which itself has an interface to the service provider system (e.g., through a web API, federated authentication service, etc.). In some embodiments, the query **208** comprises a user identifier, a query type indicating what services the user **206** is requesting, and a query address, such as a uniform resource locator (URL) referencing the services requested. The query is sent by the user system to the portal interface **102**.

[0030] The query **208** is received by the portal interface **102**. The portal interface **102** may identify that the query **208** is received through a direct login or authenticated landing page, and given the previous authentication, bypass validation and credential generation (such as described above for FIGS. **2**A and **2**B). The routing module **116** may route the

query **208** directly to the appropriate application domain **114** for the query (including any redirection necessitated by resource relocation). The resource in the application domain **114** may then process the service request. In some implementations the resource may access the data store **115** to retrieve service request data **212** associated with the query **208**. In one example, the query type in the query **208** may indicate that the service request relates to a mobile device, such as a smartphone, and the service request data **212** includes information regarding the devices the user **206** is authorized to request. In some embodiments, the user identifier in the query **208** is used to filter the items in the service request data **212** based on the role of the user **206**. For example, the devices in the service request data **212** may be filtered such that only devices within a predetermined price range are selected. In some embodiments, the actual list of services that may be obtained is not sent to the user **206**, but rather, the service request data **212** is a custom link address, such as a URL, that references the list of services associated with the service request. The list may be managed by the application domain **114** and stored in the data store **115** at a location corresponding to the link address.

[0031] The application domain **114** may send a query response including the service request data **212** towards the user **206** by sending the service request data **212** to the system **104**A, **104**B, **104**C, **104**D employed by the user **206** at the customer entity. The user may then make an order request **214** through the portal interface **102**. Again, since the direct login interface **106** or authenticated landing page **107** is already authenticated, the routing module **116** may bypass the validation module **118** and the credential generation module **120** and sends the order request **214** to the designated resource in application domain **114**, which executes the transaction and generates an order response **220** for the order (which may include an order link to access order information). The routing module **116** sends the order response **220** to the system **104**A, **104**B, **104**C, **104**D employed by the user **206** at the customer entity

[0032] FIG. **4** is a flow chart illustrating an example method **400** for interfacing with service provider services through a portal interface **102**, according to some embodiments. At **402**, a query **208** is received at a portal interface **102**. The query **208** includes a first identifier of a first entity, such as a customer entity. The portal interface **102** is controlled by a second entity, such as a service provider. At **404**, the first entity is validated based on the first identifier to generate a validated first entity **210**. At **406**, a first credential is generated based on the validated first entity **210** and a second identifier generated by the second entity for the first entity. At **408**, the first credential is sent to the first entity. At **410**, service request data is sent to the first entity. At **412**, an order request **214** associated with the service request data and a second credential is received at the portal interface **102**. At **414**, responsive to validating that the second credential matches the first credential, an order response corresponding to the order request is sent by the portal interface **102** to the user.

[0033] The portal interface **102** provides flexibility, security, and configuration control for the service provider. The service provider can make changes to the application domain **114** without losing connectivity with existing systems, such as a web portal **108**, which have not been updated. Security is enhanced by using the time limited credential and encryption/decryption services for communicating link addresses and the credential.

[0034] FIG. **5** is an interaction diagram of a scenario **500** illustrating a service **502** provided by a set of computers **504** to a set of client devices **510** via various types of transmission mediums. The computers **504** and/or client devices **510** may be capable of transmitting, receiving, processing, and/or storing many types of signals, such as in memory as physical memory states.

[0035] The computers **504** of the service **502** may be communicatively coupled together, such as for exchange of communications using a transmission medium **506**. The transmission medium **506** may be organized according to one or more network architectures, such as computer/client, peer-to-peer, and/or mesh architectures, and/or a variety of roles, such as administrative computers, authentication computers, security monitor computers, data stores for objects such as files and databases, business logic computers, time synchronization computers, and/or front-end computers providing a user-facing interface for the service **502**.

[0036] Likewise, the transmission medium **506** may comprise one or more sub-networks, such as may employ different architectures, may be compliant or compatible with differing protocols and/or may interoperate within the transmission medium **506**. Additionally, various types of transmission medium **506** may be interconnected (e.g., a router may provide a link between otherwise separate and independent transmission medium **506**).

[0037] In scenario **500** of FIG. **5**, the transmission medium **506** of the service **502** is connected to a transmission medium **508** that allows the service **502** to exchange data with other services **502** and/or client devices **510**. The transmission medium **508** may encompass various combinations of devices with varying levels of distribution and exposure, such as a public wide-area network and/or a private network (e.g., a virtual private network (VPN) of a distributed enterprise).

[0038] In the scenario **500** of FIG. **5**, the service **502** may be accessed via the transmission medium **508** by a user **512** of one or more client devices **510**, such as a portable media player (e.g., an electronic text reader, an audio device, or a portable gaming, exercise, or navigation device); a portable communication device (e.g., a camera, a phone, a wearable or a text chatting device); a workstation; and/or a laptop form factor computer. The respective client devices **510** may communicate with the service **502** via various communicative couplings to the transmission medium **508**. As a first such example, one or more client devices **510** may comprise a cellular communicator and may communicate with the service **502** by connecting to the transmission medium **508** via a transmission medium **507** provided by a cellular provider. As a second such example, one or more client devices **510** may communicate with the service **502** by connecting to the transmission medium **508** via a transmission medium **509** provided by a location such as the user's home or workplace (e.g., a Wi-Fi (Institute of Electrical and Electronics Engineers (IEEE) Standard 802.11) network or a Bluetooth (IEEE Standard 802.15.1) personal area network). In this manner, the computers **504** and the client devices **510** may communicate over various types of transmission mediums.

[0039] FIG. **6** presents a schematic architecture diagram **600** of a computer **604** that may utilize at least a portion of the techniques provided herein. Such a computer **604** may

vary widely in configuration or capabilities, alone or in conjunction with other computers, in order to provide a service such as the service **502**.

[0040] The computer **604** may comprise one or more processors **610** that process instructions. The one or more processors **610** may optionally include a plurality of cores; one or more coprocessors, such as a mathematics coprocessor or an integrated graphical processing unit (GPU); and/or one or more layers of local cache memory. The computer **504** may comprise memory **602** storing various forms of applications, such as an operating system **604**; one or more computer applications **606**; and/or various forms of data, such as a database **608** or a file system. The computer **604** may comprise a variety of peripheral components, such as a wired and/or wireless network adapter **614** connectible to a local area network and/or wide area network; one or more storage components **616**, such as a hard disk drive, a solid-state storage device (SSD), a flash memory device, and/or a magnetic and/or optical disk reader.

[0041] The computer **604** may comprise a mainboard featuring one or more communication buses **612** that interconnect the processor **610**, the memory **602**, and various peripherals, using a variety of bus technologies, such as a variant of a serial or parallel AT Attachment (ATA) bus protocol; a Uniform Serial Bus (USB) protocol; and/or Small Computer System Interface (SCI) bus protocol. In a multibus scenario, a communication bus **612** may interconnect the computer **604** with at least one other computer. Other components that may optionally be included with the computer **604** (though not shown in the schematic architecture diagram **600** of FIG. **6**) include a display; a display adapter, such as a graphical processing unit (GPU); input peripherals, such as a keyboard and/or mouse; and a flash memory device that may store a basic input/output system (BIOS) routine that facilitates booting the computer **604** to a state of readiness.

[0042] The computer **604** may operate in various physical enclosures, such as a desktop or tower, and/or may be integrated with a display as an "all-in-one" device. The computer **604** may be mounted horizontally and/or in a cabinet or rack, and/or may simply comprise an interconnected set of components. The computer **604** may comprise a dedicated and/or shared power supply **618** that supplies and/or regulates power for the other components. The computer **604** may provide power to and/or receive power from another computer and/or other devices. The computer **604** may comprise a shared and/or dedicated climate control unit **620** that regulates climate properties, such as temperature, humidity, and/or airflow. Many such computers **604** may be configured and/or adapted to utilize at least a portion of the techniques presented herein.

[0043] FIG. **7** presents a schematic architecture diagram **700** of a client device **710** whereupon at least a portion of the techniques presented herein may be implemented. Such a client device **710** may vary widely in configuration or capabilities, in order to provide a variety of functionality to a user such as the user **512**. The client device **710** may be provided in a variety of form factors, such as a desktop or tower workstation; an "all-in-one" device integrated with a display **708**; a laptop, tablet, convertible tablet, or palmtop device; a wearable device mountable in a headset, eyeglass, earpiece, and/or wristwatch, and/or integrated with an article of clothing; and/or a component of a piece of furniture, such as a tabletop, and/or of another device, such as a vehicle or residence. The client device **710** may serve the user in a variety of roles, such as a workstation, kiosk, media player, gaming device, and/or appliance.

[0044] The client device **710** may comprise one or more processors **709** that process instructions. The one or more processors **709** may optionally include a plurality of cores; one or more coprocessors, such as a mathematics coprocessor or an integrated graphical processing unit (GPU); and/or one or more layers of local cache memory. The client device **710** may comprise memory **701** storing various forms of applications, such as an operating system **703**; one or more user applications **702**, such as document applications, media applications, file and/or data access applications, communication applications such as web browsers and/or email clients, utilities, and/or games; and/or drivers for various peripherals. The client device **710** may comprise a variety of peripheral components, such as a wired and/or wireless network adapter **706** connectible to a local area network and/or wide area network; one or more output components, such as a display **708** coupled with a display adapter (optionally including a graphical processing unit (GPU)), a sound adapter coupled with a speaker, and/or a printer; input devices for receiving input from the user, such as a keyboard **711**, a mouse, a microphone, a camera, and/or a touch-sensitive component of the display **708**; and/or environmental sensors, such as a global positioning system (GPS) receiver **719** that detects the location, velocity, and/or acceleration of the client device **710**, a compass, accelerometer, and/or gyroscope that detects a physical orientation of the client device **710**. Other components that may optionally be included with the client device **710** (though not shown in the schematic architecture diagram **700** of FIG. **7**) include one or more storage components, such as a hard disk drive, a solid-state storage device (SSD), a flash memory device, and/or a magnetic and/or optical disk reader; and/or a flash memory device that may store a basic input/output system (BIOS) routine that facilitates booting the client device **710** to a state of readiness; and a climate control unit that regulates climate properties, such as temperature, humidity, and airflow.

[0045] The client device **710** may comprise a mainboard featuring one or more communication buses **712** that interconnect the processor **709**, the memory **701**, and various peripherals, using a variety of bus technologies, such as a variant of a serial or parallel AT Attachment (ATA) bus protocol; the Uniform Serial Bus (USB) protocol; and/or the Small Computer System Interface (SCI) bus protocol. The client device **710** may comprise a dedicated and/or shared power supply **718** that supplies and/or regulates power for other components, and/or a battery **704** that stores power for use while the client device **710** is not connected to a power source via the power supply **718**. The client device **710** may provide power to and/or receive power from other client devices.

[0046] FIG. **8** is an illustration of a scenario **800** involving an example non-transitory machine-readable medium **802**. The non-transitory machine readable medium **802** may comprise processor-executable instructions **812** that when executed by a processor **816** cause performance (e.g., by the processor **816**) of at least some of the provisions herein. The non-transitory machine readable medium **802** may comprise a memory semiconductor (e.g., a semiconductor utilizing static random access memory (SRAM), dynamic random access memory (DRAM), and/or synchronous dynamic ran-

dom access memory (SDRAM) technologies), a platter of a hard disk drive, a flash memory device, or a magnetic or optical disc (such as a compact disk (CD), a digital versatile disk (DVD), or floppy disk). The example non-transitory machine-readable medium **802** stores machine-readable data **804** that, when subjected to reading **806** by a reader **810** of a device **808** (e.g., a read head of a hard disk drive, or a read operation invoked on a solid-state storage device), express the processor-executable instructions **812**. In some embodiments, the processor-executable instructions **812**, when executed cause performance of operations, such as at least some of the example method **400** of FIG. **4**, for example. In some embodiments, the processor-executable instructions **812** are configured to cause implementation of a system.

[0047] As used in this application, "component," "module," "system", "interface", and/or the like are generally intended to refer to a computer-related entity, either hardware, a combination of hardware and software, software, or software in execution. For example, a component may be, but is not limited to being, a process running on a processor, a processor, an object, an executable, a thread of execution, a program, and/or a computer. By way of illustration, both an application running on a controller and the controller can be a component. One or more components may reside within a process and/or thread of execution and a component may be localized on one computer and/or distributed between two or more computers.

[0048] Unless specified otherwise, "first," "second," and/or the like are not intended to imply a temporal aspect, a spatial aspect, an ordering, etc. Rather, such terms are merely used as identifiers, names, etc. for features, elements, items, etc. For example, a first object and a second object generally correspond to object A and object B or two different or two identical objects or the same object.

[0049] Moreover, "example" is used herein to mean serving as an example, instance, illustration, etc., and not necessarily as advantageous. As used herein, "or" is intended to mean an inclusive "or" rather than an exclusive "or". In addition, "a" and "an" as used in this application are generally be construed to mean "one or more" unless specified otherwise or clear from context to be directed to a singular form. Also, at least one of A and B and/or the like generally means A or B or both A and B. Furthermore, to the extent that "includes", "having", "has", "with", and/or variants thereof are used in either the detailed description or the claims, such terms are intended to be inclusive in a manner similar to the term "comprising".

[0050] Although the subject matter has been described in language specific to structural features and/or methodological acts, it is to be understood that the subject matter defined in the appended claims is not necessarily limited to the specific features or acts described above. Rather, the specific features and acts described above are disclosed as example forms of implementing at least some of the claims.

[0051] Furthermore, the claimed subject matter may be implemented as a method, apparatus, or article of manufacture using standard programming and/or engineering techniques to produce software, firmware, hardware, or any combination thereof to control a computer to implement the disclosed subject matter. The term "article of manufacture" as used herein is intended to encompass a computer program accessible from any computer-readable device, carrier, or media. Of course, many modifications may be made to this configuration without departing from the scope or spirit of the claimed subject matter.

[0052] Various operations of embodiments are provided herein. In an embodiment, one or more of the operations described may constitute computer readable instructions stored on one or more computer readable media, which if executed by a computing device, will cause the computing device to perform the operations described. The order in which some or all of the operations are described should not be construed as to imply that these operations are necessarily order dependent. Alternative ordering may be implemented without departing from the scope of the disclosure. Further, it will be understood that not all operations are necessarily present in each embodiment provided herein. Also, it will be understood that not all operations are necessary in some embodiments.

[0053] Also, although the disclosure has been shown and described with respect to one or more implementations, alterations and modifications may be made thereto and additional embodiments may be implemented based upon a reading and understanding of this specification and the annexed drawings. The disclosure includes all such modifications, alterations and additional embodiments and is limited only by the scope of the following claims. The specification and drawings are accordingly to be regarded in an illustrative rather than restrictive sense. In particular regard to the various functions performed by the above described components (e.g., elements, resources, etc.), the terms used to describe such components are intended to correspond, unless otherwise indicated, to any component which performs the specified function of the described component (e.g., that is functionally equivalent), even though not structurally equivalent to the disclosed structure. In addition, while a particular feature of the disclosure may have been disclosed with respect to only one of several implementations, such feature may be combined with one or more other features of the other implementations as may be desired and advantageous for any given or particular application.

What is claimed is:

1. A method, comprising:

receiving a query comprising a first identifier of a first entity at a portal interface controlled by a second entity;

validating the first entity based on the first identifier to generate a validated first entity;

generating a first credential based on the validated first entity and a second identifier generated by the second entity for the first entity;

sending the first credential to the first entity;

sending service request data to the first entity;

receiving at the portal interface an order request associated with the service request data and a second credential at the portal interface; and

responsive to validating that the second credential matches the first credential, sending an order response corresponding to the order request.

2. The method of claim **1**, wherein:

sending the first credential comprises encrypting the first credential; and

validating that the second credential matches the first credential comprises decrypting the second credential.

3. The method of claim 1, wherein sending the service request data comprises:
sending a link address to a list of available services.
4. The method of claim 1, wherein:
the query comprises a first address; and
the method comprises:
mapping the first address to a second address; and
forwarding the query from the portal interface to the second address.
5. The method of claim 1, wherein generating the first credential based on the validated first entity comprises:
generating the first credential based on at least one of a public business identifier or a network identifier associated with the validated first entity.
6. The method of claim 1, wherein:
the query comprises a query type; and
validating the first entity based on the validated first entity comprises validating that the first entity is authorized for the query type based on the validated first entity.
7. The method of claim 1, comprising:
invalidating the first credential after a predetermined time period, and
rejecting the order request responsive to receiving the order request after invalidating the first credential.
8. The method of claim 1, comprising:
receiving a second query at the portal interface from a third entity using an authenticated interface;
sending second service request data to the third entity;
receiving at the portal interface an order request associated with the second service request data; and
sending an order response corresponding to the order request.
9. A communication system, comprising:
a portal interface, comprising:
a routing module configured to receive a query comprising a first identifier of a first entity;
a validation module configured to validate the first entity based on the first identifier to generate a validated first entity; and
a credential generation module configured to generate a first credential based on the validated first entity and a second identifier generated by a second entity for the first entity,
wherein:
the routing module is configured to send the first credential to the first entity, send service request data to the first entity, and receive at the portal interface an order request associated with the service request data and a second credential at the portal interface,
the credential generation module is configured to validate that the second credential matches the first credential, and
the routing module is configured to, responsive to the credential generation module validating that the second credential matches the first credential, send an order response corresponding to the order request.
10. The communication system of claim 9, comprising:
a security module configured to encrypt the first credential prior to the routing module sending the first credential and decrypt the second credential prior to the credential generation module validating that the second credential matches the first credential.
11. The communication system of claim 9, wherein:
the service request data comprises a link address to a list of available services.
12. The communication system of claim 11, comprising:
a security module configured to encrypt the link address prior to the routing module sending the service request data to the first entity.
13. The communication system of claim 9, wherein:
the routing module is configured to map a first address in the query to a second address, and forward the query to the second address.
14. The communication system of claim 9, wherein:
the credential generation module is configured to generate the first credential based on at least one of a public business identifier or a network identifier associated with the validated first entity.
15. The communication system of claim 9, wherein:
the query comprises a query type; and
the validation module is configured to validate that the first entity is authorized for the query type based on the validated first entity.
16. The communication system of claim 9, wherein:
the credential generation module is configured to invalidate the first credential after a predetermined time period, and reject the order request responsive to receiving the order request after invalidating the first credential.
17. A non-transitory computer-readable medium storing instructions thereon that when executed by a processor cause the processor to:
receive a query comprising a first identifier of a first entity at a portal interface controlled by a second entity;
validate the first entity based on the first identifier to generate a validated first entity;
generate a first credential based on the validated first entity and a second identifier generated by the second entity for the first entity;
send the first credential to the first entity;
send service request data to the first entity;
receive at the portal interface an order request generated based on the service request data and a second credential at the portal interface; and
responsive to validating that the second credential matches the first credential, send an order response corresponding to the order request.
18. The medium of claim 17, wherein the processor is to:
send the service request data by sending a link address to a list of available services.
19. The medium of claim 17, wherein the processor is to:
map a first address in the query to a second address; and
forward the query from the portal interface to the second address.
20. The medium of claim 17, wherein the processor is to:
invalidate the first credential after a predetermined time period, and
reject the order request responsive to receiving the order request after invalidating the first credential.

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