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(54) Title: ZONE CLASSIFICATION OF ELECTRONIC MAIL MESSAGES

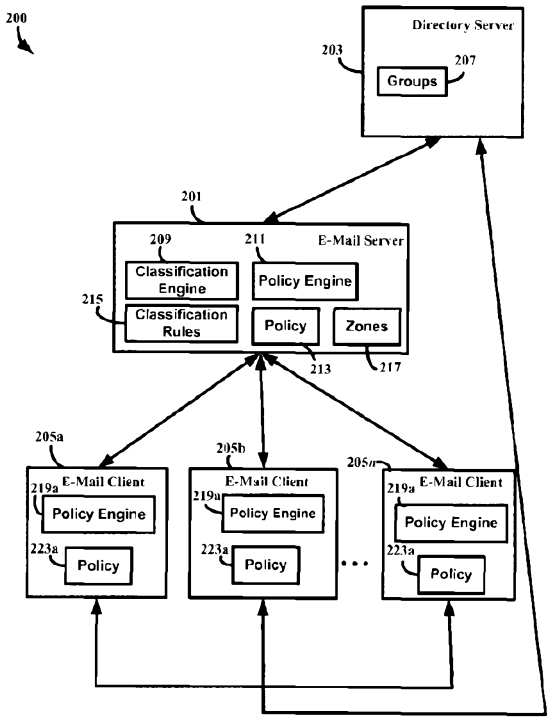

Figure 2

(57) Abstract: Embodiments of the invention relate to techniques for classifying received e-mails and e-mails to be sent. In some embodiments, a set of e-mail zones may be defined and e-mails may be classified into one of the plurality of zones. An indication of the zone into which an e-mail has been classified may be displayed in a visual display of the e-mail.

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ZONE CLASSIFICATION OF ELECTRONIC MAIL MESSAGES

Field of Invention

The present invention relates to a computer-readable storage device storing computer-executable instructions that, when executed by a computing device; and a computer system.

Background of Invention

Electronic mail (e-mail) is a well-known system for exchanging electronic messages. While the use of e-mail as a method of communication has rapidly increased, there are a number of phenomena that can limit the usefulness of e-mail.

One such phenomenon is spamming. Spamming is sending, in large quantities, unsolicited commercial e-mails. An e-mail recipient may receive a large number of "spam" e-mails, which can present a challenge to a user in discerning important e-mails from spam.

Another such phenomenon is e-mail bombing. E-mail bombing is sending a large volume of messages to a single e-mail address in an effort to render it unusable and/or cause the e-mail server to fail.

A third such phenomenon is transmitting viruses or worms via e-mail. Such viruses and worms can take malicious action on an unwitting recipient's computer and cause data loss, system unavailability, or other detriments.

In addition to the above-discussed phenomenon, e-mail also presents the risk that confidential information included in an e-mail message may be received by an unintended recipient. For example, when sending confidential information via e-mail, the sender may accidentally send the e-mail to the wrong person, such that someone who is not authorized to view the confidential information receives it. Moreover, when confidential information sent via e-mail is not encrypted, there is a risk that the confidential information may be

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maliciously intercepted by someone who is not authorized to have access to the information.

It is generally desirable to overcome or ameliorate one or more of the above described difficulties, or to at least provide a useful alternative.

Summary of Invention

According to the present invention, there is provided a method comprising:

composing, via an electronic mail (e-mail) client application program executing on a computer, an e-mail message to be sent to multiple intended recipients from an e-mail address domain that is internal to an organization, the e-mail message having a header that identifies a plurality of e-mail addresses associated with the intended recipients of the e-mail message, wherein the e-mail addresses include at least one e-mail address associated with an intended recipient that is internal to the organization and at least one e-mail address associated with an intended recipient that is external to the organization;

sending, by the e-mail client application program to an e-mail server, the e-mail addresses associated with the intended recipients of the e-mail message;

receiving, by the e-mail client application program from the e-mail server, zone classification information identifying a plurality of different e-mail zones into which the e-mail message has been classified based on e-mail address domains of the e-mail addresses associated with the intended recipients of the e-mail message, the plurality of different e-mail zones including:

an intra-organization zone for the intended recipient that is internal to the organization, and

one of a trusted partner zone, an general internet zone, or a restricted zone for the intended recipient that is external to the organization;

visually displaying, by the e-mail client application program, an indication of the plurality of different e-mail zones in the header of the e-mail message;

processing by the e-mail client application program the e-mail message to be sent to the multiple intended recipients as multiple separate e-mail messages wherein each separate e-mail message is addressed to one of the multiple intended recipients;

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accessing, by a policy engine of the e-mail client application program, policy information stored in memory of the computer;

determining, by the policy engine, a policy action specified by the policy information that is to be performed on the separate e-mail message addressed to the intended recipient that is external to organization based on the zone classification information;

performing, by the policy engine, the policy action on the separate e-mail message addressed to the intended recipient that is external to organization; and

sending, by the e-mail client application program to the e-mail server, the separate e-mail message addressed to the intended recipient that is internal to the organization without the policy action being applied.

According to the present invention, there is also provided a computer-readable storage device storing computer-executable instructions that, when executed by a computing device, cause the computing device to perform a method comprising:

composing, via an electronic mail (e-mail) client application, an e-mail message to be sent to multiple intended recipients from an e-mail address domain that is internal to an organization, the e-mail message having a header that identifies a plurality of e-mail addresses associated with the intended recipients of the e-mail message, wherein the e-mail addresses include at least one e-mail address associated with an intended recipient that is internal to the organization and at least one e-mail address associated with an intended recipient that is external to the organization;

sending, by the e-mail client application program to an e-mail server, the e-mail addresses associated with the intended recipients of the e-mail message;

receiving, by the e-mail client application program from the e-mail server, zone classification information identifying a plurality of different e-mail zones into which the e-mail message has been classified based on e-mail address domains of the e-mail addresses associated with the intended recipients of the e-mail message, the plurality of different e-mail zones including:

an intra-organization zone for the intended recipient that is internal to the organization, and

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one of a trusted partner zone, an general Internet zone, or a restricted zone for the intended recipient that is external to the organization;

visually displaying, by the e-mail client application program, an indication of the plurality of different e-mail zones in the header of the e-mail message;

processing, by the e-mail client application program, the e-mail message to be sent to the multiple intended recipients as multiple separate e-mail messages, wherein each separate e-mail message is addressed to one of the multiple intended recipients;

accessing, by a policy engine of the e-mail client application program, policy information stored in memory of the computing device;

determining, by the policy engine, a policy action specified by the policy information that is to be performed on the separate e-mail message addressed to the intended recipient that is external to organization based on the zone classification information;

performing, by the policy engine, the policy action on the separate e-mail message addressed to the intended recipient that is external to organization; and

sending, by the e-mail client application program to the e-mail server, the separate e-mail message addressed to the intended recipient that is internal to the organization without the policy action being applied.

According to the present invention, there is also provided a computer system comprising:

a processor configured to execute processor-executable instructions; and

memory storing processor-executable instructions for causing an electronic mail (e-mail) client application program to:

receive user input for composing an e-mail message to be sent to multiple intended recipients from an e-mail address domain that is internal to an organization, the e-mail message having a header that identifies a plurality of e-mail addresses associated with the intended recipients of the e-mail message, wherein the e-mail addresses include at least one e-mail address associated with an intended recipient that is internal to the organization and at least one e-mail address associated with an intended recipient that is external to the organization;

send the e mail associated with the intended recipients to an e-mail server;

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receive, from the e-mail server, zone classification information identifying a plurality of different e-mail zones into which the e-mail message has been classified based on e-mail address domains of the e-mail addresses associated with the intended recipients of the e-mail message, the plurality of different e-mail zones including,

an intra-organization zone for the intended recipient that is internal to the organization, and

one of a trusted partner zone, an general internet zone, or a restricted zone for the intended recipient that is external to the organization;

visually display an indication of the plurality of different e-mail zones in the header of the e-mail message; process the e-mail message to be sent to the multiple intended recipients as multiple separate e-mail messages, wherein each separate e-mail message is addressed to one of the multiple intended recipients,

access, via a policy engine of the e-mail client application program, policy information stored in the memory;

determine, via the policy engine, a policy action specified by the policy information that is to be performed on the separate e-mail message addressed to the intended recipient that is external to organization based on the zone classification information;

perform, via the policy engine, the policy action on the separate e-mail message addressed to the intended recipient that is external to organization; and

send, to the e-mail server, the separate e-mail message addressed to the intended recipient that is internal to the organization without the policy action being applied.

The inventors have recognized that classifying received e-mails and e-mails to be sent using an enterprise- wide classification scheme provides a number of benefits. First, such classification enables e-mail recipients to easily differentiate between e-mails that are trusted and those that may present a security threat, and to easily determine when he or she may be unintentionally addressing an e-mail to an unintended recipient. Second,

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classifying in e-mails in this way enables a uniform security policy with respect to e-mails to be applied across the enterprise.

Thus, some embodiments are directed to classifying e-mails into one of a plurality of pre-defined e-mail zones. When an e-mail is received, the e-mail may be classified into one of the plurality of zones and information may be added to the e-mail

header identifying the zone into which it has been classified. When the e-mail is displayed, information identifying this zone (e.g., an icon, text label, or other information) may be displayed such that the zone into which the e-mail is classified is apparent to the user.

[0008] In some embodiments, when an e-mail is being composed to be sent, the e-mail may be classified based upon the recipient e-mail address(es) in the e-mail, and information may be displayed in the e-mail indicating the zone into which the e-mail is classified.

[0009] One embodiment is directed to a method performed by an electronic mail (e-mail) client application program executing on a computer having at least one tangible memory that stores processor-executable instructions for the client application program and at least one processor that executes the processor-executable instructions. The method comprises: receiving an e-mail message from an e-mail server that identifies an e-mail address associated with the client application program as an intended recipient, the e-mail message including classification information identifying one of a plurality of pre-defined e-mail zones into which the e-mail message has been classified; accessing the classification information from the e-mail message; determining, from the classification information, the one of the plurality of pre-defined e-mail zones in which the e-mail message has been classified; accessing policy information stored in the at least one tangible memory to determine whether any policy action is to be performed in connection with the e-mail message; when it is determined that a policy action is to be performed in connection with the e-mail message, performing the policy action; and visually displaying the e-mail message, wherein the visual display of the e-mail message includes at least one indication of the one of the plurality of pre-defined e-mail zones into which the e-mail message has been classified.

[0010] Another embodiment is directed to at least one computer-readable medium encoded with processor-executable instructions for an e-mail server application program that, when executed on a computer having at least one tangible memory and at least one processor perform a method comprising: receiving an e-mail message; accessing a set of classification rules; based on the set of classification rules, classifying the e-mail message into one of a plurality of predefined e-mail zones; adding to the e-mail message information identifying the one of the plurality of pre-defined e-mail zones; and transferring the e-mail message to an e-mail client associated with an intended recipient of the e-mail message.

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A further embodiment is directed to a computer having at least one tangible memory that stores processor-executable instructions for an e-mail client application program and at least one processor that executes the processor-executable instructions to: receive user input specifying at least one recipient e-mail address for an e-mail message to be sent; send the at least one recipient e-mail address to at least one e-mail server; and in response to sending the at least one recipient e-mail address, receive at least one zone classification indicating one of a plurality of pre-defined zones into which the e-mail message is classified.

The foregoing is a non-limiting summary of the invention, which is defined by the attached claims.

Brief Description of the Drawings

Preferred embodiments of the present invention are hereafter described, by way of non-limiting example only, with reference to the accompanying drawings, in which:

Figure 1 is a block diagram of a computer system in which some embodiments of the invention may be implemented;

Figure 2 is a block diagram of computer system in which e-mail messages to be sent and e-mail messages that have been received may be classified, in accordance with some embodiments;

Figure 3 is a flow chart of a process for classifying a received e-mail message and applying policy in response to the classification, in accordance with some embodiments'

Figure 4 is a flow chart of a process for classifying an e-mail to be sent, and applying policy in response to the classification, in accordance with some embodiments; and

Figure 5 is a block diagram of a computer on which some processes related to classifying an e-mail message and applying policy in response to the classification may be implemented.

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Detailed Description of Preferred Embodiments of the Invention

The inventors have recognized that because some e-mails may be unwanted (e.g., spam e-mails) or may be malicious, and some e-mails may include confidential information, it may desirable to identify such e-mails and apply policy to them so that they are handled in an appropriate way.

[0020] The inventors have recognized that by defining a zone classification scheme for e-mails in which each a number of mutually exclusive e-mail zones are defined and each e-mail that is received is classified into exactly one of these e-mail zones, a policy may be associated with each e-mail zone which is applied to every e-mail classified into that zone.

[0021] While some existing systems perform classification of e-mail, the classifications into which e-mail messages are classified are abstract and difficult for users and/or administrators to understand. The inventors have recognized that defining zones that relate to real-world constructs (e.g., "Trusted Partners" or "Internal Company") enables users to more easily understand and explain the classification of e-mails.

[0022] The inventors have further recognized that there are benefits to applying the same zone classification scheme across an entire enterprise or organization, so that the same e-mail zones, classification rules, and policy are applied for each e-mail user in the organization. In this way, information about what the available e-mail zones into which an e-mail may be classified are, why a particular e-mail has been classified into a particular zone, and why a particular policy action has been taken with respect to a particular e-mail may be shared and/or made available to the users.

[0023] Figure 1 shows an enterprise 100 comprising an e-mail server 103 and a plurality of clients 105a, 105b, ..., 105*n*. E-mail server 103 receives e-mail messages sent from senders external to the enterprise via internet 101 and receives e-mail messages from sent from senders internal to the enterprise (e.g., clients 105). E-mail server 103 sends e-mails received from external senders to their intended internal recipients, and sends e-mails received from internal senders to their intended internal recipients or to their intended external recipients via internet 101.

[0024] As discussed above, embodiments of the invention employ a zone classification scheme to classify e-mails sent from and received by an enterprise into one of a plurality of e-mail zones, and, if warranted, take policy action based on the classification. As discussed in detail below, the classification of e-mails into zones and the taking of policy actions may be performed by the e-mail server (e.g., e-mail server 103 in Figure 1), by an e-mail client (e.g., clients 105 in Figure 1), or by the e-mail server and e-mail client in combination.

[0025] Any suitable set of e-mail zones may be used to classify e-mails. In some embodiments, a default set of zones may be provided and a network administrator may be provided with the capability to modify and/or customize the default set of zones. In some

embodiments, a default set of zones may include: a trusted partner zone; an intra-organization zone; a restricted zone; and an internet zone.

[0026] E-mails received from or being sent to domains that have been listed as trusted partners may be classified into the trusted partner zone. Thus, for example, an organization may have a trusted relationship with another organization and may treat e-mails sent from e-mail addresses having that organization's domain as trusted. As one possible example, if the trusted organization has a domain name "contoso.com," then all e-mails sent from the domain "contoso.com" may be classified into the trusted partner zone.

[0027] The inventors have recognized that when classifying an e-mail into a zone based on the e-mail address and/or e-mail address domain of the sender, it may be useful to verify that the e-mail was actually sent from that address or domain. That is, the inventors have appreciated that it is possible to spoof the e-mail address of a sender, such that it appears to have been sent from a trusted domain, when in fact it was sent from an untrusted and/or malicious third party. Thus, in some embodiments, an e-mail that appears to have been sent from a trusted partner may be treated as coming from a trusted domain if it can be verified that the e-mail was actually sent from that domain (e.g., based on a certificate from a trusted certificate authority, a digital signature, or other verification technique).

[0028] Intra-organization e-mails (i.e., e-mails sent from one user in the enterprise to another user in the enterprise) may be classified into the intra-organization zone. E-mails identified as being spam or containing a virus or worm, or e-mails identified as being from an e-mail address, IP address, or domain that has been listed as restricted may be classified into the restricted zone. E-mails that don't belong in any of the above zones may be classified in the internet zone.

[0029] In the illustrative zone classification scheme discussed above, e-mails received from or being sent to trusted partners may be classified into the trusted partner zone. Thus, as should be appreciated from this example, an e-mail may be classified into a zone based on the sender or a recipient of the e-mail. In such cases, it should be appreciated that when an e-mail message is being sent to multiple recipients, it may be treated as a separate e-mail message with respect to each of those recipients. That is, for example, if an e-mail message is being sent to three different recipients, it may be considered as being three separate e-mail messages, each being sent to one of the three recipients, and each of these three e-mail messages may be separately classified into an e-mail zone.

[0030] When classifying an e-mail based on the sender and/or recipients, it is frequently useful to define groups of senders or recipients. For example, as discussed above, a trusted partners e-mail zone may be used for e-mails received from or being sent to a trusted partner. In this respect, it may be useful to define a group of e-mail addresses or domain names of trusted partners. Thus, in some embodiments, a directory service, such as for example, Active Directory™ sold by Microsoft Corporation of Redmond, Washington, may be used to define groups of senders and/or recipients which may be used in classifying e-mails and/or applying policies to e-mails.

[0031] As discussed above, each zone may have associated with any suitable policy or policies, such that when an e-mail is classified into a zone, the policy or policies associated with the zone are applied to the e-mail. Any suitable policy or polices may be applied to e-mails classified into each zone. For example, information protection policies related to whether encryption is to be applied to an e-mail, filtering policies that relate to whether spam filtering or virus scanning is to be applied to an e-mail, mail flow policies that define whether an e-mail is permitted to be sent or received and/or any other type of policy may be applied. In addition, the policy may be applied and policy actions may be taken at the e-mail server, the e-mail client, or both the e-mail server and the e-mail client.

[0032] Figure 2 shows an illustrative computer system 200 comprising an e-mail server 201, a directory server 203, and a plurality of e-mail clients 205a, 205b, ...205*n*. As shown in Figure 2, server 201 comprises a classification engine 209 and a policy engine 211. Server 201 also stores information (i.e., zones 213) that defines what zones are to be used in classifying e-mails. Thus, the information stored in zones 213 defines the "buckets" into which e-mail are to be classified. Server 203 also stores classification rules 215, which are the rules that classification engine uses to classify an e-mail into one of the defined zones, and policies 217, which define the policies that policy engine applies to e-mails, once they are classified into a zone.

[0033] Each of clients 205 has a classification engine 221 for classifying e-mails and a policy engine 219 for applying policy to e-mail messages. Each client 205 also stores policy information 223 that policy engine 219 uses to determine the policy to be applied to an e-mail.

[0034] Directory server 203 stores group information 203, which indicates which users, e-mail addresses, or domains belong to particular groups. Server 201 and clients 205 may communicate with directory server to obtain group information 207 and use this

information in determine into which zone an e-mail is to be classified or what policy actions to perform.

[0035] Figure 3 shows a process that may be used in computer system 200, in some embodiments, for classifying received e-mails and taking policy actions on received e-mails. The process begins at act 301, where e-mail server 201 receives an e-mail message either from a sender external to the enterprise (e.g., via the internet) or from an internal sender. The process next continues to act 303, where classification engine 209 of server 201 uses classification rules 215 and zone information 213 to classify the e-mail into a zone. In some embodiments, depending on the classification rules, server 201 may obtain group information 207 from directory server 203 to determine into which zone to classify an e-mail.

[0036] After act 303, the process continues to act 305, where server 201 adds information into the header of the e-mail that indicates the zone into which the e-mail was classified in act 303. The process next continues to act 307, where policy engine 211 performs any policy actions that are warranted based on policy information 217. In some embodiments, depending on the content of policy information 217, server 201 may obtain group information 207 from directory server 203 to determine the policy to be applied to an e-mail.

[0037] Any suitable policy actions may be taken. For example, for e-mails classified into the "Trusted Partner" zone or "Intra-Organization" zone, server 201 may skip "spam" filtering or virus scanning, whereas for e-mails classified into the "Internet" zone, the policy may specify that "spam" filtering and virus scanning is to be performed. As another example, e-mail attachment size limits may be imposed on e-mails classified into the "Internet" zone, such that e-mails with attachments that exceed the size limits are bounced, whereas no e-mail attachment size limits or less restrictive limits may be imposed on e-mails classified into the "Trusted Partner" zone or "Intra-Organization" zone. As yet another example, e-mails classified into the "Restricted" zone may be dropped or may be subject to SPAM quarantine.

[0038] The above-described policies are merely examples of policies that may be applied to an e-mail based upon the zone into which it is classified. Many other types of policies are possible, and the invention is not limited to use with any particular policies or policy types. In this respect, it should be appreciated that the policies applied to e-mails may be configured by a network administrator and any suitable policies may be used.

[0039] The process next continues to act 309, where server 201 sends the e-mail to the client 205 of the intended recipient of the e-mail. In some embodiments, this may be accomplished using a "pull" technique, wherein each client 205 is configured to periodically poll server 201. When polled by a client 205, if server 201 has received any e-mail messages for the user of that client, then these e-mail messages are downloaded to the client. It should be appreciated that the invention is not limited to using such a "pull" technique, as in some embodiments e-mail server 201 may use a "push" technique, whereby, rather than being polled by clients 205, server 201 actively contacts a client 205 when it has received one or more e-mail messages intended for the user of that client.

[0040] After act 309, the process continues to act 311, where policy engine 219 of the client 205 that downloaded the e-mail accesses the policy information stored thereon and the zone information added to the header of the e-mail by server 201, and determines whether any policy actions are to be taken. If it is determined that any policy actions are to be taken, policy engine performs those actions or causes those actions to be performed.

[0041] Any suitable policy actions may be performed by the client. For example, based on the zone classification, the e-mail may be stored in a particular e-mail folder. As another example, the policy information may specify, based on the zone information, that that calendar reminders or tasks are to be generated, and/or other local actions on the client computer are to be performed.

[0042] The above-described policies are merely examples of policies that may be applied to an e-mail based upon the zone into which it is classified. Many other types of policies are possible, and the invention is not limited to use with any particular policies or policy types. In this respect, it should be appreciated that the policies applied to e-mails at the client may be configured by a user of the client and/or the network administrator and any suitable policies may be used.

[0043] The process then continues to act 313, where the client 205 displays the e-mail to the user of the client. In some embodiments, this act may be performed, for example, into a user action that indicates the user's desire that the e-mail be displayed. For example, the user may select the e-mail (e.g., using a mouse pointer) and/or take some other action indicating a desire that the e-mail be displayed.

[0044] The client may display the e-mail in a manner that conveys the zone information into which the e-mail was classified to the user. For example, the displayed e-mail may have a zone icon and/or associated text that indicates the zone into which the e-mail was classified. Any other of a variety of techniques may be used to convey the zone

information, including, for example, using colors to color portions of the e-mail (e.g., a status bar at the top of the displayed e-mail message) depending on the zone into which the e-mail has been classified, playing an audible notification indicative of the zone, and/or any other suitable technique that conveys zone information.

[0045] In the example process of Figure 3, policy is applied at both the e-mail server and the e-mail client. However, the invention is not limited in this respect as, in some embodiments, policy may be applied only at the client, with in other embodiments policy may be applied only at the server.

[0046] Figure 4 shows an illustrative process that may be used in computer system 200, in some embodiments, to classify an e-mail that is being composed to be sent to one or more recipients and to perform policy actions on the e-mail. The recipient(s) may include one or more recipients external to the enterprise and/or one or more recipients internal to the enterprise. The process begins at act 401, where a user composing an e-mail via an e-mail client (e.g. one of clients 205), inputs one or more recipient e-mail addresses for the e-mail. The process then continues to act 403, where the client sends the recipient e-mail address(es) to server 201 for classification. In response, at act 405, the server classifies the e-mail into a zone based on the recipient e-mail address(es).

[0047] As discussed above, when there are multiple recipient e-mail addresses, the e-mail message may be treated as multiple separate e-mail messages, each addressed to one of the multiple recipients. Thus, at act 405, server 201 may perform a separate zone classification for each recipient e-mail addressed received in act 403. For example, if there are three recipients, where the first recipient is a trusted partner, the second recipient is an internal recipient, and the third recipient is an external recipient who is not a trusted partner, server 201 may classify the e-mail message to the first recipient as belonging in the "Trusted Partner" zone, may classify the e-mail message to the second recipient as belonging in the "Intra-Organization Zone," and may classify the e-mail message to the third recipient as belonging in the "Internet Zone."

[0048] After act 405, the process continues to act 407, where the server returns the zone classifications for each recipient back to the client 205. In some embodiments, the client may display an indication of the zone classification for the e-mail message in the displayed e-mail message. In situations where there are multiple recipients and different e-mail zone classifications for different recipients, an indication of the zone classification for each recipient may be displayed in the e-mail message.

[0049] The process next continues to act 409, where based on the received zone classifications, the policy engine on the client determines, using policy information 223, whether any policy actions are warranted and, if so, performs the policy action(s).

[0050] Client 205 may take any suitable policy action based on the classification. For example, if it is determined that one of the recipients is in the "Internet" zone, then the client may scan the e-mail (e.g., using keyword scanning techniques) to determine if it contains confidential information and, if it is determined that the e-mail contains confidential information, may block sending of the e-mail. As another example, if one of the recipients is in the "Internet" zone and the e-mail includes an attachment, the policy information may specify that the client is to prompt the user to verify that the user wishes to send the attachment to this recipient. This reduces the risk of a user accidentally sending a confidential attachment to an unintended recipient.

[0051] The above-described policies are merely examples of policies that may be applied to an e-mail based upon the zone into which it is classified. Many other types of policies are possible, and the invention is not limited to use with any particular policies or policy types. In this respect, it should be appreciated that the policies applied to e-mails at the client may be configured by a user of the client and/or the network administrator and any suitable policies may be used.

[0052] The process then continues to act 411, where the e-mail client sends the e-mail message to server 201 for transmission to the recipients. It should be appreciated that when server 201 receives the e-mail message for transmission, it may perform the process discussed above in connection Figure 3 associated with sending an e-mail message.

[0053] Figure 5 shows a schematic block diagram of an illustrative computer 500 on which aspects of the invention may be implemented. Only illustrative portions of the computer 500 are identified for purposes of clarity and not to limit aspects of the invention in any way. For example, the computer 500 may include one or more additional volatile or non-volatile memories (which may also be referred to as storage media), one or more additional processors, any other user input devices, and any suitable software or other instructions that may be executed by the computer 500 so as to perform the function described herein.

[0054] In the illustrative embodiment, the computer 500 includes a system bus 510, to allow communication between a central processing unit 502 (which may include one or more hardware general purpose programmable computer processors), a tangible memory 504, a video interface 506, a user input interface 508, and a network interface

512. The network interface 512 may be connected via network connection 520 to at least one remote computing device 518. Peripherals such as a monitor 522, a keyboard 514, and a mouse 516, in addition to other user input/output devices may also be included in the computer system, as the invention is not limited in this respect.

[0055] As may be appreciated from the discussion above, e-mail server 201 may be an application program that executes on a computer such as computer 500. Thus, central processing unit 502 may perform the process steps in Figures 3 and 4 that are described as being performed by server 201, classification engine 209 of server 201, and/or policy engine 211 of server 201, and memory 504 may store computer program instructions (that are accessed and executed by the central processing unit) for performing such processing steps. Memory 504 may also be used to store information 213, 215 and 217.

[0056] Similarly, each of clients 205 may be an application program that executes on a computer such as computer 500. In this respect, central processing unit 502 may perform the process steps in Figures 3 and 4 that are described as being performed by a client 205, and memory 504 may store computer program instructions (that are accessed and executed by the central processing unit) for performing such processing steps. Memory 504 may also be used to store information 223.

[0057] Having thus described several aspects of at least one embodiment of this invention, it is to be appreciated that various alterations, modifications, and improvements will readily occur to those skilled in the art.

[0058] Such alterations, modifications, and improvements are intended to be part of this disclosure, and are intended to be within the spirit and scope of the invention. Accordingly, the foregoing description and drawings are by way of example only.

[0059] The above-described embodiments of the present invention can be implemented in any of numerous ways. For example, the embodiments may be implemented using hardware, software or a combination thereof. When implemented in software, the software code can be executed on any suitable processor or collection of processors, whether provided in a single computer or distributed among multiple computers.

[0060] Further, it should be appreciated that a computer may be embodied in any of a number of forms, such as a rack-mounted computer, a desktop computer, a laptop computer, or a tablet computer. Additionally, a computer may be embedded in a device not generally regarded as a computer but with suitable processing capabilities, including a

Personal Digital Assistant (PDA), a smart phone or any other suitable portable or fixed electronic device.

[0061] Also, a computer may have one or more input and output devices. These devices can be used, among other things, to present a user interface. Examples of output devices that can be used to provide a user interface include printers or display screens for visual presentation of output and speakers or other sound generating devices for audible presentation of output. Examples of input devices that can be used for a user interface include keyboards, and pointing devices, such as mice, touch pads, and digitizing tablets. As another example, a computer may receive input information through speech recognition or in other audible format.

[0062] Such computers may be interconnected by one or more networks in any suitable form, including as a local area network or a wide area network, such as an enterprise network or the Internet. Such networks may be based on any suitable technology and may operate according to any suitable protocol and may include wireless networks, wired networks or fiber optic networks.

[0063] Also, the various methods or processes outlined herein may be coded as software that is executable on one or more processors that employ any one of a variety of operating systems or platforms. Additionally, such software may be written using any of a number of suitable programming languages and/or programming or scripting tools, and also may be compiled as executable machine language code or intermediate code that is executed on a framework or virtual machine.

[0064] In this respect, the invention may be embodied as a computer readable medium (or multiple computer readable media) (e.g., a computer memory, one or more floppy discs, compact discs (CD), optical discs, digital video disks (DVD), magnetic tapes, flash memories, circuit configurations in Field Programmable Gate Arrays or other semiconductor devices, or other non-transitory, tangible computer storage medium) encoded with one or more programs that, when executed on one or more computers or other processors, perform methods that implement the various embodiments of the invention discussed above. The computer readable medium or media can be transportable, such that the program or programs stored thereon can be loaded onto one or more different computers or other processors to implement various aspects of the present invention as discussed above.

[0065] The terms "program" or "software" are used herein in a generic sense to refer to any type of computer code or set of computer-executable instructions that can be

employed to program a computer or other processor to implement various aspects of the present invention as discussed above. Additionally, it should be appreciated that according to one aspect of this embodiment, one or more computer programs that when executed perform methods of the present invention need not reside on a single computer or processor, but may be distributed in a modular fashion amongst a number of different computers or processors to implement various aspects of the present invention.

[0066] Computer-executable instructions may be in many forms, such as program modules, executed by one or more computers or other devices. Generally, program modules include routines, programs, objects, components, data structures, etc. that perform particular tasks or implement particular abstract data types. Typically the functionality of the program modules may be combined or distributed as desired in various embodiments.

[0067] Also, data structures may be stored in computer-readable media in any suitable form. For simplicity of illustration, data structures may be shown to have fields that are related through location in the data structure. Such relationships may likewise be achieved by assigning storage for the fields with locations in a computer-readable medium that conveys relationship between the fields. However, any suitable mechanism may be used to establish a relationship between information in fields of a data structure, including through the use of pointers, tags or other mechanisms that establish relationship between data elements.

[0068] Various aspects of the present invention may be used alone, in combination, or in a variety of arrangements not specifically discussed in the embodiments described in the foregoing and is therefore not limited in its application to the details and arrangement of components set forth in the foregoing description or illustrated in the drawings. For example, aspects described in one embodiment may be combined in any manner with aspects described in other embodiments.

[0069] Also, the invention may be embodied as a method, of which an example has been provided. The acts performed as part of the method may be ordered in any suitable way. Accordingly, embodiments may be constructed in which acts are performed in an order different than illustrated, which may include performing some acts simultaneously, even though shown as sequential acts in illustrative embodiments.

[0070] Use of ordinal terms such as "first," "second," "third," etc., in the claims to modify a claim element does not by itself connote any priority, precedence, or order of one claim element over another or the temporal order in which acts of a method are performed,

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but are used merely as labels to distinguish one claim element having a certain name from another element having a same name (but for use of the ordinal term) to distinguish the claim elements.

Also, the phraseology and terminology used herein is for the purpose of description and should not be regarded as limiting. The use of "including," "comprising," or "having," "containing," "involving," and variations thereof herein, is meant to encompass the items listed thereafter and equivalents thereof as well as additional items

Throughout this specification and the claims which follow, unless the context requires otherwise, the word “comprise”, and variations such as “comprises” and “comprising”, will be understood to imply the inclusion of a stated integer or step or group of integers or steps but not the exclusion of any other integer or step or group of integers or steps.

The reference in this specification to any prior publication (or information derived from it), or to any matter which is known, is not, and should not be taken as an acknowledgment or admission or any form of suggestion that that prior publication (or information derived from it) or known matter forms part of the common general knowledge in the field of endeavour to which this specification relates.

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Claims Defining the Invention

1. A method comprising:

composing, via an electronic mail (e-mail) client application program executing on a computer, an e-mail message to be sent to multiple intended recipients from an e-mail address domain that is internal to an organization, the e-mail message having a header that identifies a plurality of e-mail addresses associated with the intended recipients of the e-mail message, wherein the e-mail addresses include at least one e-mail address associated with an intended recipient that is internal to the organization and at least one e-mail address associated with an intended recipient that is external to the organization;

sending, by the e-mail client application program to an e-mail server, the e-mail addresses associated with the intended recipients of the e-mail message;

receiving, by the e-mail client application program from the e-mail server, zone classification information identifying a plurality of different e-mail zones into which the e-mail message has been classified based on e-mail address domains of the e-mail addresses associated with the intended recipients of the e-mail message, the plurality of different e-mail zones including:

an intra-organization zone for the intended recipient that is internal to the organization, and

one of a trusted partner zone, an general internet zone, or a restricted zone for the intended recipient that is external to the organization;

visually displaying, by the e-mail client application program, an indication of the plurality of different e-mail zones in the header of the e-mail message;

processing by the e-mail client application program the e-mail message to be sent to the multiple intended recipients as multiple separate e-mail messages wherein each separate e-mail message is addressed to one of the multiple intended recipients;

accessing, by a policy engine of the e-mail client application program, policy information stored in memory of the computer;

determining, by the policy engine, a policy action specified by the policy information that is to be performed on the separate e-mail message addressed to the intended recipient that is external to organization based on the zone classification

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information;

performing, by the policy engine, the policy action on the separate e-mail message addressed to the intended recipient that is external to organization; and

sending, by the e-mail client application program to the e-mail server, the separate e-mail message addressed to the intended recipient that is internal to the organization without the policy action being applied.

2. The method of claim 1, wherein the indication comprises an icon associated with each one of the plurality of different e-mail zones into which the e-mail message has been classified.

3. The method of claim 1, wherein the indication comprises a text label specifying each one of the plurality of different e-mail zones into which the e-mail message has been classified.

4. The method of claim 1, wherein:

the policy action comprises scanning contents of the separate e-mail message addressed to the intended recipient that is external to organization for confidential information.

5. The method of claim 1, wherein:

the e-mail message to be sent to the multiple intended recipients comprises at least one attachment, and

the policy action comprises prompting a user of the e-mail client application program to verify that the attachment is to be sent to the intended recipient that is external to the organization.

6. The method of claim 1, wherein:

the policy action comprises blocking the separate e-mail message addressed to the intended recipient that is external to the organization when the plurality of different e-mail zones includes a restricted zone for the intended recipient that is external to the

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organization.

7. A computer-readable storage device storing computer-executable instructions that, when executed by a computing device, cause the computing device to perform a method comprising:

composing, via an electronic mail (e-mail) client application, an e-mail message to be sent to multiple intended recipients from an e-mail address domain that is internal to an organization, the e-mail message having a header that identifies a plurality of e-mail addresses associated with the intended recipients of the e-mail message, wherein the e-mail addresses include at least one e-mail address associated with an intended recipient that is internal to the organization and at least one e-mail address associated with an intended recipient that is external to the organization;

sending, by the e-mail client application program to an e-mail server, the e-mail addresses associated with the intended recipients of the e-mail message;

receiving, by the e-mail client application program from the e-mail server, zone classification information identifying a plurality of different e-mail zones into which the e-mail message has been classified based on e-mail address domains of the e-mail addresses associated with the intended recipients of the e-mail message, the plurality of different e-mail zones including:

an intra-organization zone for the intended recipient that is internal to the organization, and

one of a trusted partner zone, an general Internet zone, or a restricted zone for the intended recipient that is external to the organization;

visually displaying, by the e-mail client application program, an indication of the plurality of different e-mail zones in the header of the e-mail message;

processing, by the e-mail client application program, the e-mail message to be sent to the multiple intended recipients as multiple separate e-mail messages, wherein each separate e-mail message is addressed to one of the multiple intended recipients;

accessing, by a policy engine of the e-mail client application program, policy information stored in memory of the computing device;

determining, by the policy engine, a policy action specified by the policy

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information that is to be performed on the separate e-mail message addressed to the intended recipient that is external to organization based on the zone classification information;

performing, by the policy engine, the policy action on the separate e-mail message addressed to the intended recipient that is external to organization; and

sending, by the e-mail client application program to the e-mail server, the separate e-mail message addressed to the intended recipient that is internal to the organization without the policy action being applied.

8. The computer-readable storage device of claim 7, wherein:

the policy action comprises scanning contents of the separate e-mail message addressed to the intended recipient that is external to organization for confidential information.

9. The computer-readable storage device of claim 7, wherein:

the e-mail message to be sent to the multiple intended recipients comprises at least one attachment, and

the policy action comprises prompting a user of the e-mail client application program to verify that the attachment is to be sent to the intended recipient that is external to the organization.

10. The computer-readable storage device of claim 7, wherein the policy information is configurable by a user of the computing device.

11. The computer-readable storage device of claim 7, wherein the indication comprises an icon associated with each one of the plurality of different e-mail zones into which the e-mail message has been classified.

12. The computer-readable storage device of claim 7, wherein the indication comprises a text label specifying each one of the plurality of different e-mail zones into which the e-mail message has been classified.

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13. The computer-readable storage device of claim 7, wherein:

the policy action comprises blocking the separate e-mail message addressed to the intended recipient that is external to the organization when the plurality of different e-mail zones includes a restricted zone for the intended recipient that is external to the organization.

14. A computer system comprising:

a processor configured to execute processor-executable instructions; and

memory storing processor-executable instructions for causing an electronic mail (e-mail) client application program to:

receive user input for composing an e-mail message to be sent to multiple intended recipients from an e-mail address domain that is internal to an organization, the e-mail message having a header that identifies a plurality of e-mail addresses associated with the intended recipients of the e-mail message, wherein the e-mail addresses include at least one e-mail address associated with an intended recipient that is internal to the organization and at least one e-mail address associated with an intended recipient that is external to the organization;

send the e mail associated with the intended recipients to an e-mail server;

receive, from the e-mail server, zone classification information identifying a plurality of different e-mail zones into which the e-mail message has been classified based on e-mail address domains of the e-mail addresses associated with the intended recipients of the e-mail message, the plurality of different e-mail zones including,

an intra-organization zone for the intended recipient that is internal to the organization, and

one of a trusted partner zone, an general internet zone, or a restricted zone for the intended recipient that is external to the organization;

visually display an indication of the plurality of different e-mail zones in the header of the e-mail message; process the e-mail message to be sent to the multiple intended recipients as multiple separate e-mail messages, wherein each separate e-

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mail message is addressed to one of the multiple intended recipients,

access, via a policy engine of the e-mail client application program, policy information stored in the memory;

determine, via the policy engine, a policy action specified by the policy information that is to be performed on the separate e-mail message addressed to the intended recipient that is external to organization based on the zone classification information;

perform, via the policy engine, the policy action on the separate e-mail message addressed to the intended recipient that is external to organization; and

send, to the e-mail server, the separate e-mail message addressed to the intended recipient that is internal to the organization without the policy action being applied.

15. The computer system of claim 14, wherein:

the policy action comprises blocking the separate e-mail message addressed to the intended recipient that is external to the organization when the plurality of different e-mail zones includes a restricted zone for the intended recipient that is external to the organization.

16. The computer system of claim 14, wherein the indication comprises an icon associated with each one of the plurality of different e-mail zones into which the e-mail message has been classified.

17. The computer system of claim 14, wherein:

the policy action comprises scanning contents of the separate e-mail message addressed to the intended recipient that is external to organization for confidential information.

18. The computer system of claim 14, wherein:

the e-mail message to be sent to the multiple intended recipients comprises at least one attachment, and

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the policy action comprises prompting a user of the e-mail client application program to verify that the attachment is to be sent to the intended recipient that is external to the organization.

19. The computer system of claim 14, wherein the indication comprises a text label specifying each one of the plurality of different e-mail zones into which the e-mail message has been classified.

20. The computer system of claim 14, wherein the memory further stores processor-executable instructions for causing the e-mail client application program to:

send, to the e-mail server, the separate e-mail message addressed to the intended recipients that is external to the organization with the policy action being applied.

21. A computer-readable storage device storing computer-executable instructions that, when executed by a computing device, substantially as hereinbefore described with reference to the accompanying drawings.

22. A computer system, substantially as hereinbefore described with reference to the accompanying drawings.

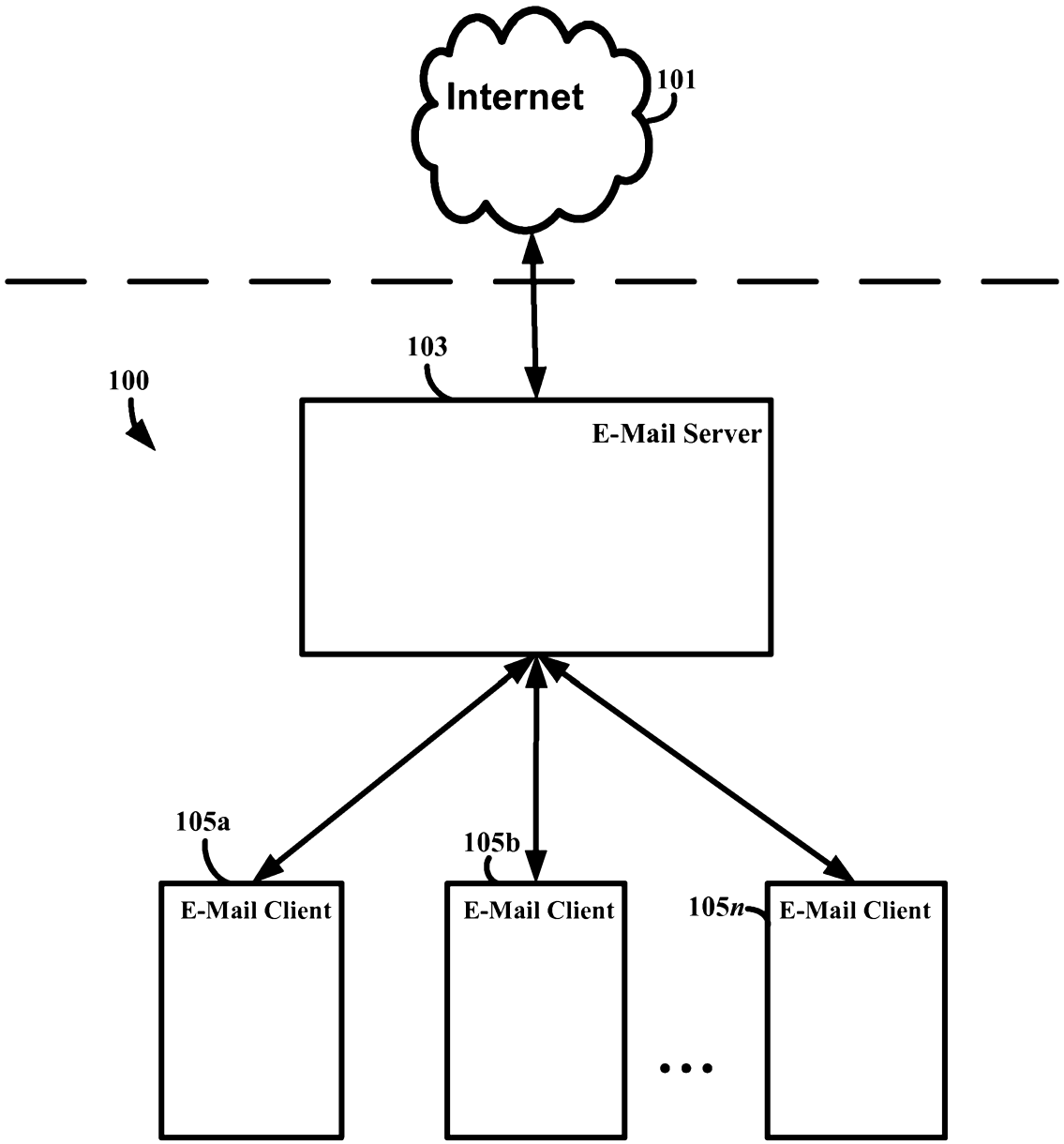
Internet
101
103
100
E-Mail Server
105a
105b
E-Mail Client
E-Mail Client
105n
E-Mail Client

Figure 1

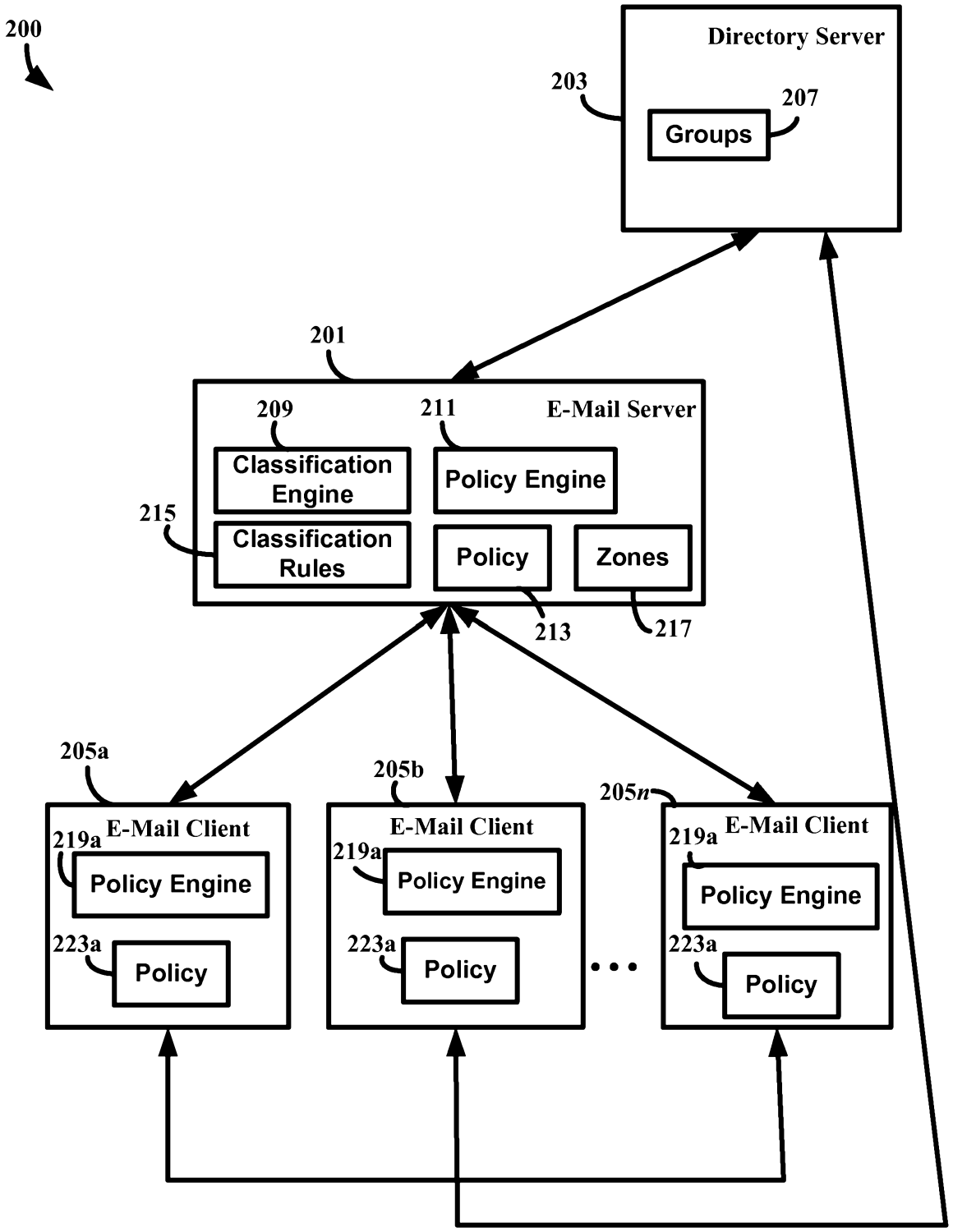
200
Directory Server
203
207
Groups
201
209
211
E-Mail Server
Classification Engine
Policy Engine
215
Classification Rules
Policy
Zones
213
217
205a
205b
205n
E-Mail Client
219a
Policy Engine
223a
Policy

Figure 2

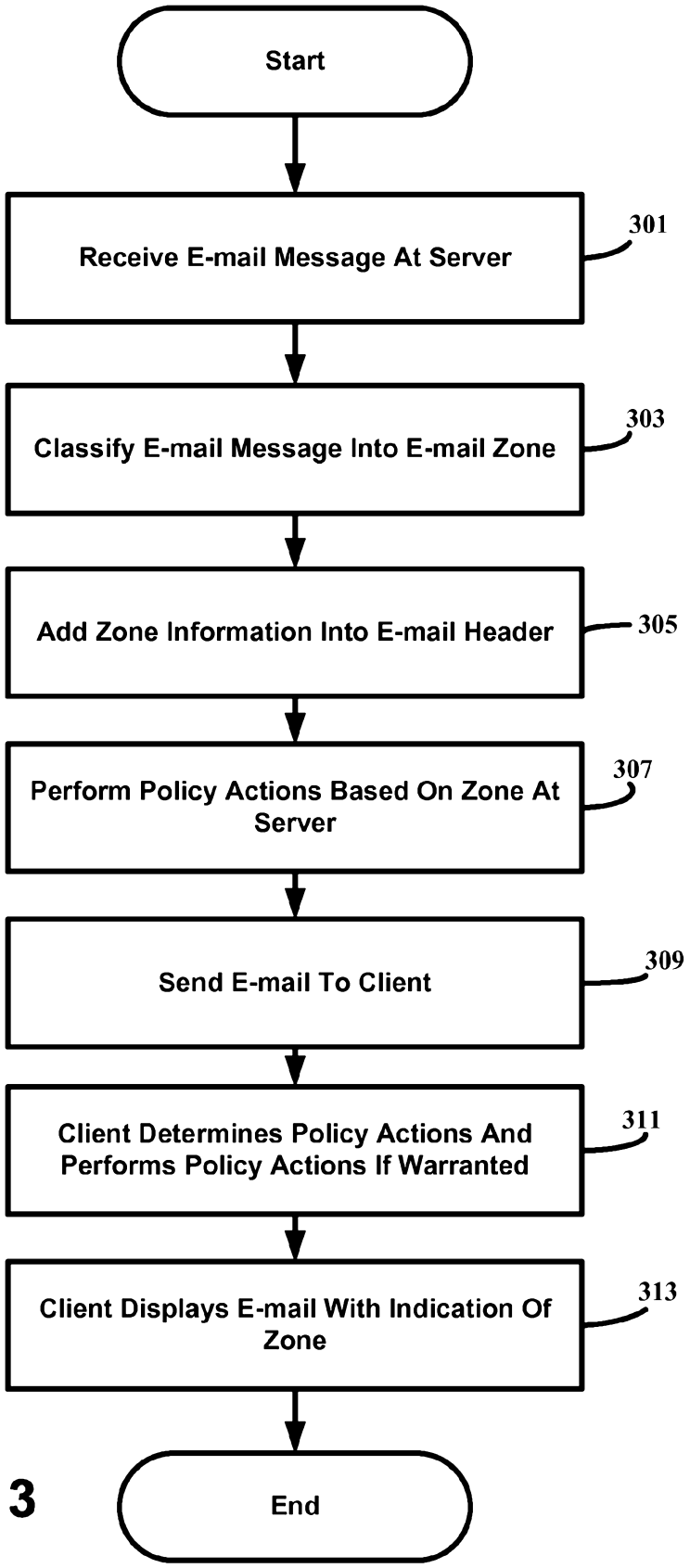
Start
Receive E-mail Message At Server
301
Classify E-mail Message Into E-mail Zone
303
Add Zone Information Into E-mail Header
305
Perform Policy Actions Based On Zone At Server
307
Send E-mail To Client
309
Client Determines Policy Actions And Performs Policy Actions If Warranted
311
Client Displays E-mail With Indication Of Zone
313
End

Figure 3

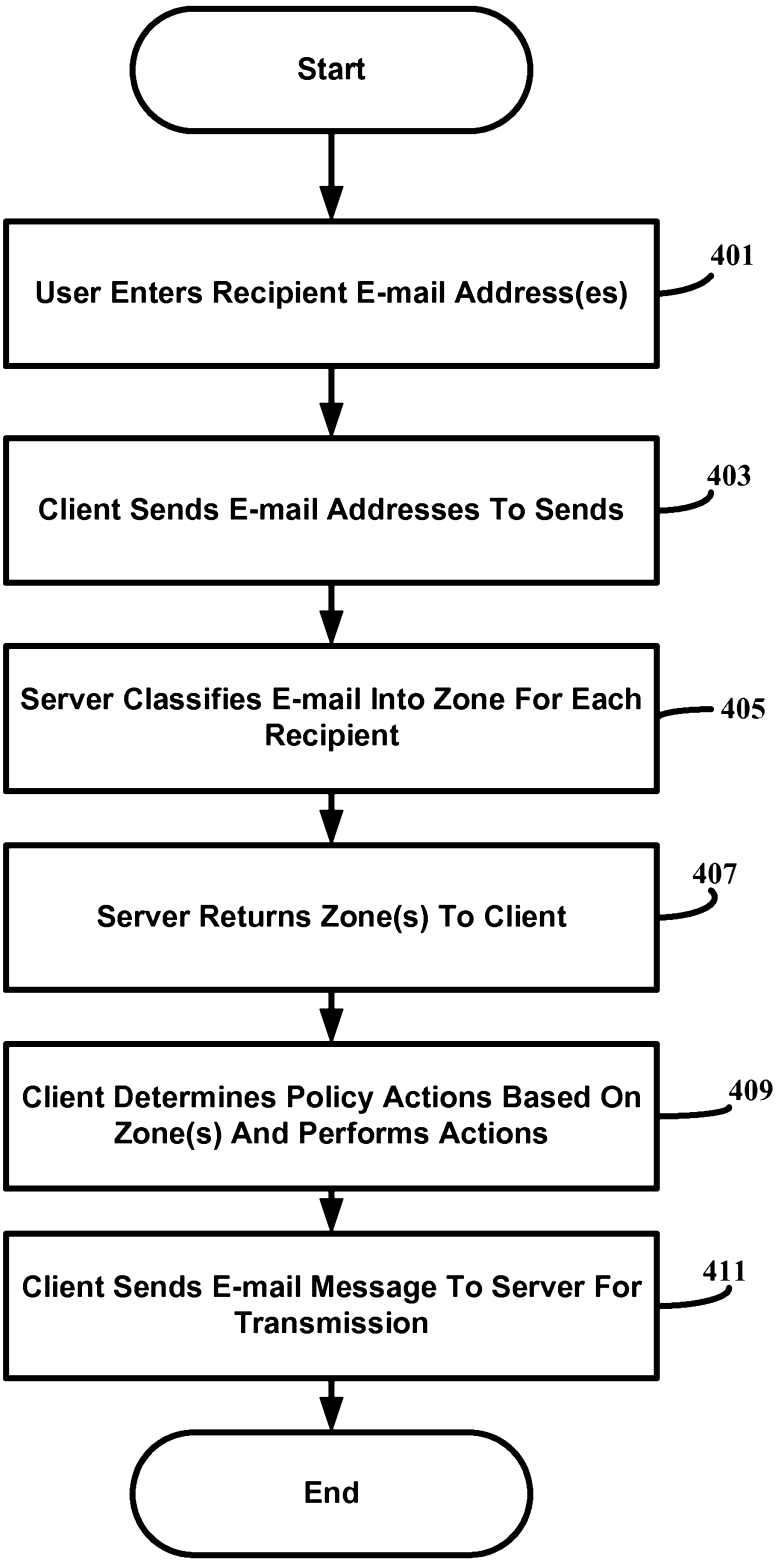
Start
User Enters Recipient E-mail Address(es)
401
Client Sends E-mail Addresses To Sends
403
Server Classifies E-mail Into Zone For Each Recipient
405
Server Returns Zone(s) To Client
407
Client Determines Policy Actions Based On Zone(s) And Performs Actions
409
Client Sends E-mail Message To Server For Transmission
411
End

Figure 4

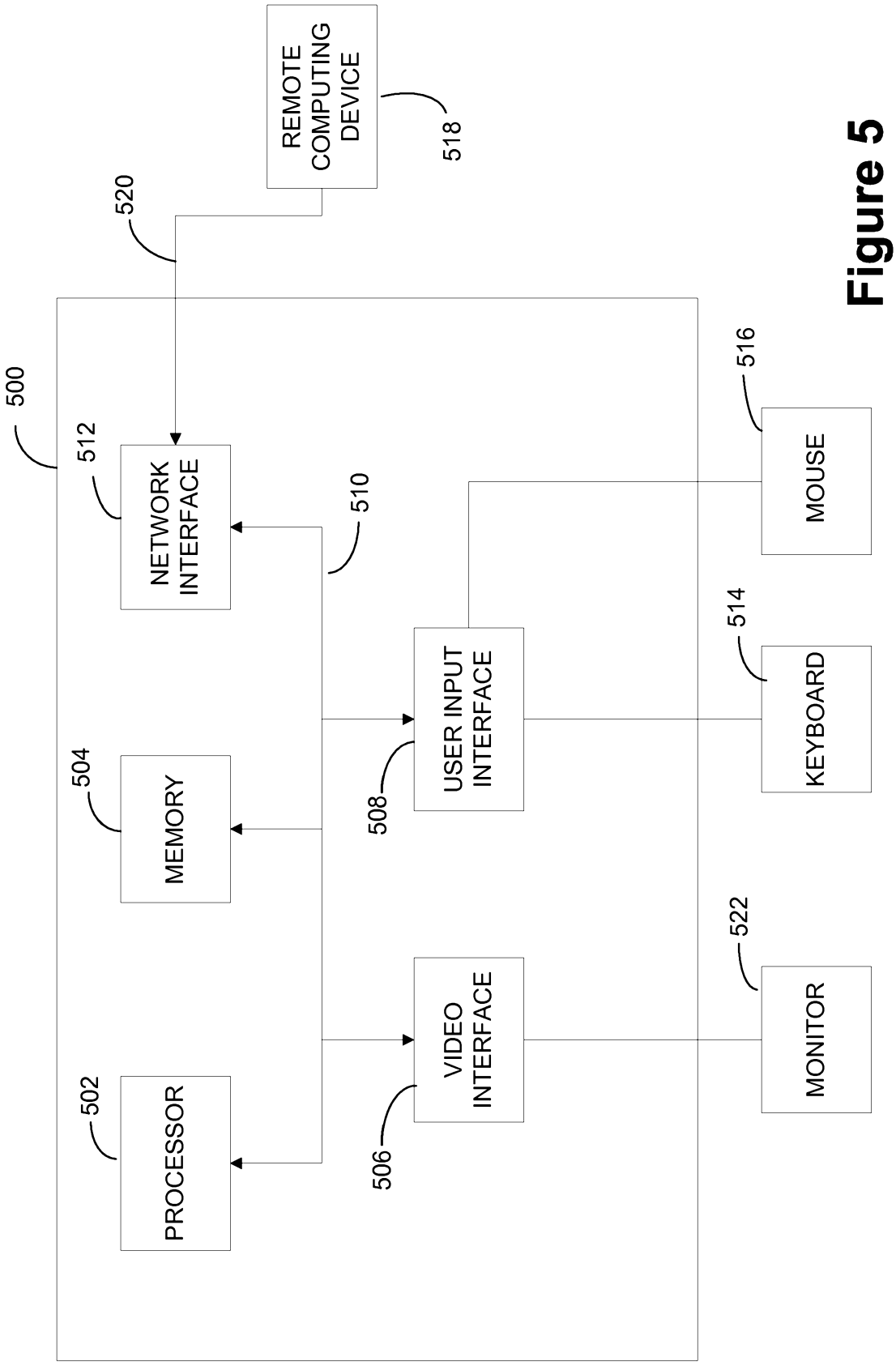
REMOTE COMPUTING DEVICE
518
520
500
512
NETWORK INTERFACE
510
516
MOUSE
514
KEYBOARD
504
MEMORY
508
USER INPUT INTERFACE
522
MONITOR
502
PROCESSOR
506
VIDEO INTERFACE

Figure 5