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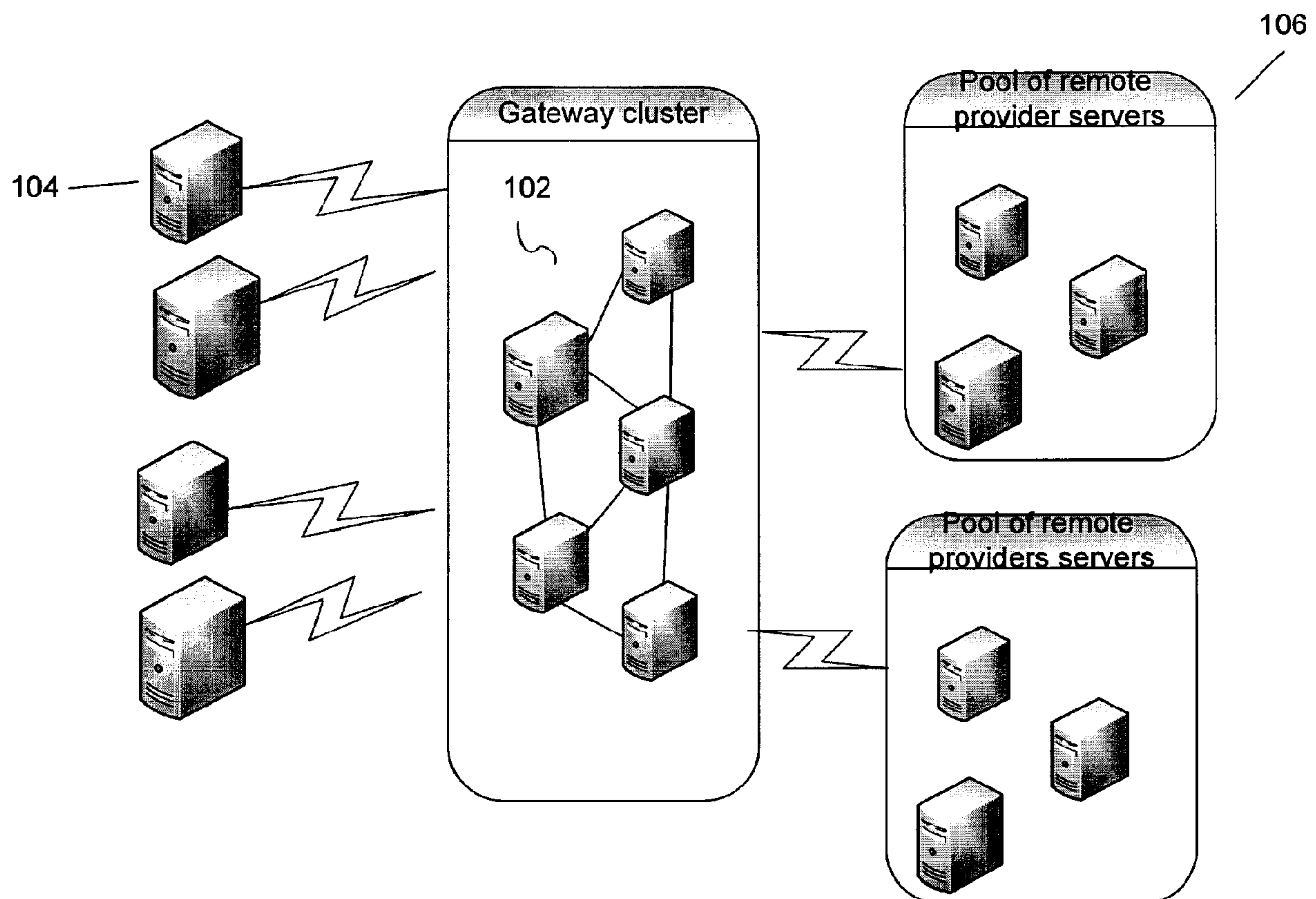
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(57) Abrégé/Abstract:

The present invention provides a system for intermediating between client nodes and pools of server nodes in an NGN network where the server nodes provide network services to client nodes, wherein the client nodes use various communication protocols and at least part of said communication protocols are different from the communication protocol used by the server nodes. The system comprising: a cluster of associated gateway nodes providing an integrated service for the clients nodes, where each



(57) **Abrégé(suite)/Abstract(continued):**

gateway provides services of at least one of translations of request and answers between the client node and a provider server node, load balancing and managing scenario rules. Each gateway comprise: a database of scripts including, scenario rules, routing scripts and associated transformation scripts, an execution processing module for handling events of at least client requests and server answers according to scenario rules.

ABSTRACT

The present invention provides a system for intermediating between client nodes and pools of server nodes in an NGN network where the server nodes provide network services to client nodes, wherein the client nodes use various communication protocols and at least part of said communication protocols are different from the communication protocol used by the server nodes. The system comprising: a cluster of associated gateway nodes providing an integrated service for the clients nodes, where each gateway provides services of at least one of: translations of request and answers between the client node and a provider server node, load balancing and managing scenario rules. Each gateway comprise: a database of scripts including, scenario rules, routing scripts and associated transformation scripts, an execution processing module for handling events of at least client requests and server answers according to scenario rules.

Method and System for Providing Network Services

BACKGROUND

TECHNICAL FIELD

The present invention relates to the field of data communications services, and more particularly, to NGN network services.

DISCUSSION OF RELATED ART

The known gateway servers which support communication between client nodes and provider server require customization for configuring the gateway for adapting between the different protocols of the client nodes and provider's server.

BRIEF SUMMARY

The present invention provides a system for intermediating between client nodes and pools of server nodes in an NGN network where the server nodes provide network services to client nodes, wherein the client nodes use various communication protocols and at least part of said communication protocols are different from the communication protocol used by the server nodes.

The system comprise a cluster of associated gateway nodes providing an integrated service for the clients nodes , where each gateway provides services of at least one of: translations of request and answers between the client node and a provider server node, load balancing and managing scenario rules. Each gateway comprise: a database of scripts including, scenario rules, routing scripts and associated transformation scripts, an execution processing module for handling events of at least client requests and server answers according to scenario rules. The module including: a routing manager for selecting the appropriate routing script for the incoming messages or answers from the servers by selecting at least routing script according to the request properties, client profile and session history, where the

selected routing script determines the destination server or pools of servers, a transformation manager for selecting the appropriate transformation script for the incoming messages or answers according to the selected routing script, the request properties, client profile and information of session history , and a scenario manager for applying scenario rules on incoming requests and the received answers for generating new subsequence requests derived from clients original requests and received answers.

The handling of the clients requests and generated subsequence request includes activating rules of the selected scripts for transforming sequence of incoming user requests into sequence of transformed requests adapted to destination server communication protocols and transforming sequence of answers coming from the server into sequence of transformed answers adapted to clients nodes communication protocols, where the sequence of incoming user requests or answers includes consecutive client requests or answers having a correlated context.

According to some embodiments of the present invention the scenario rules may define analyzing the requests content and properties for deriving new subsequence requests or answers which perform actions for completing the execution of the original client request.

According to some embodiments of the present invention, the scenario rules define analyzing the requests or answers content and properties for deriving new subsequence equivalent requests which are transmitted in parallel to different servers.

According to some embodiments of the present invention the gateway nodes can be interconnected through peer to peer connections.

According to some embodiments of the present invention, the sequence of requests can be correlated context is a single session flow.

According to some embodiments of the present invention the selection of the routing scripts and the transformation scripts is preformed by checking at least part of the transformation scripts and checking at least part of the routing scripts.

According to some embodiments of the present invention the execution processing module further handles timeout events, error events, and maintenance events.

According to some embodiments of the present invention the database structure is hierarchical and each routing script is related to a plurality of transformation scripts and each scenario rule is related to plurality of routing scripts.

The present invention provides a method for intermediating between client node and pools of server nodes in an NGN network where the server nodes provide network services to client nodes, wherein the client nodes use various communication protocols, wherein at least part of said communication protocols are different from the communication protocol used by the server nodes. The method comprise the following steps; receiving incoming requests from client nodes, temporarily recording sequence of incoming requests having correlated context, generating subsequent derived requests by analyzing the received incoming request from the client according to scenario rules, selecting the appropriate routing script for each message according to request properties, client profile and session history, determining the destination pool of servers of at least one server according to selected routing script, selecting the appropriate transformation script for each message according to the selected routing script ,the request properties, client profile and session history, identifying end of client request sequence according context of requests; activating rules of the selected scripts for transforming sequence of incoming user requests into sequence of transformed requests adapted to destination servers communication protocols, where

the sequence of incoming user requests are consecutive client requests having a correlated context, sending transformed requests to destination servers; receiving answers from servers, temporarily recording sequence of received answers related to a correlated context, applying selected transformation script to adapt recorded sequence answers related to a correlated context, to the client node protocol and analyzing answers according to scenarios rules, for generating new subsequent request or activating originating request utilizing the received answers, sending transformed answers to client nodes.

According to some embodiments of the present invention selection of the routing scripts and the transformation scripts is preformed by checking at least part of the transformation scripts and checking at least part of the routing scripts.

According to some embodiments of the present invention the sequence of requests or answers are related to a single session flow.

According to some embodiments of the present invention the scenario rules define analyzing the requests content and properties for deriving new serial subsequence requests which perform actions for completing the execution of the original client request.

According to some embodiments of the present invention the scenario rules define analyzing the requests content and properties for deriving parallel new subsequence equivalent requests which are transmitted in parallel to different destination servers.

According to some embodiments of the present invention, at least part of the scenario rules define deriving new serial subsequence equivalent requests which are transmitted in parallel to different destination servers.

According to some embodiments of the present invention the scenario rules enable deriving parallel new subsequence equivalent requests originated from serial subsequence request, said parallel requests are transmitted simultaneously to different destination servers.

According to some embodiments of the present invention at least some of the requests are originated from the server.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will be more readily understood from the detailed description of embodiments thereof made in conjunction with the accompanying drawings of which:

Fig. 1A is a in a overview of environment in which the present invention is practiced according to some embodiments of the invention;

Fig. 2 is a block diagram of gateway components according to some embodiments of the invention;

Fig. 3 is a flow chart illustrating the method of handling network events according to some embodiments of the invention;

Fig. 4 is a flow chart analyzing and handling networks events according to some embodiments of the invention.

DETAILED DESCRIPTION

Before explaining at least one embodiment of the invention in detail, it is to be understood that the invention is not limited in its application to the details of construction and the arrangement of the components set forth in the following description or illustrated in the drawings. The invention is applicable to other embodiments or of being practiced or carried out in various ways. Also, it is to be

understood that the phraseology and terminology employed herein is for the purpose of description and should not be regarded as limiting.

The present invention discloses a method and system for handling events of an NGN network including requests and answers of client nodes and provider's servers using gateway servers.

Fig.1 illustrates the environment in which the gateway servers are practiced according to the present invention. The system according to the present invention includes cluster of gateway servers 102 linking between client nodes 104 and pool of providers servers 106. In general, the gateway server 102 handles client received request, process the requests to be adapted the destination servers protocol and transmit processed requests to the destination provider's server. Answers received from the provider servers are processed to be adapted to client protocol and the processed answers are transferred back to the client. The gateway server further provides load balancing functionality and analysis of events according to defined scenario rules. The defined scenario rules represent implementation of business rules policies defined by the system operator. According to some embodiments of the present invention the gateway server with the cluster are interconnected creating peer to peer network configuration. The gateway cluster may function as a single entity distributing the handling and processing of requests between the cluster gateway servers. Each gateway server supports multiple protocols. Pool of servers represent group of providers server which share the same network protocol. The gateway server maintains data dictionaries which correspond with the different protocols of clients' nodes and providers' servers.

Fig.2 illustrates the different components and modules of the gateway server according to some embodiments of the present invention. Each gateway server comprises the following components: a script database 200, execution processing application 210 and network processing 220. The database includes scenario rules 202 defining the processing rules of the requests and answers, each scenario rule may be configured to specific network protocol, routing scripts 204 for determining the destination of requests and transformation scripts 206 for translating between client nodes and server node protocols. According to some embodiments of the present invention the database structure is hierarchal, where for each routing scripts are associated plurality of transformation scripts. The execution processing application comprises scenario manager 212 for analyzing incoming requests and answers and determining the rules and flows of actions for handling each event, routing manager 214 for selecting and defining the appropriate routing script and transformation module 216 for selecting the appropriate transformation script for adapting the incoming messages or answers to the destination node protocol. The execution processing component further handles timeout events, error events, and maintenance events. Network processing 220 comprises protocol adapter server module 222 for transforming the incoming client requests to the destination server protocol according determined transformation script and client protocol adapter module 224 for transforming the incoming answers to the requesting client protocol according determined transformation script.

Fig 3 illustrates the flowchart of handling events according to some embodiments of the present invention. The events received at the gateway server mainly include client requests 302 and answers received from the provider servers 320. The received requests are analyzed 304 according to predefined scenario rules,

which defined if to generate new subsequent request 306(as further described in FIG.4) and define the flow of actions for handling the client requests. All the request including original client requests and subsequent requests are recorded 308 in a temporary cache list including sequence of requests. At the next steps the recorded requests 310 are analyzed for selecting the routing script, determining the routing destination 314 and selecting the transformation script 316. The temporary list of requests sequence is maintained as long as the request have correlated context , for example all request are within the same communication session of a client. Once the system indentifies 309 that the group of correlated request has ended, e.g., end of session, the sequence of requests are transformed into sequence of requests adapted to the protocol of the determined destination server or pull of servers 313. Once preparing the transformed requests they are transferred to the destination servers 313. At this stage the system awaits the providers servers answers, in case a predefined time has lapsed the (time out expired) 315, a non response event is generated 336 by the system and transferred to the client 330. The gateway system receives events of answers from the providers server 320 and aggregate the answers into temporary list of answers, 322. Once the getaway system identifies the end of correlated answers 334, the getaway applies the selected transformation script to adapt the sequence of answers to the client protocol. The received answers are further analyzed according to scenario rules 322, the scenario rules may determine to generate new subsequent requests or activate original request of the client 324. For example if the answers from the server require to supply additional information such as location information, a new subsequent request is generated for receiving the required information. The new subsequence requests are processed in the same manner as original client's requests are processed.

The transformed answers are transmitted to the client 330.

Fig.4 illustrates the process of analyzing the client requests and answers according to scenario rules. The client's requests are analyzed according to the scenario rules 400 for enhancing the process of handling the requests. One type of such analysis enables to generate parallel subsequent requests which are equivalent to the original client's request 402, the multiple subsequent events are transmitted to several servers destinations simultaneously 406. The gateway handles the receiving of the multiple answers from the servers 410, and selects the answers from the server which replied in minimum time 412. Such method can improve the timing of responding to user requests by the gateway server to the client.

Another analysis type of the requests of the scenario rules may identify the need to generate new subsequent requests for performing actions which are required for completing the original client requests. For example the scenario rule may identify that for completing client request, the user account must be checked before authorizing his request. In such case a new subsequent request for retrieving user account status is generated. The new subsequence request is transmitted to the respective server, the received responses input is analyzed by the gateway 408. Following our example of checking user account, the received response of the server of user account status is analyzed. In case of positive results, the original request of the user is reactivated and transmitted to the selected destination server. Other type of businesses rules analysis may generate new subsequent request required to complete received answers from the server 414, for example location based client requests require to generate subsequence request to retrieve location information for completing the server answer.

The two types of business rules analysis may be combined, generating parallel requests of new generated subsequence requests or generating new subsequent requests for new parallel requests.

In the above description, an embodiment is an example or implementation of the inventions. The various appearances of "one embodiment," "an embodiment" or "some embodiments" do not necessarily all refer to the same embodiments.

Although various features of the invention may be described in the context of a single embodiment, the features may also be provided separately or in any suitable combination. Conversely, although the invention may be described herein in the context of separate embodiments for clarity, the invention may also be implemented in a single embodiment.

Reference in the specification to "some embodiments", "an embodiment", "one embodiment" or "other embodiments" means that a particular feature, structure, or characteristic described in connection with the embodiments is included in at least some embodiments, but not necessarily all embodiments, of the inventions.

It is to be understood that the phraseology and terminology employed herein is not to be construed as limiting and are for descriptive purpose only.

The principles and uses of the teachings of the present invention may be better understood with reference to the accompanying description, figures and examples.

It is to be understood that the details set forth herein do not construe a limitation to an application of the invention.

Furthermore, it is to be understood that the invention can be carried out or practiced in various ways and that the invention can be implemented in embodiments other than the ones outlined in the description above.

It is to be understood that the terms “including”, “comprising”, “consisting” and grammatical variants thereof do not preclude the addition of one or more components, features, steps, or integers or groups thereof and that the terms are to be construed as specifying components, features, steps or integers.

If the specification or claims refer to "an additional" element, that does not preclude there being more than one of the additional element.

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

It is to be understood that where the specification states that a component, feature, structure, or characteristic "may", "might", "can" or "could" be included, that particular component, feature, structure, or characteristic is not required to be included.

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

Methods of the present invention may be implemented by performing or completing manually, automatically, or a combination thereof, selected steps or tasks.

The term "method" may refer to manners, means, techniques and procedures for accomplishing a given task including, but not limited to, those manners, means, techniques and procedures either known to, or readily developed from known manners, means, techniques and procedures by practitioners of the art to which the invention belongs.

The descriptions, examples, methods and materials presented in the claims and the specification are not to be construed as limiting but rather as illustrative only.

Meanings of technical and scientific terms used herein are to be commonly understood as by one of ordinary skill in the art to which the invention belongs, unless otherwise defined.

Any publications, including patents, patent applications and articles, referenced or mentioned in this specification are herein incorporated in their entirety into the specification, to the same extent as if each individual publication was specifically and individually indicated to be incorporated herein. In addition, citation or identification of any reference in the description of some embodiments of the invention shall not be construed as an admission that such reference is available as prior art to the present invention.

What is claimed is:

1. A system for intermediating between client nodes and pools of server nodes in an NGN network where the server nodes provide network services to client nodes, wherein the client nodes use various communication protocols and at least part of said communication protocols are different from the communication protocol used by the server nodes, said system comprising:
 - a cluster of associated gateway nodes providing an integrated service for the clients nodes, where each gateway provides services of at least one of: translations of request and answers between the client node and a provider server node, load balancing and managing scenario rules, each gateway comprising:
 - i. a repository of scripts including, scenario rules, routing scripts and associated transformation scripts;
 - ii. an execution processing module for handling events of at least client requests and server answers according to the scenario rules, said module including:
 - a) a routing manager for selecting the appropriate routing script for the incoming messages or answers from the servers by selecting at least routing script according to the request properties, client profile and session history, where the selected routing script determines the destination server or pools of servers;
 - b) a transformation manager for selecting the appropriate transformation script for the incoming messages or answers according to the selected routing script, the request properties, client profile and information of session history;
 - c) scenario manager for applying scenario rules on incoming requests and the received answers for generating new subsequence requests derived from clients original requests and received answers,
- wherein the handling of the clients' nodes requests and generated subsequence request includes activating rules of the selected scripts for

transforming sequence of incoming user requests into sequence of transformed requests adapted to destination server node communication protocols and transforming sequence of answers coming from the server into sequence of transformed answers adapted to client nodes' communication protocols, and where the sequence of incoming user requests or answers includes consecutive client node requests or answers sharing a correlated context.

2. The system of claim 1, wherein the scenario rules define analyzing the requests content and properties for deriving new subsequence requests or answers which perform actions for completing the execution of the original client request.
3. The system of claim 1, wherein the scenario rules define analyzing the requests or answers content and properties for deriving new subsequence equivalent requests which are transmitted in parallel to different servers.
4. The system of claim 1, wherein the gateway nodes are interconnected through peer to peer connections.
5. The system of claim 1, wherein the sequence of requests having correlated context is a single session flow.
6. The system of claim 1, wherein the selection of the routing scripts and the transformation scripts is preformed by checking at least part of the transformation scripts and checking at least part of the routing scripts.
7. The system of claim 1, wherein execution processing module further handles timeout events, error events, and maintenance events.
8. The system of claim 1, wherein the database structure is hierarchical and each routing script is related to a plurality of transformation scripts and each scenario rule is related to plurality of routing scripts.
9. A method for intermediating between client node and pools of server nodes in an NGN network where the server nodes provide network services to client nodes, wherein the client nodes use various communication protocols, wherein at least part

of said communication protocols are different from the communication protocol used by the server nodes, said method comprising:

- i. receiving incoming requests from client nodes;
- ii. temporarily recording sequence of incoming requests having a correlated context;
- iii. generating subsequent derived requests by analyzing the received incoming request from the client according to scenario rules;
- iv. selecting the appropriate routing script for each message according to request properties, client profile and session history;
- v. determining the destination pool of servers of at least one server according to selected routing script;
- vi. selecting the appropriate transformation script for each message according to the selected routing script, the request properties, client profile and session history;
- vii. identifying end of client request sequence according context of requests;
- viii. activating rules of the selected scripts for transforming sequence of incoming user requests into a sequence of transformed requests adapted to destination servers communication protocols, where the sequence of incoming user requests are consecutive client requests having a correlated context;
- ix. sending transformed requests to destination servers;
- x. receiving answers from servers;
- xi. temporarily recording sequence of received answers related to a request context;
- xii. applying selected transformation script to adapt recorded sequence answers related to a correlated context, to the client node protocol;
- xiii. analyzing answers according to scenarios rules, for generating new subsequent request or activating originating request utilizing the received answers; and
- xiv. sending transformed answers to client nodes.

10. The method of claim 9, wherein the selection of the routing scripts and the transformation scripts is preformed by checking at least part of the transformation scripts and checking at least part of the routing scripts.
11. The method of claim 9, wherein the sequence of requests or answers are related to a single session flow.
12. The method of claim 9, wherein the scenario rules define analyzing the requests content and properties for deriving new serial subsequence requests which perform actions for completing the execution of the original client request.
13. The method of claim 9, wherein the scenario rules define analyzing the requests content and properties for deriving parallel new subsequence equivalent requests which are transmitted in parallel to different destination servers.
14. The method of claim 9, wherein at least part of the scenario rules define deriving new serial subsequence equivalent requests which are transmitted in parallel to different destination servers.
15. The method of claim 13, wherein the scenario rules enable deriving parallel new subsequence equivalent requests originated from serial subsequence request, said parallel requests are transmitted simultaneously to different destination servers.
16. The method of claim 9, wherein the at least some of the requests are originated from the server.

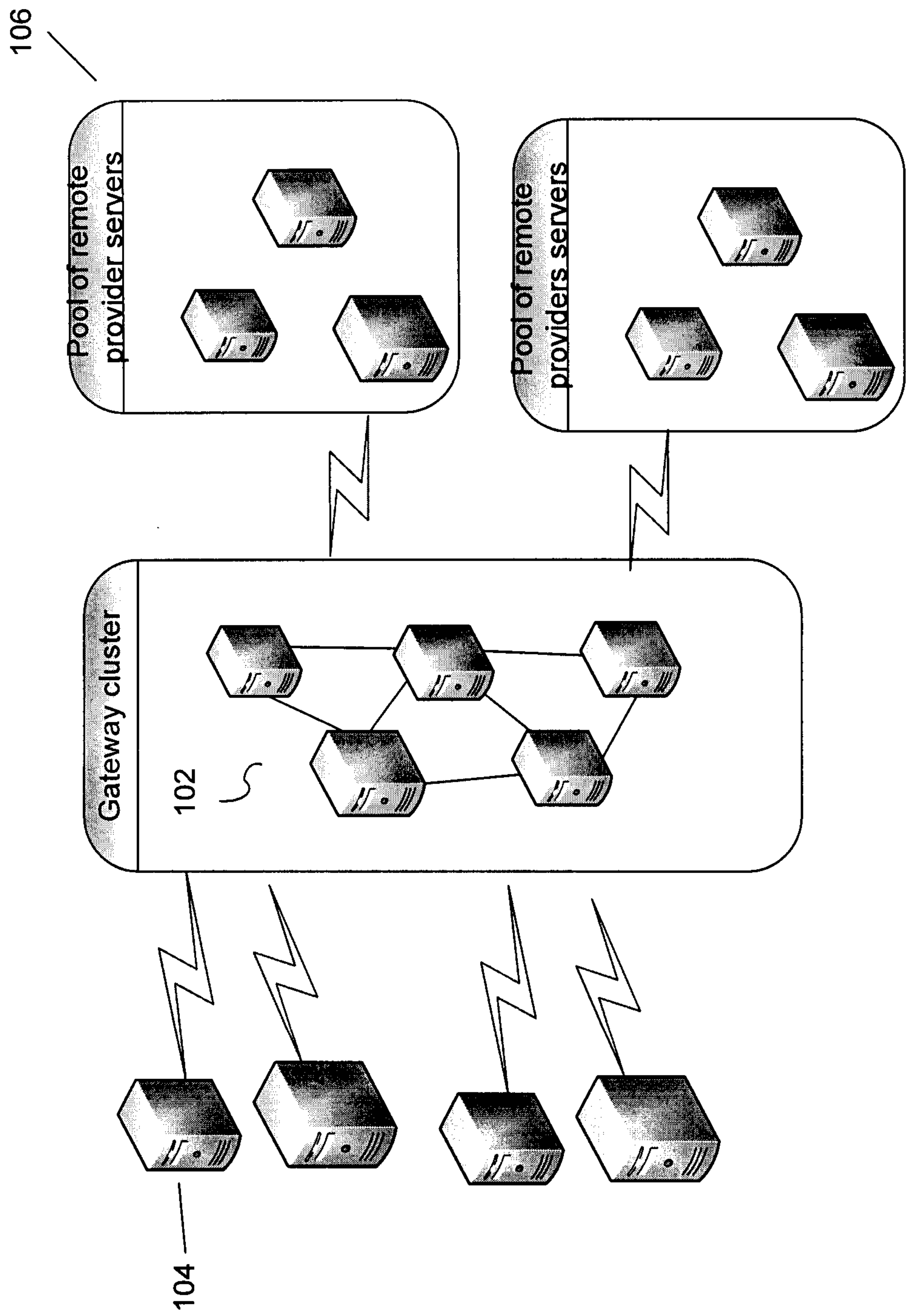


Fig. 1

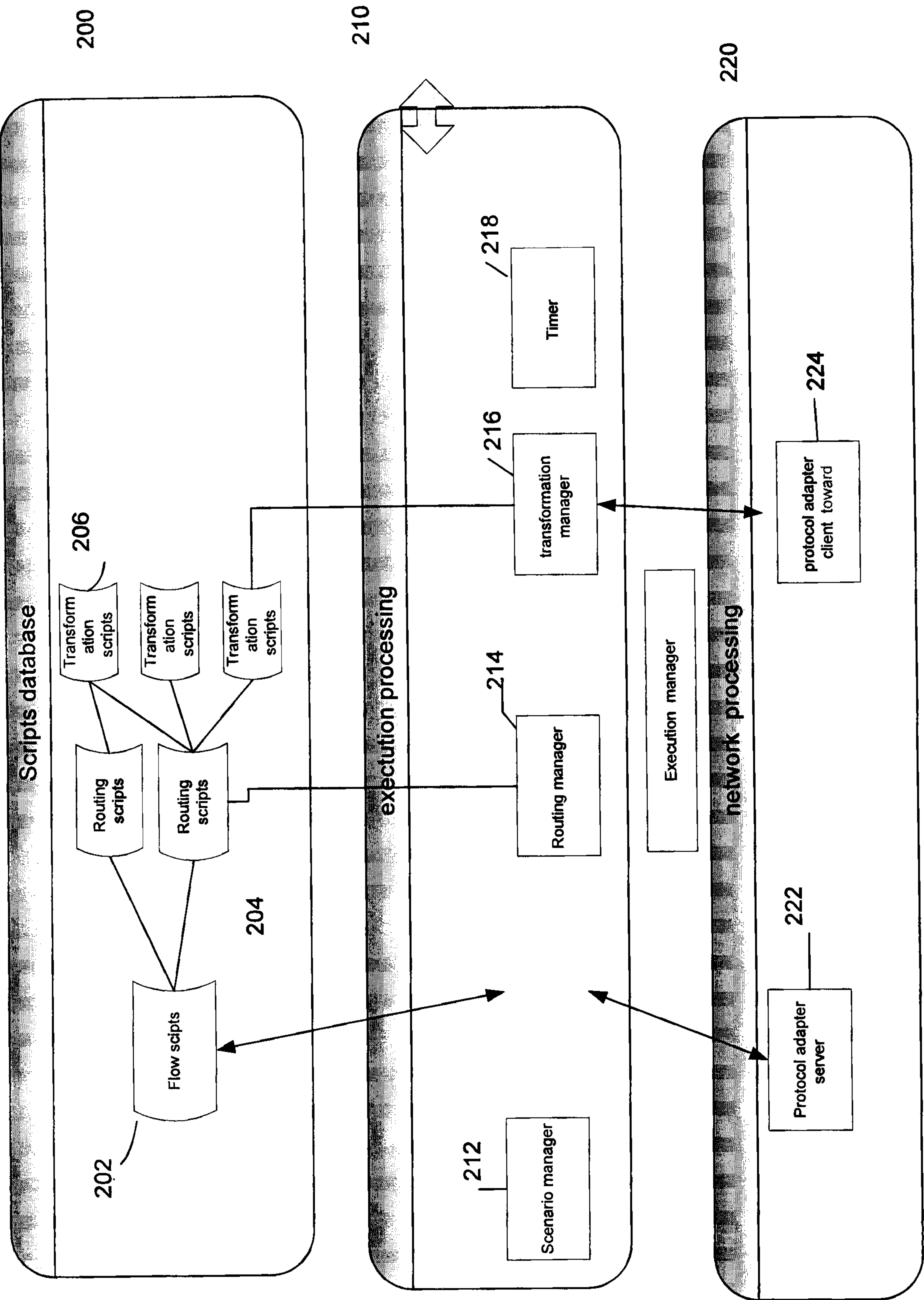


Fig. 2

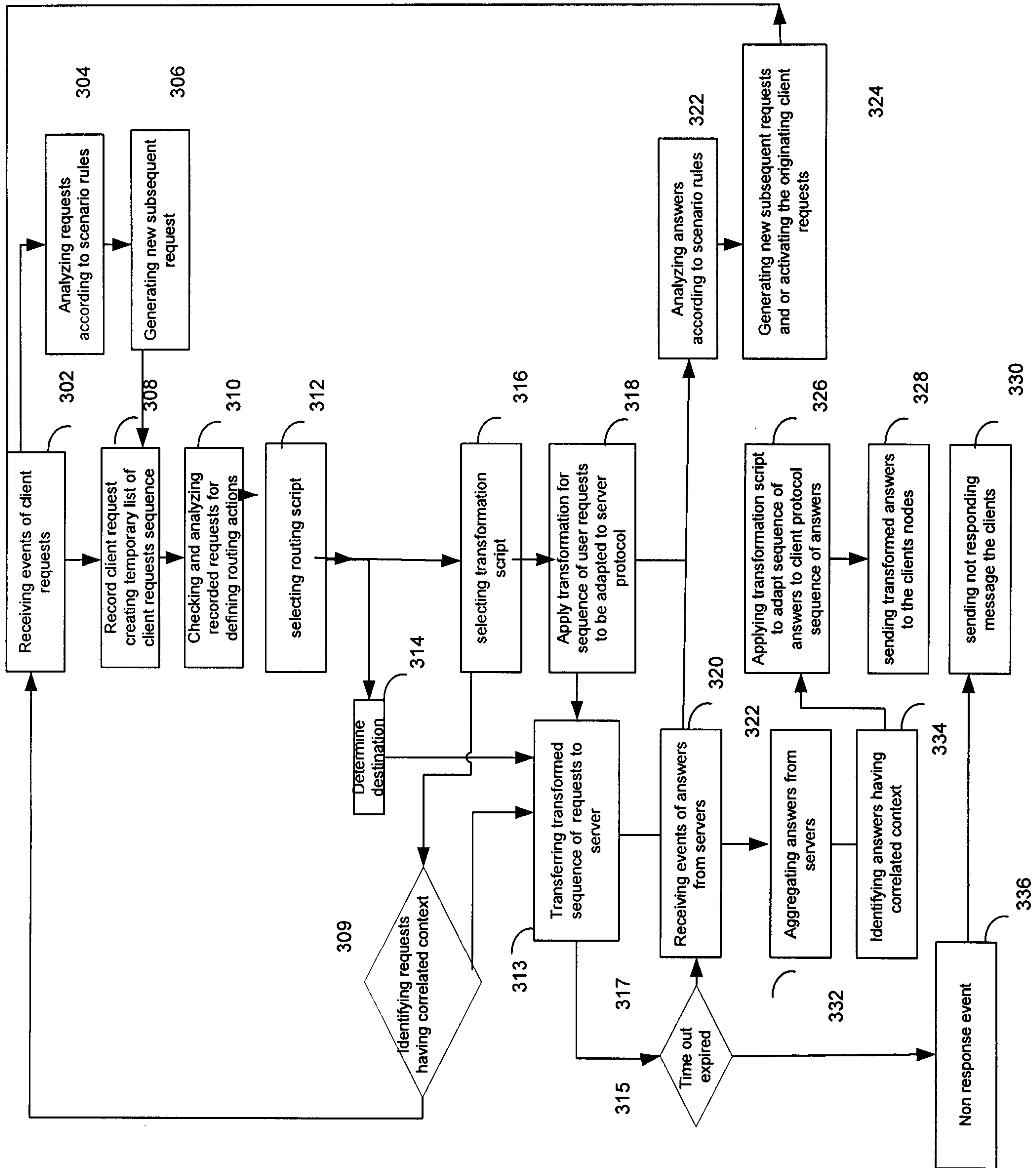


Fig. 3

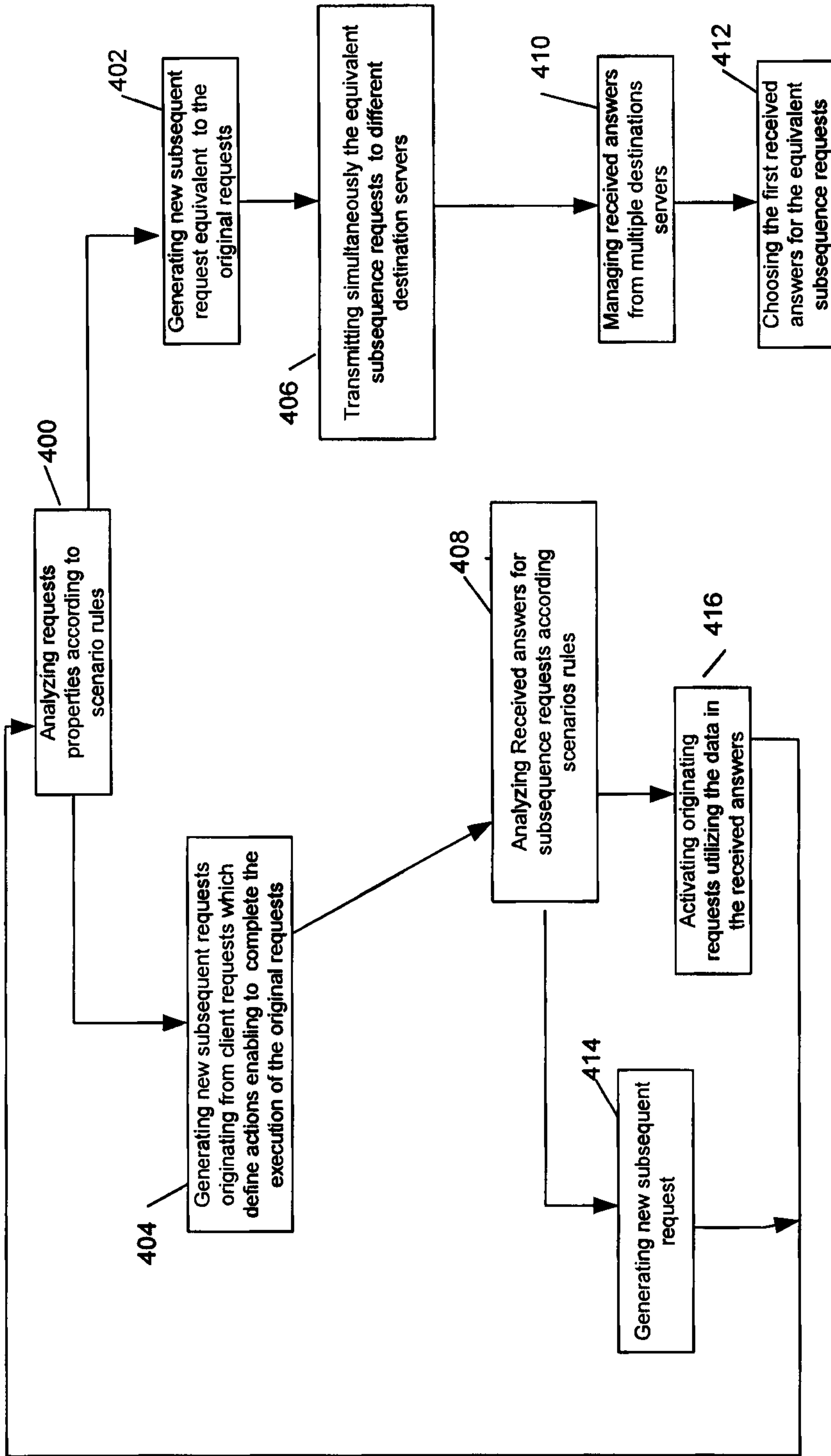


Fig. 4

