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Yu

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(54) **LOADING BALANCING ACROSS SERVERS IN A COMPUTER NETWORK**

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(51) **Int. Cl.**⁷ **G06F 15/173**

(52) **U.S. Cl.** **709/238; 709/239; 709/240; 709/241; 709/242; 370/237; 370/400**

(58) **Field of Search** **709/242, 239, 709/240, 241, 238; 370/237, 400**

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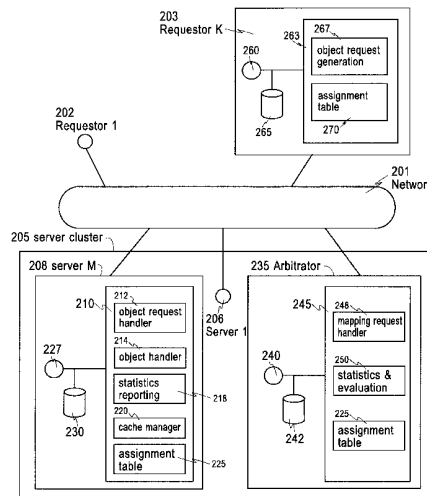
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(57) **ABSTRACT**

A dynamic routing of object requests among a collection or cluster of servers factors the caching efficiency of the servers and the load balance or just the load balance. The routing information on server location can be dynamically updated by piggybacking meta information with the request response. To improve the cache hit at the server, the server selection factors the identifier (e.g. URL) of the object requested. A partitioning method can map object identifiers into classes; and requester nodes maintain a server assignment table to map each class into a server selection. The class-to-server assignment table can change dynamically as the workload varies and also factors the server capacity. The requester node need only be informed on an "on-demand" basis on the dynamic change of the class-to-server assignment (and thus reduce communication traffic). In the Internet, the collection of servers can be either a proxy or Web server cluster and can include a DNS and/or TCP-router. The PICS protocol can be used by the server to provide the meta information on the "new" class-to-server mapping when a request is directed to a server based on an invalid or obsolete class-to-server mapping. DNS based routing for load balancing of a server cluster can also benefit. By piggybacking meta data with the returned object to reassign the requester to another server for future requests, adverse effects of the TTL on the load balance are overcome without increasing traffic.

75 Claims, 15 Drawing Sheets



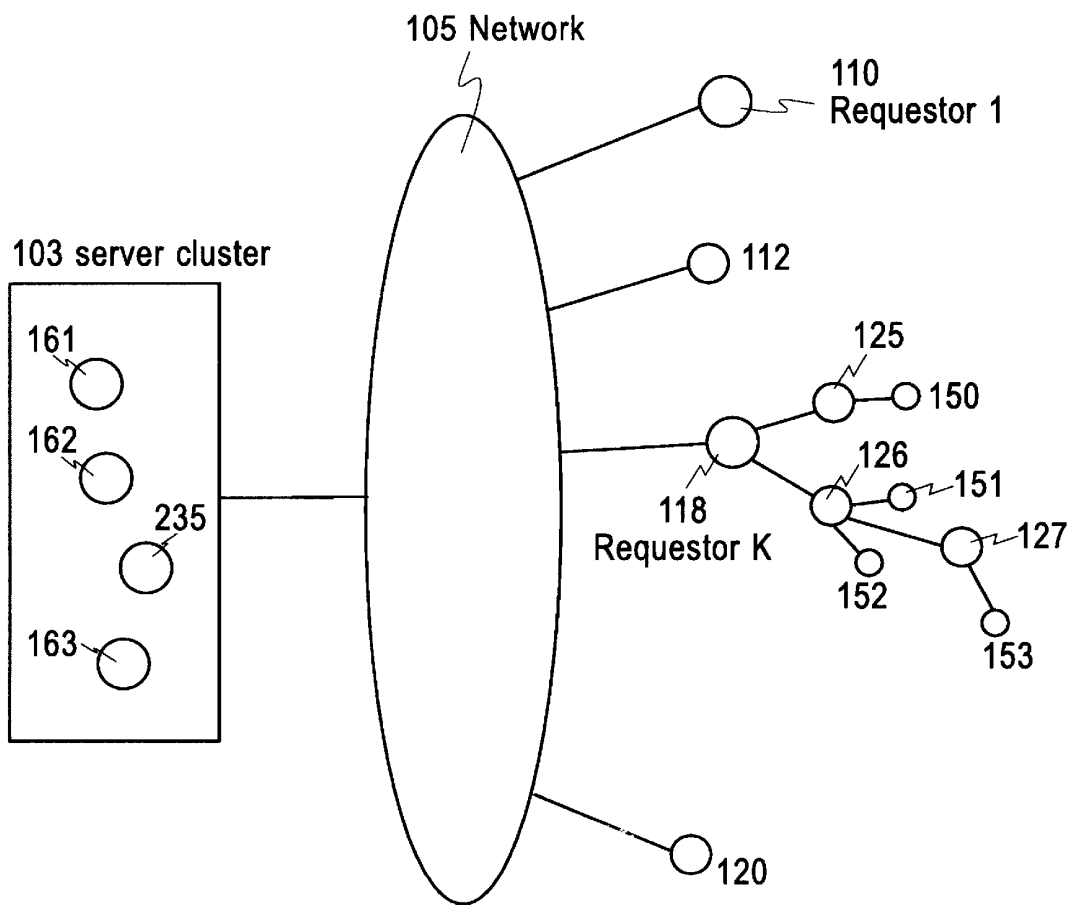


Fig.1

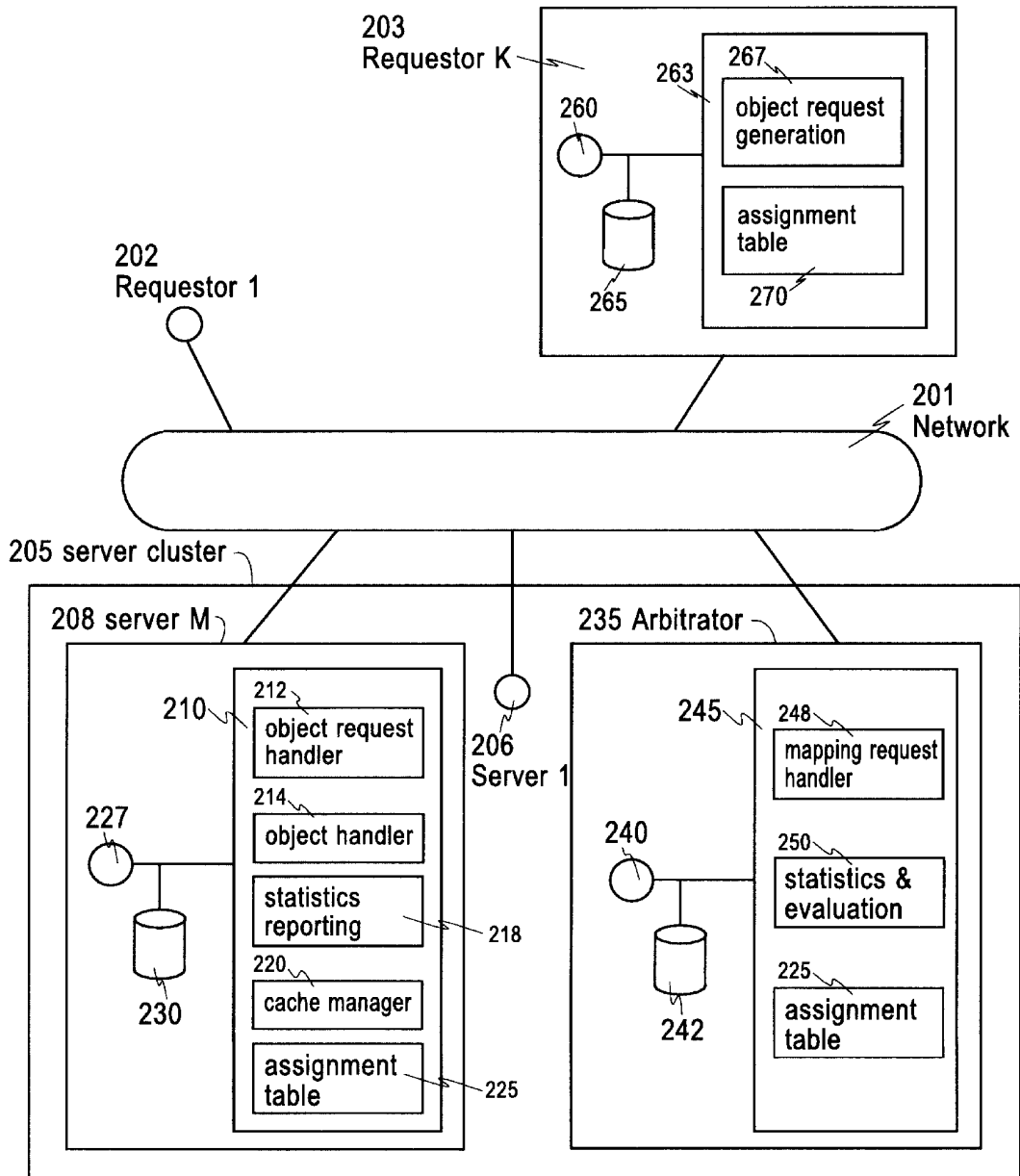


Fig.2

Assignment Table
 N=16, M=3

Class	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Server	2	3	2	2	2	2	2	3	1	3	1	2	2	3	2	3

Fig. 3

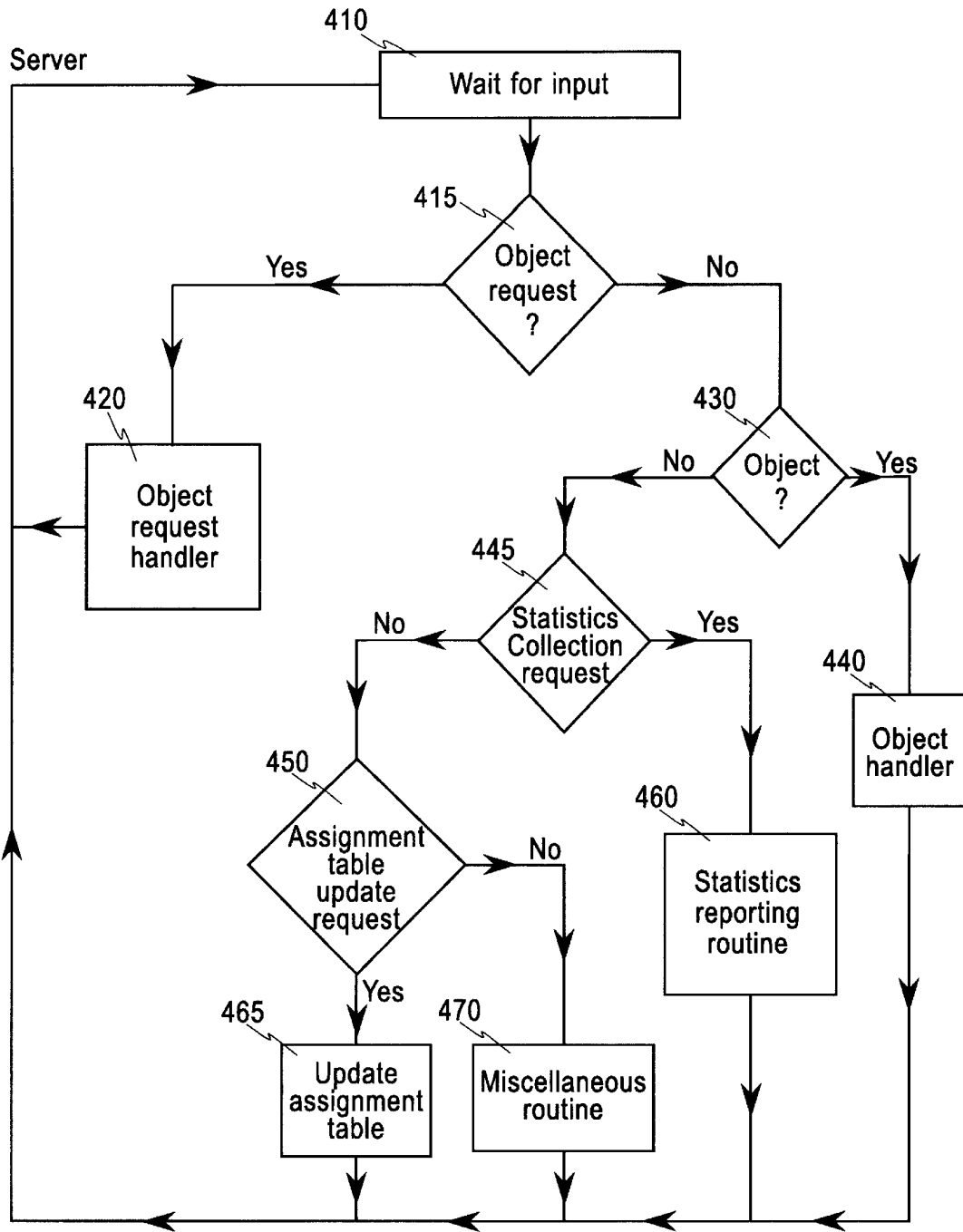


Fig. 4

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