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Harvell et al.

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(54) **CONDITIONAL PROTOCOL CONTROL**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 169 days.

This patent is subject to a terminal disclaimer.

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(51) **Int. Cl.**

G01R 31/08	(2006.01)
G06F 11/00	(2006.01)
G08C 15/00	(2006.01)
H04J 1/16	(2006.01)
H04J 3/14	(2006.01)
H04L 1/00	(2006.01)
H04L 12/26	(2006.01)
H04L 12/56	(2006.01)

(52) **U.S. Cl.**
CPC *H04L 47/193* (2013.01)
USPC **370/252**; 370/389; 370/412; 370/466

(58) **Field of Classification Search**
CPC H04L 47/193; H04L 69/326; G06F 15/16
See application file for complete search history.

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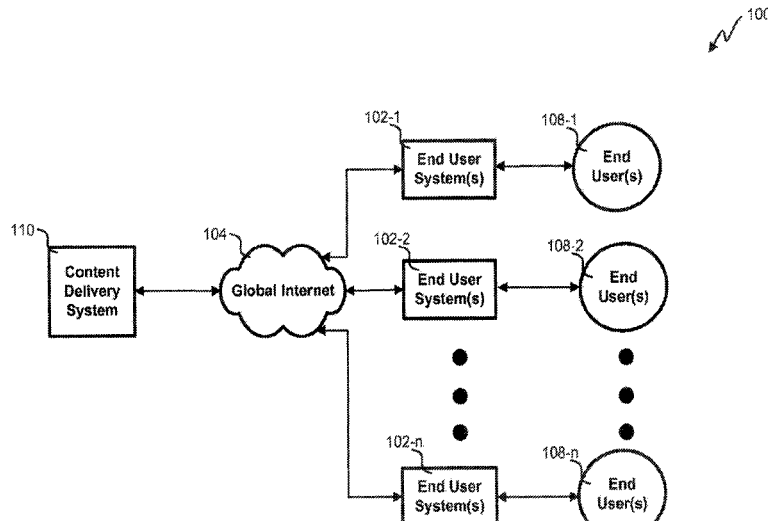|				
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(57) **ABSTRACT**

Techniques for modifying the performance of a transport layer protocol in response to a request for content are disclosed. A connection can be established between a content distribution server and an end user computer according to preconfigured parameters. When a request for content is received over the connection, the content distribution server can determine one or more parameters relating to the performance of the connection using information from the request. The content distribution server can modify the connection at the transport layer according to the one or more parameters. Thereafter, the transport layer can manage delivery of the requested content to the end user computer in accordance with the modified parameters. In various embodiments, the content distribution server includes a modified TCP protocol stack which adjusts timing, pacing, and buffer allocation associated with a connection in response to requests from an application-layer data source.
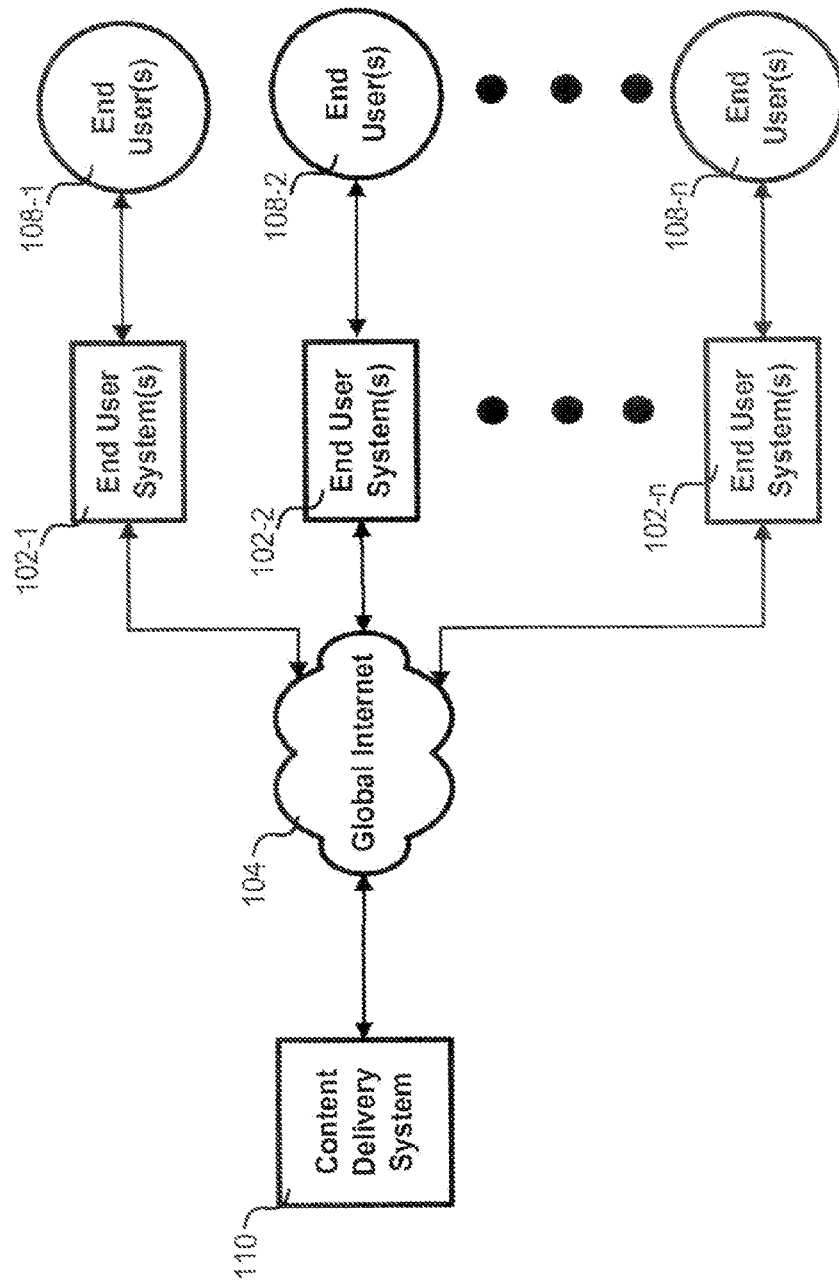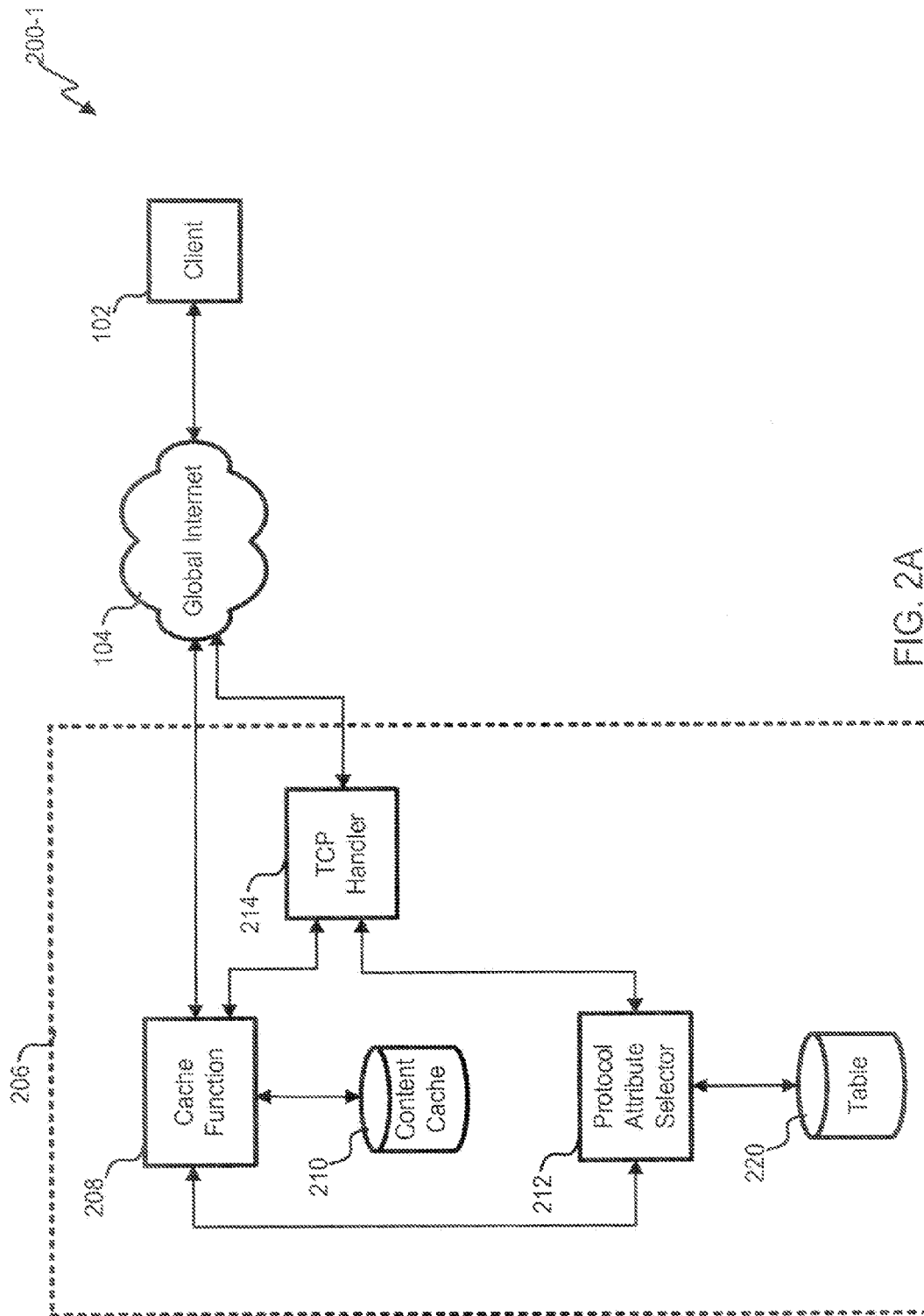
20 Claims, 14 Drawing Sheets

AKAMAI

100

108-1 End User(s)

108-2 End User(s)

108-n End User(s)

102-1 End User System(s)

102-2 End User System(s)

102-n End User System(s)

104 Global Internet

110 Content Delivery System

FIG. 1

200-1

102 — Client

104 — Global Internet

206

208 — Cache Function

210 — Content Cache

214 — TCP Handler

212 — Protocol Attribute Selector
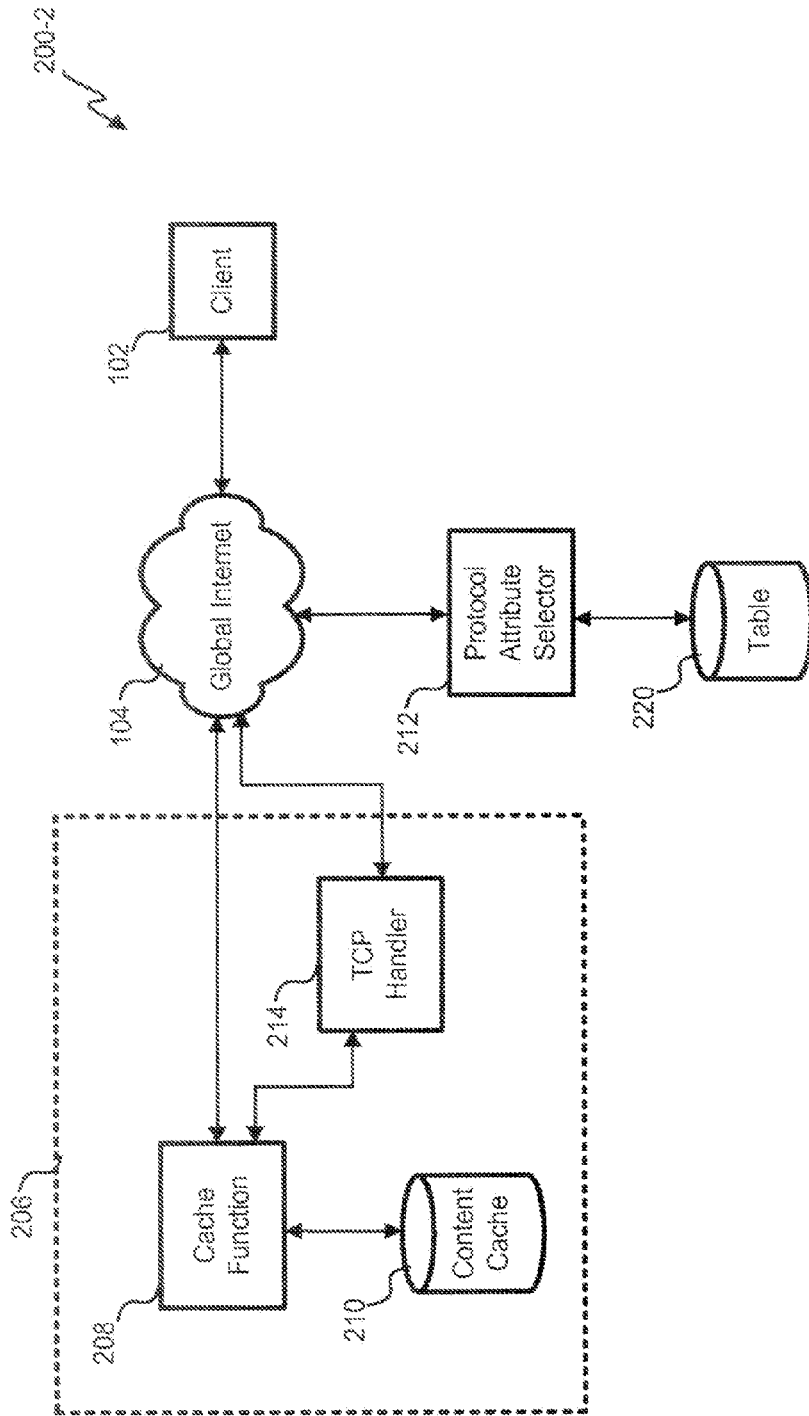
220 — Table

FIG. 2A

FIG. 2B

FIG. 2C

DOCKET ALARM
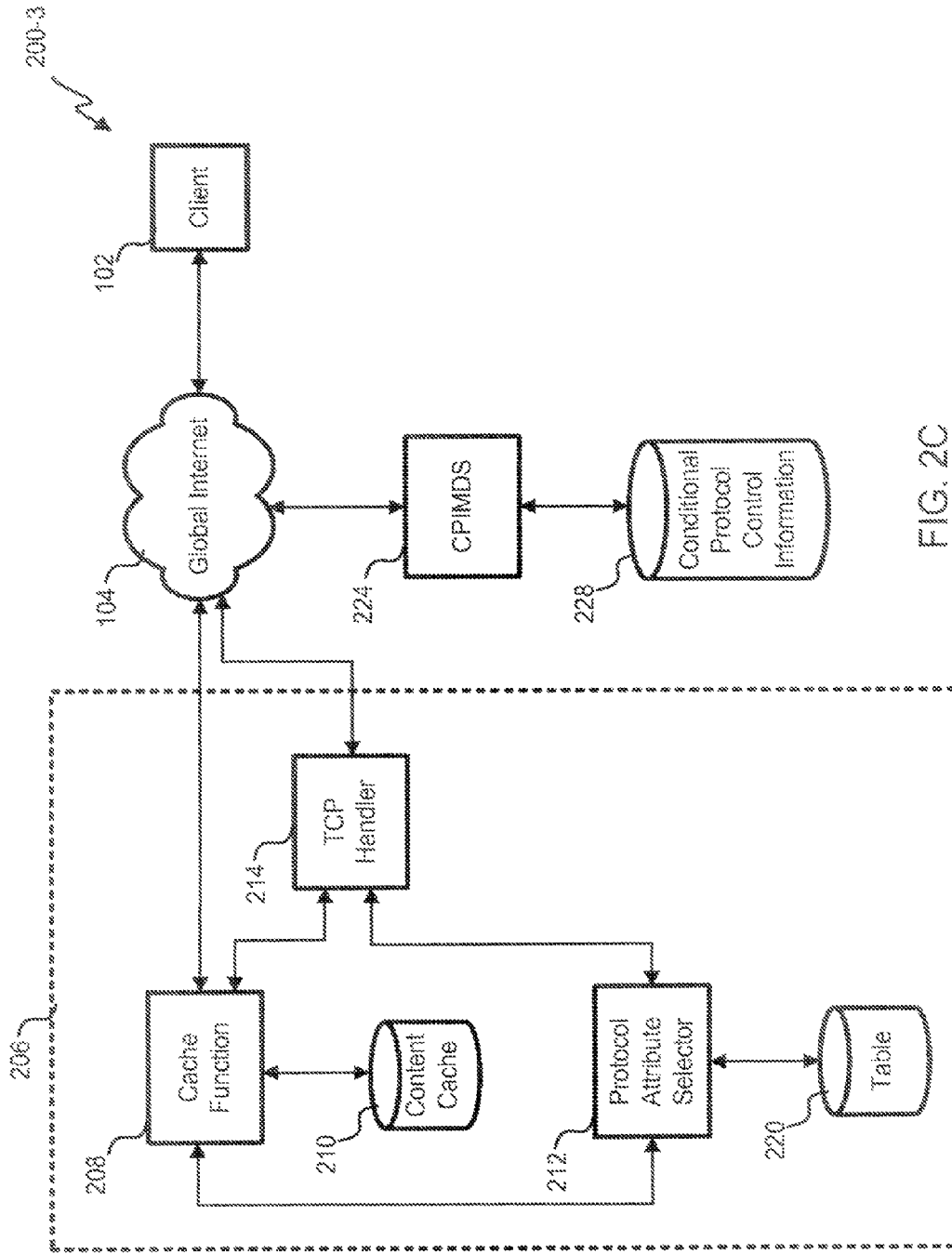
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