US007342929B2

(12) United States Patent
Bremler-Barr et al.

(10) **Patent No.:** **US 7,342,929 B2**
(45) **Date of Patent:** **Mar. 11, 2008**

(54) **WEIGHTED FAIR QUEUING-BASED METHODS AND APPARATUS FOR PROTECTING AGAINST OVERLOAD CONDITIONS ON NODES OF A DISTRIBUTED NETWORK**

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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 1030 days.

(21) Appl. No.: **10/134,048**

(22) Filed: **Apr. 26, 2002**

(65) **Prior Publication Data**

US 2003/0076848 A1 Apr. 24, 2003

Related U.S. Application Data

(60) Provisional application No. 60/286,943, filed on Apr. 27, 2001.

(51) **Int. Cl.**
H04L 12/28 (2006.01)

(52) **U.S. Cl.** **370/395.4**; 370/412

(58) **Field of Classification Search** .... None
See application file for complete search history.

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(57) **ABSTRACT**

An improved network device that controls throughput of packets received thereby, e.g., to downstream devices or to downstream logic contained within the same network device. The network device comprises a scheduler that schedules one or more packets of a selected class for throughput as a function of a weight of that class and weights of one or more other classes. The weight of at least the selected class is dynamic and is a function of a history of volume of packets received by the network device in the selected class. An apparatus for protecting against overload conditions on a network, e.g., of the type caused by DDoS attacks, has a scheduler and a token bucket mechanism, e.g., as described above. Such apparatus can also include a plurality of queues into which packets of the respective classes are placed on receipt by the apparatus. Those packets are dequeued by the scheduler, e.g., in the manner described above, for transmittal to downstream devices (e.g., potential victim nodes) on the network.

37 Claims, 6 Drawing Sheets
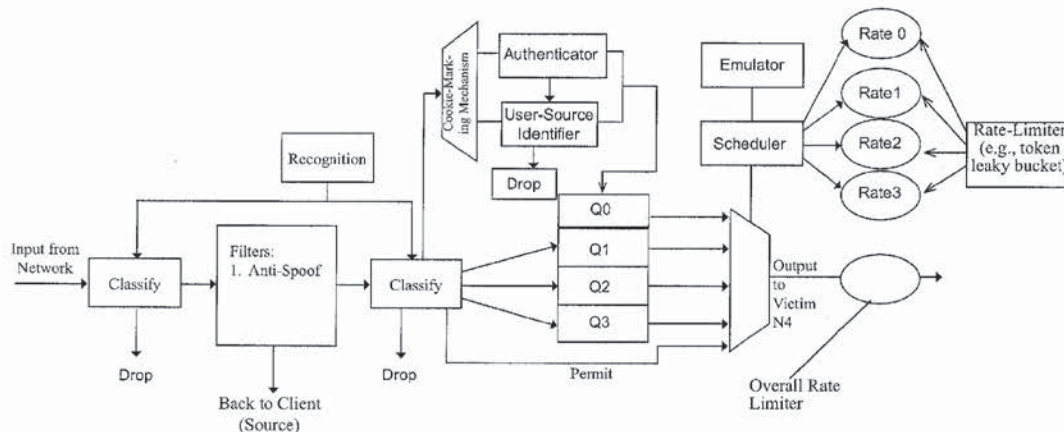
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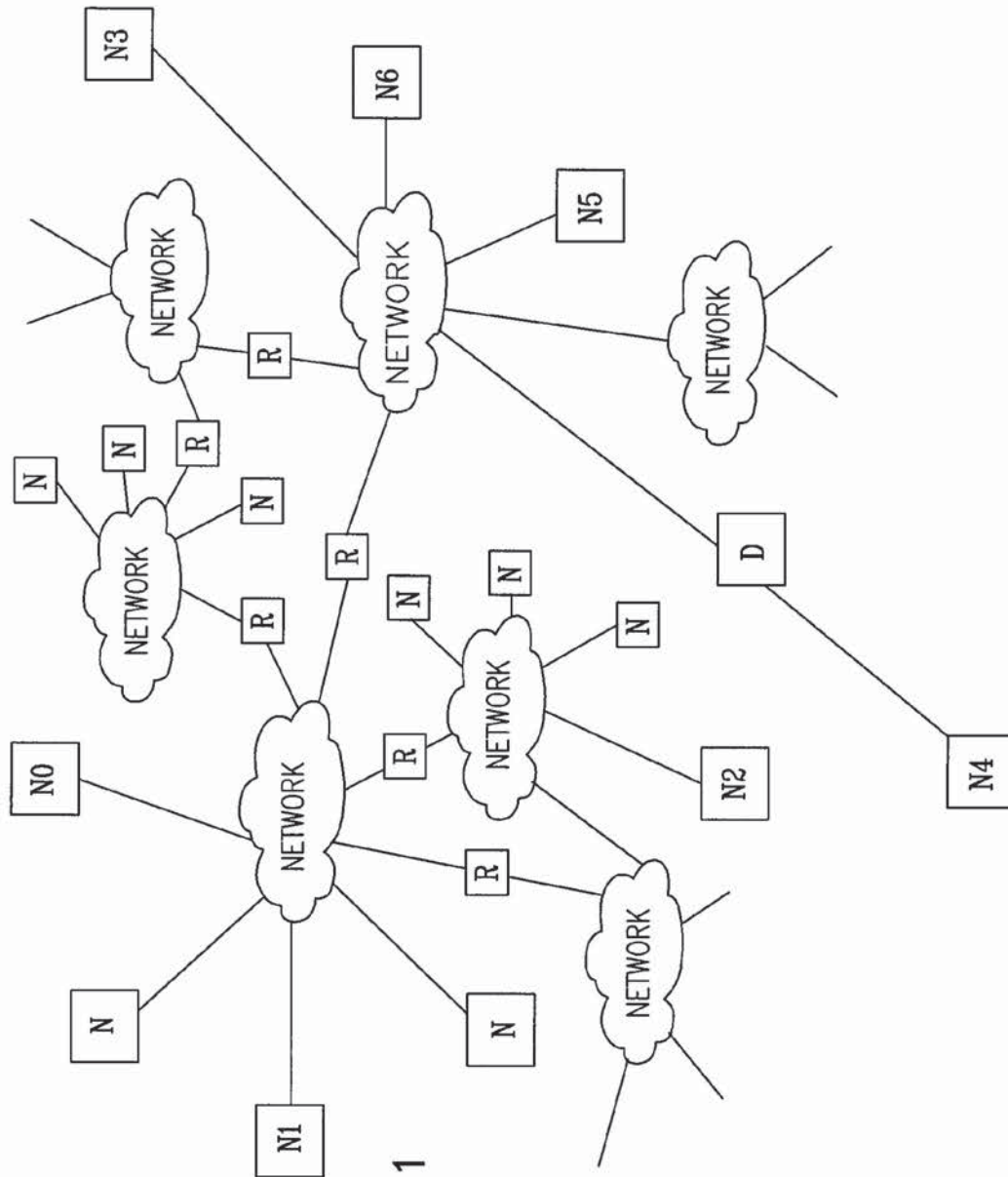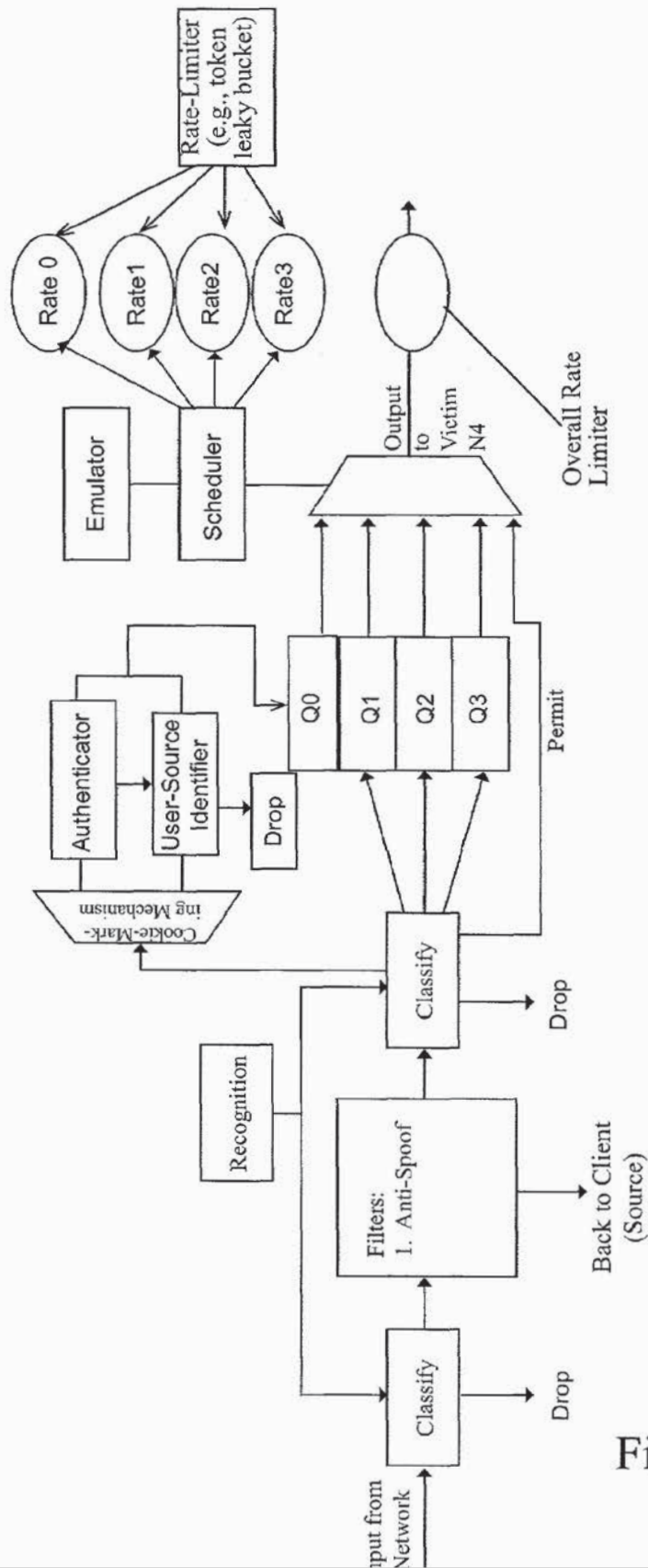
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FIG. 1

FIG. 2

Fig. 3A

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