US008458784B2

(12) **United States Patent**
Krumel

(10) **Patent No.: US 8,458,784 B2**
(45) **Date of Patent: *Jun. 4, 2013**

(54) **DATA PROTECTION SYSTEM SELECTIVELY ALTERING AN END PORTION OF PACKETS BASED ON INCOMPLETE DETERMINATION OF WHETHER A PACKET IS VALID OR INVALID**

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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 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **12/807,641**

(22) Filed: **Sep. 10, 2010**

(65) **Prior Publication Data**

US 2011/0197273 A1 Aug. 11, 2011

Related U.S. Application Data

(63) Continuation of application No. 11/374,465, filed on Mar. 13, 2006, now abandoned, which is a continuation of application No. 09/611,775, filed on Jul. 7, 2000, now Pat. No. 7,013,482.

(51) **Int. Cl.**

G06F 17/00	(2006.01)
G06F 15/16	(2006.01)
G06F 9/00	(2006.01)

(52) **U.S. Cl.**

USPC **726/13**; 713/154; 726/11; 726/12; 709/229

(58) **Field of Classification Search**

USPC 713/154; 709/229; 726/11, 12, 13

See application file for complete search history.

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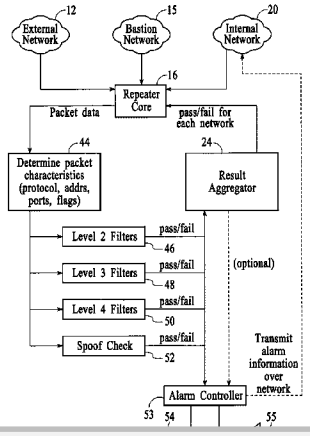
(57) **ABSTRACT**

Methods and systems for firewall/data protection that filters data packets in real time and without packet buffering are disclosed. A data packet filtering hub, which may be implemented as part of a switch or router, receives a packet on one link, reshapes the electrical signal, and transmits it to one or more other links. During this process, a number of filters checks are performed in parallel, resulting in a decision about whether each packet should or should not be invalidated by the time that the last bit is transmitted. To execute this task, the filtering hub performs rules-based filtering on several levels simultaneously, preferably with a programmable logic or other hardware device. Various methods for packet filtering in real time and without buffering with programmable logic are disclosed. The system may include constituent elements of a stateful packet filtering hub, such as microprocessors, controllers, and integrated circuits. The system may be reset, enabled, disabled, configured, and/or reconfigured with toggles or other physical switches. Audio and visual feedback may be provided regarding the operation and status of the system.

36 Claims, 14 Drawing Sheets



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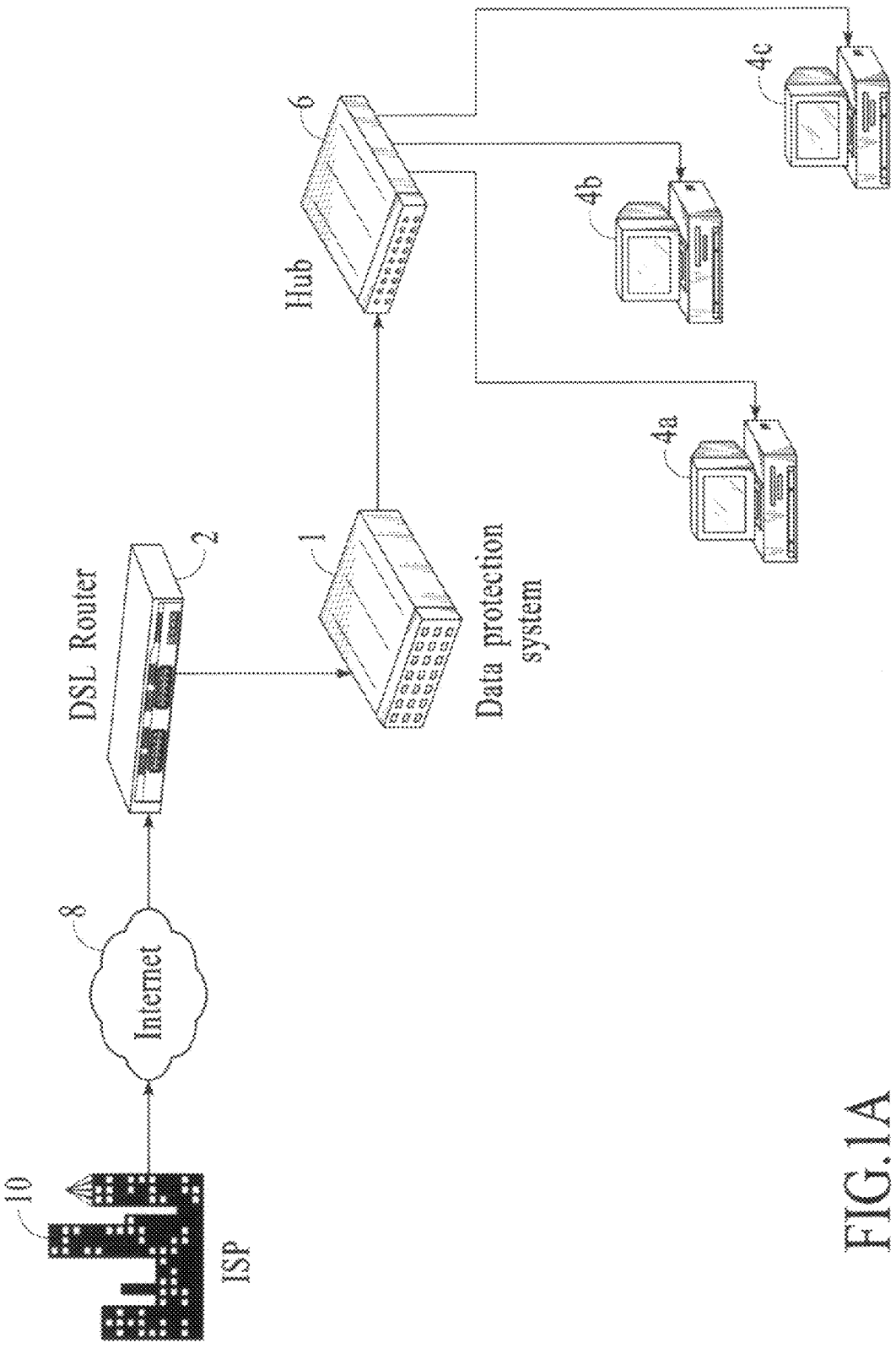
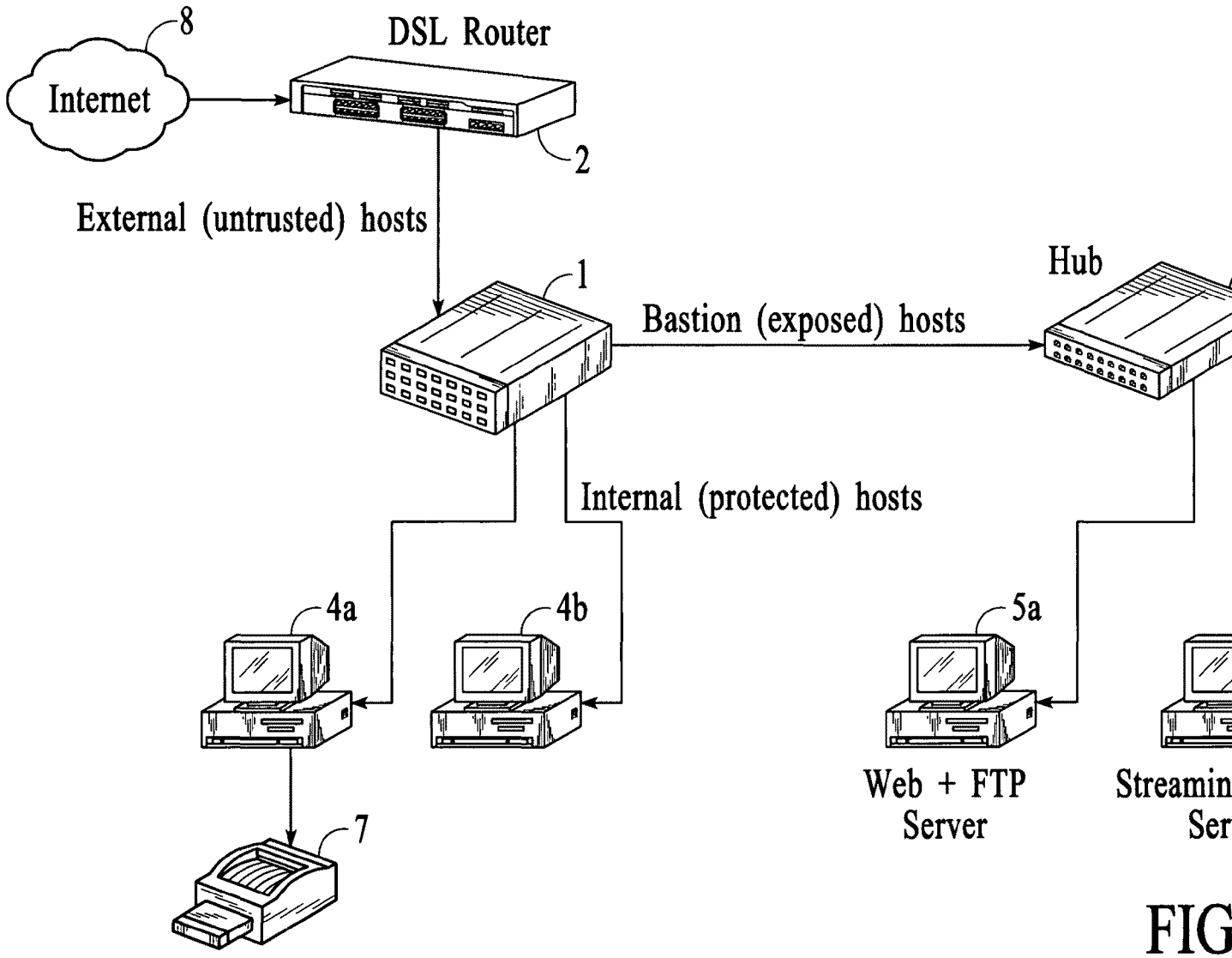


FIG.1A



FIG

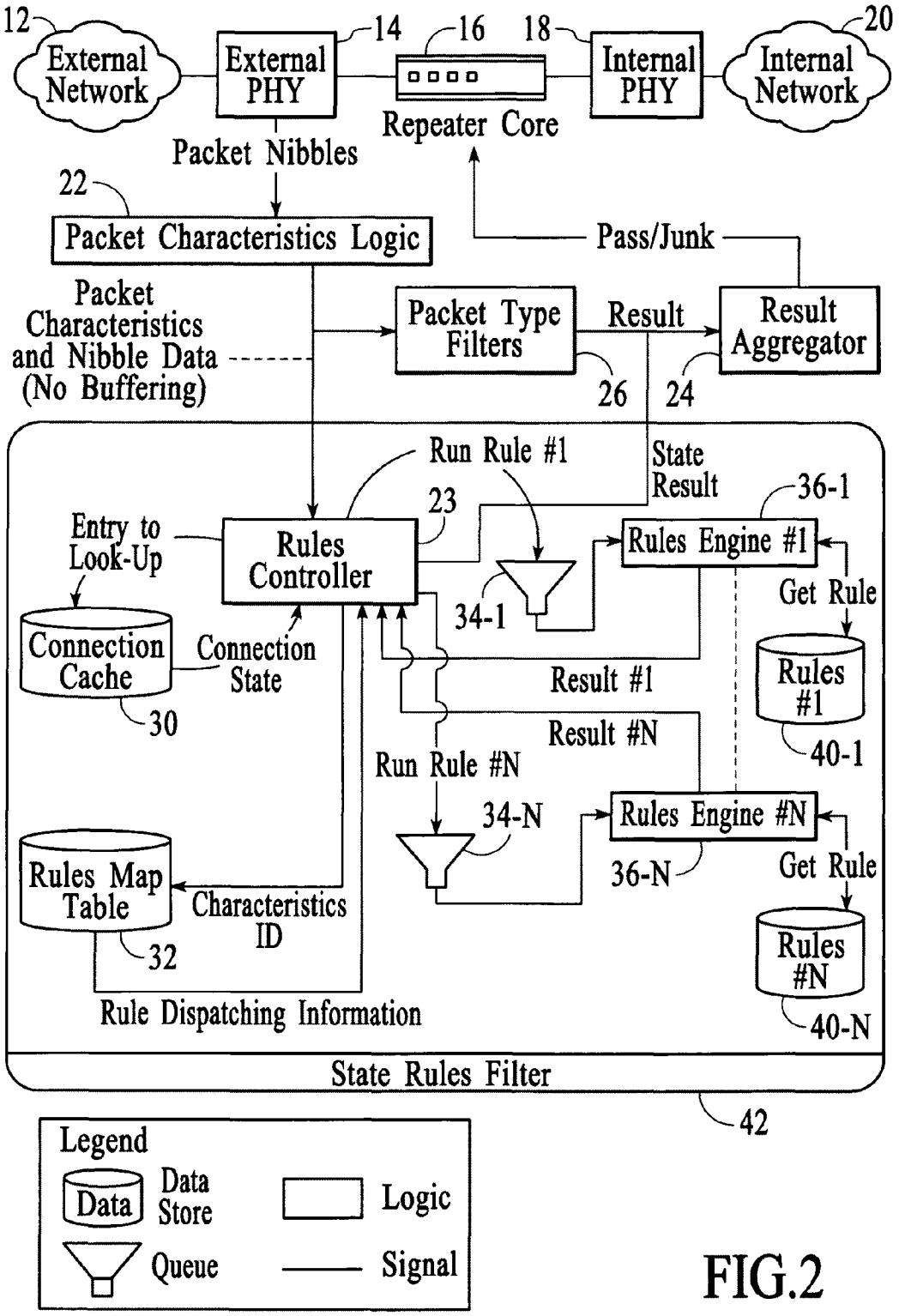


FIG.2

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