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**Munger et al.**

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(54) **AGILE NETWORK PROTOCOL FOR  
SECURE COMMUNICATIONS WITH  
ASSURED SYSTEM AVAILABILITY**

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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.

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(21) Appl. No.: **09/504,783**

*Primary Examiner*—Krisna Lim

(22) Filed: **Feb. 15, 2000**

(74) *Attorney, Agent, or Firm*—Banner & Witcoff, Ltd.

**Related U.S. Application Data**

(57) **ABSTRACT**

(63) Continuation-in-part of application No. 09/429,643, filed on Oct. 29, 1999

A plurality of computer nodes communicate using seemingly random Internet Protocol source and destination addresses. Data packets matching criteria defined by a moving window of valid addresses are accepted for further processing, while those that do not meet the criteria are quickly rejected. Improvements to the basic design include (1) a load balancer that distributes packets across different transmission paths according to transmission path quality; (2) a DNS proxy server that transparently creates a virtual private network in response to a domain name inquiry; (3) a large-to-small link bandwidth management feature that prevents denial-of-service attacks at system chokepoints; (4) a traffic limiter that regulates incoming packets by limiting the rate at which a transmitter can be synchronized with a receiver; and (5) a signaling synchronizer that allows a large number of nodes to communicate with a central node by partitioning the communication function between two separate entities.

(60) Provisional application No. 60/106,261, filed on Oct. 30, 1998, and provisional application No. 60/137,704, filed on Jun. 7, 1999.

(51) **Int. Cl.**<sup>7</sup> ..... **G06F 15/173**

(52) **U.S. Cl.** ..... **709/225; 709/229; 709/245**

(58) **Field of Search** ..... **709/249, 223, 709/225, 229, 245; 713/201**

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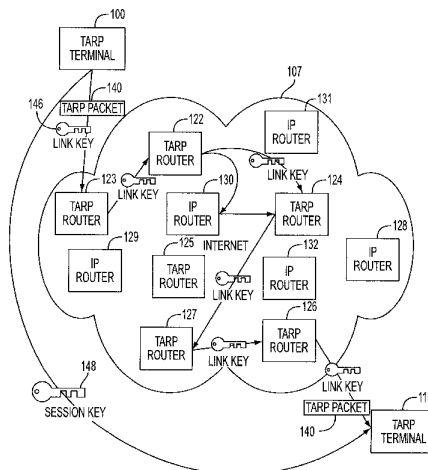
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**17 Claims, 35 Drawing Sheets**



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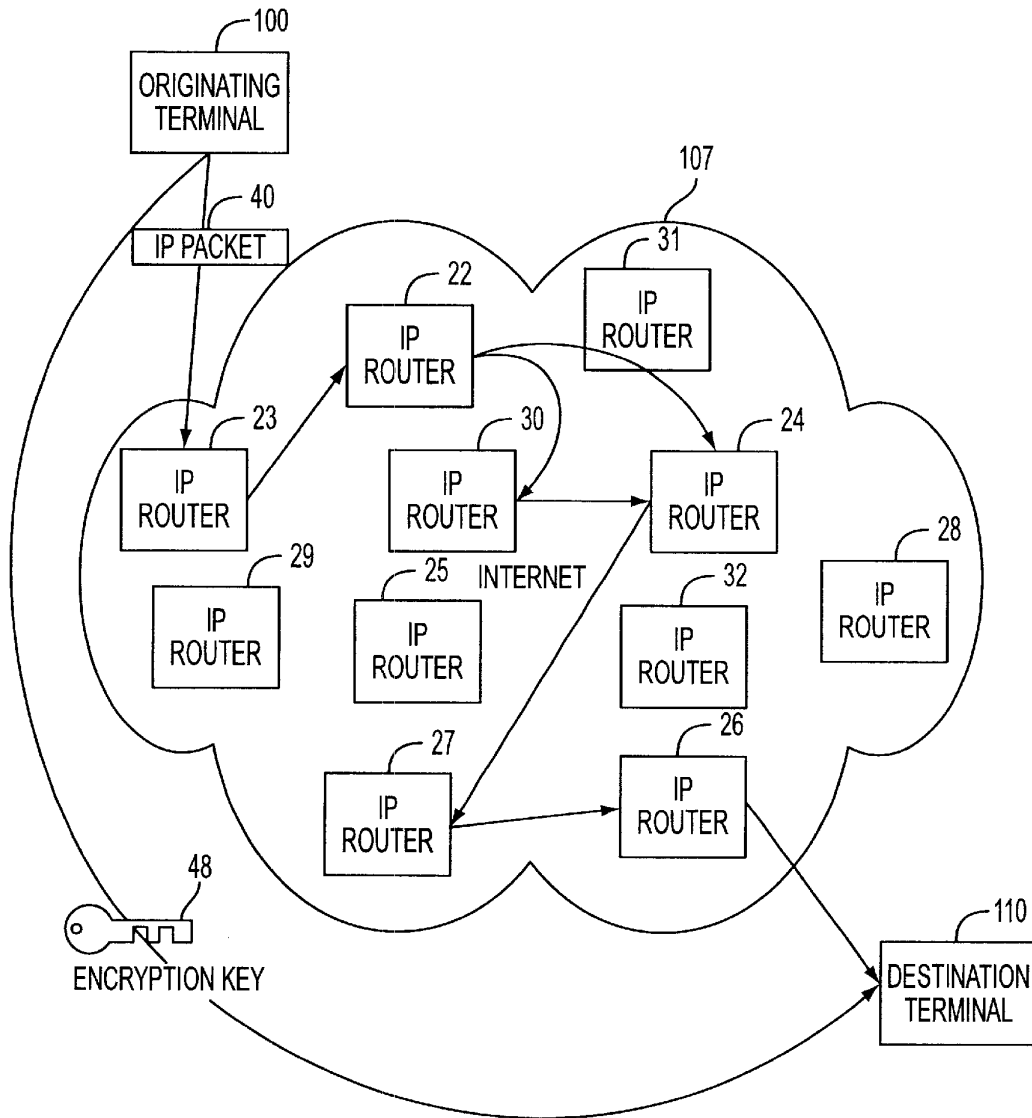


FIG. 1

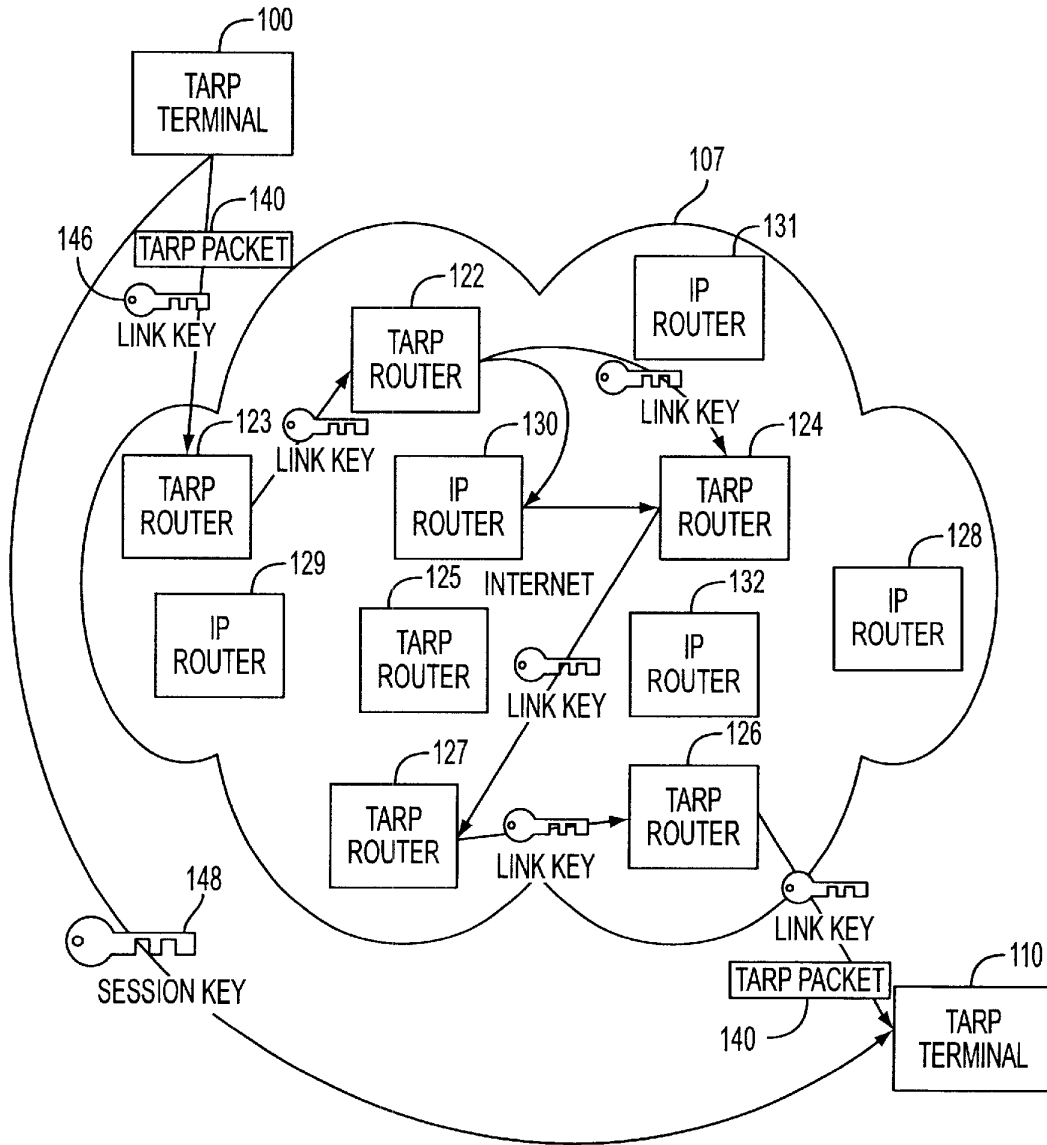


FIG. 2

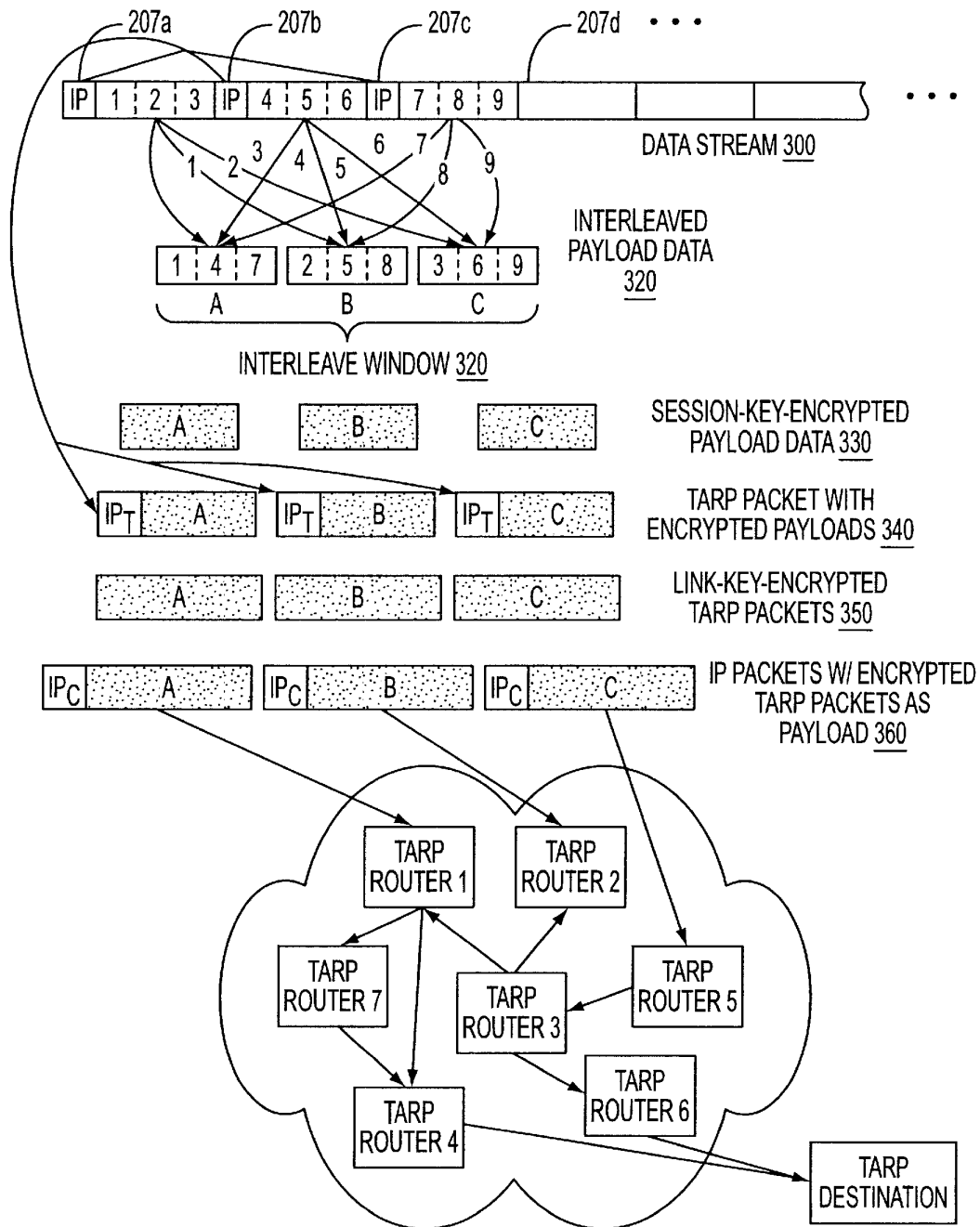


FIG. 3A

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