

(12) **United States Patent**  
**Pearce et al.**

(10) **Patent No.:** **US 6,556,574 B1**  
 (45) **Date of Patent:** **Apr. 29, 2003**

- (54) **DUPLICATE IGNORE DELAY TIMER FOR ARP LIKE PROTOCOL MESSAGES USING ARE PROTOCOL**
- (75) Inventors: **Bernie Paul Pearce**, Cary, NC (US); **Nitin Karkhanis**, San Francisco, CA (US); **Richard Livingston**, Hollister, CA (US)
- (73) Assignee: **Cisco Technology, Inc.**, San Jose, CA (US)
- (\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.
- (21) Appl. No.: **09/283,124**
- (22) Filed: **Mar. 31, 1999**
- (51) **Int. Cl.**<sup>7</sup> ..... **H04L 12/56; H04J 3/16**
- (52) **U.S. Cl.** ..... **370/401; 370/403; 370/469; 709/242**
- (58) **Field of Search** ..... **370/231, 235, 370/248, 351, 386, 389, 392, 401, 402, 403, 410, 469, 466, 467, 474; 709/242; 379/221.01, 265.03**

(56) **References Cited**

**U.S. PATENT DOCUMENTS**

- 5,805,594 A \* 9/1998 Kotchey et al. .... 370/401
- 5,844,902 A \* 12/1998 Perlman ..... 370/401
- 6,272,112 B1 \* 8/2001 Orita ..... 370/243

**OTHER PUBLICATIONS**

Perlman, Radia, *Interconnections, Bridges and Routers*, 1992, pp. 1-8; 31-33; 99-125 and 149-164.  
 Tanenbaum, Andrew, *Computer Networks*, Third Edition, Prentice Hall, 1996, pp. 28-34 and 420-242.

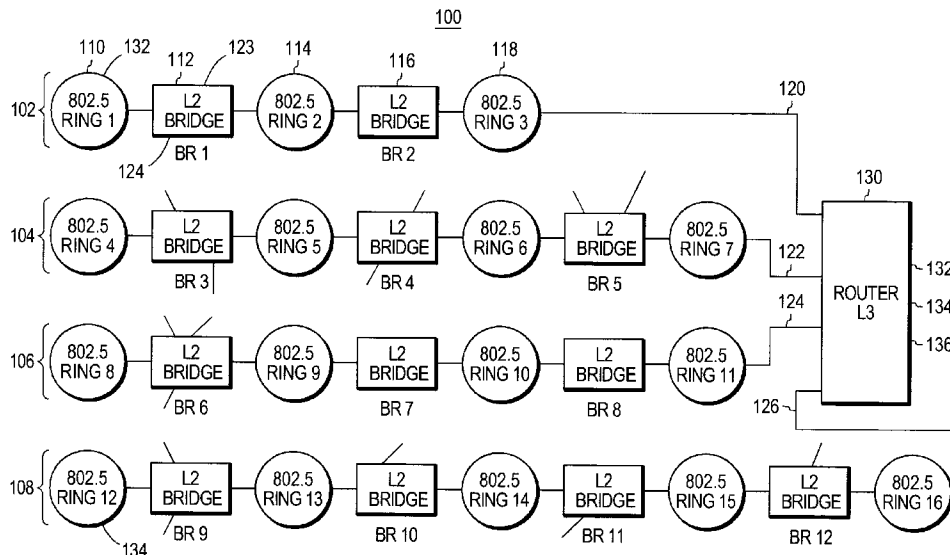
Comer, Douglas E., *Computer Networks and Internets*, Prentice Hall, 1997, Chapter 18, pp. 239-249.  
 Comer, Douglas E., *Internetworking with TCP/IP*, vol. 1, Third Edition, Prentice Hall, 1995, pp. 89-107.  
 Comer, E and Stevens, David L., *Internetworking with TCP/IP*, vol. 2, Design Implementation, and Internal, Prentice Hall, 1991, pp. 37-58.  
 RFC-791.  
 RFC-793.  
 RFC-1122.  
 Lewis, Chris, *Cisco TCP/IP Routing Professional Reference*, McGraw Hill, 1998, pp. 188-205.  
 International Business Business Corporation, *Token-Ring Network*, MAC Frame Format, Chapter 2, pp. 2-1, 2-12.  
 \* cited by examiner

*Primary Examiner*—Huy D. Vu  
*Assistant Examiner*—Duc Ho  
 (74) *Attorney, Agent, or Firm*—Cesari and McKenna, LLP

(57) **ABSTRACT**

A router transmits an ARP Explorer request packet onto a subnetwork in order to learn the route (RIF information) from the router to an end station. The end station receives a plurality of ARP Explorer request packets from the router because of multiple paths in an SRB network, and the end station transmits an ARP Explorer response packet in response to each ARP Explorer request packet received. The invention adopts the path of the first ARP Explorer response packet received by the router from the end station for the RIF information from the router to the end station, and uses a “duplicate ignore” timer in order to avoid freezing this route into the router tables. The timer begins running upon receipt of the first ARP Explorer response packet, and expires after an “update time interval”. No further ARP Explorer response packet is processed until after expiration of the update time interval.

**16 Claims, 12 Drawing Sheets**



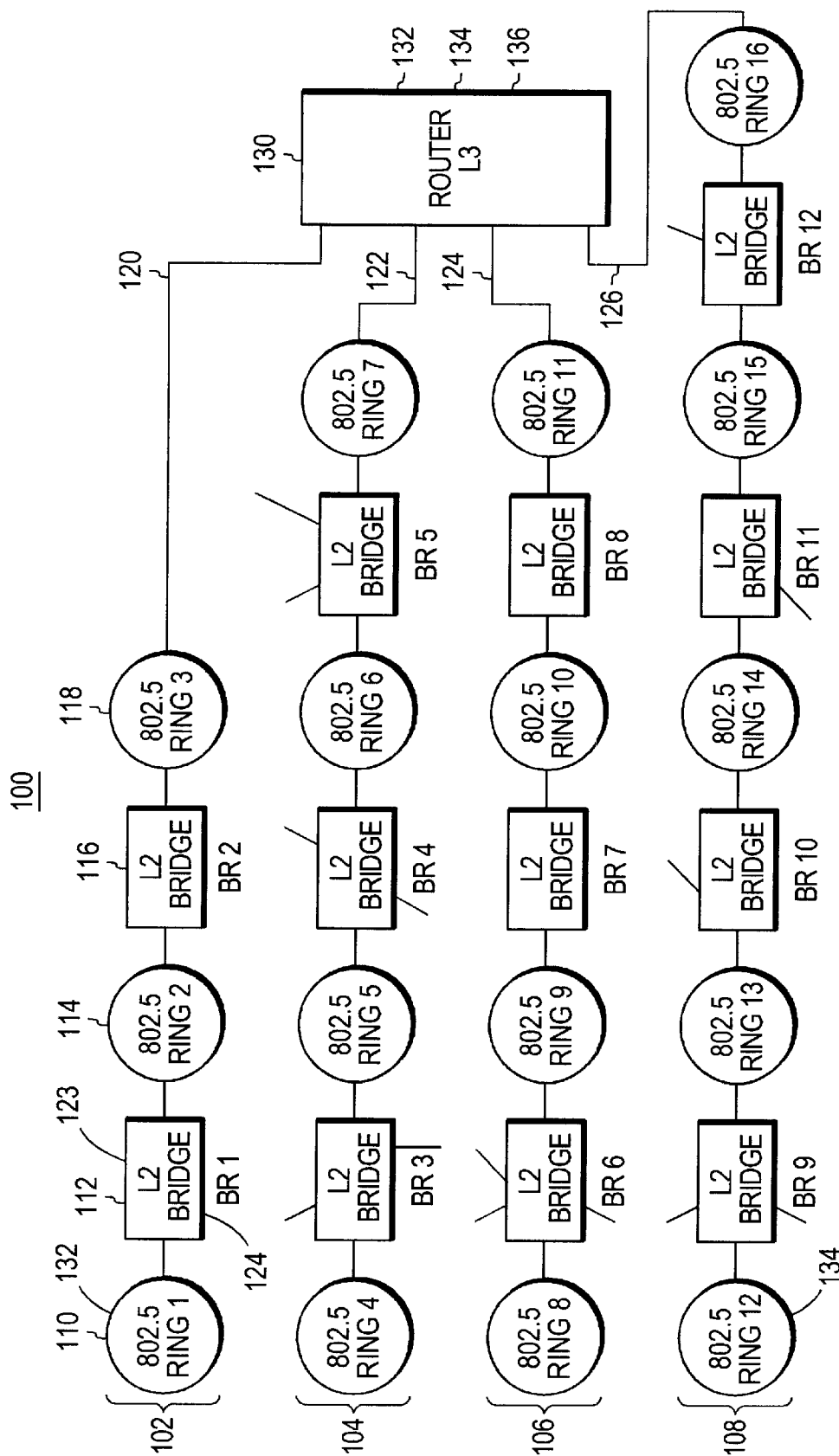


FIG. 1

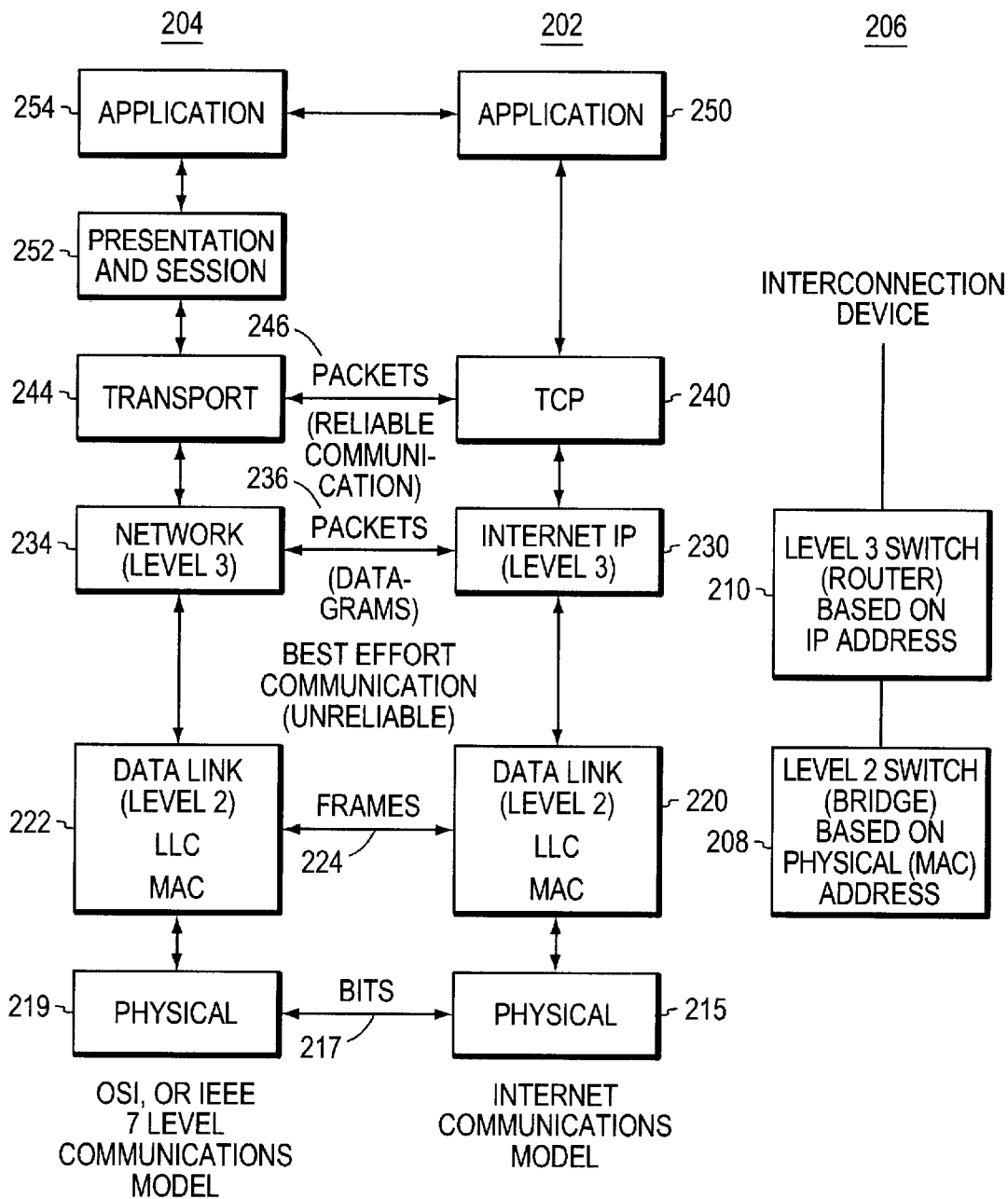


FIG. 2

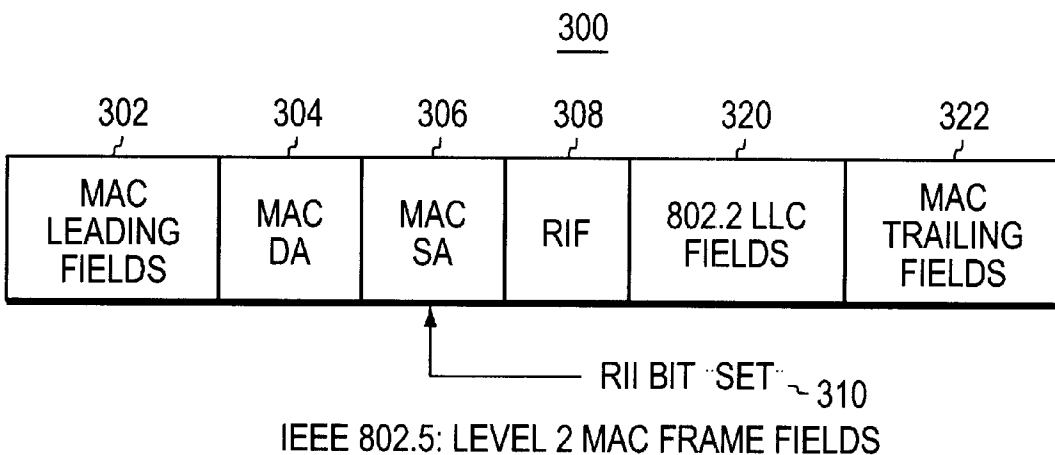


FIG. 3

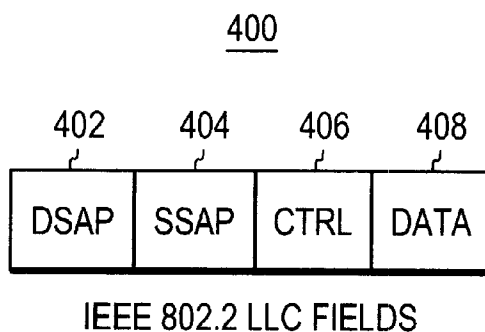


FIG. 4

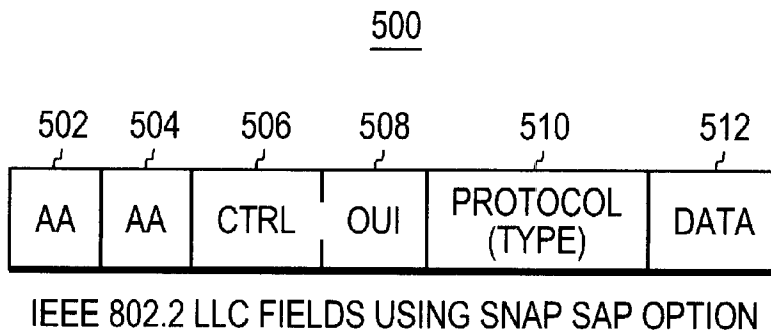


FIG. 5

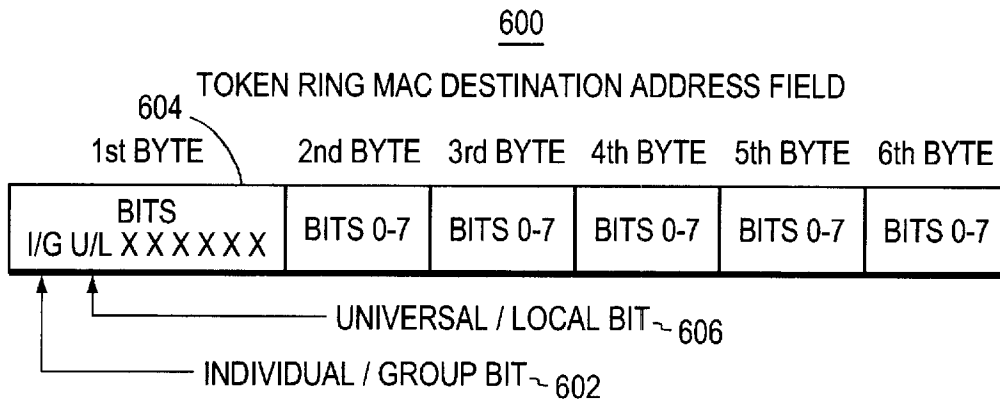


FIG. 6A

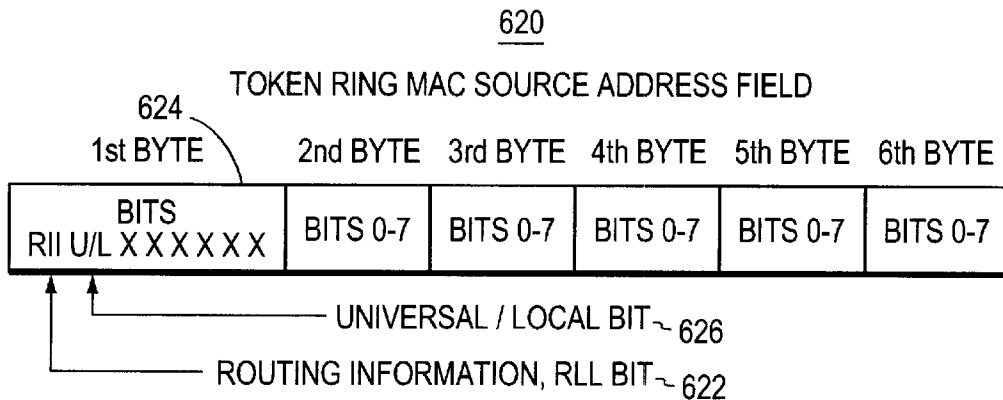


FIG. 6B

# Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

## Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

## Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

## Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

## API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

## LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

## FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

## E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.