



US006775235B2

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

(10) **Patent No.:** **US 6,775,235 B2**  
(45) **Date of Patent:** **Aug. 10, 2004**

- (54) **TOOLS AND TECHNIQUES FOR DIRECTING PACKETS OVER DISPARATE NETWORKS**
- (75) Inventors: **Sanchaita Datta**, Salt Lake City, UT (US); **Ragula Bhaskar**, Salt Lake City, UT (US)
- (73) Assignee: **Ragula Systems**, Salt Lake City, UT (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.

5,948,069	A	9/1999	Kitai et al. ....	709/240
6,016,307	A	* 1/2000	Kaplan et al. ....	370/238
6,119,170	A	* 9/2000	Schoffelman et al. ....	709/244
6,128,298	A	* 10/2000	Wootton et al. ....	370/392
6,253,247	B1	6/2001	Bhaskar et al. ....	709/237
6,295,276	B1	9/2001	Datta et al. ....	370/218
6,339,595	B1	1/2002	Rekhter et al. ....	370/392
6,438,100	B1	8/2002	Halpern et al. ....	370/218
6,449,259	B1	9/2002	Allain et al. ....	370/253
6,456,594	B1	9/2002	Kaplan et al. ....	370/238
6,493,341	B1	12/2002	Datta et al. ....	370/392
6,493,349	B1	12/2002	Casey ....	370/409
6,665,702	B1	* 12/2003	Zisapel et al. ....	718/105

- (21) Appl. No.: **10/361,837**
- (22) Filed: **Feb. 7, 2003**
- (65) **Prior Publication Data**  
US 2003/0147408 A1 Aug. 7, 2003

**Related U.S. Application Data**

- (63) Continuation-in-part of application No. 10/034,197, filed on Dec. 28, 2001.
- (60) Provisional application No. 60/355,509, filed on Feb. 8, 2002, and provisional application No. 60/259,269, filed on Dec. 29, 2000.
- (51) **Int. Cl.**<sup>7</sup> ..... **H04L 12/64**
- (52) **U.S. Cl.** ..... **370/238; 370/252; 370/352**
- (58) **Field of Search** ..... **370/252, 352, 370/230, 235, 238**

**References Cited**

**U.S. PATENT DOCUMENTS**

5,398,012	A	3/1995	Derby et al. ....	340/825.03
5,420,862	A	5/1995	Perlman ....	370/85.13
5,473,599	A	12/1995	Li et al. ....	370/16
5,737,526	A	4/1998	Periasamy et al. ....	395/200.06
5,898,673	A	4/1999	Riggan et al. ....	370/237

**OTHER PUBLICATIONS**

- 'Radware announces LinkProof: The first IP Load Balancing Solution for networks with multiple ISP connection', Press Release, published Oct. 7, 1999.\*
- 'Radware Balances the Network', Internet Traffic Management Center, published Jan. 1, 2000.\*
- 'Global Product Spotlight: Radware Linkproof', Network-Magazine.com, published Dec. 1, 1999.\*

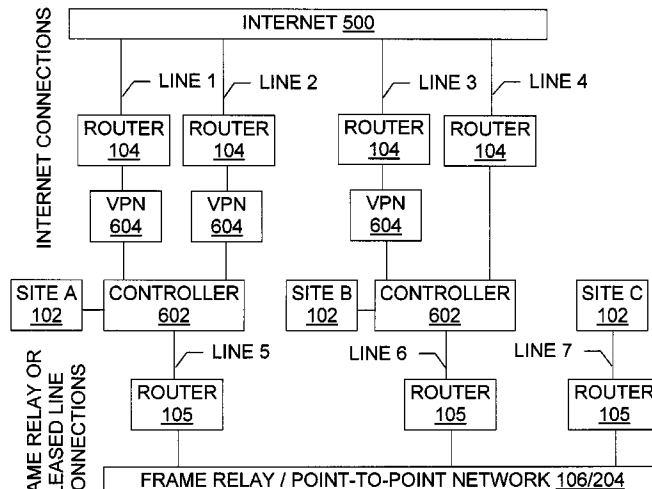
(List continued on next page.)

*Primary Examiner*—Melvin Marcelo  
(74) *Attorney, Agent, or Firm*—Thorpe North & Western LLP

(57) **ABSTRACT**

Methods, configured storage media, and systems are provided for communications using two or more disparate networks in parallel to provide load balancing across network connections, greater reliability, and/or increased security. A controller provides access to two or more disparate networks in parallel, through direct or indirect network interfaces. When one attached network fails, the failure is sensed by the controller and traffic is routed through one or more other disparate networks. When all attached disparate networks are operating, one controller preferably balances the load between them.

**24 Claims, 6 Drawing Sheets**



## OTHER PUBLICATIONS

'Radware Seeks Solutions to Easy-Access Problems', South China Morning Post, published Dec. 7, 1999.\*

B. Gleeson et al., "A Framework for IP Based Virtual Private Networks," RFC 2764 (Feb. 2000).

U.S. patent application, Attorney Docket No. 3003.2.9A; see USPTO published application No. US-2002-0087724-A1, Jul. 4, 2002.

T. Liao et al., "Using multiple links to interconnect LANs and public circuit switched data networks," *Proc. Int. Conference on Communications Systems: Towards Global Integration*, vol. 1, Singapore, 59 Nov. 1990, pp. 289-293.

Press release from [www.coyotepoint.com](http://www.coyotepoint.com), Sep. 8, 1997.

Network Address Translation Technical Discussion, from [safety.net](http://safety.net); no later than May 7, 1999.

Higginson et al., "Development of Router Clusters to Provide Fast Failover in IP Networks," from [www.asia-pacific.digital.com](http://www.asia-pacific.digital.com); no later than Sep. 29, 1998.

Pages from [www.navpoint.com](http://www.navpoint.com); no later than Dec. 24, 2001.

"The Basic Guide to Frame Relay Networking", pp. 1-85, copyright date 1998.

"NNI & UNI", pp. 1-2, Nov. 16, 2001.

"Disaster Recovery for Frame Relay Networks", pp. 1-14, no later than Dec. 7, 2001.

T. Nolle, "Watching Your Back", pp. 1-3, Nov. 1, 1999.

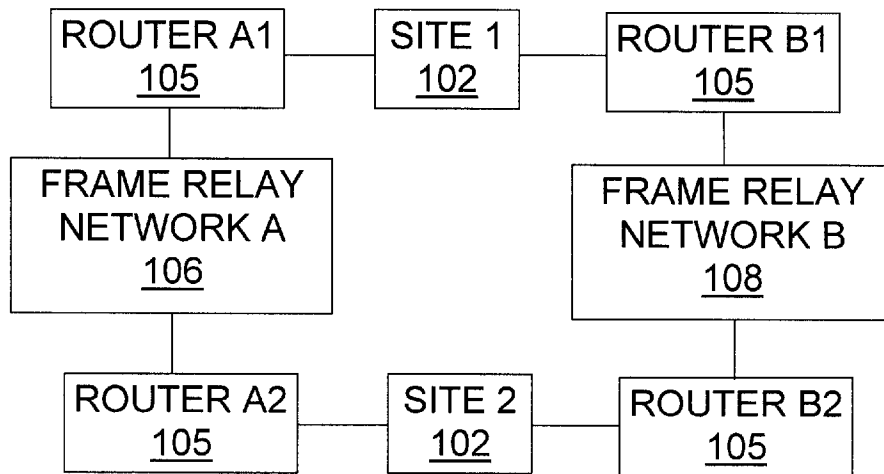
"Multi-Attached and Multi-Homed Dedicated Access", pp. 1-5, no later than Dec. 8, 2001.

Feibel, "Internetwork Link," Novell's® Complete Encyclopedia of Networking, copyright date 1995.

Tanenbaum, *Computer Networks* (3<sup>rd</sup> Ed.), pp. 396-406; copyright date 1996.

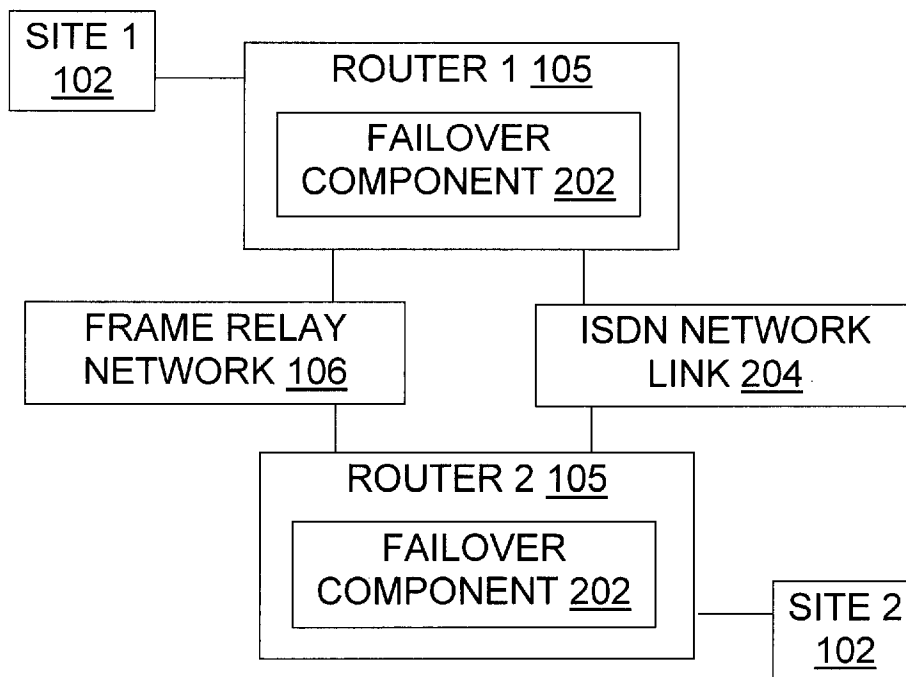
Wexler, "Frame Relay and IP VPNs: Compete Or Coexist?," from [www.bcr.com](http://www.bcr.com); Jul. 1999.

\* cited by examiner



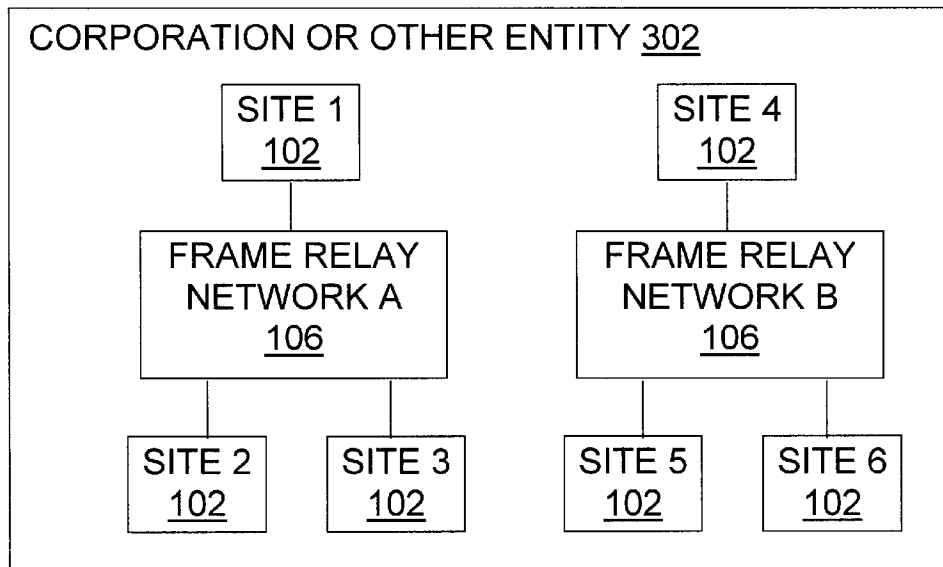
(PRIOR ART)

Fig. 1



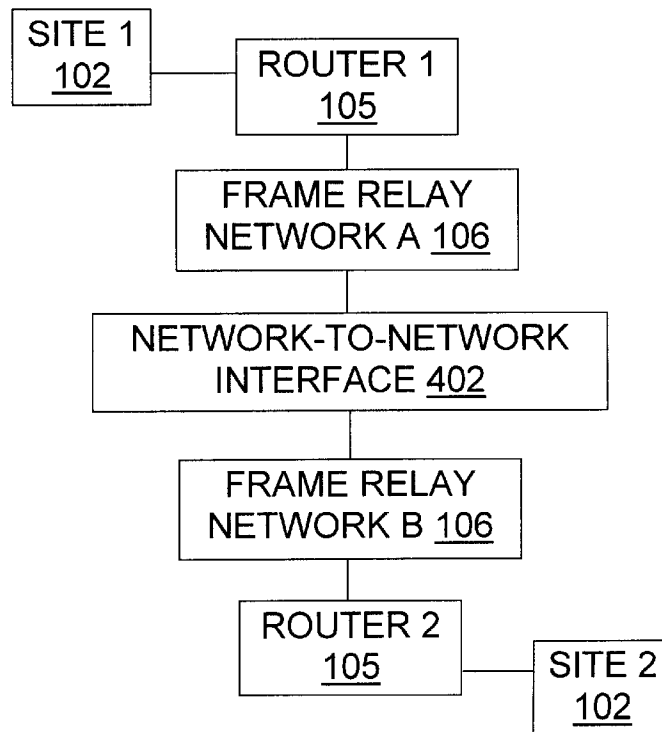
(PRIOR ART)

Fig. 2



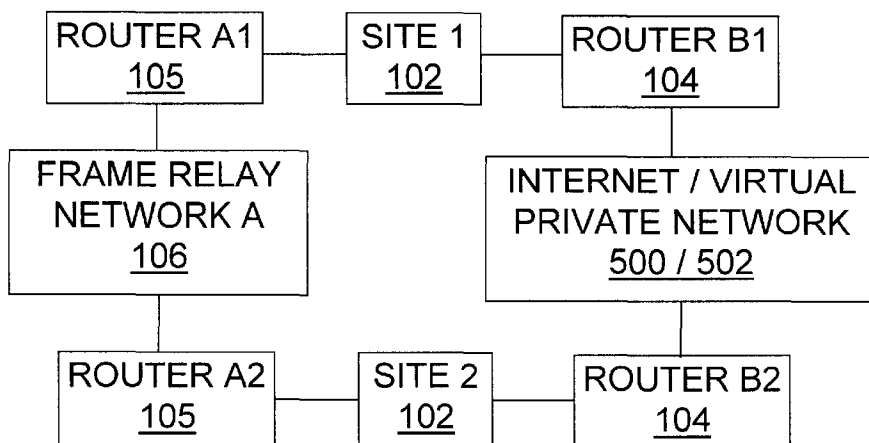
(PRIOR ART)

Fig. 3



(PRIOR ART)

Fig. 4



(PRIOR ART)

Fig. 5

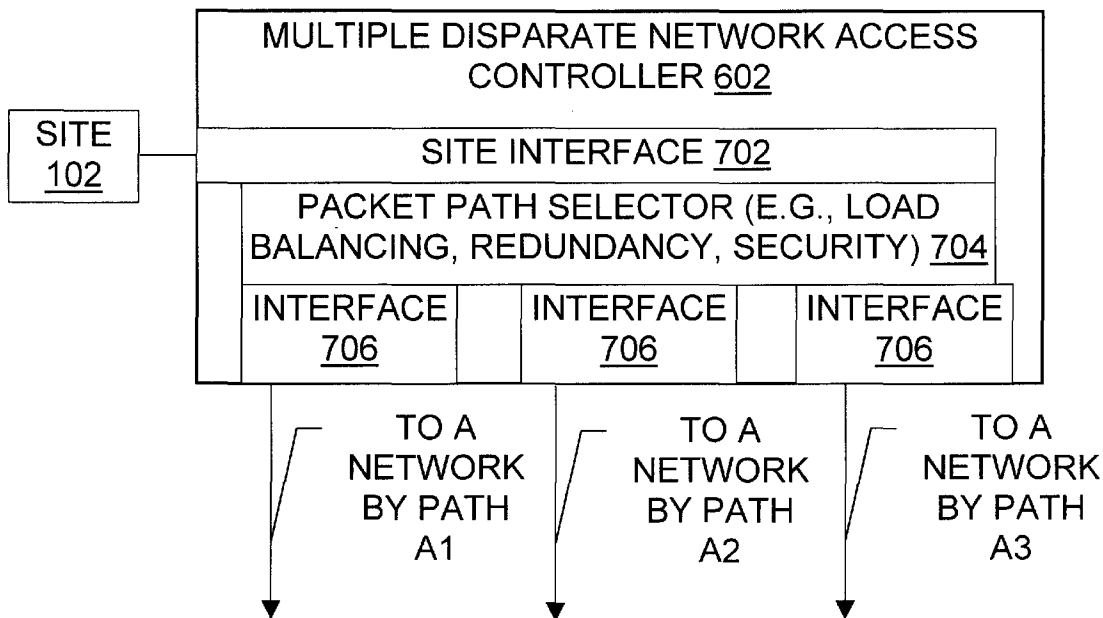


Fig. 7

# 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.