

# Exhibit 5

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

(10) **Patent No.:** US 6,910,069 B1  
 (45) **Date of Patent:** Jun. 21, 2005

- (54) **JOINING A BROADCAST CHANNEL**
- (75) Inventors: **Fred B. Holt**, Seattle, WA (US); **Virgil E. Bourassa**, Bellevue, WA (US)
- (73) Assignee: **The Boeing Company**, Seattle, WA (US)
- (\* ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 708 days.

5,696,903 A	12/1997	Mahany
5,732,074 A	3/1998	Spaur et al.
5,732,086 A *	3/1998	Liang et al. .... 370/410
5,732,219 A	3/1998	Blumer et al.
5,734,865 A	3/1998	Yu
5,737,526 A	4/1998	Periasamy et al.
5,754,830 A	5/1998	Butts et al.

(Continued)

- (21) Appl. No.: **09/629,570**
- (22) Filed: **Jul. 31, 2000**
- (51) **Int. Cl.**<sup>7</sup> ..... **G06F 15/177**
- (52) **U.S. Cl.** ..... **709/221; 709/252; 709/243; 709/227**
- (58) **Field of Search** ..... **709/221, 220, 709/252, 243, 227, 223, 204, 238; 370/225, 260, 400; 455/428**

**OTHER PUBLICATIONS**

Cho et al., "A Flood Routing Method for Data Networks," Sep. 1997, Proceedings of 1997 International Conference on Information, Communications and Signal Processing, vol. 3, pp. 1418-1422.\*  
 Bandyopadhyay et al., "A Flexible Architecture for Multi-Hop Optical Networks," Oct. 1998, 7th International Conference on Computer Communications and Networks, 1998, pp. 472-478.\*

(Continued)

*Primary Examiner*—Glenton B. Burgess  
*Assistant Examiner*—Bradley Edelman  
 (74) *Attorney, Agent, or Firm*—Perkins Coie LLP

(56) **References Cited**

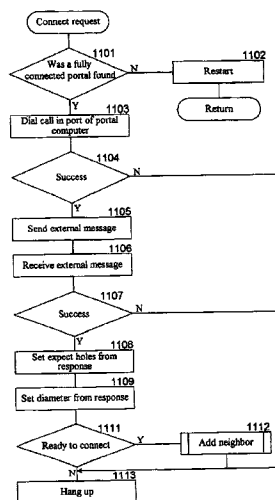
**U.S. PATENT DOCUMENTS**

4,912,656 A	3/1990	Cain et al.
5,056,085 A	10/1991	Vu
5,058,105 A	10/1991	Mansour et al.
5,079,767 A	1/1992	Perlman
5,099,235 A *	3/1992	Crookshanks ..... 455/13.1
5,101,480 A *	3/1992	Shin et al. .... 710/317
5,117,422 A *	5/1992	Hauptschein et al. .... 370/255
5,309,437 A	5/1994	Perlman et al.
5,345,558 A	9/1994	Opher et al.
5,426,637 A	6/1995	Derby et al.
5,459,725 A	10/1995	Bodner et al.
5,471,623 A *	11/1995	Napolitano, Jr. .... 709/243
5,511,168 A	4/1996	Perlman et al.
5,535,199 A	7/1996	Amri et al.
5,568,487 A	10/1996	Sitbon et al.
5,636,371 A	6/1997	Yu
5,644,714 A	7/1997	Kikinis
5,673,265 A	9/1997	Gupta et al.

(57) **ABSTRACT**

A technique for adding a participant to a network is provided. This technique allows for the simultaneous sharing of information among many participants in a network without the placement of a high overhead on the underlying communication network. To connect to the broadcast channel, a seeking computer first locates a computer that is fully connected to the broadcast channel. The seeking computer then establishes a connection with a number of the computers that are already connected to the broadcast channel. The technique for adding a participant to a network includes identifying a pair of participants that are connected to the network, disconnecting the participants of the identified pair from each other, and connecting each participant of the identified pair of participants to the added participant.

**17 Claims, 39 Drawing Sheets**



## US 6,910,069 B1

Page 2

## U.S. PATENT DOCUMENTS

5,757,795	A	5/1998	Schnell	
5,761,425	A	6/1998	Miller	
5,764,756	A	6/1998	Onweller	
5,790,548	A	8/1998	Sistanizadeh et al.	
5,790,553	A	8/1998	Deaton, Jr. et al.	
5,799,016	A	8/1998	Onweller	
5,802,285	A	9/1998	Hirviniemi	
5,850,592	A	12/1998	Ramanathan	
5,864,711	A	1/1999	Mairs et al.	
5,867,660	A	2/1999	Schmidt et al.	
5,867,667	A	2/1999	Butman et al.	
5,870,605	A	2/1999	Bracho et al.	
5,874,960	A	2/1999	Mairs et al.	
5,899,980	A	5/1999	Wilf et al.	
5,907,610	A	5/1999	Onweller	
5,925,097	A	7/1999	Gopinath et al.	
5,928,335	A	7/1999	Morita	
5,935,215	A	8/1999	Bell et al.	
5,946,316	A	8/1999	Chen et al.	
5,948,054	A	9/1999	Nielsen	
5,949,975	A	9/1999	Batty et al.	
5,953,318	A	9/1999	Nattkemper et al.	
5,956,484	A	9/1999	Rosenberg et al.	
5,970,232	A	10/1999	Passint et al.	
5,974,043	A	10/1999	Solomon	
5,987,506	A	11/1999	Carter et al.	
6,003,088	A	12/1999	Houston et al.	
6,013,107	A	1/2000	Blackshear et al.	
6,023,734	A	2/2000	Ratcliff et al.	
6,029,171	A	2/2000	Smiga et al.	
6,032,188	A	2/2000	Mairs et al.	
6,038,602	A	3/2000	Ishikawa	
6,047,289	A	4/2000	Thorne et al.	
6,065,063	A *	5/2000	Abali .....	709/242
6,073,177	A	6/2000	Hebel et al.	
6,094,676	A	7/2000	Gray et al.	
6,115,580	A	9/2000	Chuprun et al.	
6,151,633	A	11/2000	Hurst	
6,167,432	A	12/2000	Jiang	
6,173,314	B1	1/2001	Kurashima et al.	
6,195,366	B1	2/2001	Kayashima	
6,199,116	B1	3/2001	May et al.	
6,216,177	B1	4/2001	Mairs et al.	
6,223,212	B1	4/2001	Batty et al.	
6,243,691	B1	6/2001	Fisher et al.	
6,252,884	B1	6/2001	Hunter	
6,268,855	B1	7/2001	Mairs et al.	
6,269,080	B1	7/2001	Kumar	
6,271,839	B1	8/2001	Mairs et al.	
6,272,548	B1	8/2001	Cotter et al.	
6,285,363	B1	9/2001	Mairs et al.	
6,304,928	B1	10/2001	Mairs et al.	
6,321,270	B1	11/2001	Crawley	
6,353,599	B1	3/2002	Bi et al.	
6,415,270	B1	7/2002	Rackson et al.	
6,434,622	B1	8/2002	Monteiro et al.	
6,463,078	B1	10/2002	Engstrom et al.	
6,490,247	B1 *	12/2002	Gilbert et al. ....	370/222
6,499,251	B2	12/2002	Weder	
6,505,289	B1 *	1/2003	Han et al. ....	712/11
6,524,189	B1	2/2003	Rautila	
6,553,020	B1 *	4/2003	Hughes et al. ....	370/347
6,603,742	B1 *	8/2003	Steele et al. ....	370/254
6,611,872	B1	8/2003	McCanne	
6,618,752	B1	9/2003	Moore et al.	

## OTHER PUBLICATIONS

Hsu, "On Four-Connecting a Triconnected Graph," Oct. 1992, Annual Symposium on Foundations of Computer Science, 1992, pp. 70-79.\*

Shiokawa et al., "Performance Analysis of Network Connective Probability of Multihop Network under Correlated Breakage," Jun. 1996, 1996 IEEE International Conference on Communications, vol. 3, pp. 1581-1585.\*

Komine et al., "A Distributed Restoration Algorithm for Multiple-Link and Node Failures of Transport Networks," Dec. 1999 IEEE Globecom '90, 'Communications: Connecting the Future,' vol. 1, pp. 459-463.\*

U.S. Appl. No. 09/629,576, filed Jul. 31, 2000, Bourassa et al.

U.S. Appl. No. 09/629,577, filed Jul. 31, 2000, Bourassa et al.

U.S. Appl. No. 09/629,575, filed Jul. 31, 2000, Bourassa et al.

U.S. Appl. No. 09/629,572, filed Jul. 31, 2000, Bourassa et al.

U.S. Appl. No. 09/629,023, filed Jul. 31, 2000, Bourassa et al.

U.S. Appl. No. 09/629,043, filed Jul. 31, 2000, Bourassa et al.

U.S. Appl. No. 09/629,024, filed Jul. 31, 2000, Bourassa et al.

U.S. Appl. No. 09/629,042, filed Jul. 31, 2000, Bourassa et al.

Murphy, Patricia, A., "The Next Generation Networking Paradigm: Producer/Consumer Model," Dedicated Systems Magazine—2000 (pp. 26-28).

The Gamer's Guide, "First-Person Shooters," Oct. 20, 1998 (4 pages).

The O'Reilly Network, "Gnutella: Alive, Well, and Changing Fast," Jan. 25, 2001 (5 pages) <http://www.open2p.com/1pt/> . . . [Accessed Jan. 29, 2002].

Oram, Andy, "Gnutella and Freenet Represents True Technological Innovation," May 12, 2000 (7 pages) The O'Reilly Network <http://www.oreillynet.com/1pt/> . . . [Accessed Jan. 29, 2003].

Internetworking Technologies Handbook, Chapter 43 (pp. 43-1-43-16).

Oram, Andy, "Peer-to-Peer Makes the Internet Interesting Again," Sep. 22, 2000 (7 pages) The O'Reilly Network <http://linux.oreillynet.com/1pt/> . . . [Accessed Jan. 29, 2002].

Monte, Richard, "The Random Walk for Dummies," MIT Undergraduate Journal of Mathematics (pp. 143-148).

Srinivasan, R., "XDR: External Data Representation Standard," Sun Microsystems, Aug. 1995 (20 pages) Internet RFC/STD/FYI/BCP Archives <http://www.faqs.org/rfcs/rfc1832.html> [Accessed Jan. 29, 2002].

A Databeam Corporate White Paper, "A Primer on the T.120 Series Standards," Copyright 1995 (pp. 1-16).

Kessler, Gary, C., "An Overview of TCP/IP Protocols and the Internet," Apr. 23, 1999 (23 pages) Hill Associates, Inc. <http://www.hill.com/library/publications/t/> . . . [Accessed Jan. 29, 2002].

Bondy, J.A., and Murty, U.S.R., "Graph Theory with Applications," Chapters 1-3 (pp. 1-47), 1976 American Elsevier Publishing Co., Inc., New York, New York.

Cormen, Thomas, H. et al., Introduction to Algorithms, Chapter 5.3 (pp. 84-91), Chapter 12 (pp. 218-243), Chapter

US 6,910,069 B1

Page 3

---

The Common Object Request Broker: Architecture and Specification, Review 2.6, Dec. 2001, Chapter 12 (pp. 12-1-12-10), Chapter 13 (pp. 13-1-13-56), Chapter 16 (pp. 16-1-16-26), Chapter 18 (pp. 18-1-18-52), Chapter 20 (pp. 20-1-20-22).

The University of Warwick, Computer Science Open Days, "Demonstration on the Problems of Distributed Systems," <http://www.dcs.warwick.ac.uk> . . . [Accessed Jan. 29, 2002]. Alagar, S. and Venkatesan, S., "Reliable Broadcast in Mobile Wireless Networks," Department of Computer Science, University of Texas at Dallas, Military Communications Conference, 1995, MILCOM '95 Conference Record, IEEE San Diego, California, Nov. 5-8, 1995 (pp. 236-240). International Search Report for The Boeing Company, International Patent Application No. PCT/US01/24240, Jun. 5, 2002 (7 pages).

Yavatkar et al., "A reliable Dissemination Protocol for Interactive Collaborative Applications," Proc. ACM Multimedia, 1995, p. 333-344; <http://citeseer.nj.nec.com/article/yavatkar95reliable.htm>.

Business Wire, "Boeing Panthesis Complete SWAN Transaction," Jul. 22, 2002, pp 1ff.

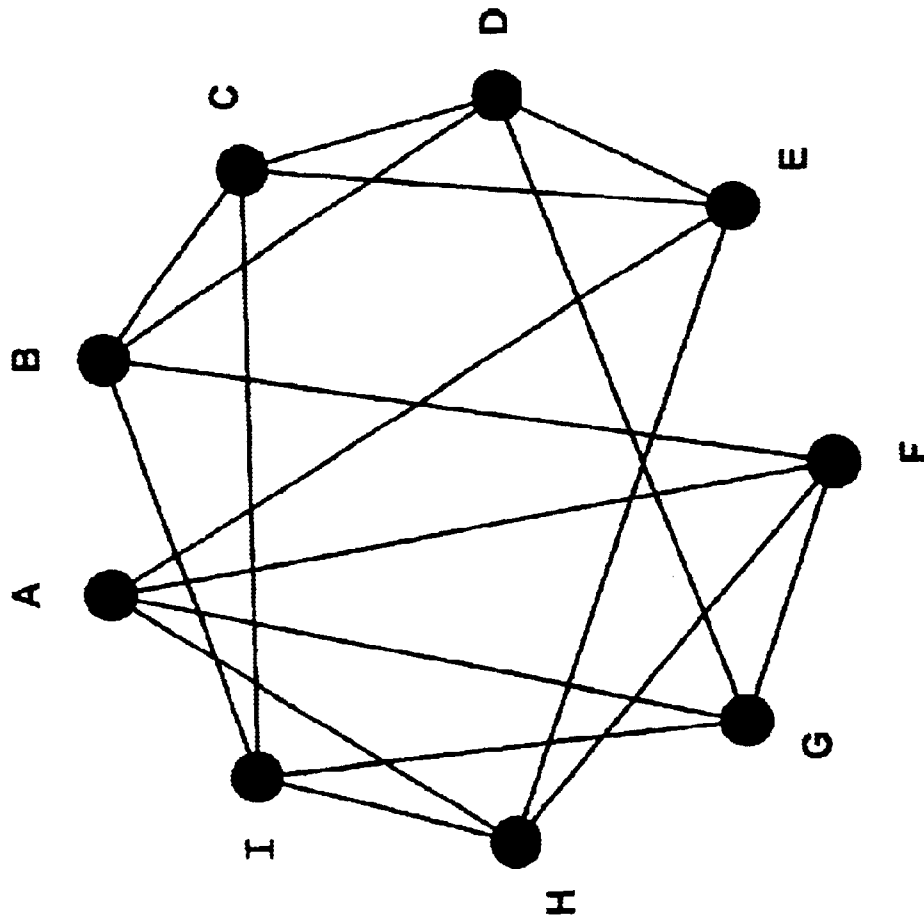
PR Newswire, "Microsoft Annouces Launch Date for UltraCrops, Its Second Premium Title for the Internet Gaming Zone," Mar. 27, 1998, pp1 ff.

PR Newswire, "Microsoft Boosts Accessibility to Internet Gaming Zone with Latest Release," Apr. 27, 1998, pp 1ff.

Peercy et al., "Distributed Algorithms for Shortest-Path, Deadlock-Free Routing and Broadcasting in Arbitrarily Faulty Hypercubes," Jun. 1990, 20th International Symposium on Fault-Tolerant Computing, 1990, pp-218-225.

Azar et al., "Routing Strategies for Fast Networks," May 1992, INFOCOM '92 Eleventh Annual Joint Conference of the IEEE Computer Communications Societies, vol. 1, 170-179###.

\* cited by examiner



*Fig. 1*

# 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.