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Anderson, IV et al.

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(54) **SYSTEM, METHOD AND COMPUTER PROGRAM PRODUCT FOR CACHING DOMAIN NAME SYSTEM INFORMATION ON A NETWORK GATEWAY**

FOREIGN PATENT DOCUMENTS

WO WO 00/27092 5/2000

OTHER PUBLICATIONS

WO 00/27092; "DNS Relay Module in a Digital Network Modem"; Eicon Technology Corporation; May 11, 2000.*
Mockapetris, P.; "Domain Names—Implementation and Specification"; RFC 1035; Nov. 1987.*
Kasser, Barbara; "Practical Internet"; 2000; Que; pp. 40-43.*
Perry, Greg M.; "Sams Teach Yourself PCs in 24 Hours"; 1999; Sams Publishing; pp. 72 and 431.*
Copy of European Search Report, dated Aug. 24, 2004, issued in EP application No. 03004067.9, 5 pages.
Cohen et al. "Prefetching The Means For Document Transfer: A New Approach For Reducing Web Latency".IEEE INFOCOM 2000, Proceedings of the Nineteenth Annual Joint Conference of the IEEE Computer and Communications Societies, Tel Aviv, Israel, Mar. 26-30, 2000, pp. 854-863.

(75) Inventors: **Charles Edward Anderson, IV**, Woodstock, GA (US); **Thomas Carroll Willis, Jr.**, Westminster, CO (US); **Jason Andrew Willis**, Westminster, CO (US)

(73) Assignee: **Broadcom Corporation**, Irvine, CA (US)

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(65) **Prior Publication Data**

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(51) **Int. Cl.**
G06F 15/16 (2006.01)

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

(58) **Field of Classification Search** **709/245, 709/203, 202, 225**

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

6,016,512	A *	1/2000	Huitema	709/245
6,256,671	B1 *	7/2001	Strentzsch et al.	709/227
6,262,987	B1 *	7/2001	Mogul	370/400
6,532,490	B1 *	3/2003	Lewis et al.	709/217
6,976,090	B1 *	12/2005	Ben-Shaul et al.	709/246
2002/0031102	A1 *	3/2002	Wiedeman et al.	370/316
2002/0103783	A1 *	8/2002	Muhlestein	707/1
2003/0012147	A1 *	1/2003	Buckman et al.	370/260
2004/0073707	A1 *	4/2004	Dillon	709/245

(Continued)

Primary Examiner—William Vaughn

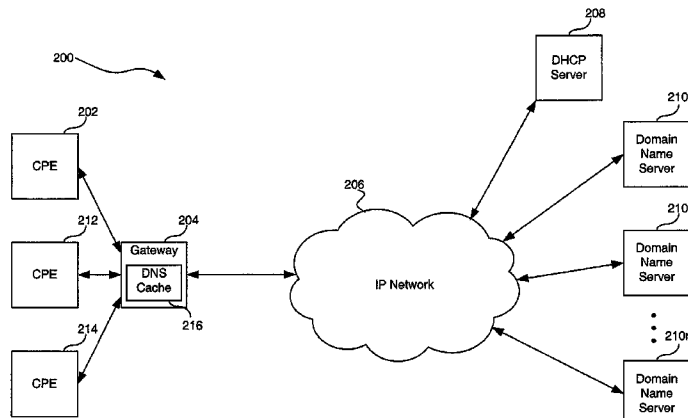
Assistant Examiner—Joseph Maniwang

(74) *Attorney, Agent, or Firm*—Sterne, Kessler, Goldstein & Fox P.L.L.C.

(57) **ABSTRACT**

A system, method and computer program product is provided for caching domain name system (DNS) information on a network gateway. In particular, a network gateway that interfaces one or more customer premises equipment (CPE) devices to an IP network maintains a centralized on-board cache for storing domain names and corresponding IP addresses. The domain names and IP addresses in the cache are used by the network gateway to resolve DNS queries generated by application programs running on the CPE devices in a manner that is transparent to the CPE devices and that does not expend CPE resources. The cache may be initially loaded by an attached CPE or an external network entity and is continuously populated with information extracted from DNS messages exchanged between a CPE device and the external IP network.

31 Claims, 10 Drawing Sheets



OTHER PUBLICATIONS

Cohen et al., "Proactive Caching Of DNS Records: Addressing A Performance Bottleneck", *Applications and the Internet, 2001 Proceedings*, San Diego, CA, Jan. 8-12, 2001, pp. 85-94.

CableHome 1.0 Network Management and Provisioning Specification (CH-SP-NMP-W01-101201), Cable Television Laboratories, Inc., Oct. 12, 2001, 125 pages.

* cited by examiner

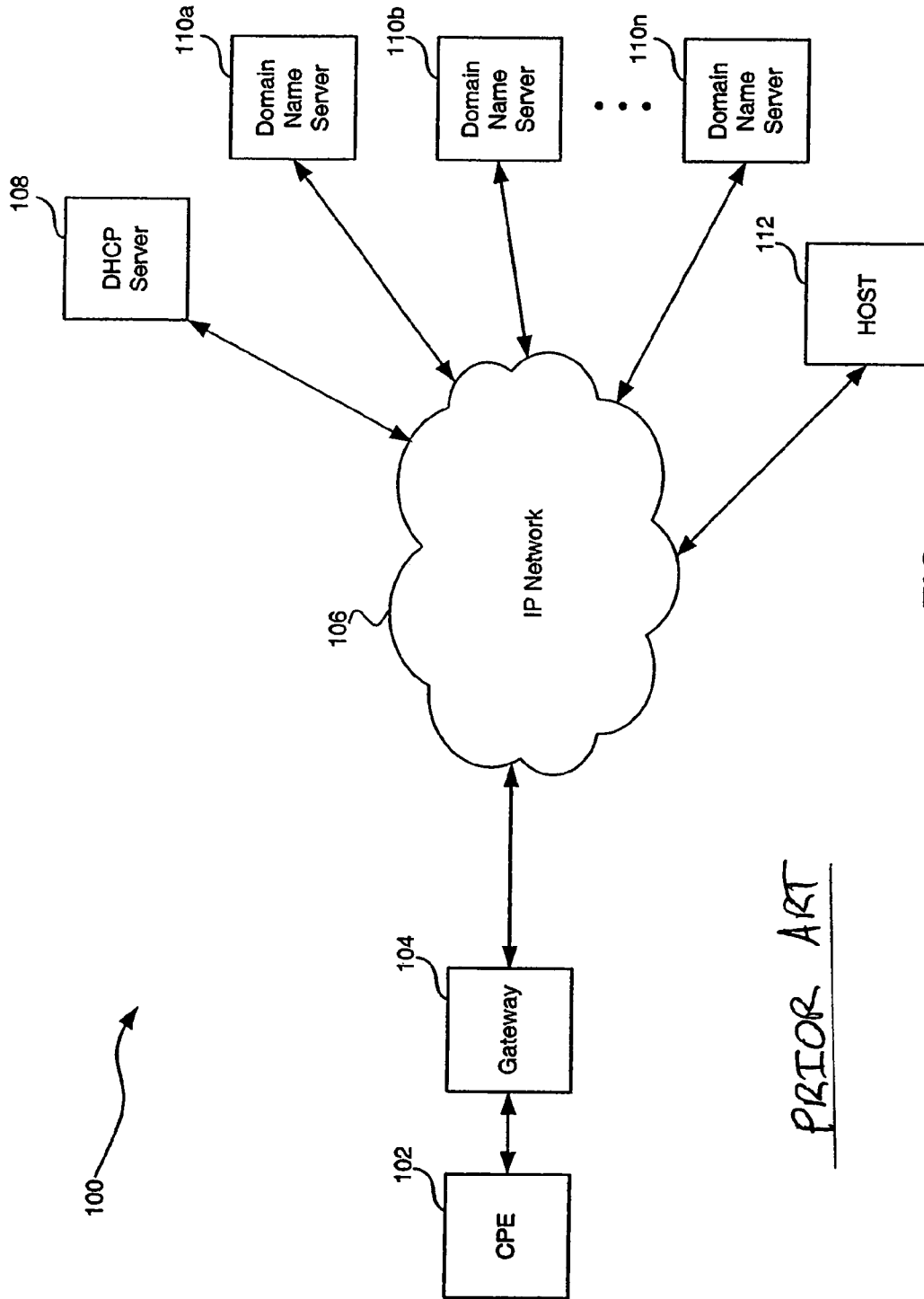


FIG. 1

PRIOR ART

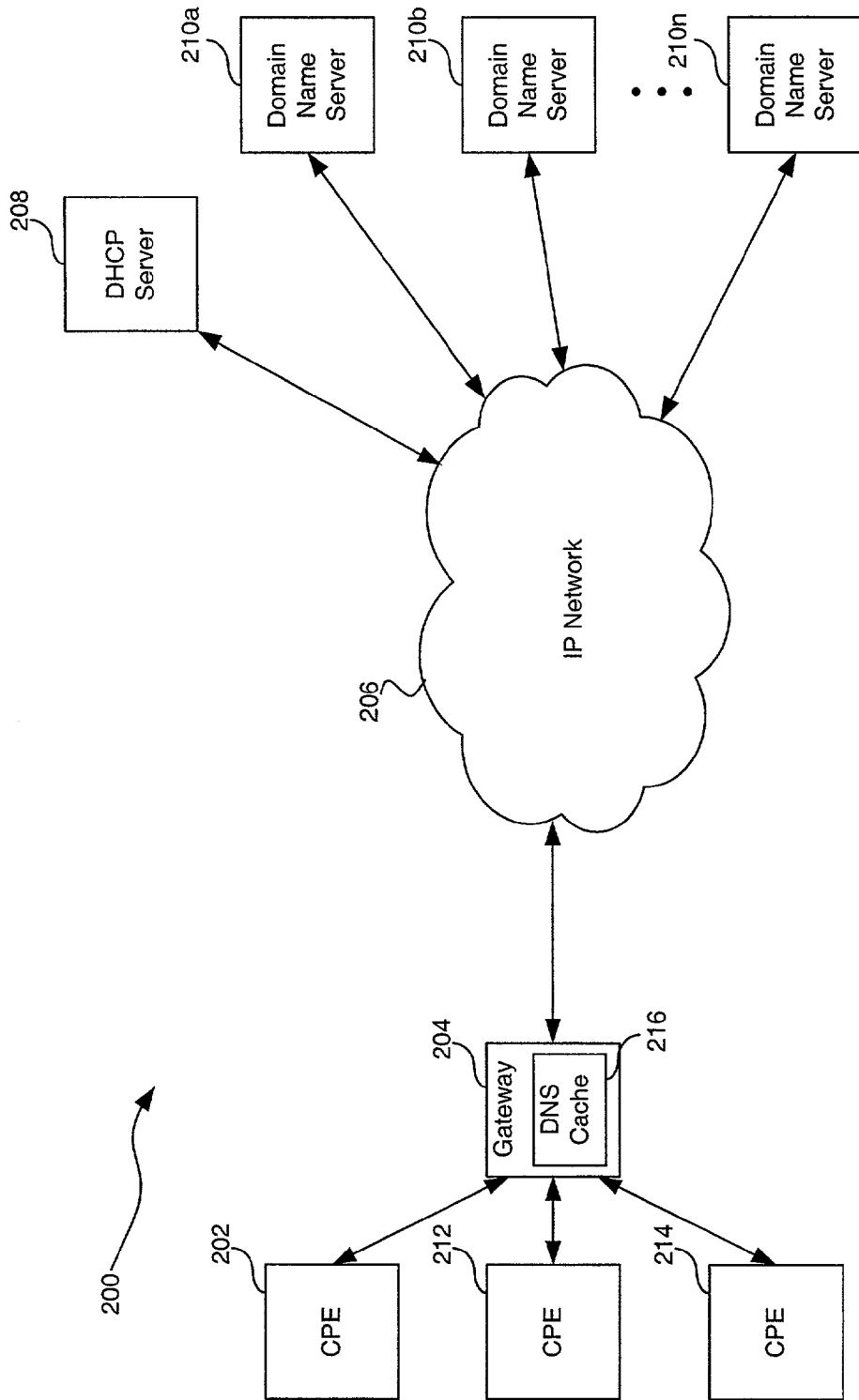


FIG. 2

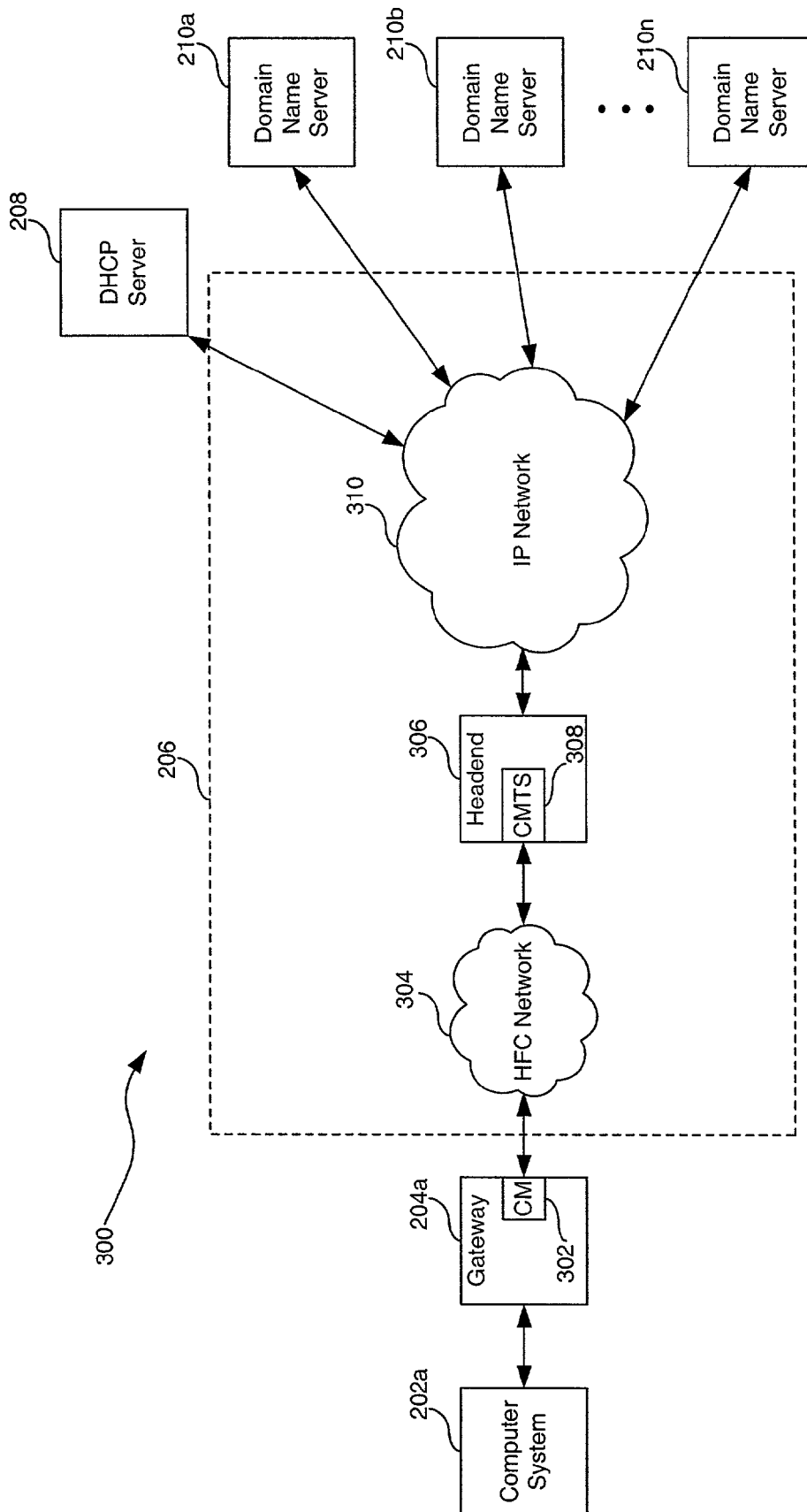


FIG. 3

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