US006865595B2

(54) **METHODS AND APPARATUS FOR SPECULATIVE PROBING OF A REMOTE CLUSTER**

(75) Inventor: **David B. Glasco**, Austin, TX (US)

(73) Assignee: **Newisys, Inc.**, Austin, TX (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 491 days.

(21) Appl. No.: **10/157,340**

(22) Filed: **May 28, 2002**

(65) **Prior Publication Data**

US 2003/0225978 A1 Dec. 4, 2003

(51) **Int. Cl.**⁷ **G06F 13/14**; G06F 12/16
(52) **U.S. Cl.** **709/206**; 709/216; 709/217; 711/141; 711/146
(58) **Field of Search** 709/206, 213, 709/216, 217, 218, 219; 711/141, 146

(56) **References Cited**

U.S. PATENT DOCUMENTS

6,067,603 A	*	5/2000	Carpenter et al.	711/141
6,167,492 A		12/2000	Keller et al.	711/154
6,338,122 B1	*	1/2002	Baumgartner et al.	711/141
6,385,705 B1		5/2002	Keller et al.	711/154
6,490,661 B1		12/2002	Keller et al.	711/150
6,615,319 B2	*	9/2003	Khare et al.	711/141
6,633,960 B1	*	10/2003	Kessler et al.	711/144
6,704,842 B1	*	3/2004	Janakiraman et al.	711/141
6,751,698 B1	*	6/2004	Deneroff et al.	710/317
6,754,782 B2	*	6/2004	Arimilli et al.	711/144
2002/0087811 A1	*	7/2002	Khare et al.	711/146
2003/0196047 A1	*	10/2003	Kessler et al.	711/147

OTHER PUBLICATIONS

HyperTransport ™ I/O Link Specification Revision 1.03, HyperTransport ™ Consortium, Oct. 10, 2001, Copyright© 2001 HyperTransport Technology Consortium.

* cited by examiner

Primary Examiner—Kevin Verbrugge
(74) *Attorney, Agent, or Firm*—Beyer Weaver & Thomas, LLP

(57) **ABSTRACT**

According to the present invention, methods and apparatus are provided for increasing the efficiency of data access in a multiple processor, multiple cluster system. Techniques are provided for speculatively probing a remote cluster from either a request cluster or a home cluster. A speculative probe associated with a particular memory line is transmitted to the remote cluster before the cache access request associated with the memory line is serialized at a home cluster. When a non-speculative probe is received at a remote cluster, the information associated with the response to the speculative probe is used to provide a response to the non-speculative probe.
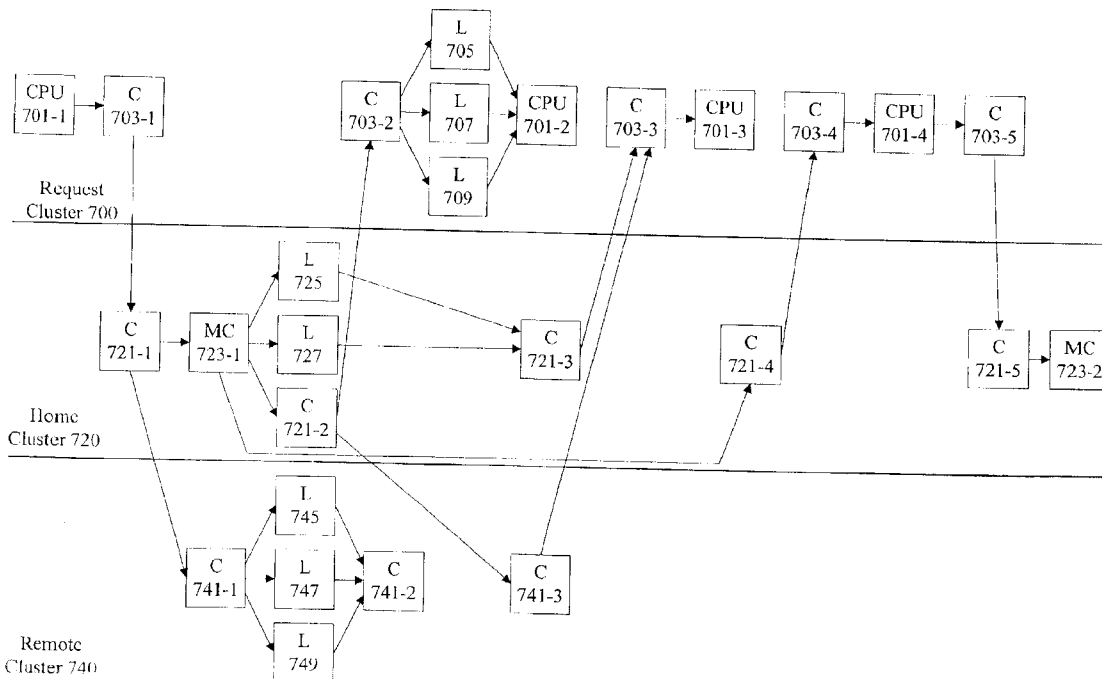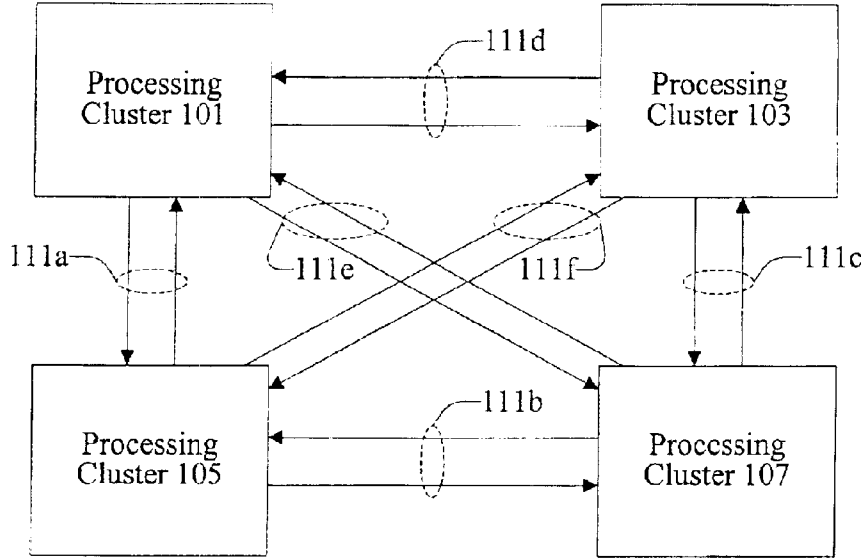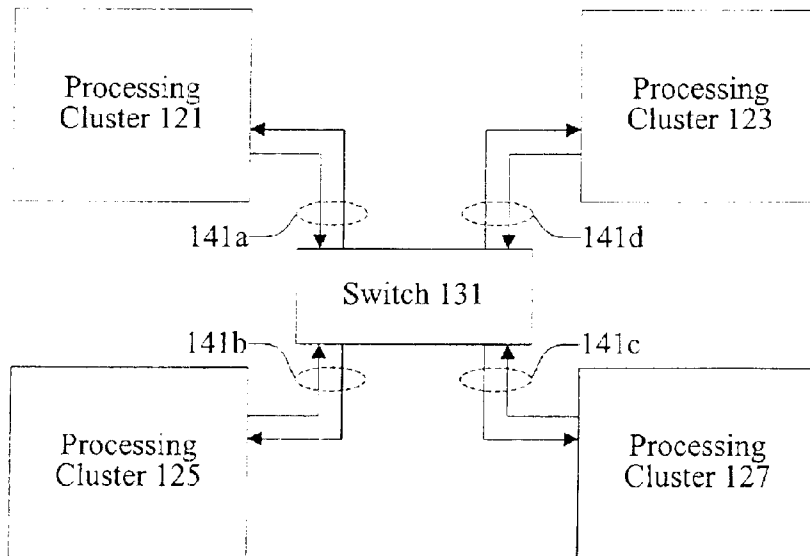
39 Claims, 15 Drawing Sheets

Figure 1A

Figure 1B

Figure 2

Figure 3

230

Coherent Interface 307

Protocol Engine 305
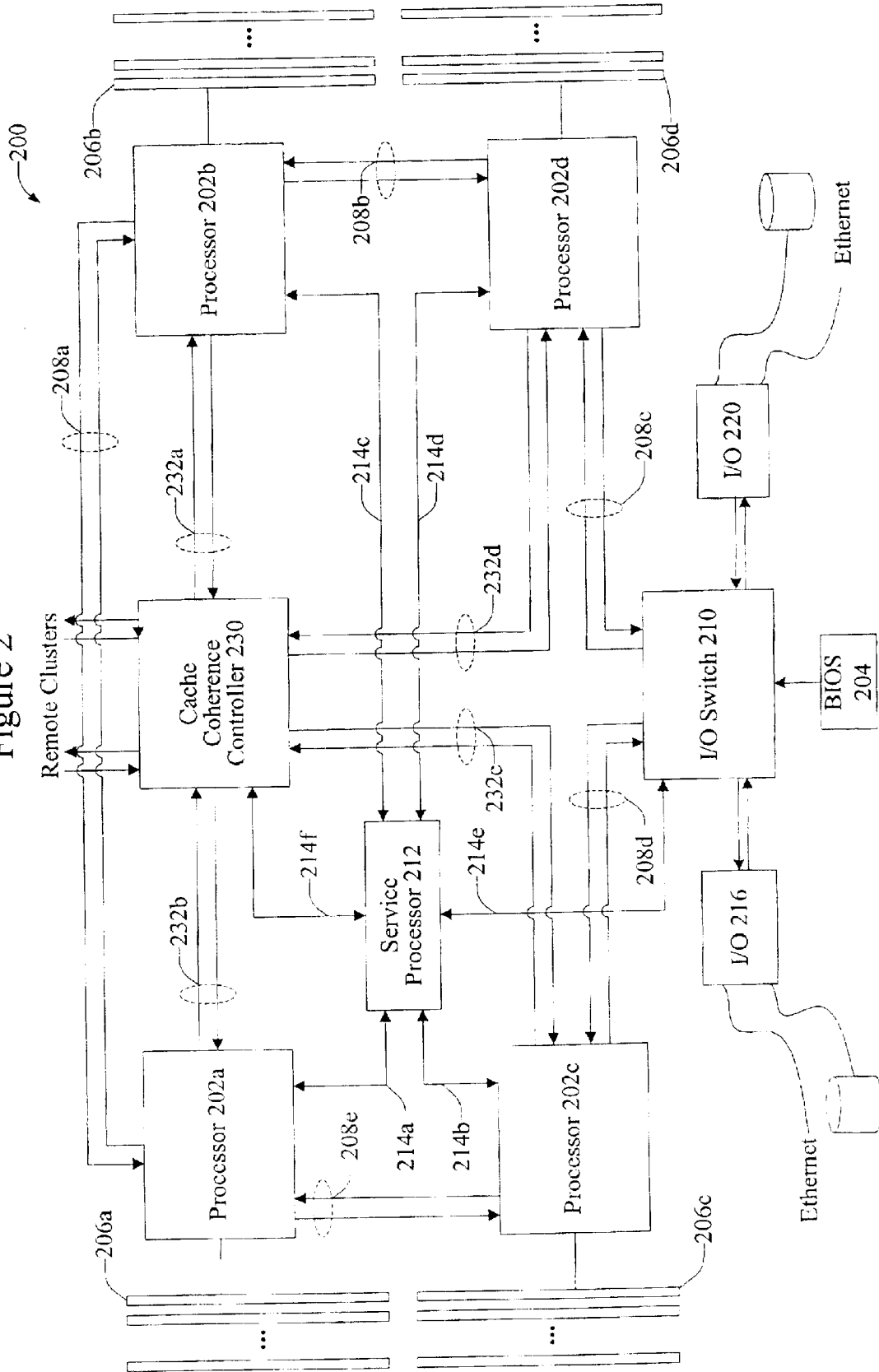
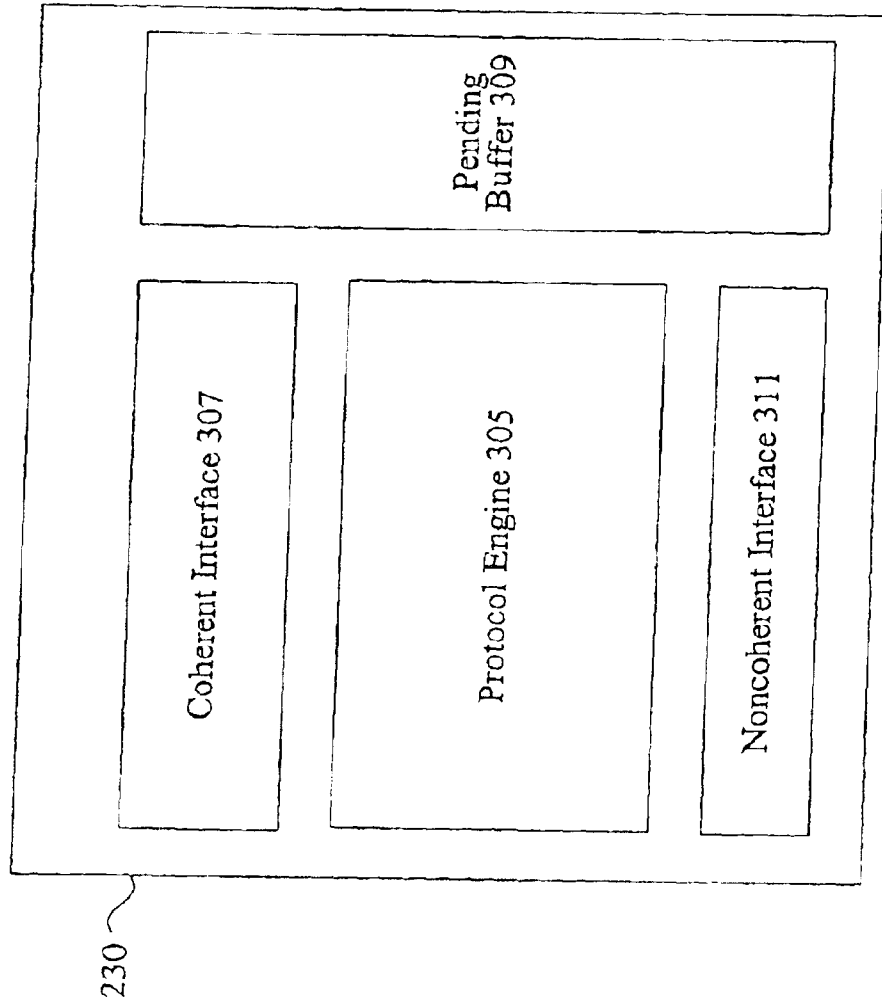Noncoherent Interface 311

Pending Buffer 309

Figure 4

DOCKET ALARM
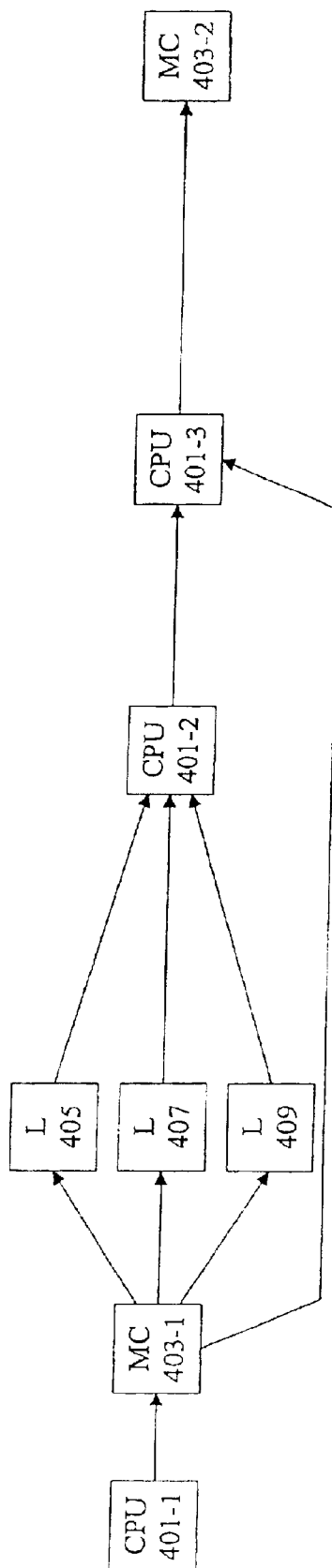
Explore Litigation Insights

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.