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**Glasco**

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- (54) **METHODS AND APPARATUS FOR SPECULATIVE PROBING WITH EARLY COMPLETION AND EARLY REQUEST**
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- (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 454 days.

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- (51) **Int. Cl.**  
**G06F 12/08** (2006.01)  
**G06F 12/16** (2006.01)
  - (52) **U.S. Cl.** ..... **711/141**; 711/118; 711/128;  
711/130; 711/146
  - (58) **Field of Classification Search** ..... 711/141-146,  
711/130, 147-149, 135-136, 119-122, 118,  
711/117
- See application file for complete search history.

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(57) **ABSTRACT**

According to the present invention, methods and apparatus are provided for increasing the efficiency of data access in multiple processor, multiple cluster systems. A cache coherence controller associated with a first cluster of processors can determine whether speculative probing can be performed before forwarding a data access request to a second cluster. The cache coherence controller can also forward the data access request to the second cluster before receiving a probe response.

**53 Claims, 15 Drawing Sheets**

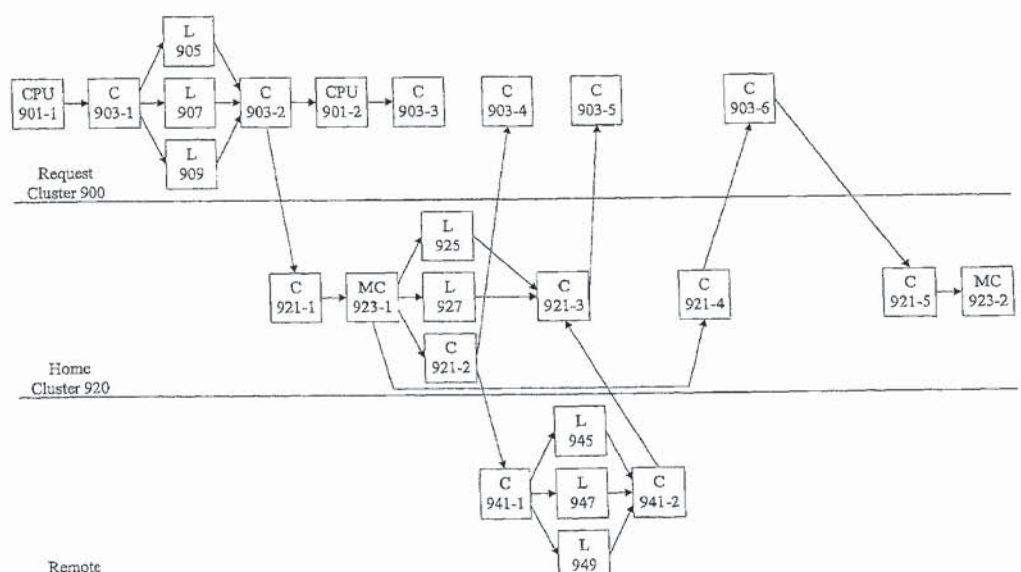


Figure 1A

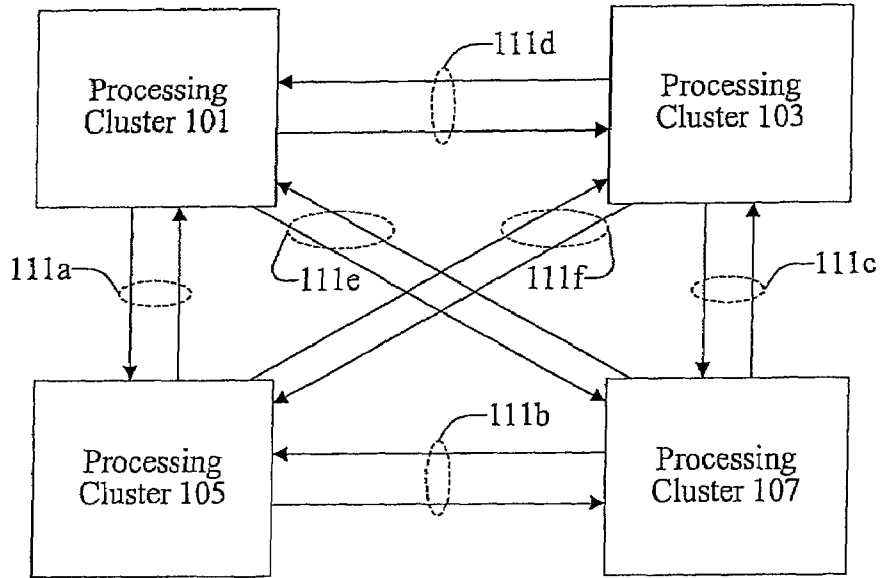


Figure 1B

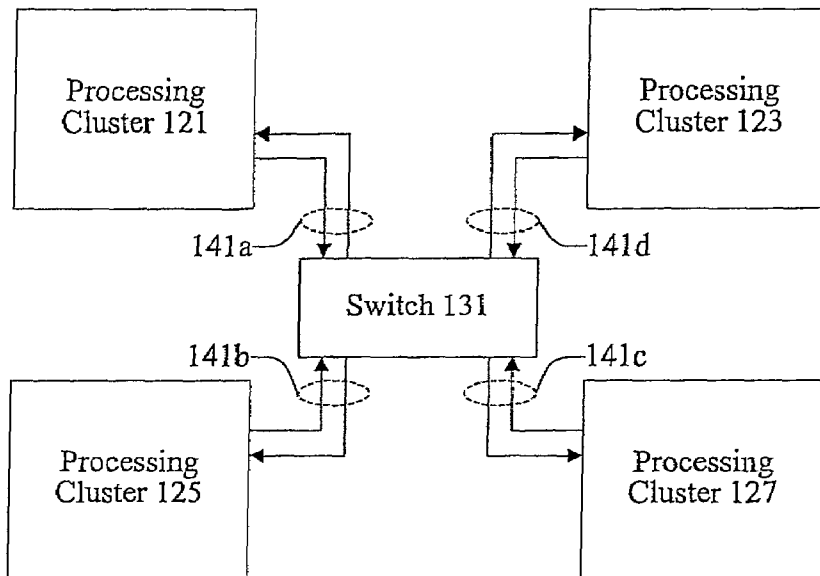


Figure 2

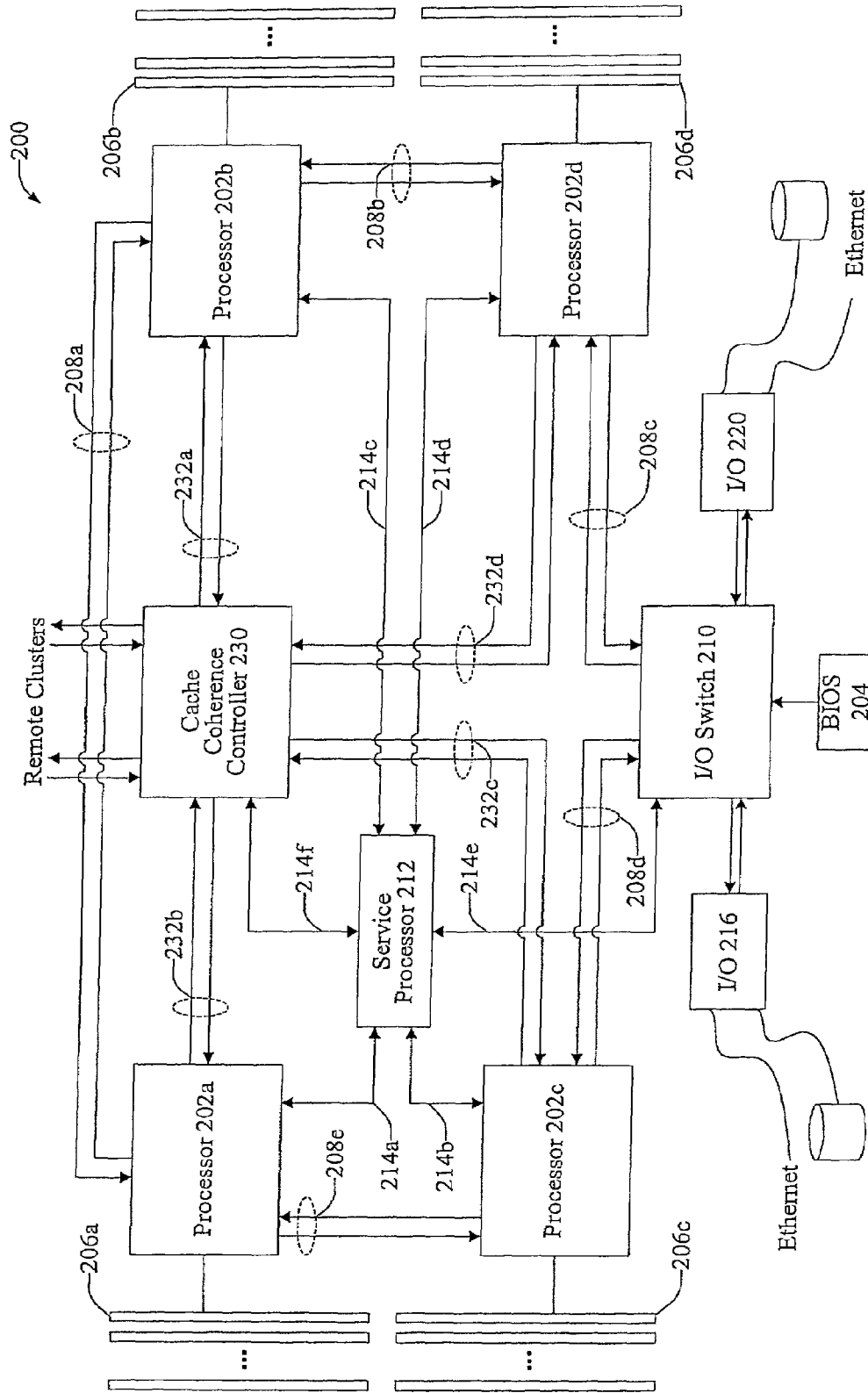


Figure 3

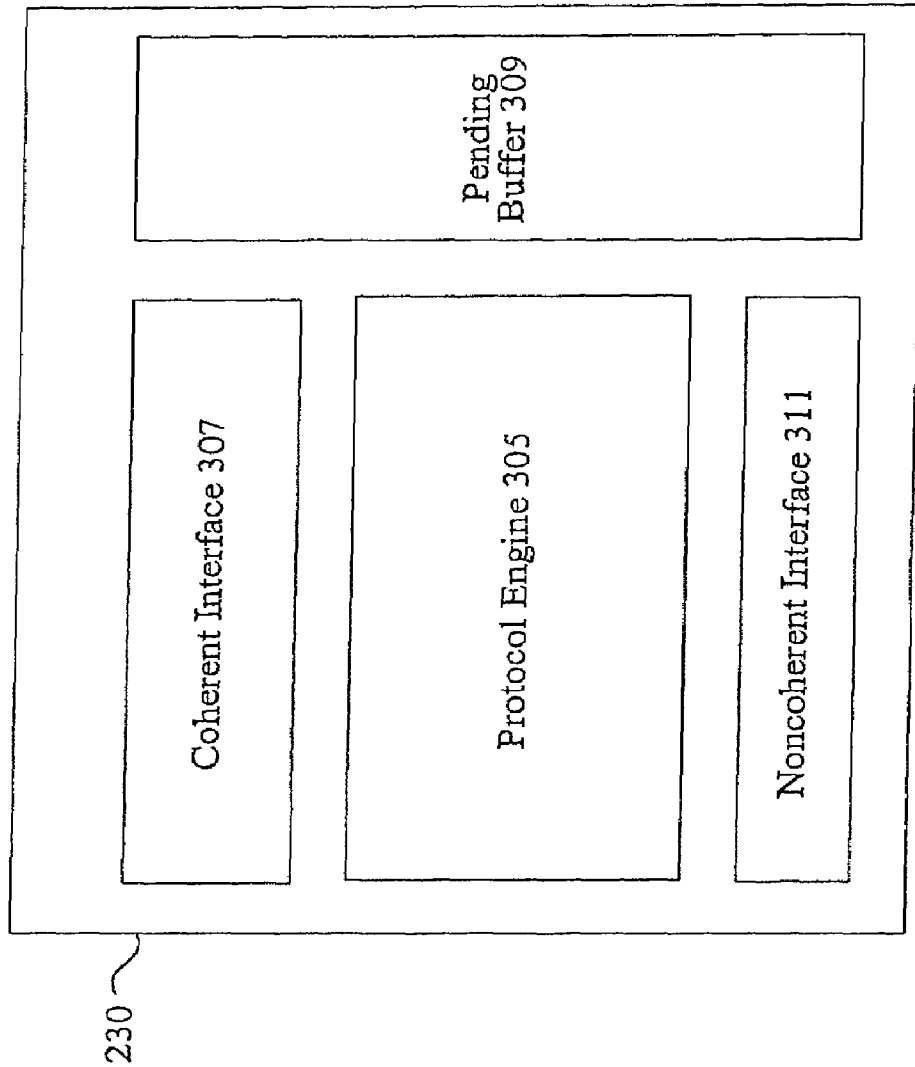
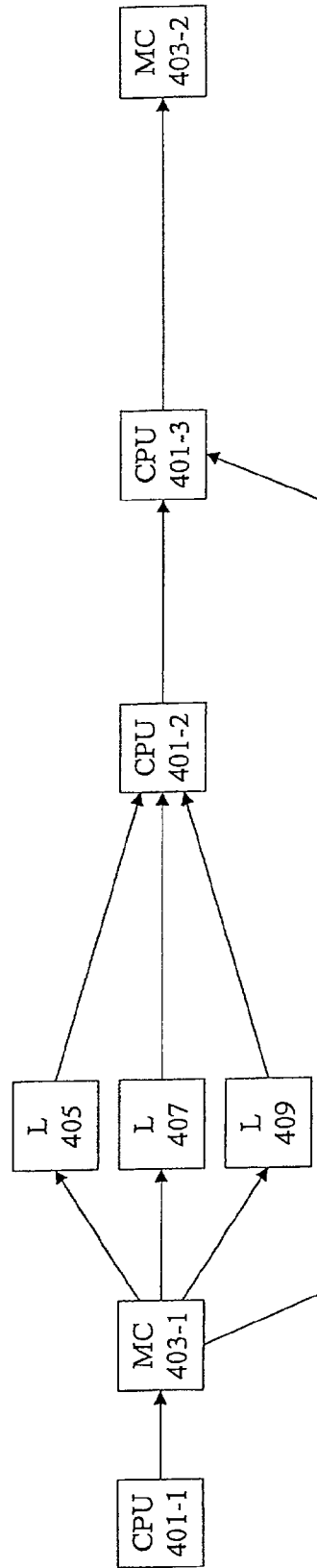


Figure 4



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