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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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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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Primary Examiner—Matthew Kim

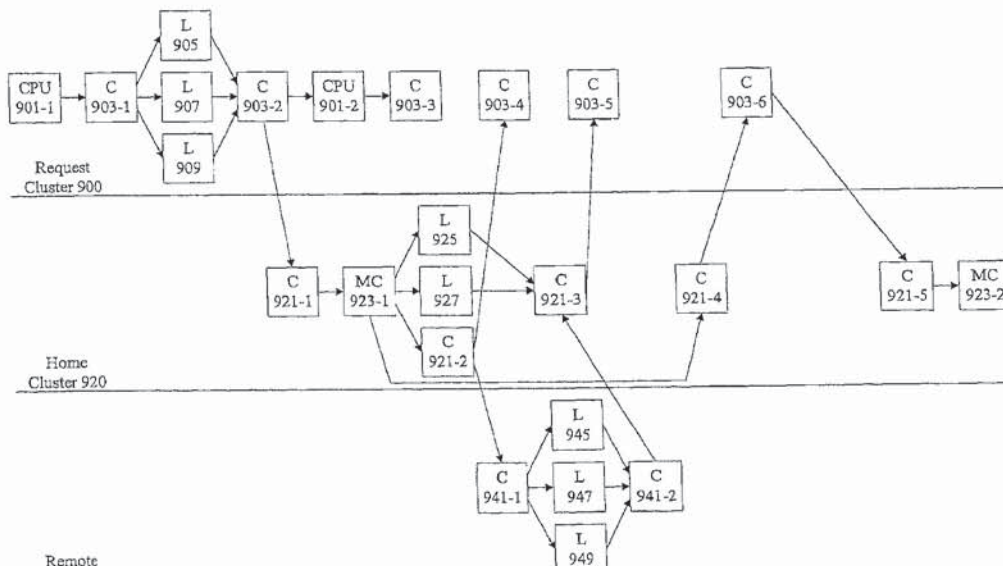
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(57) **ABSTRACT**

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



Remote

Figure 1A

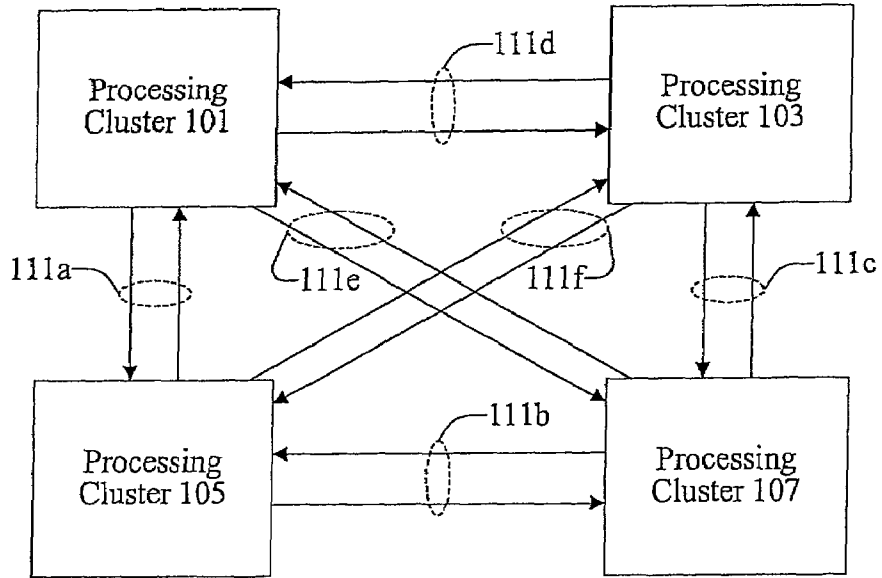


Figure 1B

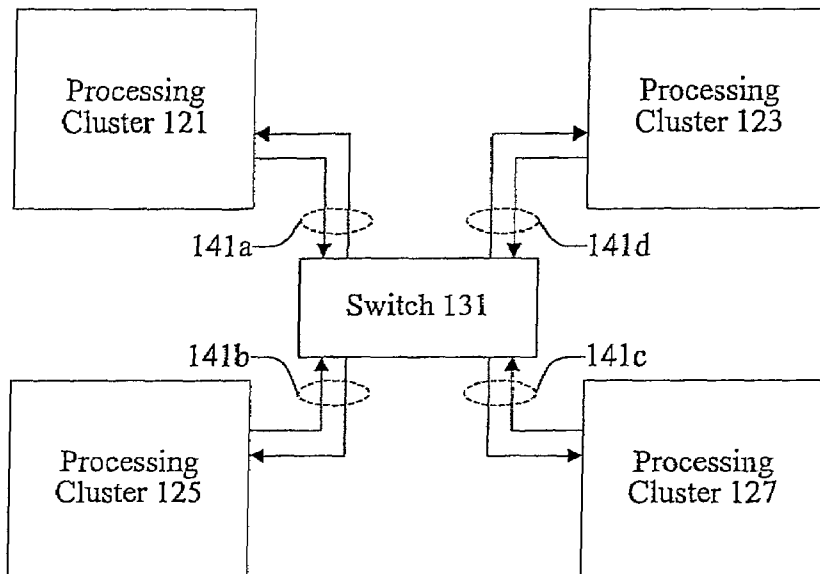


Figure 2

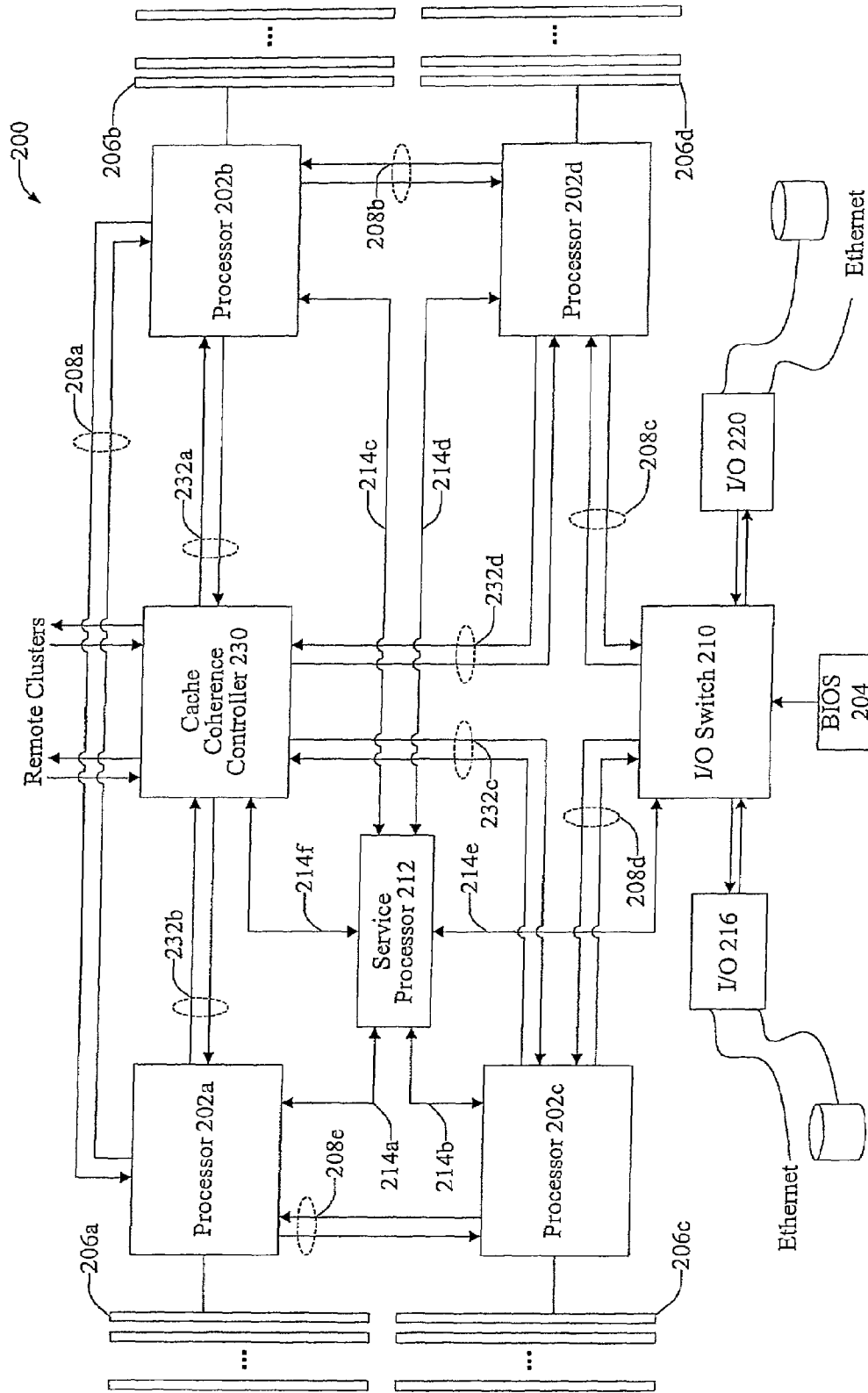


Figure 3

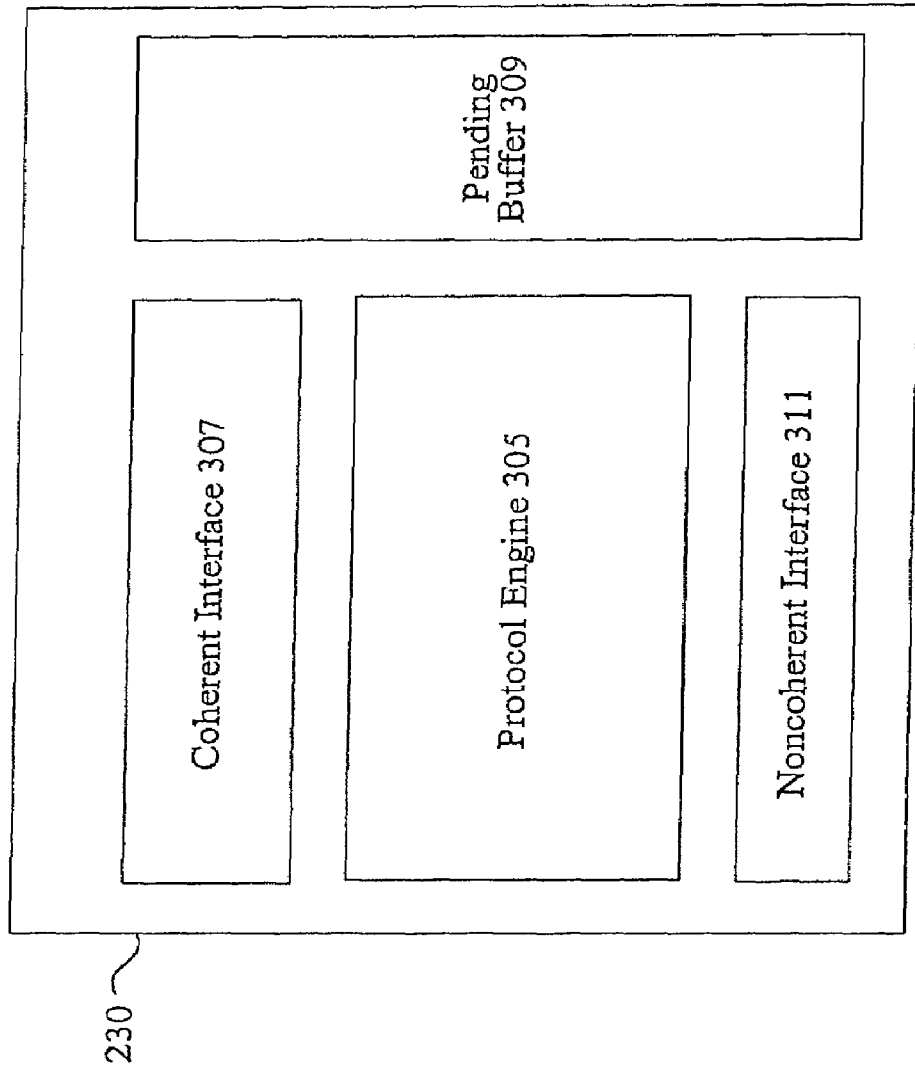
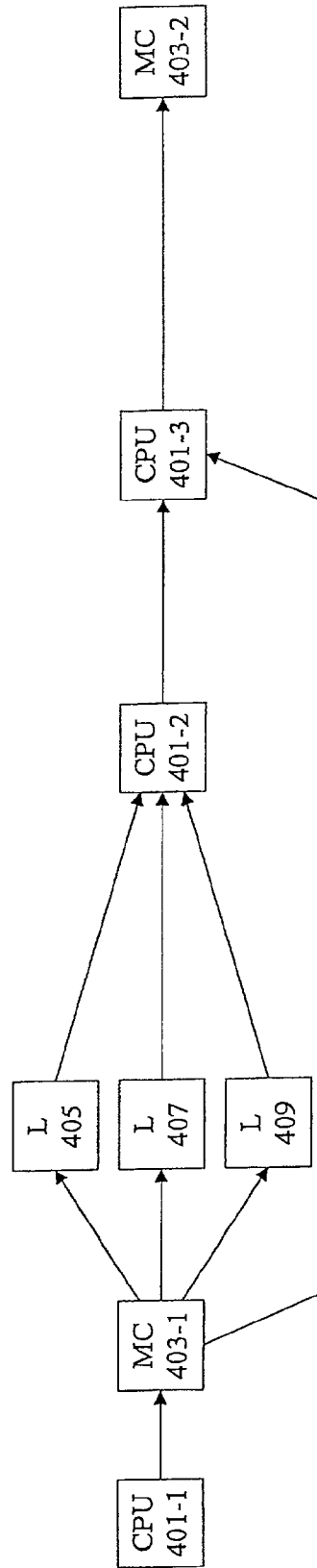


Figure 4



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