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**Mehrotra et al.**

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- (54) **METHODS AND SYSTEMS FOR FAST PACKET FORWARDING** 5,983,223 A \* 11/1999 Perlman ..... 707/6  
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**Related U.S. Application Data**

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(51) **Int. Cl.**  
**G06F 12/00** (2006.01)

(52) **U.S. Cl.** ..... **370/389; 370/400; 707/3; 709/238**

(57) **ABSTRACT**

(58) **Field of Classification Search** ..... **370/389, 370/392, 393, 400; 707/3; 709/238**  
See application file for complete search history.

Methods and systems for fast packet forwarding include traversing a trie data structure stored in on-chip memory based on bits in an input address. The bits in the input address result in a predetermined location in the data structure. The number of bits that have a first value and that are located before the determined location is calculated. The calculated number of bits corresponds to an offset in a second memory device of an address to which the packet having the input address is to be forwarded. The address can be extracted using a single access to an off-chip memory device.

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**20 Claims, 20 Drawing Sheets**

