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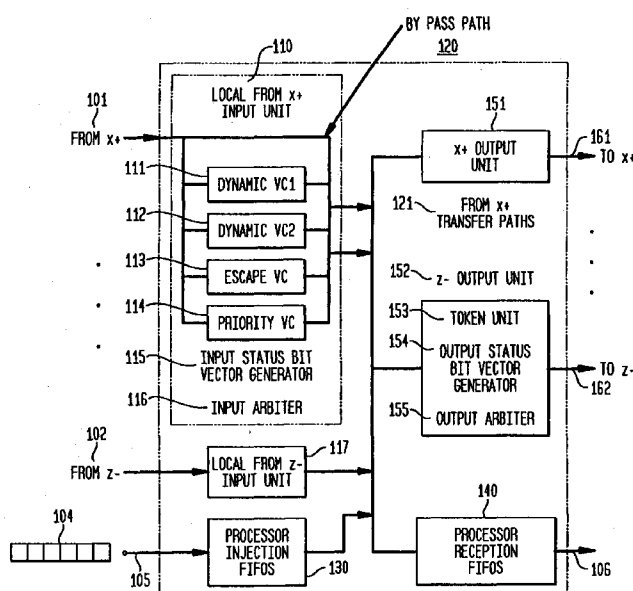
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(54) Title: OPTIMIZED SCALABLE NETWORK SWITCH



(57) Abstract: In a massively parallel computing system having a plurality of nodes configured in m multi-dimensions, each node including a computing device, a method for routing packets towards their destination nodes is provided which includes generating at least one of a 2m plurality of compact bit vectors (115, 154) containing information derived from downstream nodes. A multilevel arbitration process (116, 155) in which downstream information stored in the compact vectors, such as link status information and fullness of downstream buffers (130, 140), is used to determine a preferred direction and virtual channel for packet transmission. Preferred direction ranges are encoded and virtual channels are selected by examining the plurality of compact bit vectors (115, 154). This dynamic routing method eliminates the necessity of routing tables, thus enhancing scalability of the switch.



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