A Framework of Cycle-based Clustering on the Crossed Cube Architecture

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ABSTRACT

For large-scale networking environments, grouping network nodes into clusters is a key technique to achieve the scalability objective. This paper addresses cycle-based node clustering in the crossed cube architecture. Let \( r \) be a positive integer. For any \( r \) distinct vertices \( v_1, \ldots, v_r \) of a network \( G = (V,E) \), \( G \) is said to be spanning \((v_1, \ldots, v_r)\)-cyclable if there exists a set of \( r \) vertex-disjoint cycles \( C_1, \ldots, C_r \) in \( G \) such that \( \min\{|C_1|, \ldots, |C_r|\} \geq 4 \), \( \sum_{i=1}^r |C_i| = |V| \), and \( v_i \in V(C_i) \) for \( 1 \leq i \leq r \), where \( |C_i| \) denotes the length of cycle \( C_i \), \( |V| \) is the total number of vertices in \( G \), and \( V(C_i) \) denotes the set of vertices traversed by \( C_i \). Then, \( C_1, \ldots, C_r \) form a collect

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REFERENCES