

# 3-arc Transitive Graphs and Abstract 4-polytopes

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**Abstract** Abstract: When restricted to the rank 1 and rank 2 faces, the Hasse diagram of a regular abstract 4-polytope provides a bipartite graph with a high degree of symmetry. Focusing on the case of the self-dual polytopes of type  $3,q,3$ , I will show that the graphs obtained are 3-arc transitive cubic graphs. Also, given any 3-arc transitive cubic graph, I will discuss when it is possible to consider that graph as the medial layer graph of an underlying abstract 4-polytope.