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Revisiting the Core of Papadimitriou's Multi-Flow Game

Papadimitriou introduced a co-operative game which models interactions between autonomous systems in the Internet. While the game is known to have a non-empty core, in the non-transferable utility version the only algorithmic work is due to Yamada and Karasawa who study the case of a path. Their analysis is based on a left-to-right or right-to-left scan which produces two core vectors. We give a generalized algorithm that produces a larger set of core elements, which allows us to explore social trade-offs between different core strategies. Half of our analysis is based on a duality argument which extends to general networks.