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The online $k$-server problem with max-distance objective.


Summary: This paper studies the online $k$-server problem with max-distance objective, i.e. minimizing the maximum distance moved among all the servers. For this objective, we prove that no deterministic online algorithm has a competitive ratio better than $k$. We also analyze several classical algorithms for two special cases and show that some algorithms do have a competitive ratio of $k$ and hence optimal. Consequently, we conjecture that any metric space allows for a deterministic $k$-competitive $k$-server algorithm with max-distance objective.

Keywords: deterministic online algorithms; $k$-server; maximum distance